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Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Trichloroethene	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	7	
Minimum	0.0065	
Maximum	0.035	
Mean	0.014944	
Standard Deviation	0.009238	
Variance	8.53E-05	
Coefficient of Variation	0.618155	
Skewness	1.47962	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.825368	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.020671	
Gamma Statistics		
k hat	3.524069	
k star (bias corrected)	2.423453	
Theta hat	0.004241	
Theta star	0.006167	
nu hat	63.43324	
nu star	43.62216	
5% Approximate Chi Square Value	29.47386	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	27.04313	
Anderson-Darling Test Statistic	0.468688	
Anderson-Darling 5% Critical Value	0.725836	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.254535	
Kolmogrov-Smirnov 5% Critical Value	0.280863	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.022118	
95% Adjusted Gamma UCL	0.024106	
Lognormal Statistics		
Minimum of log data	-5.035953	
Maximum of log data	-3.352407	
Mean of log data	-4.351955	
Standard Deviation of log data	0.566245	
Variance of log data	0.320633	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.915734	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.015121	
MLE Standard Deviation	0.009297	
MLE Coefficient of Variation	0.614817	
MLE Skewness	2.076852	
MLE Median	0.012882	
MLE 80% Quantile	0.020786	
MLE 90% Quantile	0.026667	
MLE 95% Quantile	0.032697	
MLE 99% Quantile	0.048081	
MVU Estimate of Median	0.012654	
MVU Estimate of Mean	0.014825	
MVU Estimate of Standard Deviation	0.008566	
MVU Estimate of SE of Mean	0.002847	
95% H-UCL	0.024502	
95% Chebyshev (MVUE) UCL	0.027237	
97.5% Chebyshev (MVUE) UCL	0.032607	
99% Chebyshev (MVUE) UCL	0.043156	
Non-parametric Statisitics		
95% CLT UCL	0.020009	
95% Adjusted-CLT UCL	0.021632	
95% Modified-t UCL	0.020924	
95% Jackknife UCL	0.020671	
95% Chebyshev (Mean, Sd) UCL	0.028367	
97.5% Chebyshev (Mean, Sd) UCL	0.034175	
99% Chebyshev (Mean, Sd) UCL	0.045583	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.019665	
95% Bootstrap-t UCL	0.025801	
95% Hall's Bootstrap UCL	0.05286	
95% Percentile Bootstrap UCL	0.020056	
95% BCA Bootstrap UCL	0.019222	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.022118	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Benzo(a)anthracene	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.415	
Maximum	9.6	
Mean	3.8405	
Standard Deviation	3.014814	
Variance	9.089103	
Coefficient of Variation	0.785006	
Skewness	0.7186	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.920246	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	5.588131	
Gamma Statistics		
k hat	1.477786	
k star (bias corrected)	1.101117	
Theta hat	2.598819	
Theta star	3.487821	
nu hat	29.55573	
nu star	22.02234	
5% Approximate Chi Square Value	12.35343	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	11.11402	
Anderson-Darling Test Statistic	0.231606	
Anderson-Darling 5% Critical Value	0.739632	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.144873	
Kolmogrov-Smirnov 5% Critical Value	0.271237	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6.846423	
95% Adjusted Gamma UCL	7.609924	
Lognormal Statistics		
Minimum of log data	-0.879477	
Maximum of log data	2.261763	
Mean of log data	0.970575	
Standard Deviation of log data	1.016519	
Variance of log data	1.033311	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.942608	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	4.424824	
MLE Standard Deviation	5.953579	
MLE Coefficient of Variation	1.345495	
MLE Skewness	6.472311	
MLE Median	2.639461	
MLE 80% Quantile	6.23098	
MLE 90% Quantile	9.745466	
MLE 95% Quantile	14.05178	
MLE 99% Quantile	28.07835	
MVU Estimate of Median	2.50594	
MVU Estimate of Mean	4.127139	
MVU Estimate of Standard Deviation	4.513589	
MVU Estimate of SE of Mean	1.392114	
95% H-UCL	12.80904	
95% Chebyshev (MVUE) UCL	10.19522	
97.5% Chebyshev (MVUE) UCL	12.82089	
99% Chebyshev (MVUE) UCL	17.9785	
Non-parametric Statisitics		
95% CLT UCL	5.408651	
95% Adjusted-CLT UCL	5.640138	
95% Modified-t UCL	5.624238	
95% Jackknife UCL	5.588131	
95% Chebyshev (Mean, Sd) UCL	7.996134	
97.5% Chebyshev (Mean, Sd) UCL	9.79428	
99% Chebyshev (Mean, Sd) UCL	13.32639	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	5.315161	
95% Bootstrap-t UCL	6.110952	
95% Hall's Bootstrap UCL	5.646294	
95% Percentile Bootstrap UCL	5.439	
95% BCA Bootstrap UCL	5.043	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	5.588131	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Benzo(a)pyrene	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.49	
Maximum	10	
Mean	3.768	
Standard Deviation	3.068911	
Variance	9.418218	
Coefficient of Variation	0.814467	
Skewness	0.862519	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904948	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	5.54699	
Gamma Statistics		
k hat	1.438398	
k star (bias corrected)	1.073545	
Theta hat	2.619581	
Theta star	3.509866	
nu hat	28.76796	
nu star	21.4709	
5% Approximate Chi Square Value	11.9409	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	10.72511	
Anderson-Darling Test Statistic	0.285313	
Anderson-Darling 5% Critical Value	0.740344	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.182508	
Kolmogrov-Smirnov 5% Critical Value	0.271444	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6.775235	
95% Adjusted Gamma UCL	7.543264	
Lognormal Statistics		
Minimum of log data	-0.71335	
Maximum of log data	2.302585	
Mean of log data	0.940289	
Standard Deviation of log data	1.013103	
Variance of log data	1.026377	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.935969	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	4.277966	
MLE Standard Deviation	5.725027	
MLE Coefficient of Variation	1.338259	
MLE Skewness	6.411515	
MLE Median	2.560721	
MLE 80% Quantile	6.027673	
MLE 90% Quantile	9.413325	
MLE 95% Quantile	13.55619	
MLE 99% Quantile	27.02511	
MVU Estimate of Median	2.432035	
MVU Estimate of Mean	3.992465	
MVU Estimate of Standard Deviation	4.349763	
MVU Estimate of SE of Mean	1.341963	
95% H-UCL	12.31046	
95% Chebyshev (MVUE) UCL	9.841947	
97.5% Chebyshev (MVUE) UCL	12.37302	
99% Chebyshev (MVUE) UCL	17.34483	
Non-parametric Statisitics		
95% CLT UCL	5.364289	
95% Adjusted-CLT UCL	5.647125	
95% Modified-t UCL	5.591107	
95% Jackknife UCL	5.54699	
95% Chebyshev (Mean, Sd) UCL	7.998203	
97.5% Chebyshev (Mean, Sd) UCL	9.828615	
99% Chebyshev (Mean, Sd) UCL	13.4241	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	5.255347	
95% Bootstrap-t UCL	5.958948	
95% Hall's Bootstrap UCL	5.786261	
95% Percentile Bootstrap UCL	5.258	
95% BCA Bootstrap UCL	5.059	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	5.54699	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Benzo(b)fluoranthene	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.555	
Maximum	16	
Mean	6.5955	
Standard Deviation	5.075889	
Variance	25.76465	
Coefficient of Variation	0.769599	
Skewness	0.634385	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.938628	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	9.537897	
Gamma Statistics		
k hat	1.425861	
k star (bias corrected)	1.06477	
Theta hat	4.625625	
Theta star	6.194297	
nu hat	28.51723	
nu star	21.29539	
5% Approximate Chi Square Value	11.80997	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	10.60178	
Anderson-Darling Test Statistic	0.207508	
Anderson-Darling 5% Critical Value	0.74057	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.126027	
Kolmogrov-Smirnov 5% Critical Value	0.27151	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	11.89281	
95% Adjusted Gamma UCL	13.24814	
Lognormal Statistics		
Minimum of log data	-0.588787	
Maximum of log data	2.772589	
Mean of log data	1.496418	
Standard Deviation of log data	1.06699	
Variance of log data	1.138468	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.93148	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	7.890444	
MLE Standard Deviation	11.49403	
MLE Coefficient of Variation	1.456702	
MLE Skewness	7.461201	
MLE Median	4.465667	
MLE 80% Quantile	11.00143	
MLE 90% Quantile	17.59299	
MLE 95% Quantile	25.83208	
MLE 99% Quantile	53.42279	
MVU Estimate of Median	4.217308	
MVU Estimate of Mean	7.294246	
MVU Estimate of Standard Deviation	8.427327	
MVU Estimate of SE of Mean	2.587844	
95% H-UCL	24.99533	
95% Chebyshev (MVUE) UCL	18.5744	
97.5% Chebyshev (MVUE) UCL	23.45533	
99% Chebyshev (MVUE) UCL	33.04297	
Non-parametric Statisitics		
95% CLT UCL	9.235715	
95% Adjusted-CLT UCL	9.579784	
95% Modified-t UCL	9.591565	
95% Jackknife UCL	9.537897	
95% Chebyshev (Mean, Sd) UCL	13.59213	
97.5% Chebyshev (Mean, Sd) UCL	16.61958	
99% Chebyshev (Mean, Sd) UCL	22.56641	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	9.098238	
95% Bootstrap-t UCL	9.934421	
95% Hall's Bootstrap UCL	9.623129	
95% Percentile Bootstrap UCL	9.1055	
95% BCA Bootstrap UCL	8.5655	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	9.537897	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Benzo(k)fluoranthene	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.48	
Maximum	14	
Mean	4.988	
Standard Deviation	4.594066	
Variance	21.10544	
Coefficient of Variation	0.921024	
Skewness	1.239716	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.829195	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	7.651093	
Gamma Statistics		
k hat	1.339874	
k star (bias corrected)	1.004578	
Theta hat	3.722739	
Theta star	4.965268	
nu hat	26.79747	
nu star	20.09156	
5% Approximate Chi Square Value	10.91717	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	9.761811	
Anderson-Darling Test Statistic	0.329275	
Anderson-Darling 5% Critical Value	0.742125	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.187578	
Kolmogrov-Smirnov 5% Critical Value	0.271962	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	9.179734	
95% Adjusted Gamma UCL	10.2662	
Lognormal Statistics		
Minimum of log data	-0.733969	
Maximum of log data	2.639057	
Mean of log data	1.189568	
Standard Deviation of log data	1.025549	
Variance of log data	1.051751	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.953	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	5.559137	
MLE Standard Deviation	7.587069	
MLE Coefficient of Variation	1.364793	
MLE Skewness	6.63652	
MLE Median	3.28566	
MLE 80% Quantile	7.815871	
MLE 90% Quantile	12.27295	
MLE 95% Quantile	17.75373	
MLE 99% Quantile	35.69443	
MVU Estimate of Median	3.116548	
MVU Estimate of Mean	5.177152	
MVU Estimate of Standard Deviation	5.71872	
MVU Estimate of SE of Mean	1.762483	
95% H-UCL	16.34918	
95% Chebyshev (MVUE) UCL	12.85964	
97.5% Chebyshev (MVUE) UCL	16.18385	
99% Chebyshev (MVUE) UCL	22.71363	
Non-parametric Statisitics		
95% CLT UCL	7.377596	
95% Adjusted-CLT UCL	7.986151	
95% Modified-t UCL	7.746016	
95% Jackknife UCL	7.651093	
95% Chebyshev (Mean, Sd) UCL	11.32048	
97.5% Chebyshev (Mean, Sd) UCL	14.06055	
99% Chebyshev (Mean, Sd) UCL	19.44289	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	7.238885	
95% Bootstrap-t UCL	9.987966	
95% Hall's Bootstrap UCL	20.60845	
95% Percentile Bootstrap UCL	7.33	
95% BCA Bootstrap UCL	8.59	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	9.179734	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Dibenz(a,h)anthracene	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.082	
Maximum	2	
Mean	0.5522	
Standard Deviation	0.637541	
Variance	0.406458	
Coefficient of Variation	1.154547	
Skewness	1.772034	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.728007	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.92177	
Gamma Statistics		
k hat	1.117128	
k star (bias corrected)	0.848656	
Theta hat	0.494303	
Theta star	0.650676	
nu hat	22.34256	
nu star	16.97313	
5% Approximate Chi Square Value	8.65171	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	7.640721	
Anderson-Darling Test Statistic	0.566352	
Anderson-Darling 5% Critical Value	0.746152	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.229526	
Kolmogrov-Smirnov 5% Critical Value	0.273134	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.083319	
95% Adjusted Gamma UCL	1.226659	
Lognormal Statistics		
Minimum of log data	-2.501036	
Maximum of log data	0.693147	
Mean of log data	-1.104081	
Standard Deviation of log data	1.037323	
Variance of log data	1.076038	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.939416	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.567757	
MLE Standard Deviation	0.789373	
MLE Coefficient of Variation	1.390337	
MLE Skewness	6.85858	
MLE Median	0.331515	
MLE 80% Quantile	0.796488	
MLE 90% Quantile	1.257189	
MLE 95% Quantile	1.826341	
MLE 99% Quantile	3.701475	
MVU Estimate of Median	0.314067	
MVU Estimate of Mean	0.527664	
MVU Estimate of Standard Deviation	0.590434	
MVU Estimate of SE of Mean	0.181787	
95% H-UCL	1.704878	
95% Chebyshev (MVUE) UCL	1.320053	
97.5% Chebyshev (MVUE) UCL	1.662921	
99% Chebyshev (MVUE) UCL	2.336418	
Non-parametric Statisitics		
95% CLT UCL	0.883816	
95% Adjusted-CLT UCL	1.004531	
95% Modified-t UCL	0.9406	
95% Jackknife UCL	0.92177	
95% Chebyshev (Mean, Sd) UCL	1.430989	
97.5% Chebyshev (Mean, Sd) UCL	1.811242	
99% Chebyshev (Mean, Sd) UCL	2.558176	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.870166	
95% Bootstrap-t UCL	1.774921	
95% Hall's Bootstrap UCL	2.906168	
95% Percentile Bootstrap UCL	0.8812	
95% BCA Bootstrap UCL	0.847	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	1.083319	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Indeno(1,2,3-cd)pyrene	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.22	
Maximum	6.9	
Mean	1.8665	
Standard Deviation	2.177573	
Variance	4.741823	
Coefficient of Variation	1.166661	
Skewness	1.672949	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.777628	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	3.128798	
Gamma Statistics		
k hat	0.968957	
k star (bias corrected)	0.744937	
Theta hat	1.926298	
Theta star	2.505582	
nu hat	19.37914	
nu star	14.89873	
5% Approximate Chi Square Value	7.189977	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	6.282077	
Anderson-Darling Test Statistic	0.406282	
Anderson-Darling 5% Critical Value	0.74935	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.211434	
Kolmogrov-Smirnov 5% Critical Value	0.274027	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	3.867674	
95% Adjusted Gamma UCL	4.426639	
Lognormal Statistics		
Minimum of log data	-1.514128	
Maximum of log data	1.931521	
Mean of log data	0.026129	
Standard Deviation of log data	1.164176	
Variance of log data	1.355305	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.952138	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	2.021382	
MLE Standard Deviation	3.429175	
MLE Coefficient of Variation	1.69645	
MLE Skewness	9.971641	
MLE Median	1.026473	
MLE 80% Quantile	2.74521	
MLE 90% Quantile	4.581813	
MLE 95% Quantile	6.967093	
MLE 99% Quantile	15.39437	
MVU Estimate of Median	0.958813	
MVU Estimate of Mean	1.832832	
MVU Estimate of Standard Deviation	2.340187	
MVU Estimate of SE of Mean	0.71169	
95% H-UCL	7.709303	
95% Chebyshev (MVUE) UCL	4.935016	
97.5% Chebyshev (MVUE) UCL	6.277333	
99% Chebyshev (MVUE) UCL	8.914055	
Non-parametric Statisitics		
95% CLT UCL	2.999161	
95% Adjusted-CLT UCL	3.388417	
95% Modified-t UCL	3.189514	
95% Jackknife UCL	3.128798	
95% Chebyshev (Mean, Sd) UCL	4.868077	
97.5% Chebyshev (Mean, Sd) UCL	6.166861	
99% Chebyshev (Mean, Sd) UCL	8.718072	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.947661	
95% Bootstrap-t UCL	4.182932	
95% Hall's Bootstrap UCL	7.393811	
95% Percentile Bootstrap UCL	3.0255	
95% BCA Bootstrap UCL	2.82	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	3.867674	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Phenanthrene	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.4	
Maximum	12	
Mean	3.72	
Standard Deviation	3.488648	
Variance	12.17067	
Coefficient of Variation	0.937809	
Skewness	1.630821	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.840763	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	5.742304	
Gamma Statistics		
k hat	1.347827	
k star (bias corrected)	1.010145	
Theta hat	2.759999	
Theta star	3.682638	
nu hat	26.95653	
nu star	20.20291	
5% Approximate Chi Square Value	10.99936	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	9.839047	
Anderson-Darling Test Statistic	0.163033	
Anderson-Darling 5% Critical Value	0.741981	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.123613	
Kolmogrov-Smirnov 5% Critical Value	0.27192	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6.832657	
95% Adjusted Gamma UCL	7.638424	
Lognormal Statistics		
Minimum of log data	-0.916291	
Maximum of log data	2.484907	
Mean of log data	0.898959	
Standard Deviation of log data	1.022061	
Variance of log data	1.044609	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.984078	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	4.142349	
MLE Standard Deviation	5.622444	
MLE Coefficient of Variation	1.357308	
MLE Skewness	6.572475	
MLE Median	2.457043	
MLE 80% Quantile	5.82757	
MLE 90% Quantile	9.13677	
MLE 95% Quantile	13.20042	
MLE 99% Quantile	26.47689	
MVU Estimate of Median	2.33142	
MVU Estimate of Mean	3.860024	
MVU Estimate of Standard Deviation	4.247439	
MVU Estimate of SE of Mean	1.309424	
95% H-UCL	12.10808	
95% Chebyshev (MVUE) UCL	9.567668	
97.5% Chebyshev (MVUE) UCL	12.03737	
99% Chebyshev (MVUE) UCL	16.88862	
Non-parametric Statisitics		
95% CLT UCL	5.534615	
95% Adjusted-CLT UCL	6.142531	
95% Modified-t UCL	5.837126	
95% Jackknife UCL	5.742304	
95% Chebyshev (Mean, Sd) UCL	8.52877	
97.5% Chebyshev (Mean, Sd) UCL	10.60953	
99% Chebyshev (Mean, Sd) UCL	14.69678	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	5.459205	
95% Bootstrap-t UCL	7.126007	
95% Hall's Bootstrap UCL	12.75188	
95% Percentile Bootstrap UCL	5.62	
95% BCA Bootstrap UCL	5.18	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	6.832657	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Aroclor 1260	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	0.021	
Maximum	0.105	
Mean	0.050722	
Standard Deviation	0.025187	
Variance	0.000634	
Coefficient of Variation	0.496566	
Skewness	1.328185	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.861764	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.066334	
Gamma Statistics		
k hat	5.093569	
k star (bias corrected)	3.469787	
Theta hat	0.009958	
Theta star	0.014618	
nu hat	91.68424	
nu star	62.45616	
5% Approximate Chi Square Value	45.27449	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	42.20613	
Anderson-Darling Test Statistic	0.453138	
Anderson-Darling 5% Critical Value	0.722741	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.231521	
Kolmogrov-Smirnov 5% Critical Value	0.27983	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.069971	
95% Adjusted Gamma UCL	0.075058	
Lognormal Statistics		
Minimum of log data	-3.863233	
Maximum of log data	-2.253795	
Mean of log data	-3.082754	
Standard Deviation of log data	0.476586	
Variance of log data	0.227135	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.937756	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.051345	
MLE Standard Deviation	0.025928	
MLE Coefficient of Variation	0.504974	
MLE Skewness	1.64369	
MLE Median	0.045833	
MLE 80% Quantile	0.068561	
MLE 90% Quantile	0.084556	
MLE 95% Quantile	0.100382	
MLE 99% Quantile	0.13887	
MVU Estimate of Median	0.045257	
MVU Estimate of Mean	0.050651	
MVU Estimate of Standard Deviation	0.024493	
MVU Estimate of SE of Mean	0.008152	
95% H-UCL	0.075205	
95% Chebyshev (MVUE) UCL	0.086186	
97.5% Chebyshev (MVUE) UCL	0.101563	
99% Chebyshev (MVUE) UCL	0.131766	
Non-parametric Statisitics		
95% CLT UCL	0.064532	
95% Adjusted-CLT UCL	0.068503	
95% Modified-t UCL	0.066954	
95% Jackknife UCL	0.066334	
95% Chebyshev (Mean, Sd) UCL	0.087318	
97.5% Chebyshev (Mean, Sd) UCL	0.103153	
99% Chebyshev (Mean, Sd) UCL	0.134258	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.063778	
95% Bootstrap-t UCL	0.080043	
95% Hall's Bootstrap UCL	0.165262	
95% Percentile Bootstrap UCL	0.064333	
95% BCA Bootstrap UCL	0.072167	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.066334	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	0.72	
Maximum	3.1	
Mean	1.8655	
Standard Deviation	0.79664	
Variance	0.634636	
Coefficient of Variation	0.427039	
Skewness	0.06261	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.964185	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.327297	
Gamma Statistics		
k hat	5.374324	
k star (bias corrected)	3.828693	
Theta hat	0.347113	
Theta star	0.487242	
nu hat	107.4865	
nu star	76.57387	
5% Approximate Chi Square Value	57.41341	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	54.53864	
Anderson-Darling Test Statistic	0.243907	
Anderson-Darling 5% Critical Value	0.729121	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.174079	
Kolmogrov-Smirnov 5% Critical Value	0.26737	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.488069	
95% Adjusted Gamma UCL	2.619217	
Lognormal Statistics		
Minimum of log data	-0.328504	
Maximum of log data	1.131402	
Mean of log data	0.527619	
Standard Deviation of log data	0.482976	
Variance of log data	0.233266	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.944267	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.904561	
MLE Standard Deviation	0.976201	
MLE Coefficient of Variation	0.512559	
MLE Skewness	1.672337	
MLE Median	1.694892	
MLE 80% Quantile	2.549083	
MLE 90% Quantile	3.152649	
MLE 95% Quantile	3.751345	
MLE 99% Quantile	5.2123	
MVU Estimate of Median	1.675218	
MVU Estimate of Mean	1.880632	
MVU Estimate of Standard Deviation	0.925167	
MVU Estimate of SE of Mean	0.292072	
95% H-UCL	2.712438	
95% Chebyshev (MVUE) UCL	3.153746	
97.5% Chebyshev (MVUE) UCL	3.704623	
99% Chebyshev (MVUE) UCL	4.786715	
Non-parametric Statisitics		
95% CLT UCL	2.279871	
95% Adjusted-CLT UCL	2.285201	
95% Modified-t UCL	2.328129	
95% Jackknife UCL	2.327297	
95% Chebyshev (Mean, Sd) UCL	2.963593	
97.5% Chebyshev (Mean, Sd) UCL	3.438739	
99% Chebyshev (Mean, Sd) UCL	4.37207	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.27385	
95% Bootstrap-t UCL	2.33202	
95% Hall's Bootstrap UCL	2.266379	
95% Percentile Bootstrap UCL	2.27	
95% BCA Bootstrap UCL	2.18	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.327297	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	10.3	
Maximum	129	
Mean	57.015	
Standard Deviation	39.53137	
Variance	1562.729	
Coefficient of Variation	0.69335	
Skewness	0.578315	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.92503	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	79.93059	
Gamma Statistics		
k hat	2.043677	
k star (bias corrected)	1.49724	
Theta hat	27.89825	
Theta star	38.08006	
nu hat	40.87354	
nu star	29.94481	
5% Approximate Chi Square Value	18.44742	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	16.89556	
Anderson-Darling Test Statistic	0.280279	
Anderson-Darling 5% Critical Value	0.735431	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.185567	
Kolmogrov-Smirnov 5% Critical Value	0.269751	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	92.54969	
95% Adjusted Gamma UCL	101.0504	
Lognormal Statistics		
Minimum of log data	2.332144	
Maximum of log data	4.859812	
Mean of log data	3.779138	
Standard Deviation of log data	0.81789	
Variance of log data	0.668945	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.950254	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	61.16716	
MLE Standard Deviation	59.68661	
MLE Coefficient of Variation	0.975795	
MLE Skewness	3.856513	
MLE Median	43.77829	
MLE 80% Quantile	87.37904	
MLE 90% Quantile	125.2269	
MLE 95% Quantile	168.1015	
MLE 99% Quantile	293.4041	
MVU Estimate of Median	42.33391	
MVU Estimate of Mean	58.69752	
MVU Estimate of Standard Deviation	50.44906	
MVU Estimate of SE of Mean	15.76652	
95% H-UCL	129.2208	
95% Chebyshev (MVUE) UCL	127.4222	
97.5% Chebyshev (MVUE) UCL	157.1594	
99% Chebyshev (MVUE) UCL	215.5724	
Non-parametric Statisitics		
95% CLT UCL	77.57718	
95% Adjusted-CLT UCL	80.01997	
95% Modified-t UCL	80.31162	
95% Jackknife UCL	79.93059	
95% Chebyshev (Mean, Sd) UCL	111.5052	
97.5% Chebyshev (Mean, Sd) UCL	135.0832	
99% Chebyshev (Mean, Sd) UCL	181.3975	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	76.41596	
95% Bootstrap-t UCL	83.70659	
95% Hall's Bootstrap UCL	78.22122	
95% Percentile Bootstrap UCL	77.235	
95% BCA Bootstrap UCL	72.95	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	79.93059	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Barium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	21.35	
Maximum	118	
Mean	63.645	
Standard Deviation	35.95323	
Variance	1292.635	
Coefficient of Variation	0.564903	
Skewness	0.215475	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.911185	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	84.48641	
Gamma Statistics		
k hat	3.070423	
k star (bias corrected)	2.215963	
Theta hat	20.72842	
Theta star	28.72115	
nu hat	61.40846	
nu star	44.31925	
5% Approximate Chi Square Value	30.04804	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	28.01902	
Anderson-Darling Test Statistic	0.408142	
Anderson-Darling 5% Critical Value	0.731984	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.179617	
Kolmogrov-Smirnov 5% Critical Value	0.268406	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	93.87296	
95% Adjusted Gamma UCL	100.6709	
Lognormal Statistics		
Minimum of log data	3.061052	
Maximum of log data	4.770685	
Mean of log data	3.981727	
Standard Deviation of log data	0.646626	
Variance of log data	0.418125	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904501	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	66.07492	
MLE Standard Deviation	47.60652	
MLE Coefficient of Variation	0.720493	
MLE Skewness	2.535494	
MLE Median	53.60953	
MLE 80% Quantile	92.58485	
MLE 90% Quantile	123.0562	
MLE 95% Quantile	155.3105	
MLE 99% Quantile	241.2366	
MVU Estimate of Median	52.49829	
MVU Estimate of Mean	64.5076	
MVU Estimate of Standard Deviation	43.07274	
MVU Estimate of SE of Mean	13.55242	
95% H-UCL	111.8597	
95% Chebyshev (MVUE) UCL	123.5812	
97.5% Chebyshev (MVUE) UCL	149.1424	
99% Chebyshev (MVUE) UCL	199.3525	
Non-parametric Statisitics		
95% CLT UCL	82.34601	
95% Adjusted-CLT UCL	83.17379	
95% Modified-t UCL	84.61553	
95% Jackknife UCL	84.48641	
95% Chebyshev (Mean, Sd) UCL	113.2031	
97.5% Chebyshev (Mean, Sd) UCL	134.6469	
99% Chebyshev (Mean, Sd) UCL	176.7692	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	81.73928	
95% Bootstrap-t UCL	86.54571	
95% Hall's Bootstrap UCL	80.3345	
95% Percentile Bootstrap UCL	81.36	
95% BCA Bootstrap UCL	78.975	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	84.48641	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.23	
Maximum	10.3	
Mean	3.2675	
Standard Deviation	3.172422	
Variance	10.06426	
Coefficient of Variation	0.970902	
Skewness	1.282948	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.8573	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	5.106493	
Gamma Statistics		
k hat	1.1022	
k star (bias corrected)	0.838207	
Theta hat	2.964525	
Theta star	3.898203	
nu hat	22.044	
nu star	16.76414	
5% Approximate Chi Square Value	8.502642	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	7.50176	
Anderson-Darling Test Statistic	0.278423	
Anderson-Darling 5% Critical Value	0.746422	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.202474	
Kolmogrov-Smirnov 5% Critical Value	0.273212	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6.442328	
95% Adjusted Gamma UCL	7.301861	
Lognormal Statistics		
Minimum of log data	-1.469676	
Maximum of log data	2.332144	
Mean of log data	0.666111	
Standard Deviation of log data	1.176268	
Variance of log data	1.383606	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.958379	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	3.888073	
MLE Standard Deviation	6.722274	
MLE Coefficient of Variation	1.728947	
MLE Skewness	10.35511	
MLE Median	1.946652	
MLE 80% Quantile	5.259611	
MLE 90% Quantile	8.825231	
MLE 95% Quantile	13.47817	
MLE 99% Quantile	30.02737	
MVU Estimate of Median	1.815733	
MVU Estimate of Mean	3.516183	
MVU Estimate of Standard Deviation	4.543539	
MVU Estimate of SE of Mean	1.37994	
95% H-UCL	15.19236	
95% Chebyshev (MVUE) UCL	9.531203	
97.5% Chebyshev (MVUE) UCL	12.13391	
99% Chebyshev (MVUE) UCL	17.24641	
Non-parametric Statisitics		
95% CLT UCL	4.91763	
95% Adjusted-CLT UCL	5.352521	
95% Modified-t UCL	5.174328	
95% Jackknife UCL	5.106493	
95% Chebyshev (Mean, Sd) UCL	7.640382	
97.5% Chebyshev (Mean, Sd) UCL	9.532532	
99% Chebyshev (Mean, Sd) UCL	13.24929	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	4.82141	
95% Bootstrap-t UCL	6.086575	
95% Hall's Bootstrap UCL	5.625773	
95% Percentile Bootstrap UCL	4.8945	
95% BCA Bootstrap UCL	4.689	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	5.106493	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	31.9	
Maximum	442	
Mean	177.26	
Standard Deviation	122.402	
Variance	14982.26	
Coefficient of Variation	0.690523	
Skewness	1.048459	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.922595	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	248.2142	
Gamma Statistics		
k hat	2.212312	
k star (bias corrected)	1.615285	
Theta hat	80.12431	
Theta star	109.7391	
nu hat	44.24624	
nu star	32.3057	
5% Approximate Chi Square Value	20.31251	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	18.67558	
Anderson-Darling Test Statistic	0.184649	
Anderson-Darling 5% Critical Value	0.734858	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.145053	
Kolmogrov-Smirnov 5% Critical Value	0.269521	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	281.9203	
95% Adjusted Gamma UCL	306.6308	
Lognormal Statistics		
Minimum of log data	3.462606	
Maximum of log data	6.09131	
Mean of log data	4.934903	
Standard Deviation of log data	0.782465	
Variance of log data	0.612252	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.967841	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	188.8643	
MLE Standard Deviation	173.5683	
MLE Coefficient of Variation	0.919011	
MLE Skewness	3.533212	
MLE Median	139.0596	
MLE 80% Quantile	269.37	
MLE 90% Quantile	380.0758	
MLE 95% Quantile	503.739	
MLE 99% Quantile	858.2687	
MVU Estimate of Median	134.8556	
MVU Estimate of Mean	181.9769	
MVU Estimate of Standard Deviation	149.0547	
MVU Estimate of SE of Mean	46.66318	
95% H-UCL	379.7265	
95% Chebyshev (MVUE) UCL	385.377	
97.5% Chebyshev (MVUE) UCL	473.3884	
99% Chebyshev (MVUE) UCL	646.2697	
Non-parametric Statisitics		
95% CLT UCL	240.9272	
95% Adjusted-CLT UCL	254.6398	
95% Modified-t UCL	250.353	
95% Jackknife UCL	248.2142	
95% Chebyshev (Mean, Sd) UCL	345.9796	
97.5% Chebyshev (Mean, Sd) UCL	418.9847	
99% Chebyshev (Mean, Sd) UCL	562.389	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	237.5752	
95% Bootstrap-t UCL	268.6843	
95% Hall's Bootstrap UCL	283.5913	
95% Percentile Bootstrap UCL	239.06	
95% BCA Bootstrap UCL	227.05	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	248.2142	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	23.4	
Maximum	380	
Mean	164.74	
Standard Deviation	119.8793	
Variance	14371.04	
Coefficient of Variation	0.727688	
Skewness	0.621117	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.930434	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	234.2318	
Gamma Statistics		
k hat	1.810354	
k star (bias corrected)	1.333914	
Theta hat	90.99878	
Theta star	123.5012	
nu hat	36.20708	
nu star	26.67829	
5% Approximate Chi Square Value	15.90082	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	14.47224	
Anderson-Darling Test Statistic	0.18619	
Anderson-Darling 5% Critical Value	0.736964	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.124318	
Kolmogrov-Smirnov 5% Critical Value	0.270307	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	276.3996	
95% Adjusted Gamma UCL	303.6835	
Lognormal Statistics		
Minimum of log data	3.152736	
Maximum of log data	5.940171	
Mean of log data	4.80344	
Standard Deviation of log data	0.887404	
Variance of log data	0.787486	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.959936	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	180.7624	
MLE Standard Deviation	197.839	
MLE Coefficient of Variation	1.09447	
MLE Skewness	4.594438	
MLE Median	121.9292	
MLE 80% Quantile	258.087	
MLE 90% Quantile	381.3642	
MLE 95% Quantile	524.9066	
MLE 99% Quantile	960.5851	
MVU Estimate of Median	117.2049	
MVU Estimate of Mean	171.9414	
MVU Estimate of Standard Deviation	161.6084	
MVU Estimate of SE of Mean	50.30942	
95% H-UCL	423.3578	
95% Chebyshev (MVUE) UCL	391.2351	
97.5% Chebyshev (MVUE) UCL	486.1236	
99% Chebyshev (MVUE) UCL	672.5138	
Non-parametric Statisitics		
95% CLT UCL	227.095	
95% Adjusted-CLT UCL	235.0511	
95% Modified-t UCL	235.4727	
95% Jackknife UCL	234.2318	
95% Chebyshev (Mean, Sd) UCL	329.9822	
97.5% Chebyshev (Mean, Sd) UCL	401.4826	
99% Chebyshev (Mean, Sd) UCL	541.9313	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	225.5312	
95% Bootstrap-t UCL	246.1973	
95% Hall's Bootstrap UCL	229.9397	
95% Percentile Bootstrap UCL	226.11	
95% BCA Bootstrap UCL	213.47	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	234.2318	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	41.2	
Maximum	480	
Mean	250.59	
Standard Deviation	163.967	
Variance	26885.16	
Coefficient of Variation	0.654324	
Skewness	0.286651	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.912073	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	345.6386	
Gamma Statistics		
k hat	2.106734	
k star (bias corrected)	1.541381	
Theta hat	118.9471	
Theta star	162.575	
nu hat	42.13469	
nu star	30.82761	
5% Approximate Chi Square Value	19.14259	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	17.55855	
Anderson-Darling Test Statistic	0.284895	
Anderson-Darling 5% Critical Value	0.735217	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.137354	
Kolmogrov-Smirnov 5% Critical Value	0.269665	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	403.5552	
95% Adjusted Gamma UCL	439.9619	
Lognormal Statistics		
Minimum of log data	3.718438	
Maximum of log data	6.173786	
Mean of log data	5.268094	
Standard Deviation of log data	0.822671	
Variance of log data	0.676787	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.929425	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	272.1865	
MLE Standard Deviation	267.7334	
MLE Coefficient of Variation	0.98364	
MLE Skewness	3.902636	
MLE Median	194.0457	
MLE 80% Quantile	388.8721	
MLE 90% Quantile	558.4839	
MLE 95% Quantile	750.9862	
MLE 99% Quantile	1315.045	
MVU Estimate of Median	187.5695	
MVU Estimate of Mean	261.048	
MVU Estimate of Standard Deviation	225.7951	
MVU Estimate of SE of Mean	70.54896	
95% H-UCL	578.96	
95% Chebyshev (MVUE) UCL	568.5638	
97.5% Chebyshev (MVUE) UCL	701.6262	
99% Chebyshev (MVUE) UCL	963.0013	
Non-parametric Statisitics		
95% CLT UCL	335.8771	
95% Adjusted-CLT UCL	340.8993	
95% Modified-t UCL	346.4219	
95% Jackknife UCL	345.6386	
95% Chebyshev (Mean, Sd) UCL	476.6028	
97.5% Chebyshev (Mean, Sd) UCL	574.3988	
99% Chebyshev (Mean, Sd) UCL	766.5	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	332.5889	
95% Bootstrap-t UCL	358.1241	
95% Hall's Bootstrap UCL	326.2194	
95% Percentile Bootstrap UCL	332.49	
95% BCA Bootstrap UCL	314.6	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	345.6386	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	108.55	
Maximum	595	
Mean	315.055	
Standard Deviation	174.9884	
Variance	30620.95	
Coefficient of Variation	0.555422	
Skewness	0.266853	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.900131	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	416.4925	
Gamma Statistics		
k hat	3.282805	
k star (bias corrected)	2.36463	
Theta hat	95.97127	
Theta star	133.2365	
nu hat	65.65611	
nu star	47.29261	
5% Approximate Chi Square Value	32.50778	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	30.39013	
Anderson-Darling Test Statistic	0.502156	
Anderson-Darling 5% Critical Value	0.731391	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.231452	
Kolmogrov-Smirnov 5% Critical Value	0.268272	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	458.3448	
95% Adjusted Gamma UCL	490.2833	
Lognormal Statistics		
Minimum of log data	4.687211	
Maximum of log data	6.388561	
Mean of log data	5.592775	
Standard Deviation of log data	0.617474	
Variance of log data	0.381274	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904987	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	324.8656	
MLE Standard Deviation	221.3258	
MLE Coefficient of Variation	0.681284	
MLE Skewness	2.360069	
MLE Median	268.4795	
MLE 80% Quantile	452.3878	
MLE 90% Quantile	593.6133	
MLE 95% Quantile	741.3839	
MLE 99% Quantile	1128.922	
MVU Estimate of Median	263.4011	
MVU Estimate of Mean	317.9079	
MVU Estimate of Standard Deviation	202.1611	
MVU Estimate of SE of Mean	63.65833	
95% H-UCL	531.9049	
95% Chebyshev (MVUE) UCL	595.3882	
97.5% Chebyshev (MVUE) UCL	715.4541	
99% Chebyshev (MVUE) UCL	951.3003	
Non-parametric Statisitics		
95% CLT UCL	406.075	
95% Adjusted-CLT UCL	411.0645	
95% Modified-t UCL	417.2708	
95% Jackknife UCL	416.4925	
95% Chebyshev (Mean, Sd) UCL	556.2599	
97.5% Chebyshev (Mean, Sd) UCL	660.6295	
99% Chebyshev (Mean, Sd) UCL	865.6433	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	401.9335	
95% Bootstrap-t UCL	421.4166	
95% Hall's Bootstrap UCL	395.2713	
95% Percentile Bootstrap UCL	398	
95% BCA Bootstrap UCL	390	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	416.4925	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.055	
Maximum	5.7	
Mean	1.385499	
Standard Deviation	1.619058	
Variance	2.621348	
Coefficient of Variation	1.168574	
Skewness	2.48358	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.693812	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2.324036	
Gamma Statistics		
k hat	1.052432	
k star (bias corrected)	0.803369	
Theta hat	1.316474	
Theta star	1.724611	
nu hat	21.04864	
nu star	16.06738	
5% Approximate Chi Square Value	8.008471	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	7.041722	
Anderson-Darling Test Statistic	0.374256	
Anderson-Darling 5% Critical Value	0.747322	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.196159	
Kolmogrov-Smirnov 5% Critical Value	0.273474	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.779724	
95% Adjusted Gamma UCL	3.161349	
Lognormal Statistics		
Minimum of log data	-2.900422	
Maximum of log data	1.740466	
Mean of log data	-0.219168	
Standard Deviation of log data	1.229661	
Variance of log data	1.512065	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.92553	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.710635	
MLE Standard Deviation	3.216763	
MLE Coefficient of Variation	1.880449	
MLE Skewness	12.29079	
MLE Median	0.803187	
MLE 80% Quantile	2.270262	
MLE 90% Quantile	3.899881	
MLE 95% Quantile	6.071611	
MLE 99% Quantile	14.02755	
MVU Estimate of Median	0.744309	
MVU Estimate of Mean	1.528335	
MVU Estimate of Standard Deviation	2.079607	
MVU Estimate of SE of Mean	0.627737	
95% H-UCL	7.462094	
95% Chebyshev (MVUE) UCL	4.264578	
97.5% Chebyshev (MVUE) UCL	5.448552	
99% Chebyshev (MVUE) UCL	7.77424	
Non-parametric Statisitics		
95% CLT UCL	2.227649	
95% Adjusted-CLT UCL	2.657305	
95% Modified-t UCL	2.391054	
95% Jackknife UCL	2.324036	
95% Chebyshev (Mean, Sd) UCL	3.617216	
97.5% Chebyshev (Mean, Sd) UCL	4.582882	
99% Chebyshev (Mean, Sd) UCL	6.479745	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.181698	
95% Bootstrap-t UCL	3.854625	
95% Hall's Bootstrap UCL	5.752777	
95% Percentile Bootstrap UCL	2.296499	
95% BCA Bootstrap UCL	2.180998	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	2.779724	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Nickel	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	8.2	
Maximum	37.5	
Mean	21.935	
Standard Deviation	9.540442	
Variance	91.02003	
Coefficient of Variation	0.434941	
Skewness	0.077313	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.958893	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	27.46541	
Gamma Statistics		
k hat	5.186321	
k star (bias corrected)	3.697091	
Theta hat	4.229395	
Theta star	5.933042	
nu hat	103.7264	
nu star	73.94183	
5% Approximate Chi Square Value	55.1354	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	52.32199	
Anderson-Darling Test Statistic	0.314339	
Anderson-Darling 5% Critical Value	0.729286	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.169163	
Kolmogrov-Smirnov 5% Critical Value	0.2674	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	29.41693	
95% Adjusted Gamma UCL	30.99871	
Lognormal Statistics		
Minimum of log data	2.104134	
Maximum of log data	3.624341	
Mean of log data	2.988589	
Standard Deviation of log data	0.491761	
Variance of log data	0.241829	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.938565	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	22.40992	
MLE Standard Deviation	11.7214	
MLE Coefficient of Variation	0.523045	
MLE Skewness	1.712228	
MLE Median	19.85765	
MLE 80% Quantile	30.08802	
MLE 90% Quantile	37.35632	
MLE 95% Quantile	44.59117	
MLE 99% Quantile	62.32889	
MVU Estimate of Median	19.61873	
MVU Estimate of Mean	22.11728	
MVU Estimate of Standard Deviation	11.0856	
MVU Estimate of SE of Mean	3.499269	
95% H-UCL	32.18562	
95% Chebyshev (MVUE) UCL	37.37024	
97.5% Chebyshev (MVUE) UCL	43.9702	
99% Chebyshev (MVUE) UCL	56.93456	
Non-parametric Statisitics		
95% CLT UCL	26.89745	
95% Adjusted-CLT UCL	26.97626	
95% Modified-t UCL	27.47771	
95% Jackknife UCL	27.46541	
95% Chebyshev (Mean, Sd) UCL	35.08559	
97.5% Chebyshev (Mean, Sd) UCL	40.77586	
99% Chebyshev (Mean, Sd) UCL	51.9533	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	26.68071	
95% Bootstrap-t UCL	27.4973	
95% Hall's Bootstrap UCL	26.90242	
95% Percentile Bootstrap UCL	26.64	
95% BCA Bootstrap UCL	25.79	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	27.46541	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	0.22	
Maximum	3.8	
Mean	1.5695	
Standard Deviation	1.102226	
Variance	1.214903	
Coefficient of Variation	0.702279	
Skewness	0.864365	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.937683	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.20844	
Gamma Statistics		
k hat	1.918839	
k star (bias corrected)	1.409854	
Theta hat	0.817942	
Theta star	1.113236	
nu hat	38.37678	
nu star	28.19708	
5% Approximate Chi Square Value	17.07963	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	15.59287	
Anderson-Darling Test Statistic	0.196392	
Anderson-Darling 5% Critical Value	0.736172	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.171988	
Kolmogrov-Smirnov 5% Critical Value	0.270023	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.591117	
95% Adjusted Gamma UCL	2.838177	
Lognormal Statistics		
Minimum of log data	-1.514128	
Maximum of log data	1.335001	
Mean of log data	0.168101	
Standard Deviation of log data	0.87756	
Variance of log data	0.770111	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.94189	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.738733	
MLE Standard Deviation	1.872678	
MLE Coefficient of Variation	1.077036	
MLE Skewness	4.480476	
MLE Median	1.183056	
MLE 80% Quantile	2.483426	
MLE 90% Quantile	3.653791	
MLE 95% Quantile	5.011257	
MLE 99% Quantile	9.109383	
MVU Estimate of Median	1.138213	
MVU Estimate of Mean	1.656068	
MVU Estimate of Standard Deviation	1.537522	
MVU Estimate of SE of Mean	0.478924	
95% H-UCL	4.011197	
95% Chebyshev (MVUE) UCL	3.743648	
97.5% Chebyshev (MVUE) UCL	4.646946	
99% Chebyshev (MVUE) UCL	6.421299	
Non-parametric Statisitics		
95% CLT UCL	2.142821	
95% Adjusted-CLT UCL	2.244621	
95% Modified-t UCL	2.224318	
95% Jackknife UCL	2.20844	
95% Chebyshev (Mean, Sd) UCL	3.088814	
97.5% Chebyshev (Mean, Sd) UCL	3.746222	
99% Chebyshev (Mean, Sd) UCL	5.037574	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.121894	
95% Bootstrap-t UCL	2.442514	
95% Hall's Bootstrap UCL	2.642687	
95% Percentile Bootstrap UCL	2.156	
95% BCA Bootstrap UCL	2.4415	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.20844	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	17.2	
Maximum	79.2	
Mean	39.83	
Standard Deviation	20.80444	
Variance	432.8246	
Coefficient of Variation	0.522331	
Skewness	0.683902	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.915081	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	51.88994	
Gamma Statistics		
k hat	4.11971	
k star (bias corrected)	2.950464	
Theta hat	9.668156	
Theta star	13.49957	
nu hat	82.3942	
nu star	59.00928	
5% Approximate Chi Square Value	42.3441	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	39.90147	
Anderson-Darling Test Statistic	0.359028	
Anderson-Darling 5% Critical Value	0.729397	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.220408	
Kolmogrov-Smirnov 5% Critical Value	0.267773	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	55.50571	
95% Adjusted Gamma UCL	58.90358	
Lognormal Statistics		
Minimum of log data	2.844909	
Maximum of log data	4.371976	
Mean of log data	3.558371	
Standard Deviation of log data	0.53562	
Variance of log data	0.286889	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.928808	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	40.52078	
MLE Standard Deviation	23.35754	
MLE Coefficient of Variation	0.576434	
MLE Skewness	1.920836	
MLE Median	35.10595	
MLE 80% Quantile	55.20036	
MLE 90% Quantile	69.8704	
MLE 95% Quantile	84.72962	
MLE 99% Quantile	122.0246	
MVU Estimate of Median	34.60532	
MVU Estimate of Mean	39.88476	
MVU Estimate of Standard Deviation	21.84804	
MVU Estimate of SE of Mean	6.891779	
95% H-UCL	60.7786	
95% Chebyshev (MVUE) UCL	69.92533	
97.5% Chebyshev (MVUE) UCL	82.92391	
99% Chebyshev (MVUE) UCL	108.4571	
Non-parametric Statisitics		
95% CLT UCL	50.65139	
95% Adjusted-CLT UCL	52.1717	
95% Modified-t UCL	52.12708	
95% Jackknife UCL	51.88994	
95% Chebyshev (Mean, Sd) UCL	68.50694	
97.5% Chebyshev (Mean, Sd) UCL	80.91547	
99% Chebyshev (Mean, Sd) UCL	105.2896	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	50.19956	
95% Bootstrap-t UCL	55.15267	
95% Hall's Bootstrap UCL	51.81986	
95% Percentile Bootstrap UCL	50.82	
95% BCA Bootstrap UCL	48.02	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	51.88994	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - 07.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	106	
Maximum	2490	
Mean	929.95	
Standard Deviation	707.4648	
Variance	500506.5	
Coefficient of Variation	0.760756	
Skewness	1.145408	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.898711	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1340.054	
Gamma Statistics		
k hat	1.752409	
k star (bias corrected)	1.293353	
Theta hat	530.6694	
Theta star	719.0224	
nu hat	35.04819	
nu star	25.86707	
5% Approximate Chi Square Value	15.27522	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	13.87838	
Anderson-Darling Test Statistic	0.249734	
Anderson-Darling 5% Critical Value	0.737387	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.170619	
Kolmogrov-Smirnov 5% Critical Value	0.270459	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1574.778	
95% Adjusted Gamma UCL	1733.277	
Lognormal Statistics		
Minimum of log data	4.663439	
Maximum of log data	7.820038	
Mean of log data	6.523451	
Standard Deviation of log data	0.915521	
Variance of log data	0.838179	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.947004	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1035.397	
MLE Standard Deviation	1186.04	
MLE Coefficient of Variation	1.145492	
MLE Skewness	4.939538	
MLE Median	680.9242	
MLE 80% Quantile	1475.964	
MLE 90% Quantile	2208.118	
MLE 95% Quantile	3070.155	
MLE 99% Quantile	5727.035	
MVU Estimate of Median	652.872	
MVU Estimate of Mean	981.0376	
MVU Estimate of Standard Deviation	954.4427	
MVU Estimate of SE of Mean	296.5903	
95% H-UCL	2533.85	
95% Chebyshev (MVUE) UCL	2273.845	
97.5% Chebyshev (MVUE) UCL	2833.244	
99% Chebyshev (MVUE) UCL	3932.074	
Non-parametric Statisitics		
95% CLT UCL	1297.937	
95% Adjusted-CLT UCL	1384.522	
95% Modified-t UCL	1353.56	
95% Jackknife UCL	1340.054	
95% Chebyshev (Mean, Sd) UCL	1905.123	
97.5% Chebyshev (Mean, Sd) UCL	2327.081	
99% Chebyshev (Mean, Sd) UCL	3155.936	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1273.842	
95% Bootstrap-t UCL	1481.505	
95% Hall's Bootstrap UCL	1533.868	
95% Percentile Bootstrap UCL	1281.35	
95% BCA Bootstrap UCL	1235.2	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1340.054	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	6	
Minimum	0.85	
Maximum	5.1	
Mean	1.304167	
Standard Deviation	1.201979	
Variance	1.444754	
Coefficient of Variation	0.921645	
Skewness	3.398465	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.405157	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.927305	
Gamma Statistics		
k hat	3.013209	
k star (bias corrected)	2.315462	
Theta hat	0.432817	
Theta star	0.563242	
nu hat	72.31702	
nu star	55.5711	
5% Approximate Chi Square Value	39.43647	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	37.37012	
Anderson-Darling Test Statistic	2.871126	
Anderson-Darling 5% Critical Value	0.738968	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.377257	
Kolmogrov-Smirnov 5% Critical Value	0.247397	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1.83774	
95% Adjusted Gamma UCL	1.939356	
Lognormal Statistics		
Minimum of log data	-0.162519	
Maximum of log data	1.629241	
Mean of log data	0.090546	
Standard Deviation of log data	0.499006	
Variance of log data	0.249007	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.51228	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.239924	
MLE Standard Deviation	0.659322	
MLE Coefficient of Variation	0.531744	
MLE Skewness	1.745583	
MLE Median	1.094772	
MLE 80% Quantile	1.66897	
MLE 90% Quantile	2.078756	
MLE 95% Quantile	2.487832	
MLE 99% Quantile	3.494657	
MVU Estimate of Median	1.083463	
MVU Estimate of Mean	1.225921	
MVU Estimate of Standard Deviation	0.627574	
MVU Estimate of SE of Mean	0.180764	
95% H-UCL	1.710854	
95% Chebyshev (MVUE) UCL	2.013854	
97.5% Chebyshev (MVUE) UCL	2.354793	
99% Chebyshev (MVUE) UCL	3.024503	
Non-parametric Statisitics		
95% CLT UCL	1.8749	
95% Adjusted-CLT UCL	2.23863	
95% Modified-t UCL	1.98404	
95% Jackknife UCL	1.927305	
95% Chebyshev (Mean, Sd) UCL	2.816624	
97.5% Chebyshev (Mean, Sd) UCL	3.471065	
99% Chebyshev (Mean, Sd) UCL	4.756589	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.846796	
95% Bootstrap-t UCL	8.239648	
95% Hall's Bootstrap UCL	5.036858	
95% Percentile Bootstrap UCL	1.975	
95% BCA Bootstrap UCL	2.345833	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.927305	95% Student's-t UCL
2nd Recommended UCL	1.98404	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	5.4	
Maximum	485	
Mean	71.44167	
Standard Deviation	132.4723	
Variance	17548.9	
Coefficient of Variation	1.854272	
Skewness	3.261938	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.492569	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	140.1189	
Gamma Statistics		
k hat	0.732078	
k star (bias corrected)	0.604614	
Theta hat	97.58757	
Theta star	118.1608	
nu hat	17.56986	
nu star	14.51073	
5% Approximate Chi Square Value	6.92132	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	6.138233	
Anderson-Darling Test Statistic	0.831189	
Anderson-Darling 5% Critical Value	0.766986	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.223303	
Kolmogrov-Smirnov 5% Critical Value	0.255087	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	149.7793	
95% Adjusted Gamma UCL	168.8875	
Lognormal Statistics		
Minimum of log data	1.686399	
Maximum of log data	6.184149	
Mean of log data	3.448461	
Standard Deviation of log data	1.22571	
Variance of log data	1.502365	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.947333	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	66.66259	
MLE Standard Deviation	124.5771	
MLE Coefficient of Variation	1.86877	
MLE Skewness	12.13262	
MLE Median	31.45196	
MLE 80% Quantile	88.60483	
MLE 90% Quantile	151.942	
MLE 95% Quantile	236.2178	
MLE 99% Quantile	544.2796	
MVU Estimate of Median	29.53447	
MVU Estimate of Mean	60.60888	
MVU Estimate of Standard Deviation	85.0898	
MVU Estimate of SE of Mean	23.27472	
95% H-UCL	229.1443	
95% Chebyshev (MVUE) UCL	162.061	
97.5% Chebyshev (MVUE) UCL	205.9595	
99% Chebyshev (MVUE) UCL	292.1894	
Non-parametric Statisitics		
95% CLT UCL	134.3433	
95% Adjusted-CLT UCL	172.8201	
95% Modified-t UCL	146.1205	
95% Jackknife UCL	140.1189	
95% Chebyshev (Mean, Sd) UCL	238.1323	
97.5% Chebyshev (Mean, Sd) UCL	310.2595	
99% Chebyshev (Mean, Sd) UCL	451.9393	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	130.3766	
95% Bootstrap-t UCL	369.2997	
95% Hall's Bootstrap UCL	379.2566	
95% Percentile Bootstrap UCL	143.0458	
95% BCA Bootstrap UCL	187.3458	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	149.7793	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Barium	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	11.2	
Maximum	68.9	
Mean	32.09167	
Standard Deviation	16.52312	
Variance	273.0136	
Coefficient of Variation	0.514873	
Skewness	1.034533	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.92897	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	40.6577	
Gamma Statistics		
k hat	4.387625	
k star (bias corrected)	3.346275	
Theta hat	7.314131	
Theta star	9.590267	
nu hat	105.303	
nu star	80.31059	
5% Approximate Chi Square Value	60.65787	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	58.05729	
Anderson-Darling Test Statistic	0.140717	
Anderson-Darling 5% Critical Value	0.734329	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.11321	
Kolmogrov-Smirnov 5% Critical Value	0.246218	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	42.48914	
95% Adjusted Gamma UCL	44.39237	
Lognormal Statistics		
Minimum of log data	2.415914	
Maximum of log data	4.232656	
Mean of log data	3.350333	
Standard Deviation of log data	0.512489	
Variance of log data	0.262645	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.994062	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	32.51349	
MLE Standard Deviation	17.8192	
MLE Coefficient of Variation	0.548055	
MLE Skewness	1.808783	
MLE Median	28.51222	
MLE 80% Quantile	43.96465	
MLE 90% Quantile	55.08519	
MLE 95% Quantile	66.24613	
MLE 99% Quantile	93.91423	
MVU Estimate of Median	28.20164	
MVU Estimate of Mean	32.12454	
MVU Estimate of Standard Deviation	16.91246	
MVU Estimate of SE of Mean	4.870253	
95% H-UCL	45.37073	
95% Chebyshev (MVUE) UCL	53.35348	
97.5% Chebyshev (MVUE) UCL	62.53926	
99% Chebyshev (MVUE) UCL	80.58295	
Non-parametric Statisitics		
95% CLT UCL	39.93731	
95% Adjusted-CLT UCL	41.45939	
95% Modified-t UCL	40.89512	
95% Jackknife UCL	40.6577	
95% Chebyshev (Mean, Sd) UCL	52.88281	
97.5% Chebyshev (Mean, Sd) UCL	61.87915	
99% Chebyshev (Mean, Sd) UCL	79.55072	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	39.65018	
95% Bootstrap-t UCL	43.05807	
95% Hall's Bootstrap UCL	44.16875	
95% Percentile Bootstrap UCL	40.3	
95% BCA Bootstrap UCL	43.3	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	40.6577	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	11	
Minimum	0.06	
Maximum	5.6	
Mean	1.959167	
Standard Deviation	1.802253	
Variance	3.248117	
Coefficient of Variation	0.919908	
Skewness	0.653969	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.908152	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.893504	
Gamma Statistics		
k hat	0.746498	
k star (bias corrected)	0.615429	
Theta hat	2.624475	
Theta star	3.183414	
nu hat	17.91596	
nu star	14.77031	
5% Approximate Chi Square Value	7.100875	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	6.306014	
Anderson-Darling Test Statistic	0.50381	
Anderson-Darling 5% Critical Value	0.765871	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.152503	
Kolmogrov-Smirnov 5% Critical Value	0.254864	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4.075201	
95% Adjusted Gamma UCL	4.588872	
Lognormal Statistics		
Minimum of log data	-2.813411	
Maximum of log data	1.722767	
Mean of log data	-0.129913	
Standard Deviation of log data	1.664876	
Variance of log data	2.771813	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.858023	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	3.511325	
MLE Standard Deviation	13.59368	
MLE Coefficient of Variation	3.871382	
MLE Skewness	69.63685	
MLE Median	0.878172	
MLE 80% Quantile	3.585534	
MLE 90% Quantile	7.459236	
MLE 95% Quantile	13.58286	
MLE 99% Quantile	42.20714	
MVU Estimate of Median	0.781568	
MVU Estimate of Mean	2.824248	
MVU Estimate of Standard Deviation	5.898032	
MVU Estimate of SE of Mean	1.487058	
95% H-UCL	29.5112	
95% Chebyshev (MVUE) UCL	9.306182	
97.5% Chebyshev (MVUE) UCL	12.11092	
99% Chebyshev (MVUE) UCL	17.62028	
Non-parametric Statisitics		
95% CLT UCL	2.814928	
95% Adjusted-CLT UCL	2.919875	
95% Modified-t UCL	2.909874	
95% Jackknife UCL	2.893504	
95% Chebyshev (Mean, Sd) UCL	4.226953	
97.5% Chebyshev (Mean, Sd) UCL	5.208225	
99% Chebyshev (Mean, Sd) UCL	7.135746	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.785765	
95% Bootstrap-t UCL	3.028898	
95% Hall's Bootstrap UCL	2.926022	
95% Percentile Bootstrap UCL	2.828333	
95% BCA Bootstrap UCL	3.1925	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.893504	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	8.2	
Maximum	134	
Mean	54.1125	
Standard Deviation	44.35596	
Variance	1967.451	
Coefficient of Variation	0.819699	
Skewness	0.979666	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.837304	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	77.10784	
Gamma Statistics		
k hat	1.615657	
k star (bias corrected)	1.267298	
Theta hat	33.49256	
Theta star	42.6991	
nu hat	38.77577	
nu star	30.41516	
5% Approximate Chi Square Value	18.81746	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	17.43674	
Anderson-Darling Test Statistic	0.362847	
Anderson-Darling 5% Critical Value	0.744587	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.155746	
Kolmogrov-Smirnov 5% Critical Value	0.249296	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	87.46347	
95% Adjusted Gamma UCL	94.38921	
Lognormal Statistics		
Minimum of log data	2.104134	
Maximum of log data	4.89784	
Mean of log data	3.650726	
Standard Deviation of log data	0.909124	
Variance of log data	0.826507	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.940264	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	58.20546	
MLE Standard Deviation	65.9887	
MLE Coefficient of Variation	1.13372	
MLE Skewness	4.858355	
MLE Median	38.50261	
MLE 80% Quantile	83.0079	
MLE 90% Quantile	123.835	
MLE 95% Quantile	171.7835	
MLE 99% Quantile	319.0502	
MVU Estimate of Median	37.19582	
MVU Estimate of Mean	55.65589	
MVU Estimate of Standard Deviation	54.79111	
MVU Estimate of SE of Mean	15.50499	
95% H-UCL	123.8189	
95% Chebyshev (MVUE) UCL	123.2406	
97.5% Chebyshev (MVUE) UCL	152.4845	
99% Chebyshev (MVUE) UCL	209.9285	
Non-parametric Statisitics		
95% CLT UCL	75.17397	
95% Adjusted-CLT UCL	79.04324	
95% Modified-t UCL	77.71136	
95% Jackknife UCL	77.10784	
95% Chebyshev (Mean, Sd) UCL	109.9259	
97.5% Chebyshev (Mean, Sd) UCL	134.0763	
99% Chebyshev (Mean, Sd) UCL	181.5153	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	74.19497	
95% Bootstrap-t UCL	83.5268	
95% Hall's Bootstrap UCL	74.52439	
95% Percentile Bootstrap UCL	74.62083	
95% BCA Bootstrap UCL	86.3625	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	87.46347	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	6.6	
Maximum	1560	
Mean	204.25	
Standard Deviation	433.1821	
Variance	187646.7	
Coefficient of Variation	2.120842	
Skewness	3.293129	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.470411	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	428.8234	
Gamma Statistics		
k hat	0.553496	
k star (bias corrected)	0.470677	
Theta hat	369.0182	
Theta star	433.9491	
nu hat	13.2839	
nu star	11.29626	
5% Approximate Chi Square Value	4.766283	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	4.138009	
Anderson-Darling Test Statistic	0.854986	
Anderson-Darling 5% Critical Value	0.780802	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.246094	
Kolmogrov-Smirnov 5% Critical Value	0.257852	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	484.0796	
95% Adjusted Gamma UCL	557.5773	
Lognormal Statistics		
Minimum of log data	1.88707	
Maximum of log data	7.352441	
Mean of log data	4.189494	
Standard Deviation of log data	1.476484	
Variance of log data	2.180004	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.961979	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	196.271	
MLE Standard Deviation	549.7811	
MLE Coefficient of Variation	2.801133	
MLE Skewness	30.38206	
MLE Median	65.98939	
MLE 80% Quantile	229.7801	
MLE 90% Quantile	440.0004	
MLE 95% Quantile	748.6786	
MLE 99% Quantile	2046.314	
MVU Estimate of Median	60.22065	
MVU Estimate of Mean	167.8432	
MVU Estimate of Standard Deviation	298.5463	
MVU Estimate of SE of Mean	78.32653	
95% H-UCL	1087.947	
95% Chebyshev (MVUE) UCL	509.2606	
97.5% Chebyshev (MVUE) UCL	656.9922	
99% Chebyshev (MVUE) UCL	947.1823	
Non-parametric Statisitics		
95% CLT UCL	409.9371	
95% Adjusted-CLT UCL	536.959	
95% Modified-t UCL	448.6362	
95% Jackknife UCL	428.8234	
95% Chebyshev (Mean, Sd) UCL	749.3255	
97.5% Chebyshev (Mean, Sd) UCL	985.1801	
99% Chebyshev (Mean, Sd) UCL	1448.471	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	402.7387	
95% Bootstrap-t UCL	1300.029	
95% Hall's Bootstrap UCL	1162.271	
95% Percentile Bootstrap UCL	443.4958	
95% BCA Bootstrap UCL	567.9458	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	484.0796	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	6.4	
Maximum	400	
Mean	82.39167	
Standard Deviation	112.1132	
Variance	12569.38	
Coefficient of Variation	1.360735	
Skewness	2.475719	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.659791	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	140.5142	
Gamma Statistics		
k hat	0.901033	
k star (bias corrected)	0.73133	
Theta hat	91.44136	
Theta star	112.66	
nu hat	21.62479	
nu star	17.55192	
5% Approximate Chi Square Value	9.066495	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	8.151072	
Anderson-Darling Test Statistic	0.457809	
Anderson-Darling 5% Critical Value	0.760247	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.197757	
Kolmogrov-Smirnov 5% Critical Value	0.253324	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	159.5029	
95% Adjusted Gamma UCL	177.4162	
Lognormal Statistics		
Minimum of log data	1.856298	
Maximum of log data	5.991465	
Mean of log data	3.762755	
Standard Deviation of log data	1.202804	
Variance of log data	1.446737	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.962539	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	88.77663	
MLE Standard Deviation	160.0253	
MLE Coefficient of Variation	1.802561	
MLE Skewness	11.26462	
MLE Median	43.06691	
MLE 80% Quantile	119.0001	
MLE 90% Quantile	202.0182	
MLE 95% Quantile	311.49	
MLE 99% Quantile	706.6084	
MVU Estimate of Median	40.53605	
MVU Estimate of Mean	81.08456	
MVU Estimate of Standard Deviation	111.2203	
MVU Estimate of SE of Mean	30.51824	
95% H-UCL	293.3813	
95% Chebyshev (MVUE) UCL	214.1105	
97.5% Chebyshev (MVUE) UCL	271.6709	
99% Chebyshev (MVUE) UCL	384.7372	
Non-parametric Statisitics		
95% CLT UCL	135.6262	
95% Adjusted-CLT UCL	160.341	
95% Modified-t UCL	144.3692	
95% Jackknife UCL	140.5142	
95% Chebyshev (Mean, Sd) UCL	223.4644	
97.5% Chebyshev (Mean, Sd) UCL	284.5067	
99% Chebyshev (Mean, Sd) UCL	404.4124	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	133.6377	
95% Bootstrap-t UCL	280.9192	
95% Hall's Bootstrap UCL	404.4231	
95% Percentile Bootstrap UCL	136.6292	
95% BCA Bootstrap UCL	184.0917	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	159.5029	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	47.5	
Maximum	333	
Mean	167.8333	
Standard Deviation	80.53298	
Variance	6485.561	
Coefficient of Variation	0.479839	
Skewness	0.644013	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.946587	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	209.5838	
Gamma Statistics		
k hat	4.478575	
k star (bias corrected)	3.414487	
Theta hat	37.47472	
Theta star	49.15331	
nu hat	107.4858	
nu star	81.94768	
5% Approximate Chi Square Value	62.08293	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	59.45011	
Anderson-Darling Test Statistic	0.276161	
Anderson-Darling 5% Critical Value	0.733982	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.136048	
Kolmogrov-Smirnov 5% Critical Value	0.246175	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	221.5352	
95% Adjusted Gamma UCL	231.3461	
Lognormal Statistics		
Minimum of log data	3.86073	
Maximum of log data	5.808142	
Mean of log data	5.007194	
Standard Deviation of log data	0.52582	
Variance of log data	0.276487	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.948277	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	171.6466	
MLE Standard Deviation	96.86864	
MLE Coefficient of Variation	0.564349	
MLE Skewness	1.872787	
MLE Median	149.4847	
MLE 80% Quantile	233.1105	
MLE 90% Quantile	293.7925	
MLE 95% Quantile	355.0182	
MLE 99% Quantile	507.8838	
MVU Estimate of Median	147.771	
MVU Estimate of Mean	169.4757	
MVU Estimate of Standard Deviation	91.66977	
MVU Estimate of SE of Mean	26.39138	
95% H-UCL	242.2494	
95% Chebyshev (MVUE) UCL	284.513	
97.5% Chebyshev (MVUE) UCL	334.2898	
99% Chebyshev (MVUE) UCL	432.0665	
Non-parametric Statisitics		
95% CLT UCL	206.0727	
95% Adjusted-CLT UCL	210.6908	
95% Modified-t UCL	210.3042	
95% Jackknife UCL	209.5838	
95% Chebyshev (Mean, Sd) UCL	269.1684	
97.5% Chebyshev (Mean, Sd) UCL	313.0162	
99% Chebyshev (Mean, Sd) UCL	399.1467	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	204.5552	
95% Bootstrap-t UCL	216.7597	
95% Hall's Bootstrap UCL	216.1726	
95% Percentile Bootstrap UCL	205.2083	
95% BCA Bootstrap UCL	219.75	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	209.5838	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	11	
Minimum	0.045	
Maximum	1.4	
Mean	0.4575	
Standard Deviation	0.433776	
Variance	0.188161	
Coefficient of Variation	0.948144	
Skewness	1.139076	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.847023	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.682381	
Gamma Statistics		
k hat	1.17544	
k star (bias corrected)	0.937136	
Theta hat	0.389216	
Theta star	0.48819	
nu hat	28.21057	
nu star	22.49126	
5% Approximate Chi Square Value	12.70562	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	11.59663	
Anderson-Darling Test Statistic	0.364292	
Anderson-Darling 5% Critical Value	0.7528	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.218264	
Kolmogrov-Smirnov 5% Critical Value	0.251357	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.809859	
95% Adjusted Gamma UCL	0.887305	
Lognormal Statistics		
Minimum of log data	-3.101093	
Maximum of log data	0.336472	
Mean of log data	-1.264241	
Standard Deviation of log data	1.106607	
Variance of log data	1.224579	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.93814	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.521028	
MLE Standard Deviation	0.807632	
MLE Coefficient of Variation	1.550075	
MLE Skewness	8.374638	
MLE Median	0.282453	
MLE 80% Quantile	0.719529	
MLE 90% Quantile	1.170871	
MLE 95% Quantile	1.743905	
MLE 99% Quantile	3.705158	
MVU Estimate of Median	0.268349	
MVU Estimate of Mean	0.484295	
MVU Estimate of Standard Deviation	0.600319	
MVU Estimate of SE of Mean	0.166718	
95% H-UCL	1.47146	
95% Chebyshev (MVUE) UCL	1.211001	
97.5% Chebyshev (MVUE) UCL	1.525447	
99% Chebyshev (MVUE) UCL	2.143116	
Non-parametric Statisitics		
95% CLT UCL	0.663469	
95% Adjusted-CLT UCL	0.707465	
95% Modified-t UCL	0.689244	
95% Jackknife UCL	0.682381	
95% Chebyshev (Mean, Sd) UCL	1.003322	
97.5% Chebyshev (Mean, Sd) UCL	1.2395	
99% Chebyshev (Mean, Sd) UCL	1.703426	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.658576	
95% Bootstrap-t UCL	0.751789	
95% Hall's Bootstrap UCL	0.689636	
95% Percentile Bootstrap UCL	0.668333	
95% BCA Bootstrap UCL	0.781667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.809859	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Nickel	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	0.59	
Maximum	30.6	
Mean	10.36167	
Standard Deviation	7.893501	
Variance	62.30736	
Coefficient of Variation	0.761798	
Skewness	1.55185	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.8714	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	14.45387	
Gamma Statistics		
k hat	1.643462	
k star (bias corrected)	1.288152	
Theta hat	6.304781	
Theta star	8.043823	
nu hat	39.44309	
nu star	30.91565	
5% Approximate Chi Square Value	19.21206	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	17.81542	
Anderson-Darling Test Statistic	0.338702	
Anderson-Darling 5% Critical Value	0.744365	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.182237	
Kolmogrov-Smirnov 5% Critical Value	0.249242	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	16.67378	
95% Adjusted Gamma UCL	17.98092	
Lognormal Statistics		
Minimum of log data	-0.527633	
Maximum of log data	3.421	
Mean of log data	2.004015	
Standard Deviation of log data	1.007044	
Variance of log data	1.014138	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.881778	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	12.31827	
MLE Standard Deviation	16.32803	
MLE Coefficient of Variation	1.325513	
MLE Skewness	6.305446	
MLE Median	7.418783	
MLE 80% Quantile	17.37387	
MLE 90% Quantile	27.06027	
MLE 95% Quantile	38.88476	
MLE 99% Quantile	77.2	
MVU Estimate of Median	7.110844	
MVU Estimate of Mean	11.62842	
MVU Estimate of Standard Deviation	12.88866	
MVU Estimate of SE of Mean	3.616946	
95% H-UCL	29.96556	
95% Chebyshev (MVUE) UCL	27.39432	
97.5% Chebyshev (MVUE) UCL	34.21624	
99% Chebyshev (MVUE) UCL	47.61657	
Non-parametric Statisitics		
95% CLT UCL	14.10972	
95% Adjusted-CLT UCL	15.20046	
95% Modified-t UCL	14.62401	
95% Jackknife UCL	14.45387	
95% Chebyshev (Mean, Sd) UCL	20.2941	
97.5% Chebyshev (Mean, Sd) UCL	24.59188	
99% Chebyshev (Mean, Sd) UCL	33.03402	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	13.86498	
95% Bootstrap-t UCL	16.17449	
95% Hall's Bootstrap UCL	32.57432	
95% Percentile Bootstrap UCL	14.02917	
95% BCA Bootstrap UCL	16.50333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	14.45387	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	10	
Minimum	0.85	
Maximum	2.9	
Mean	1.53125	
Standard Deviation	0.731524	
Variance	0.535128	
Coefficient of Variation	0.47773	
Skewness	0.793897	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.851216	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.910492	
Gamma Statistics		
k hat	5.220231	
k star (bias corrected)	3.970729	
Theta hat	0.29333	
Theta star	0.385635	
nu hat	125.2855	
nu star	95.29749	
5% Approximate Chi Square Value	73.77762	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	70.89302	
Anderson-Darling Test Statistic	0.673996	
Anderson-Darling 5% Critical Value	0.731916	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.214341	
Kolmogrov-Smirnov 5% Critical Value	0.245906	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.977894	
95% Adjusted Gamma UCL	2.058373	
Lognormal Statistics		
Minimum of log data	-0.162519	
Maximum of log data	1.064711	
Mean of log data	0.327256	
Standard Deviation of log data	0.457295	
Variance of log data	0.209119	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.879056	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.540051	
MLE Standard Deviation	0.742731	
MLE Coefficient of Variation	0.482277	
MLE Skewness	1.559004	
MLE Median	1.387157	
MLE 80% Quantile	2.04147	
MLE 90% Quantile	2.496476	
MLE 95% Quantile	2.943226	
MLE 99% Quantile	4.018561	
MVU Estimate of Median	1.375115	
MVU Estimate of Mean	1.52563	
MVU Estimate of Standard Deviation	0.712867	
MVU Estimate of SE of Mean	0.205461	
95% H-UCL	2.05438	
95% Chebyshev (MVUE) UCL	2.421212	
97.5% Chebyshev (MVUE) UCL	2.808731	
99% Chebyshev (MVUE) UCL	3.569938	
Non-parametric Statisitics		
95% CLT UCL	1.878598	
95% Adjusted-CLT UCL	1.930311	
95% Modified-t UCL	1.918558	
95% Jackknife UCL	1.910492	
95% Chebyshev (Mean, Sd) UCL	2.451731	
97.5% Chebyshev (Mean, Sd) UCL	2.850024	
99% Chebyshev (Mean, Sd) UCL	3.632394	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.873644	
95% Bootstrap-t UCL	2.020941	
95% Hall's Bootstrap UCL	1.85993	
95% Percentile Bootstrap UCL	1.86875	
95% BCA Bootstrap UCL	2.052083	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	1.977894	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	11	
Minimum	6.5	
Maximum	39.8	
Mean	17.59167	
Standard Deviation	10.05577	
Variance	101.1186	
Coefficient of Variation	0.571621	
Skewness	1.300107	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.862827	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	22.80485	
Gamma Statistics		
k hat	3.827961	
k star (bias corrected)	2.926526	
Theta hat	4.595571	
Theta star	6.011109	
nu hat	91.87106	
nu star	70.23663	
5% Approximate Chi Square Value	51.9395	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	49.54493	
Anderson-Darling Test Statistic	0.344096	
Anderson-Darling 5% Critical Value	0.736361	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.154736	
Kolmogrov-Smirnov 5% Critical Value	0.246574	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	23.78882	
95% Adjusted Gamma UCL	24.93856	
Lognormal Statistics		
Minimum of log data	1.871802	
Maximum of log data	3.683867	
Mean of log data	2.731158	
Standard Deviation of log data	0.541821	
Variance of log data	0.29357	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.960429	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	17.77767	
MLE Standard Deviation	10.38446	
MLE Coefficient of Variation	0.584129	
MLE Skewness	1.951697	
MLE Median	15.35065	
MLE 80% Quantile	24.26407	
MLE 90% Quantile	30.79641	
MLE 95% Quantile	37.42929	
MLE 99% Quantile	54.13245	
MVU Estimate of Median	15.16385	
MVU Estimate of Mean	17.53766	
MVU Estimate of Standard Deviation	9.791331	
MVU Estimate of SE of Mean	2.817972	
95% H-UCL	25.43921	
95% Chebyshev (MVUE) UCL	29.82092	
97.5% Chebyshev (MVUE) UCL	35.13589	
99% Chebyshev (MVUE) UCL	45.57613	
Non-parametric Statisitics		
95% CLT UCL	22.36643	
95% Adjusted-CLT UCL	23.53054	
95% Modified-t UCL	22.98643	
95% Jackknife UCL	22.80485	
95% Chebyshev (Mean, Sd) UCL	30.2449	
97.5% Chebyshev (Mean, Sd) UCL	35.71997	
99% Chebyshev (Mean, Sd) UCL	46.47467	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	22.14878	
95% Bootstrap-t UCL	26.20442	
95% Hall's Bootstrap UCL	51.03974	
95% Percentile Bootstrap UCL	22.64167	
95% BCA Bootstrap UCL	25.575	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	22.80485	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-c.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	12	
Number of Missing Data	0	
Number of Valid Observations	12	
Number of Distinct Observations	12	
Minimum	15.2	
Maximum	2800	
Mean	781.325	
Standard Deviation	928.7164	
Variance	862514.2	
Coefficient of Variation	1.188643	
Skewness	1.490798	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.786535	
Shapiro-Wilk 5% Critical Value	0.859	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1262.797	
Gamma Statistics		
k hat	0.671167	
k star (bias corrected)	0.558931	
Theta hat	1164.128	
Theta star	1397.891	
nu hat	16.10802	
nu star	13.41435	
5% Approximate Chi Square Value	6.17131	
Adjusted Level of Significance	0.02896	
Adjusted Chi Square Value	5.439069	
Anderson-Darling Test Statistic	0.205334	
Anderson-Darling 5% Critical Value	0.771698	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.110752	
Kolmogrov-Smirnov 5% Critical Value	0.25603	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1698.337	
95% Adjusted Gamma UCL	1926.978	
Lognormal Statistics		
Minimum of log data	2.721295	
Maximum of log data	7.937375	
Mean of log data	5.755209	
Standard Deviation of log data	1.682863	
Variance of log data	2.832028	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.936123	
Shapiro-Wilk 5% Critical Value	0.859	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1301.436	
MLE Standard Deviation	5202.466	
MLE Coefficient of Variation	3.997483	
MLE Skewness	75.8717	
MLE Median	315.8315	
MLE 80% Quantile	1309.274	
MLE 90% Quantile	2745.417	
MLE 95% Quantile	5031.729	
MLE 99% Quantile	15828.2	
MVU Estimate of Median	280.371	
MVU Estimate of Mean	1039.879	
MVU Estimate of Standard Deviation	2203.774	
MVU Estimate of SE of Mean	553.3263	
95% H-UCL	11411.03	
95% Chebyshev (MVUE) UCL	3451.773	
97.5% Chebyshev (MVUE) UCL	4495.401	
99% Chebyshev (MVUE) UCL	6545.407	
Non-parametric Statisitics		
95% CLT UCL	1222.306	
95% Adjusted-CLT UCL	1345.588	
95% Modified-t UCL	1282.026	
95% Jackknife UCL	1262.797	
95% Chebyshev (Mean, Sd) UCL	1949.934	
97.5% Chebyshev (Mean, Sd) UCL	2455.592	
99% Chebyshev (Mean, Sd) UCL	3448.86	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1203.381	
95% Bootstrap-t UCL	1719.517	
95% Hall's Bootstrap UCL	2335.208	
95% Percentile Bootstrap UCL	1223.525	
95% BCA Bootstrap UCL	1520.733	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	1698.337	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	6	
Minimum	0.85	
Maximum	5.1	
Mean	1.22	
Standard Deviation	1.079649	
Variance	1.165643	
Coefficient of Variation	0.884959	
Skewness	3.798537	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.359004	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.71099	
Gamma Statistics		
k hat	3.462562	
k star (bias corrected)	2.814494	
Theta hat	0.35234	
Theta star	0.43347	
nu hat	103.8769	
nu star	84.43483	
5% Approximate Chi Square Value	64.25198	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	62.08687	
Anderson-Darling Test Statistic	3.764744	
Anderson-Darling 5% Critical Value	0.742438	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.403812	
Kolmogrov-Smirnov 5% Critical Value	0.222942	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1.603227	
95% Adjusted Gamma UCL	1.659135	
Lognormal Statistics		
Minimum of log data	-0.162519	
Maximum of log data	1.629241	
Mean of log data	0.047554	
Standard Deviation of log data	0.45136	
Variance of log data	0.203726	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.463505	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.161157	
MLE Standard Deviation	0.551961	
MLE Coefficient of Variation	0.475354	
MLE Skewness	1.533475	
MLE Median	1.048703	
MLE 80% Quantile	1.535649	
MLE 90% Quantile	1.873019	
MLE 95% Quantile	2.203487	
MLE 99% Quantile	2.996416	
MVU Estimate of Median	1.041603	
MVU Estimate of Mean	1.152656	
MVU Estimate of Standard Deviation	0.534106	
MVU Estimate of SE of Mean	0.137663	
95% H-UCL	1.481127	
95% Chebyshev (MVUE) UCL	1.752717	
97.5% Chebyshev (MVUE) UCL	2.012364	
99% Chebyshev (MVUE) UCL	2.522391	
Non-parametric Statisitics		
95% CLT UCL	1.678526	
95% Adjusted-CLT UCL	1.970665	
95% Modified-t UCL	1.756558	
95% Jackknife UCL	1.71099	
95% Chebyshev (Mean, Sd) UCL	2.435105	
97.5% Chebyshev (Mean, Sd) UCL	2.960882	
99% Chebyshev (Mean, Sd) UCL	3.99367	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.657486	
95% Bootstrap-t UCL	6.615669	
95% Hall's Bootstrap UCL	4.569485	
95% Percentile Bootstrap UCL	1.77	
95% BCA Bootstrap UCL	2.11	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.71099	95% Student's-t UCL
2nd Recommended UCL	1.756558	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	15	
Minimum	5.4	
Maximum	505	
Mean	69.94667	
Standard Deviation	123.1293	
Variance	15160.81	
Coefficient of Variation	1.76033	
Skewness	3.581538	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.475481	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	125.9419	
Gamma Statistics		
k hat	0.840724	
k star (bias corrected)	0.717024	
Theta hat	83.19814	
Theta star	97.55142	
nu hat	25.22172	
nu star	21.51071	
5% Approximate Chi Square Value	11.97061	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	11.10161	
Anderson-Darling Test Statistic	0.882697	
Anderson-Darling 5% Critical Value	0.770726	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.237873	
Kolmogrov-Smirnov 5% Critical Value	0.229385	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	125.6913	
95% Adjusted Gamma UCL	135.5301	
Lognormal Statistics		
Minimum of log data	1.686399	
Maximum of log data	6.224558	
Mean of log data	3.546351	
Standard Deviation of log data	1.138877	
Variance of log data	1.297042	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.945241	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	66.34526	
MLE Standard Deviation	108.1745	
MLE Coefficient of Variation	1.630478	
MLE Skewness	9.22599	
MLE Median	34.68653	
MLE 80% Quantile	90.80395	
MLE 90% Quantile	149.8761	
MLE 95% Quantile	225.835	
MLE 99% Quantile	490.4779	
MVU Estimate of Median	33.21492	
MVU Estimate of Mean	62.21407	
MVU Estimate of Standard Deviation	82.61857	
MVU Estimate of SE of Mean	20.29147	
95% H-UCL	163.8974	
95% Chebyshev (MVUE) UCL	150.6626	
97.5% Chebyshev (MVUE) UCL	188.9343	
99% Chebyshev (MVUE) UCL	264.1117	
Non-parametric Statisitics		
95% CLT UCL	122.2396	
95% Adjusted-CLT UCL	153.6533	
95% Modified-t UCL	130.8419	
95% Jackknife UCL	125.9419	
95% Chebyshev (Mean, Sd) UCL	208.5241	
97.5% Chebyshev (Mean, Sd) UCL	268.4866	
99% Chebyshev (Mean, Sd) UCL	386.2714	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	120.4437	
95% Bootstrap-t UCL	269.3959	
95% Hall's Bootstrap UCL	323.0525	
95% Percentile Bootstrap UCL	129.4233	
95% BCA Bootstrap UCL	165.92	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	150.6626	95% Chebyshev (MVUE) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Barium	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	15	
Minimum	11.2	
Maximum	68.9	
Mean	30.05333	
Standard Deviation	15.50331	
Variance	240.3527	
Coefficient of Variation	0.51586	
Skewness	1.257792	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.902867	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	37.10375	
Gamma Statistics		
k hat	4.556558	
k star (bias corrected)	3.689691	
Theta hat	6.595621	
Theta star	8.145216	
nu hat	136.6968	
nu star	110.6907	
5% Approximate Chi Square Value	87.40119	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	84.8553	
Anderson-Darling Test Statistic	0.186071	
Anderson-Darling 5% Critical Value	0.739206	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.126491	
Kolmogrov-Smirnov 5% Critical Value	0.222288	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	38.06156	
95% Adjusted Gamma UCL	39.20351	
Lognormal Statistics		
Minimum of log data	2.415914	
Maximum of log data	4.232656	
Mean of log data	3.289247	
Standard Deviation of log data	0.490649	
Variance of log data	0.240736	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.992118	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	30.25359	
MLE Standard Deviation	15.78372	
MLE Coefficient of Variation	0.521714	
MLE Skewness	1.707145	
MLE Median	26.82265	
MLE 80% Quantile	40.60313	
MLE 90% Quantile	50.38687	
MLE 95% Quantile	60.1213	
MLE 99% Quantile	83.97306	
MVU Estimate of Median	26.60817	
MVU Estimate of Mean	29.98852	
MVU Estimate of Standard Deviation	15.17606	
MVU Estimate of SE of Mean	3.908978	
95% H-UCL	39.62621	
95% Chebyshev (MVUE) UCL	47.02735	
97.5% Chebyshev (MVUE) UCL	54.40007	
99% Chebyshev (MVUE) UCL	68.88235	
Non-parametric Statisitics		
95% CLT UCL	36.63758	
95% Adjusted-CLT UCL	38.02664	
95% Modified-t UCL	37.32041	
95% Jackknife UCL	37.10375	
95% Chebyshev (Mean, Sd) UCL	47.50173	
97.5% Chebyshev (Mean, Sd) UCL	55.05167	
99% Chebyshev (Mean, Sd) UCL	69.88206	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	36.52882	
95% Bootstrap-t UCL	39.467	
95% Hall's Bootstrap UCL	41.86903	
95% Percentile Bootstrap UCL	36.88667	
95% BCA Bootstrap UCL	39.98	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	37.10375	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	14	
Minimum	0.06	
Maximum	5.6	
Mean	1.900667	
Standard Deviation	1.620434	
Variance	2.625807	
Coefficient of Variation	0.852561	
Skewness	0.794561	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.921939	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.637589	
Gamma Statistics		
k hat	0.895565	
k star (bias corrected)	0.760897	
Theta hat	2.122309	
Theta star	2.49793	
nu hat	26.86696	
nu star	22.8269	
5% Approximate Chi Square Value	12.95846	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	12.04994	
Anderson-Darling Test Statistic	0.533134	
Anderson-Darling 5% Critical Value	0.768076	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.191099	
Kolmogrov-Smirnov 5% Critical Value	0.228881	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	3.348108	
95% Adjusted Gamma UCL	3.600544	
Lognormal Statistics		
Minimum of log data	-2.813411	
Maximum of log data	1.722767	
Mean of log data	-0.01098	
Standard Deviation of log data	1.502464	
Variance of log data	2.257398	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.85027	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	3.057872	
MLE Standard Deviation	8.945612	
MLE Coefficient of Variation	2.925437	
MLE Skewness	33.81274	
MLE Median	0.98908	
MLE 80% Quantile	3.520498	
MLE 90% Quantile	6.81882	
MLE 95% Quantile	11.71153	
MLE 99% Quantile	32.58172	
MVU Estimate of Median	0.917058	
MVU Estimate of Mean	2.670186	
MVU Estimate of Standard Deviation	5.157743	
MVU Estimate of SE of Mean	1.182163	
95% H-UCL	13.06499	
95% Chebyshev (MVUE) UCL	7.823116	
97.5% Chebyshev (MVUE) UCL	10.05279	
99% Chebyshev (MVUE) UCL	14.43256	
Non-parametric Statisitics		
95% CLT UCL	2.588864	
95% Adjusted-CLT UCL	2.680581	
95% Modified-t UCL	2.651895	
95% Jackknife UCL	2.637589	
95% Chebyshev (Mean, Sd) UCL	3.724405	
97.5% Chebyshev (Mean, Sd) UCL	4.513538	
99% Chebyshev (Mean, Sd) UCL	6.063637	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.562959	
95% Bootstrap-t UCL	2.7788	
95% Hall's Bootstrap UCL	2.771587	
95% Percentile Bootstrap UCL	2.58	
95% BCA Bootstrap UCL	2.993333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.637589	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	15	
Minimum	8.2	
Maximum	134	
Mean	52.46333	
Standard Deviation	40.412	
Variance	1633.129	
Coefficient of Variation	0.77029	
Skewness	1.086527	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.855592	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	70.84143	
Gamma Statistics		
k hat	1.853525	
k star (bias corrected)	1.527264	
Theta hat	28.30463	
Theta star	34.35118	
nu hat	55.60574	
nu star	45.81793	
5% Approximate Chi Square Value	31.28573	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	29.81139	
Anderson-Darling Test Statistic	0.293173	
Anderson-Darling 5% Critical Value	0.748876	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.120986	
Kolmogrov-Smirnov 5% Critical Value	0.224697	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	76.8325	
95% Adjusted Gamma UCL	80.63231	
Lognormal Statistics		
Minimum of log data	2.104134	
Maximum of log data	4.89784	
Mean of log data	3.666731	
Standard Deviation of log data	0.832972	
Variance of log data	0.693842	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.955273	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	55.34861	
MLE Standard Deviation	55.38706	
MLE Coefficient of Variation	1.000695	
MLE Skewness	4.004169	
MLE Median	39.12379	
MLE 80% Quantile	79.09042	
MLE 90% Quantile	114.1027	
MLE 95% Quantile	154.0025	
MLE 99% Quantile	271.5708	
MVU Estimate of Median	38.22804	
MVU Estimate of Mean	53.74588	
MVU Estimate of Standard Deviation	48.78476	
MVU Estimate of SE of Mean	12.382	
95% H-UCL	96.35218	
95% Chebyshev (MVUE) UCL	107.7178	
97.5% Chebyshev (MVUE) UCL	131.0714	
99% Chebyshev (MVUE) UCL	176.9452	
Non-parametric Statisitics		
95% CLT UCL	69.62628	
95% Adjusted-CLT UCL	72.75409	
95% Modified-t UCL	71.3293	
95% Jackknife UCL	70.84143	
95% Chebyshev (Mean, Sd) UCL	97.94553	
97.5% Chebyshev (Mean, Sd) UCL	117.6257	
99% Chebyshev (Mean, Sd) UCL	156.2836	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	68.89913	
95% Bootstrap-t UCL	75.89094	
95% Hall's Bootstrap UCL	69.87522	
95% Percentile Bootstrap UCL	69.61	
95% BCA Bootstrap UCL	78.84333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	76.8325	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	15	
Minimum	6.6	
Maximum	1560	
Mean	187.2467	
Standard Deviation	385.9859	
Variance	148985.1	
Coefficient of Variation	2.061376	
Skewness	3.664922	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.441446	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	362.7808	
Gamma Statistics		
k hat	0.651317	
k star (bias corrected)	0.565498	
Theta hat	287.4893	
Theta star	331.1181	
nu hat	19.53951	
nu star	16.96494	
5% Approximate Chi Square Value	8.645867	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	7.923217	
Anderson-Darling Test Statistic	0.958571	
Anderson-Darling 5% Critical Value	0.782168	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.206973	
Kolmogrov-Smirnov 5% Critical Value	0.231637	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	367.4159	
95% Adjusted Gamma UCL	400.9267	
Lognormal Statistics		
Minimum of log data	1.88707	
Maximum of log data	7.352441	
Mean of log data	4.295033	
Standard Deviation of log data	1.338297	
Variance of log data	1.791038	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.955536	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	179.5676	
MLE Standard Deviation	401.3515	
MLE Coefficient of Variation	2.2351	
MLE Skewness	17.87113	
MLE Median	73.3346	
MLE 80% Quantile	227.2142	
MLE 90% Quantile	409.4209	
MLE 95% Quantile	662.838	
MLE 99% Quantile	1648.977	
MVU Estimate of Median	69.06904	
MVU Estimate of Mean	162.6919	
MVU Estimate of Standard Deviation	267.3254	
MVU Estimate of SE of Mean	63.47699	
95% H-UCL	588.3793	
95% Chebyshev (MVUE) UCL	439.3817	
97.5% Chebyshev (MVUE) UCL	559.1056	
99% Chebyshev (MVUE) UCL	794.2799	
Non-parametric Statisitics		
95% CLT UCL	351.1746	
95% Adjusted-CLT UCL	451.9432	
95% Modified-t UCL	378.4987	
95% Jackknife UCL	362.7808	
95% Chebyshev (Mean, Sd) UCL	621.6594	
97.5% Chebyshev (Mean, Sd) UCL	809.6302	
99% Chebyshev (Mean, Sd) UCL	1178.862	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	342.2956	
95% Bootstrap-t UCL	972.8353	
95% Hall's Bootstrap UCL	986.6114	
95% Percentile Bootstrap UCL	370.93	
95% BCA Bootstrap UCL	504.33	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	367.4159	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	14	
Minimum	6.4	
Maximum	400	
Mean	82.81333	
Standard Deviation	101.175	
Variance	10236.38	
Coefficient of Variation	1.221723	
Skewness	2.523135	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.698233	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	128.8245	
Gamma Statistics		
k hat	1.034878	
k star (bias corrected)	0.872346	
Theta hat	80.02235	
Theta star	94.9317	
nu hat	31.04633	
nu star	26.17039	
5% Approximate Chi Square Value	15.5088	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	14.50457	
Anderson-Darling Test Statistic	0.302908	
Anderson-Darling 5% Critical Value	0.762385	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.13443	
Kolmogrov-Smirnov 5% Critical Value	0.227752	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	139.7437	
95% Adjusted Gamma UCL	149.4189	
Lognormal Statistics		
Minimum of log data	1.856298	
Maximum of log data	5.991465	
Mean of log data	3.861044	
Standard Deviation of log data	1.128587	
Variance of log data	1.273709	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.974747	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	89.82815	
MLE Standard Deviation	144.1199	
MLE Coefficient of Variation	1.604396	
MLE Skewness	8.943038	
MLE Median	47.51492	
MLE 80% Quantile	123.3098	
MLE 90% Quantile	202.6091	
MLE 95% Quantile	304.1649	
MLE 99% Quantile	655.9849	
MVU Estimate of Median	45.53464	
MVU Estimate of Mean	84.36116	
MVU Estimate of Standard Deviation	110.738	
MVU Estimate of SE of Mean	27.2377	
95% H-UCL	218.9567	
95% Chebyshev (MVUE) UCL	203.0875	
97.5% Chebyshev (MVUE) UCL	254.4605	
99% Chebyshev (MVUE) UCL	355.3728	
Non-parametric Statisitics		
95% CLT UCL	125.7823	
95% Adjusted-CLT UCL	143.9669	
95% Modified-t UCL	131.6609	
95% Jackknife UCL	128.8245	
95% Chebyshev (Mean, Sd) UCL	196.682	
97.5% Chebyshev (Mean, Sd) UCL	245.9531	
99% Chebyshev (Mean, Sd) UCL	342.7366	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	124.2513	
95% Bootstrap-t UCL	186.5345	
95% Hall's Bootstrap UCL	317.7062	
95% Percentile Bootstrap UCL	128.2733	
95% BCA Bootstrap UCL	155.4133	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	139.7437	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	15	
Minimum	47.5	
Maximum	333	
Mean	171.8533	
Standard Deviation	79.96822	
Variance	6394.916	
Coefficient of Variation	0.465328	
Skewness	0.425381	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.95852	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	208.2203	
Gamma Statistics		
k hat	4.538057	
k star (bias corrected)	3.67489	
Theta hat	37.86936	
Theta star	46.76421	
nu hat	136.1417	
nu star	110.2467	
5% Approximate Chi Square Value	87.0064	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	84.46655	
Anderson-Darling Test Statistic	0.275486	
Anderson-Darling 5% Critical Value	0.739234	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.143542	
Kolmogrov-Smirnov 5% Critical Value	0.222297	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	217.7571	
95% Adjusted Gamma UCL	224.3049	
Lognormal Statistics		
Minimum of log data	3.86073	
Maximum of log data	5.808142	
Mean of log data	5.032435	
Standard Deviation of log data	0.518834	
Variance of log data	0.269189	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.953768	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	175.393	
MLE Standard Deviation	97.48162	
MLE Coefficient of Variation	0.55579	
MLE Skewness	1.839054	
MLE Median	153.3058	
MLE 80% Quantile	237.662	
MLE 90% Quantile	298.6094	
MLE 95% Quantile	359.9326	
MLE 99% Quantile	512.4703	
MVU Estimate of Median	151.9356	
MVU Estimate of Mean	173.658	
MVU Estimate of Standard Deviation	93.26267	
MVU Estimate of SE of Mean	24.00838	
95% H-UCL	234.2995	
95% Chebyshev (MVUE) UCL	278.3081	
97.5% Chebyshev (MVUE) UCL	323.5903	
99% Chebyshev (MVUE) UCL	412.5383	
Non-parametric Statisitics		
95% CLT UCL	205.8158	
95% Adjusted-CLT UCL	208.239	
95% Modified-t UCL	208.5983	
95% Jackknife UCL	208.2203	
95% Chebyshev (Mean, Sd) UCL	261.8546	
97.5% Chebyshev (Mean, Sd) UCL	300.7982	
99% Chebyshev (Mean, Sd) UCL	377.2954	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	204.7715	
95% Bootstrap-t UCL	209.9911	
95% Hall's Bootstrap UCL	210.46	
95% Percentile Bootstrap UCL	205.72	
95% BCA Bootstrap UCL	217.4333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	208.2203	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	14	
Minimum	0.045	
Maximum	1.4	
Mean	0.461333	
Standard Deviation	0.403743	
Variance	0.163009	
Coefficient of Variation	0.875167	
Skewness	1.074998	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.864318	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.644943	
Gamma Statistics		
k hat	1.331542	
k star (bias corrected)	1.109678	
Theta hat	0.346466	
Theta star	0.415736	
nu hat	39.94625	
nu star	33.29034	
5% Approximate Chi Square Value	21.0958	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	19.90587	
Anderson-Darling Test Statistic	0.379703	
Anderson-Darling 5% Critical Value	0.756903	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.1943	
Kolmogrov-Smirnov 5% Critical Value	0.226322	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.728009	
95% Adjusted Gamma UCL	0.771528	
Lognormal Statistics		
Minimum of log data	-3.101093	
Maximum of log data	0.336472	
Mean of log data	-1.19397	
Standard Deviation of log data	1.030057	
Variance of log data	1.061018	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.938894	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.515065	
MLE Standard Deviation	0.707969	
MLE Coefficient of Variation	1.374522	
MLE Skewness	6.720467	
MLE Median	0.303016	
MLE 80% Quantile	0.72356	
MLE 90% Quantile	1.138434	
MLE 95% Quantile	1.649503	
MLE 99% Quantile	3.326575	
MVU Estimate of Median	0.292463	
MVU Estimate of Mean	0.490111	
MVU Estimate of Standard Deviation	0.573658	
MVU Estimate of SE of Mean	0.142909	
95% H-UCL	1.110888	
95% Chebyshev (MVUE) UCL	1.113037	
97.5% Chebyshev (MVUE) UCL	1.382578	
99% Chebyshev (MVUE) UCL	1.912039	
Non-parametric Statisitics		
95% CLT UCL	0.632803	
95% Adjusted-CLT UCL	0.66372	
95% Modified-t UCL	0.649766	
95% Jackknife UCL	0.644943	
95% Chebyshev (Mean, Sd) UCL	0.915732	
97.5% Chebyshev (Mean, Sd) UCL	1.11235	
99% Chebyshev (Mean, Sd) UCL	1.498569	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.627352	
95% Bootstrap-t UCL	0.706194	
95% Hall's Bootstrap UCL	0.671766	
95% Percentile Bootstrap UCL	0.629667	
95% BCA Bootstrap UCL	0.718	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.728009	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Nickel	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	15	
Minimum	0.59	
Maximum	30.6	
Mean	9.709333	
Standard Deviation	7.143195	
Variance	51.02524	
Coefficient of Variation	0.735704	
Skewness	1.868158	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.835183	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	12.95783	
Gamma Statistics		
k hat	1.935093	
k star (bias corrected)	1.592519	
Theta hat	5.017503	
Theta star	6.096841	
nu hat	58.05278	
nu star	47.77556	
5% Approximate Chi Square Value	32.90886	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	31.39373	
Anderson-Darling Test Statistic	0.42493	
Anderson-Darling 5% Critical Value	0.747742	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.153349	
Kolmogrov-Smirnov 5% Critical Value	0.224509	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	14.09556	
95% Adjusted Gamma UCL	14.77584	
Lognormal Statistics		
Minimum of log data	-0.527633	
Maximum of log data	3.421	
Mean of log data	1.992981	
Standard Deviation of log data	0.895621	
Variance of log data	0.802137	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.874107	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	10.95778	
MLE Standard Deviation	12.15427	
MLE Coefficient of Variation	1.10919	
MLE Skewness	4.692211	
MLE Median	7.337376	
MLE 80% Quantile	15.63921	
MLE 90% Quantile	23.1931	
MLE 95% Quantile	32.01736	
MLE 99% Quantile	58.92093	
MVU Estimate of Median	7.143469	
MVU Estimate of Mean	10.58045	
MVU Estimate of Standard Deviation	10.45687	
MVU Estimate of SE of Mean	2.640835	
95% H-UCL	20.33188	
95% Chebyshev (MVUE) UCL	22.09158	
97.5% Chebyshev (MVUE) UCL	27.07246	
99% Chebyshev (MVUE) UCL	36.85642	
Non-parametric Statisitics		
95% CLT UCL	12.74304	
95% Adjusted-CLT UCL	13.69364	
95% Modified-t UCL	13.10611	
95% Jackknife UCL	12.95783	
95% Chebyshev (Mean, Sd) UCL	17.74873	
97.5% Chebyshev (Mean, Sd) UCL	21.22739	
99% Chebyshev (Mean, Sd) UCL	28.06053	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	12.75176	
95% Bootstrap-t UCL	14.47484	
95% Hall's Bootstrap UCL	28.65875	
95% Percentile Bootstrap UCL	12.77	
95% BCA Bootstrap UCL	14.68333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	14.09556	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	12	
Minimum	0.85	
Maximum	2.9	
Mean	1.585	
Standard Deviation	0.662234	
Variance	0.438554	
Coefficient of Variation	0.417813	
Skewness	0.561653	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.909513	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.886163	
Gamma Statistics		
k hat	6.255767	
k star (bias corrected)	5.049058	
Theta hat	0.253366	
Theta star	0.31392	
nu hat	187.673	
nu star	151.4717	
5% Approximate Chi Square Value	124.0184	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	120.9616	
Anderson-Darling Test Statistic	0.491961	
Anderson-Darling 5% Critical Value	0.738259	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.165399	
Kolmogrov-Smirnov 5% Critical Value	0.221937	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.935863	
95% Adjusted Gamma UCL	1.984785	
Lognormal Statistics		
Minimum of log data	-0.162519	
Maximum of log data	1.064711	
Mean of log data	0.378534	
Standard Deviation of log data	0.421137	
Variance of log data	0.177357	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.917475	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.59554	
MLE Standard Deviation	0.702865	
MLE Coefficient of Variation	0.440519	
MLE Skewness	1.407042	
MLE Median	1.460143	
MLE 80% Quantile	2.084221	
MLE 90% Quantile	2.508526	
MLE 95% Quantile	2.919186	
MLE 99% Quantile	3.888795	
MVU Estimate of Median	1.451533	
MVU Estimate of Mean	1.585465	
MVU Estimate of Standard Deviation	0.683174	
MVU Estimate of SE of Mean	0.176158	
95% H-UCL	1.995642	
95% Chebyshev (MVUE) UCL	2.353318	
97.5% Chebyshev (MVUE) UCL	2.685569	
99% Chebyshev (MVUE) UCL	3.338212	
Non-parametric Statisitics		
95% CLT UCL	1.86625	
95% Adjusted-CLT UCL	1.892746	
95% Modified-t UCL	1.890296	
95% Jackknife UCL	1.886163	
95% Chebyshev (Mean, Sd) UCL	2.33032	
97.5% Chebyshev (Mean, Sd) UCL	2.65282	
99% Chebyshev (Mean, Sd) UCL	3.286309	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.861935	
95% Bootstrap-t UCL	1.933019	
95% Hall's Bootstrap UCL	1.88625	
95% Percentile Bootstrap UCL	1.85	
95% BCA Bootstrap UCL	2.001667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.886163	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	14	
Minimum	6.5	
Maximum	39.8	
Mean	16.44667	
Standard Deviation	9.250376	
Variance	85.56945	
Coefficient of Variation	0.562447	
Skewness	1.62213	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.820448	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	20.65344	
Gamma Statistics		
k hat	4.256646	
k star (bias corrected)	3.449761	
Theta hat	3.863762	
Theta star	4.76748	
nu hat	127.6994	
nu star	103.4928	
5% Approximate Chi Square Value	81.01428	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	78.56784	
Anderson-Darling Test Statistic	0.510475	
Anderson-Darling 5% Critical Value	0.73965	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.197375	
Kolmogrov-Smirnov 5% Critical Value	0.222429	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	21.01003	
95% Adjusted Gamma UCL	21.66424	
Lognormal Statistics		
Minimum of log data	1.871802	
Maximum of log data	3.683867	
Mean of log data	2.678085	
Standard Deviation of log data	0.496045	
Variance of log data	0.246061	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.9549	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	16.463	
MLE Standard Deviation	8.695476	
MLE Coefficient of Variation	0.528183	
MLE Skewness	1.7319	
MLE Median	14.55719	
MLE 80% Quantile	22.13684	
MLE 90% Quantile	27.53624	
MLE 95% Quantile	32.91996	
MLE 99% Quantile	46.14949	
MVU Estimate of Median	14.43822	
MVU Estimate of Mean	16.31529	
MVU Estimate of Standard Deviation	8.352959	
MVU Estimate of SE of Mean	2.151293	
95% H-UCL	21.64378	
95% Chebyshev (MVUE) UCL	25.69256	
97.5% Chebyshev (MVUE) UCL	29.75012	
99% Chebyshev (MVUE) UCL	37.72039	
Non-parametric Statisitics		
95% CLT UCL	20.3753	
95% Adjusted-CLT UCL	21.44419	
95% Modified-t UCL	20.82017	
95% Jackknife UCL	20.65344	
95% Chebyshev (Mean, Sd) UCL	26.85762	
97.5% Chebyshev (Mean, Sd) UCL	31.36245	
99% Chebyshev (Mean, Sd) UCL	40.21131	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	20.31496	
95% Bootstrap-t UCL	23.66806	
95% Hall's Bootstrap UCL	44.0194	
95% Percentile Bootstrap UCL	20.61667	
95% BCA Bootstrap UCL	22.23667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	21.01003	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Sed stat - lp-f.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	15	
Number of Missing Data	0	
Number of Valid Observations	15	
Number of Distinct Observations	15	
Minimum	15.2	
Maximum	2800	
Mean	699.46	
Standard Deviation	844.784	
Variance	713660.1	
Coefficient of Variation	1.207766	
Skewness	1.789659	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.749208	
Shapiro-Wilk 5% Critical Value	0.881	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1083.641	
Gamma Statistics		
k hat	0.761596	
k star (bias corrected)	0.653721	
Theta hat	918.4139	
Theta star	1069.967	
nu hat	22.84787	
nu star	19.61163	
5% Approximate Chi Square Value	10.56387	
Adjusted Level of Significance	0.03235	
Adjusted Chi Square Value	9.754015	
Anderson-Darling Test Statistic	0.244474	
Anderson-Darling 5% Critical Value	0.77455	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.117133	
Kolmogrov-Smirnov 5% Critical Value	0.230113	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1298.534	
95% Adjusted Gamma UCL	1406.349	
Lognormal Statistics		
Minimum of log data	2.721295	
Maximum of log data	7.937375	
Mean of log data	5.76591	
Standard Deviation of log data	1.506537	
Variance of log data	2.269653	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.943937	
Shapiro-Wilk 5% Critical Value	0.881	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	993.0064	
MLE Standard Deviation	2924.913	
MLE Coefficient of Variation	2.945513	
MLE Skewness	34.39194	
MLE Median	319.2296	
MLE 80% Quantile	1140.172	
MLE 90% Quantile	2212.349	
MLE 95% Quantile	3805.351	
MLE 99% Quantile	10615.97	
MVU Estimate of Median	295.8621	
MVU Estimate of Mean	866.223	
MVU Estimate of Standard Deviation	1679.713	
MVU Estimate of SE of Mean	384.6223	
95% H-UCL	4272.284	
95% Chebyshev (MVUE) UCL	2542.753	
97.5% Chebyshev (MVUE) UCL	3268.189	
99% Chebyshev (MVUE) UCL	4693.167	
Non-parametric Statisitics		
95% CLT UCL	1058.239	
95% Adjusted-CLT UCL	1165.937	
95% Modified-t UCL	1100.44	
95% Jackknife UCL	1083.641	
95% Chebyshev (Mean, Sd) UCL	1650.233	
97.5% Chebyshev (Mean, Sd) UCL	2061.633	
99% Chebyshev (Mean, Sd) UCL	2869.749	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1049.353	
95% Bootstrap-t UCL	1524.361	
95% Hall's Bootstrap UCL	2873.242	
95% Percentile Bootstrap UCL	1051.273	
95% BCA Bootstrap UCL	1296.147	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	1298.534	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Benzo(a)anthracene	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.12	
Maximum	0.25	
Mean	0.19125	
Standard Deviation	0.0536	
Variance	0.002873	
Coefficient of Variation	0.280259	
Skewness	-0.684919	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.943459	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.25432	
Gamma Statistics		
k hat	15.08388	
k star (bias corrected)	3.937636	
Theta hat	0.012679	
Theta star	0.04857	
nu hat	120.671	
nu star	31.50109	
5% Approximate Chi Square Value	19.67474	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.368246	
Anderson-Darling 5% Critical Value	0.657095	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.314143	
Kolmogrov-Smirnov 5% Critical Value	0.394579	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.306209	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-2.120264	
Maximum of log data	-1.386294	
Mean of log data	-1.687688	
Standard Deviation of log data	0.309238	
Variance of log data	0.095628	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.90177	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.194005	
MLE Standard Deviation	0.061457	
MLE Coefficient of Variation	0.316781	
MLE Skewness	0.98213	
MLE Median	0.184947	
MLE 80% Quantile	0.240176	
MLE 90% Quantile	0.275184	
MLE 95% Quantile	0.307589	
MLE 99% Quantile	0.37969	
MVU Estimate of Median	0.182744	
MVU Estimate of Mean	0.191651	
MVU Estimate of Standard Deviation	0.058846	
MVU Estimate of SE of Mean	0.029421	
95% H-UCL	0.350391	
95% Chebyshev (MVUE) UCL	0.319894	
97.5% Chebyshev (MVUE) UCL	0.375385	
99% Chebyshev (MVUE) UCL	0.484386	
Non-parametric Statisitics		
95% CLT UCL	0.235332	
95% Adjusted-CLT UCL	0.225525	
95% Modified-t UCL	0.25279	
95% Jackknife UCL	0.25432	
95% Chebyshev (Mean, Sd) UCL	0.308068	
97.5% Chebyshev (Mean, Sd) UCL	0.358615	
99% Chebyshev (Mean, Sd) UCL	0.457905	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.25432	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Benzo(a)pyrene	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.093	
Maximum	0.21	
Mean	0.1745	
Standard Deviation	0.05469	
Variance	0.002991	
Coefficient of Variation	0.31341	
Skewness	-1.921238	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.735549	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.238853	
Gamma Statistics		
k hat	10.33293	
k star (bias corrected)	2.749899	
Theta hat	0.016888	
Theta star	0.063457	
nu hat	82.66344	
nu star	21.99919	
5% Approximate Chi Square Value	12.33608	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.767279	
Anderson-Darling 5% Critical Value	0.6571	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.429657	
Kolmogrov-Smirnov 5% Critical Value	0.394907	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.31119	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-2.375156	
Maximum of log data	-1.560648	
Mean of log data	-1.794999	
Standard Deviation of log data	0.387992	
Variance of log data	0.150538	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.704294	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.179114	
MLE Standard Deviation	0.072194	
MLE Coefficient of Variation	0.403062	
MLE Skewness	1.274668	
MLE Median	0.166128	
MLE 80% Quantile	0.230583	
MLE 90% Quantile	0.273507	
MLE 95% Quantile	0.314506	
MLE 99% Quantile	0.409618	
MVU Estimate of Median	0.163019	
MVU Estimate of Mean	0.175666	
MVU Estimate of Standard Deviation	0.067403	
MVU Estimate of SE of Mean	0.033696	
95% H-UCL	0.423812	
95% Chebyshev (MVUE) UCL	0.322543	
97.5% Chebyshev (MVUE) UCL	0.386096	
99% Chebyshev (MVUE) UCL	0.510935	
Non-parametric Statisitics		
95% CLT UCL	0.219479	
95% Adjusted-CLT UCL	0.191411	
95% Modified-t UCL	0.234475	
95% Jackknife UCL	0.238853	
95% Chebyshev (Mean, Sd) UCL	0.293694	
97.5% Chebyshev (Mean, Sd) UCL	0.34527	
99% Chebyshev (Mean, Sd) UCL	0.446579	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.238853	95% Student's-t UCL
2nd Recommended UCL	0.234475	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Benzo(b)fluoranthene	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.098	
Maximum	0.2	
Mean	0.16575	
Standard Deviation	0.047035	
Variance	0.002212	
Coefficient of Variation	0.283768	
Skewness	-1.574193	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.831513	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.221095	
Gamma Statistics		
k hat	13.51215	
k star (bias corrected)	3.544703	
Theta hat	0.012267	
Theta star	0.04676	
nu hat	108.0972	
nu star	28.35763	
5% Approximate Chi Square Value	17.20479	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.548685	
Anderson-Darling 5% Critical Value	0.657096	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.323035	
Kolmogrov-Smirnov 5% Critical Value	0.394688	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.273196	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-2.322788	
Maximum of log data	-1.609438	
Mean of log data	-1.834735	
Standard Deviation of log data	0.33311	
Variance of log data	0.110962	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.791252	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.168764	
MLE Standard Deviation	0.057813	
MLE Coefficient of Variation	0.342568	
MLE Skewness	1.067905	
MLE Median	0.159656	
MLE 80% Quantile	0.211558	
MLE 90% Quantile	0.244953	
MLE 95% Quantile	0.276162	
MLE 99% Quantile	0.346483	
MVU Estimate of Median	0.157451	
MVU Estimate of Mean	0.166383	
MVU Estimate of Standard Deviation	0.05497	
MVU Estimate of SE of Mean	0.027482	
95% H-UCL	0.32841	
95% Chebyshev (MVUE) UCL	0.286175	
97.5% Chebyshev (MVUE) UCL	0.338009	
99% Chebyshev (MVUE) UCL	0.439827	
Non-parametric Statisitics		
95% CLT UCL	0.204432	
95% Adjusted-CLT UCL	0.184654	
95% Modified-t UCL	0.21801	
95% Jackknife UCL	0.221095	
95% Chebyshev (Mean, Sd) UCL	0.268259	
97.5% Chebyshev (Mean, Sd) UCL	0.312615	
99% Chebyshev (Mean, Sd) UCL	0.399744	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.221095	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Benzo(k)fluoranthene	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.1	
Maximum	0.21	
Mean	0.17625	
Standard Deviation	0.051214	
Variance	0.002623	
Coefficient of Variation	0.290578	
Skewness	-1.910158	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.742382	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.236513	
Gamma Statistics		
k hat	12.35804	
k star (bias corrected)	3.256177	
Theta hat	0.014262	
Theta star	0.054128	
nu hat	98.86434	
nu star	26.04942	
5% Approximate Chi Square Value	15.41559	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.750646	
Anderson-Darling 5% Critical Value	0.657098	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.425688	
Kolmogrov-Smirnov 5% Critical Value	0.394767	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.297829	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-2.302585	
Maximum of log data	-1.560648	
Mean of log data	-1.776857	
Standard Deviation of log data	0.351833	
Variance of log data	0.123786	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.711722	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.17997	
MLE Standard Deviation	0.06533	
MLE Coefficient of Variation	0.363007	
MLE Skewness	1.136855	
MLE Median	0.169169	
MLE 80% Quantile	0.227738	
MLE 90% Quantile	0.265869	
MLE 95% Quantile	0.301769	
MLE 99% Quantile	0.38347	
MVU Estimate of Median	0.166564	
MVU Estimate of Mean	0.177132	
MVU Estimate of Standard Deviation	0.061752	
MVU Estimate of SE of Mean	0.030872	
95% H-UCL	0.372912	
95% Chebyshev (MVUE) UCL	0.311702	
97.5% Chebyshev (MVUE) UCL	0.36993	
99% Chebyshev (MVUE) UCL	0.484309	
Non-parametric Statisitics		
95% CLT UCL	0.21837	
95% Adjusted-CLT UCL	0.192238	
95% Modified-t UCL	0.232437	
95% Jackknife UCL	0.236513	
95% Chebyshev (Mean, Sd) UCL	0.287869	
97.5% Chebyshev (Mean, Sd) UCL	0.336167	
99% Chebyshev (Mean, Sd) UCL	0.431039	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.236513	95% Student's-t UCL
2nd Recommended UCL	0.232437	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Indeno(1,2,3-cd)pyrene	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.12	
Maximum	0.2	
Mean	0.175	
Standard Deviation	0.037193	
Variance	0.001383	
Coefficient of Variation	0.212533	
Skewness	-1.836714	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.773389	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.218765	
Gamma Statistics		
k hat	25.17198	
k star (bias corrected)	6.459662	
Theta hat	0.006952	
Theta star	0.027091	
nu hat	201.3759	
nu star	51.6773	
5% Approximate Chi Square Value	36.16393	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.662551	
Anderson-Darling 5% Critical Value	0.656892	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.38593	
Kolmogrov-Smirnov 5% Critical Value	0.394168	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	0.25007	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-2.120264	
Maximum of log data	-1.609438	
Mean of log data	-1.762964	
Standard Deviation of log data	0.240403	
Variance of log data	0.057794	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.746939	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.176565	
MLE Standard Deviation	0.043067	
MLE Coefficient of Variation	0.243918	
MLE Skewness	0.746268	
MLE Median	0.171536	
MLE 80% Quantile	0.210173	
MLE 90% Quantile	0.233623	
MLE 95% Quantile	0.254743	
MLE 99% Quantile	0.300056	
MVU Estimate of Median	0.170299	
MVU Estimate of Mean	0.175278	
MVU Estimate of Standard Deviation	0.041956	
MVU Estimate of SE of Mean	0.020977	
95% H-UCL	0.265296	
95% Chebyshev (MVUE) UCL	0.266716	
97.5% Chebyshev (MVUE) UCL	0.306282	
99% Chebyshev (MVUE) UCL	0.384001	
Non-parametric Statisitics		
95% CLT UCL	0.205589	
95% Adjusted-CLT UCL	0.18734	
95% Modified-t UCL	0.215918	
95% Jackknife UCL	0.218765	
95% Chebyshev (Mean, Sd) UCL	0.256061	
97.5% Chebyshev (Mean, Sd) UCL	0.291136	
99% Chebyshev (Mean, Sd) UCL	0.360034	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.218765	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Phenanthrene	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.195	
Maximum	0.5	
Mean	0.29625	
Standard Deviation	0.142675	
Variance	0.020356	
Coefficient of Variation	0.481604	
Skewness	1.49859	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.826694	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.464133	
Gamma Statistics		
k hat	6.634533	
k star (bias corrected)	1.8253	
Theta hat	0.044653	
Theta star	0.162302	
nu hat	53.07626	
nu star	14.6024	
5% Approximate Chi Square Value	6.984647	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.440456	
Anderson-Darling 5% Critical Value	0.658399	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.292793	
Kolmogrov-Smirnov 5% Critical Value	0.395576	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.619353	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-1.634756	
Maximum of log data	-0.693147	
Mean of log data	-1.293804	
Standard Deviation of log data	0.439617	
Variance of log data	0.193263	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.867947	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.302047	
MLE Standard Deviation	0.139467	
MLE Coefficient of Variation	0.461738	
MLE Skewness	1.483658	
MLE Median	0.274226	
MLE 80% Quantile	0.397593	
MLE 90% Quantile	0.482441	
MLE 95% Quantile	0.565167	
MLE 99% Quantile	0.762422	
MVU Estimate of Median	0.267649	
MVU Estimate of Mean	0.294536	
MVU Estimate of Standard Deviation	0.127656	
MVU Estimate of SE of Mean	0.06381	
95% H-UCL	0.884698	
95% Chebyshev (MVUE) UCL	0.572678	
97.5% Chebyshev (MVUE) UCL	0.693031	
99% Chebyshev (MVUE) UCL	0.929439	
Non-parametric Statisitics		
95% CLT UCL	0.41359	
95% Adjusted-CLT UCL	0.470705	
95% Modified-t UCL	0.473042	
95% Jackknife UCL	0.464133	
95% Chebyshev (Mean, Sd) UCL	0.607204	
97.5% Chebyshev (Mean, Sd) UCL	0.741754	
99% Chebyshev (Mean, Sd) UCL	1.006051	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.464133	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.22	
Maximum	0.93999	
Mean	0.488748	
Standard Deviation	0.33616	
Variance	0.113003	
Coefficient of Variation	0.687798	
Skewness	1.021743	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.879133	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.8843	
Gamma Statistics		
k hat	2.946635	
k star (bias corrected)	0.903325	
Theta hat	0.165866	
Theta star	0.541054	
nu hat	23.57308	
nu star	7.226603	
5% Approximate Chi Square Value	2.295143	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.370777	
Anderson-Darling 5% Critical Value	0.659471	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.304745	
Kolmogrov-Smirnov 5% Critical Value	0.396632	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.538895	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-1.514128	
Maximum of log data	-0.061886	
Mean of log data	-0.895087	
Standard Deviation of log data	0.689766	
Variance of log data	0.475778	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.900303	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.518302	
MLE Standard Deviation	0.404563	
MLE Coefficient of Variation	0.780554	
MLE Skewness	2.817228	
MLE Median	0.408572	
MLE 80% Quantile	0.73181	
MLE 90% Quantile	0.991301	
MLE 95% Quantile	1.270714	
MLE 99% Quantile	2.032588	
MVU Estimate of Median	0.384703	
MVU Estimate of Mean	0.485471	
MVU Estimate of Standard Deviation	0.323663	
MVU Estimate of SE of Mean	0.161578	
95% H-UCL	6.380254	
95% Chebyshev (MVUE) UCL	1.189773	
97.5% Chebyshev (MVUE) UCL	1.494525	
99% Chebyshev (MVUE) UCL	2.093151	
Non-parametric Statisitics		
95% CLT UCL	0.765214	
95% Adjusted-CLT UCL	0.856964	
95% Modified-t UCL	0.898611	
95% Jackknife UCL	0.8843	
95% Chebyshev (Mean, Sd) UCL	1.22139	
97.5% Chebyshev (Mean, Sd) UCL	1.538405	
99% Chebyshev (Mean, Sd) UCL	2.16112	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.8843	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	3.1	
Maximum	6.2	
Mean	4.625	
Standard Deviation	1.307351	
Variance	1.709167	
Coefficient of Variation	0.28267	
Skewness	0.100359	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	1.000072	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	6.163336	
Gamma Statistics		
k hat	16.10984	
k star (bias corrected)	4.194126	
Theta hat	0.287092	
Theta star	1.102733	
nu hat	128.8787	
nu star	33.55301	
5% Approximate Chi Square Value	21.30527	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.194662	
Anderson-Darling 5% Critical Value	0.657094	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.172164	
Kolmogrov-Smirnov 5% Critical Value	0.394508	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	7.283769	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.131402	
Maximum of log data	1.824549	
Mean of log data	1.500118	
Standard Deviation of log data	0.292909	
Variance of log data	0.085796	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.993059	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	4.678681	
MLE Standard Deviation	1.400355	
MLE Coefficient of Variation	0.299305	
MLE Skewness	0.924729	
MLE Median	4.48222	
MLE 80% Quantile	5.740961	
MLE 90% Quantile	6.530651	
MLE 95% Quantile	7.256909	
MLE 99% Quantile	8.858922	
MVU Estimate of Median	4.434305	
MVU Estimate of Mean	4.627827	
MVU Estimate of Standard Deviation	1.346914	
MVU Estimate of SE of Mean	0.673419	
95% H-UCL	8.057398	
95% Chebyshev (MVUE) UCL	7.56319	
97.5% Chebyshev (MVUE) UCL	8.833324	
99% Chebyshev (MVUE) UCL	11.32826	
Non-parametric Statisitics		
95% CLT UCL	5.700201	
95% Adjusted-CLT UCL	5.735249	
95% Modified-t UCL	6.168803	
95% Jackknife UCL	6.163336	
95% Chebyshev (Mean, Sd) UCL	7.474305	
97.5% Chebyshev (Mean, Sd) UCL	8.707202	
99% Chebyshev (Mean, Sd) UCL	11.12899	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	6.163336	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Barium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	9.5	
Maximum	12.6	
Mean	10.625	
Standard Deviation	1.443087	
Variance	2.0825	
Coefficient of Variation	0.13582	
Skewness	1.155403	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.870136	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	12.32305	
Gamma Statistics		
k hat	75.52137	
k star (bias corrected)	19.04701	
Theta hat	0.140689	
Theta star	0.55783	
nu hat	604.1709	
nu star	152.3761	
5% Approximate Chi Square Value	124.8373	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.402487	
Anderson-Darling 5% Critical Value	0.656236	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.296238	
Kolmogrov-Smirnov 5% Critical Value	0.393907	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	12.96885	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	2.251292	
Maximum of log data	2.533697	
Mean of log data	2.356574	
Standard Deviation of log data	0.131623	
Variance of log data	0.017325	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.879665	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	10.64656	
MLE Standard Deviation	1.407421	
MLE Coefficient of Variation	0.132195	
MLE Skewness	0.398895	
MLE Median	10.55473	
MLE 80% Quantile	11.79642	
MLE 90% Quantile	12.49976	
MLE 95% Quantile	13.10631	
MLE 99% Quantile	14.33536	
MVU Estimate of Median	10.53189	
MVU Estimate of Mean	10.62344	
MVU Estimate of Standard Deviation	1.396474	
MVU Estimate of SE of Mean	0.698235	
95% H-UCL	12.86206	
95% Chebyshev (MVUE) UCL	13.66698	
97.5% Chebyshev (MVUE) UCL	14.98392	
99% Chebyshev (MVUE) UCL	17.57079	
Non-parametric Statisitics		
95% CLT UCL	11.81183	
95% Adjusted-CLT UCL	12.25723	
95% Modified-t UCL	12.39253	
95% Jackknife UCL	12.32305	
95% Chebyshev (Mean, Sd) UCL	13.77014	
97.5% Chebyshev (Mean, Sd) UCL	15.13104	
99% Chebyshev (Mean, Sd) UCL	17.80427	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	12.32305	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.0205	
Maximum	0.18	
Mean	0.078125	
Standard Deviation	0.074958	
Variance	0.005619	
Coefficient of Variation	0.959465	
Skewness	1.107603	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.863946	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.166327	
Gamma Statistics		
k hat	1.396553	
k star (bias corrected)	0.515805	
Theta hat	0.055941	
Theta star	0.151462	
nu hat	11.17242	
nu star	4.126438	
5% Approximate Chi Square Value	0.771973	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.396222	
Anderson-Darling 5% Critical Value	0.663247	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.315363	
Kolmogrov-Smirnov 5% Critical Value	0.400102	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.417602	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-3.88733	
Maximum of log data	-1.714798	
Mean of log data	-2.948377	
Standard Deviation of log data	1.058655	
Variance of log data	1.12075	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.879771	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.091813	
MLE Standard Deviation	0.132005	
MLE Coefficient of Variation	1.437759	
MLE Skewness	7.285346	
MLE Median	0.052425	
MLE 80% Quantile	0.128245	
MLE 90% Quantile	0.204333	
MLE 95% Quantile	0.299126	
MLE 99% Quantile	0.615115	
MVU Estimate of Median	0.045383	
MVU Estimate of Mean	0.077409	
MVU Estimate of Standard Deviation	0.075997	
MVU Estimate of SE of Mean	0.037723	
95% H-UCL	30.31451	
95% Chebyshev (MVUE) UCL	0.241838	
97.5% Chebyshev (MVUE) UCL	0.312987	
99% Chebyshev (MVUE) UCL	0.452745	
Non-parametric Statisitics		
95% CLT UCL	0.139773	
95% Adjusted-CLT UCL	0.161951	
95% Modified-t UCL	0.169786	
95% Jackknife UCL	0.166327	
95% Chebyshev (Mean, Sd) UCL	0.241493	
97.5% Chebyshev (Mean, Sd) UCL	0.312182	
99% Chebyshev (Mean, Sd) UCL	0.451037	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.166327	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	7	
Maximum	9.8	
Mean	8.325	
Standard Deviation	1.431491	
Variance	2.049167	
Coefficient of Variation	0.171951	
Skewness	0.087698	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.842892	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	10.00941	
Gamma Statistics		
k hat	44.94465	
k star (bias corrected)	11.40283	
Theta hat	0.185228	
Theta star	0.730082	
nu hat	359.5572	
nu star	91.22264	
5% Approximate Chi Square Value	70.19487	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.497649	
Anderson-Darling 5% Critical Value	0.656134	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.315937	
Kolmogrov-Smirnov 5% Critical Value	0.393891	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	10.81886	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.94591	
Maximum of log data	2.282382	
Mean of log data	2.108097	
Standard Deviation of log data	0.172727	
Variance of log data	0.029835	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.83968	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	8.356288	
MLE Standard Deviation	1.454191	
MLE Coefficient of Variation	0.174024	
MLE Skewness	0.527341	
MLE Median	8.23256	
MLE 80% Quantile	9.526253	
MLE 90% Quantile	10.27847	
MLE 95% Quantile	10.93789	
MLE 99% Quantile	12.30321	
MVU Estimate of Median	8.201892	
MVU Estimate of Mean	8.324975	
MVU Estimate of Standard Deviation	1.434746	
MVU Estimate of SE of Mean	0.717368	
95% H-UCL	10.86716	
95% Chebyshev (MVUE) UCL	11.45191	
97.5% Chebyshev (MVUE) UCL	12.80494	
99% Chebyshev (MVUE) UCL	15.4627	
Non-parametric Statisitics		
95% CLT UCL	9.502297	
95% Adjusted-CLT UCL	9.535832	
95% Modified-t UCL	10.01464	
95% Jackknife UCL	10.00941	
95% Chebyshev (Mean, Sd) UCL	11.44486	
97.5% Chebyshev (Mean, Sd) UCL	12.79483	
99% Chebyshev (Mean, Sd) UCL	15.44658	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	10.00941	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	6.7	
Maximum	16.6	
Mean	11.725	
Standard Deviation	4.813436	
Variance	23.16917	
Coefficient of Variation	0.410528	
Skewness	-0.038366	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.892568	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	17.38888	
Gamma Statistics		
k hat	7.420386	
k star (bias corrected)	2.021763	
Theta hat	1.580107	
Theta star	5.799394	
nu hat	59.36309	
nu star	16.17411	
5% Approximate Chi Square Value	8.083878	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.38591	
Anderson-Darling 5% Critical Value	0.658096	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.293854	
Kolmogrov-Smirnov 5% Critical Value	0.395425	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	23.45921	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.902108	
Maximum of log data	2.809403	
Mean of log data	2.392831	
Standard Deviation of log data	0.436585	
Variance of log data	0.190606	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.898497	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	12.03879	
MLE Standard Deviation	5.516642	
MLE Coefficient of Variation	0.458239	
MLE Skewness	1.470939	
MLE Median	10.94443	
MLE 80% Quantile	15.82743	
MLE 90% Quantile	19.1795	
MLE 95% Quantile	22.44376	
MLE 99% Quantile	30.21465	
MVU Estimate of Median	10.68553	
MVU Estimate of Mean	11.74366	
MVU Estimate of Standard Deviation	5.055725	
MVU Estimate of SE of Mean	2.527169	
95% H-UCL	34.79509	
95% Chebyshev (MVUE) UCL	22.75933	
97.5% Chebyshev (MVUE) UCL	27.52582	
99% Chebyshev (MVUE) UCL	36.88867	
Non-parametric Statisitics		
95% CLT UCL	15.6837	
95% Adjusted-CLT UCL	15.63437	
95% Modified-t UCL	17.38119	
95% Jackknife UCL	17.38888	
95% Chebyshev (Mean, Sd) UCL	22.21564	
97.5% Chebyshev (Mean, Sd) UCL	26.75495	
99% Chebyshev (Mean, Sd) UCL	35.67154	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	17.38888	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	9	
Maximum	39.9	
Mean	18.925	
Standard Deviation	14.17024	
Variance	200.7958	
Coefficient of Variation	0.748758	
Skewness	1.842847	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.777171	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	35.59887	
Gamma Statistics		
k hat	3.030495	
k star (bias corrected)	0.924291	
Theta hat	6.244854	
Theta star	20.47516	
nu hat	24.24396	
nu star	7.394324	
5% Approximate Chi Square Value	2.388867	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.476731	
Anderson-Darling 5% Critical Value	0.659394	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.343462	
Kolmogrov-Smirnov 5% Critical Value	0.396548	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	58.57907	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	2.197225	
Maximum of log data	3.686376	
Mean of log data	2.766515	
Standard Deviation of log data	0.644932	
Variance of log data	0.415937	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.889381	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	19.5795	
MLE Standard Deviation	14.06173	
MLE Coefficient of Variation	0.718186	
MLE Skewness	2.524992	
MLE Median	15.90311	
MLE 80% Quantile	27.42575	
MLE 90% Quantile	36.42489	
MLE 95% Quantile	45.94422	
MLE 99% Quantile	71.28079	
MVU Estimate of Median	15.08907	
MVU Estimate of Mean	18.50231	
MVU Estimate of Standard Deviation	11.58109	
MVU Estimate of SE of Mean	5.78349	
95% H-UCL	177.7353	
95% Chebyshev (MVUE) UCL	43.71196	
97.5% Chebyshev (MVUE) UCL	54.6202	
99% Chebyshev (MVUE) UCL	76.04731	
Non-parametric Statisitics		
95% CLT UCL	30.57899	
95% Adjusted-CLT UCL	37.55468	
95% Modified-t UCL	36.68693	
95% Jackknife UCL	35.59887	
95% Chebyshev (Mean, Sd) UCL	49.80833	
97.5% Chebyshev (Mean, Sd) UCL	63.17157	
99% Chebyshev (Mean, Sd) UCL	89.42108	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	35.59887	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	60.4	
Maximum	103	
Mean	81.65	
Standard Deviation	18.97692	
Variance	360.1233	
Coefficient of Variation	0.232418	
Skewness	0.010746	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.971304	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	103.9798	
Gamma Statistics		
k hat	24.12762	
k star (bias corrected)	6.198572	
Theta hat	3.384089	
Theta star	13.17239	
nu hat	193.021	
nu star	49.58857	
5% Approximate Chi Square Value	34.4182	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.243902	
Anderson-Darling 5% Critical Value	0.656932	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.227097	
Kolmogrov-Smirnov 5% Critical Value	0.394182	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	117.6385	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.100989	
Maximum of log data	4.634729	
Mean of log data	4.381576	
Standard Deviation of log data	0.237625	
Variance of log data	0.056466	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.969139	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	82.25371	
MLE Standard Deviation	19.82476	
MLE Coefficient of Variation	0.24102	
MLE Skewness	0.73706	
MLE Median	79.96392	
MLE 80% Quantile	97.74568	
MLE 90% Quantile	108.5189	
MLE 95% Quantile	118.2108	
MLE 99% Quantile	138.9748	
MVU Estimate of Median	79.40071	
MVU Estimate of Mean	81.66792	
MVU Estimate of Standard Deviation	19.32484	
MVU Estimate of SE of Mean	9.662176	
95% H-UCL	122.7793	
95% Chebyshev (MVUE) UCL	123.7844	
97.5% Chebyshev (MVUE) UCL	142.0082	
99% Chebyshev (MVUE) UCL	177.8054	
Non-parametric Statisitics		
95% CLT UCL	97.25712	
95% Adjusted-CLT UCL	97.3116	
95% Modified-t UCL	103.9883	
95% Jackknife UCL	103.9798	
95% Chebyshev (Mean, Sd) UCL	123.0092	
97.5% Chebyshev (Mean, Sd) UCL	140.9054	
99% Chebyshev (Mean, Sd) UCL	176.059	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	103.9798	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Nickel	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	4.9	
Maximum	7.2	
Mean	6.375	
Standard Deviation	1.040433	
Variance	1.0825	
Coefficient of Variation	0.163205	
Skewness	-1.422618	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.870321	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	7.599258	
Gamma Statistics		
k hat	45.60821	
k star (bias corrected)	11.56872	
Theta hat	0.139777	
Theta star	0.551055	
nu hat	364.8657	
nu star	92.54975	
5% Approximate Chi Square Value	71.36052	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.44931	
Anderson-Darling 5% Critical Value	0.656108	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.280218	
Kolmogrov-Smirnov 5% Critical Value	0.393881	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	8.267942	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.589235	
Maximum of log data	1.974081	
Mean of log data	1.841381	
Standard Deviation of log data	0.175438	
Variance of log data	0.030779	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.84601	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	6.403024	
MLE Standard Deviation	1.132034	
MLE Coefficient of Variation	0.176797	
MLE Skewness	0.535917	
MLE Median	6.30524	
MLE 80% Quantile	7.312801	
MLE 90% Quantile	7.899655	
MLE 95% Quantile	8.414672	
MLE 99% Quantile	9.482522	
MVU Estimate of Median	6.28101	
MVU Estimate of Mean	6.378268	
MVU Estimate of Standard Deviation	1.11642	
MVU Estimate of SE of Mean	0.558206	
95% H-UCL	8.370385	
95% Chebyshev (MVUE) UCL	8.81143	
97.5% Chebyshev (MVUE) UCL	9.864261	
99% Chebyshev (MVUE) UCL	11.93234	
Non-parametric Statisitics		
95% CLT UCL	7.23068	
95% Adjusted-CLT UCL	6.835292	
95% Modified-t UCL	7.537585	
95% Jackknife UCL	7.599258	
95% Chebyshev (Mean, Sd) UCL	8.64257	
97.5% Chebyshev (Mean, Sd) UCL	9.62375	
99% Chebyshev (Mean, Sd) UCL	11.55109	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	7.599258	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.32	
Maximum	0.54	
Mean	0.40375	
Standard Deviation	0.096555	
Variance	0.009323	
Coefficient of Variation	0.239146	
Skewness	1.352339	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.90084	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.517365	
Gamma Statistics		
k hat	25.25618	
k star (bias corrected)	6.480712	
Theta hat	0.015986	
Theta star	0.0623	
nu hat	202.0494	
nu star	51.84569	
5% Approximate Chi Square Value	36.30498	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.320631	
Anderson-Darling 5% Critical Value	0.656889	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.242174	
Kolmogrov-Smirnov 5% Critical Value	0.394166	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.576579	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-1.139434	
Maximum of log data	-0.616186	
Mean of log data	-0.926887	
Standard Deviation of log data	0.226311	
Variance of log data	0.051217	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.937772	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.40605	
MLE Standard Deviation	0.093083	
MLE Coefficient of Variation	0.22924	
MLE Skewness	0.699767	
MLE Median	0.395784	
MLE 80% Quantile	0.479192	
MLE 90% Quantile	0.529365	
MLE 95% Quantile	0.574299	
MLE 99% Quantile	0.669994	
MVU Estimate of Median	0.393255	
MVU Estimate of Mean	0.403429	
MVU Estimate of Standard Deviation	0.090952	
MVU Estimate of SE of Mean	0.045475	
95% H-UCL	0.590442	
95% Chebyshev (MVUE) UCL	0.601651	
97.5% Chebyshev (MVUE) UCL	0.687422	
99% Chebyshev (MVUE) UCL	0.855902	
Non-parametric Statisitics		
95% CLT UCL	0.48316	
95% Adjusted-CLT UCL	0.51804	
95% Modified-t UCL	0.522805	
95% Jackknife UCL	0.517365	
95% Chebyshev (Mean, Sd) UCL	0.614187	
97.5% Chebyshev (Mean, Sd) UCL	0.705244	
99% Chebyshev (Mean, Sd) UCL	0.884106	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.517365	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	7.3	
Maximum	11.6	
Mean	9.6	
Standard Deviation	1.78699	
Variance	3.193333	
Coefficient of Variation	0.186145	
Skewness	-0.473148	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.985317	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	11.70272	
Gamma Statistics		
k hat	36.57731	
k star (bias corrected)	9.310994	
Theta hat	0.262458	
Theta star	1.031039	
nu hat	292.6185	
nu star	74.48795	
5% Approximate Chi Square Value	55.60755	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.246181	
Anderson-Darling 5% Critical Value	0.656455	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.221445	
Kolmogrov-Smirnov 5% Critical Value	0.394008	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	12.85948	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.987874	
Maximum of log data	2.451005	
Mean of log data	2.248031	
Standard Deviation of log data	0.19416	
Variance of log data	0.037698	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.964714	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	9.64925	
MLE Standard Deviation	1.891295	
MLE Coefficient of Variation	0.196004	
MLE Skewness	0.595543	
MLE Median	9.469074	
MLE 80% Quantile	11.15733	
MLE 90% Quantile	12.1524	
MLE 95% Quantile	13.03222	
MLE 99% Quantile	14.87449	
MVU Estimate of Median	9.424516	
MVU Estimate of Mean	9.603505	
MVU Estimate of Standard Deviation	1.859373	
MVU Estimate of SE of Mean	0.929676	
95% H-UCL	13.0915	
95% Chebyshev (MVUE) UCL	13.65587	
97.5% Chebyshev (MVUE) UCL	15.40933	
99% Chebyshev (MVUE) UCL	18.85367	
Non-parametric Statisitics		
95% CLT UCL	11.06967	
95% Adjusted-CLT UCL	10.84381	
95% Modified-t UCL	11.66749	
95% Jackknife UCL	11.70272	
95% Chebyshev (Mean, Sd) UCL	13.49465	
97.5% Chebyshev (Mean, Sd) UCL	15.17987	
99% Chebyshev (Mean, Sd) UCL	18.49016	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	11.70272	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Sed stat - 01.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	46.1	
Maximum	153	
Mean	102.25	
Standard Deviation	47.31233	
Variance	2238.457	
Coefficient of Variation	0.462712	
Skewness	-0.241756	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.973572	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	157.9216	
Gamma Statistics		
k hat	5.334245	
k star (bias corrected)	1.500228	
Theta hat	19.1686	
Theta star	68.15631	
nu hat	42.67396	
nu star	12.00182	
5% Approximate Chi Square Value	5.227223	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.261681	
Anderson-Darling 5% Critical Value	0.658901	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.245906	
Kolmogrov-Smirnov 5% Critical Value	0.395826	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	234.7683	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.830813	
Maximum of log data	5.030438	
Mean of log data	4.530768	
Standard Deviation of log data	0.53249	
Variance of log data	0.283546	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.943602	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	106.9692	
MLE Standard Deviation	61.24676	
MLE Coefficient of Variation	0.572564	
MLE Skewness	1.905396	
MLE Median	92.82985	
MLE 80% Quantile	145.5795	
MLE 90% Quantile	184.0152	
MLE 95% Quantile	222.8981	
MLE 99% Quantile	320.3265	
MVU Estimate of Median	89.57447	
MVU Estimate of Mean	103.0201	
MVU Estimate of Standard Deviation	53.73544	
MVU Estimate of SE of Mean	26.85188	
95% H-UCL	495.2559	
95% Chebyshev (MVUE) UCL	220.0647	
97.5% Chebyshev (MVUE) UCL	270.71	
99% Chebyshev (MVUE) UCL	370.1929	
Non-parametric Statisitics		
95% CLT UCL	141.1609	
95% Adjusted-CLT UCL	138.1055	
95% Modified-t UCL	157.445	
95% Jackknife UCL	157.9216	
95% Chebyshev (Mean, Sd) UCL	205.3648	
97.5% Chebyshev (Mean, Sd) UCL	249.9827	
99% Chebyshev (Mean, Sd) UCL	337.6259	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	157.9216	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	39.6	
Maximum	266	
Mean	111.78	
Standard Deviation	93.17136	
Variance	8680.902	
Coefficient of Variation	0.833524	
Skewness	1.515906	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.83831	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	200.6087	
Gamma Statistics		
k hat	2.082929	
k star (bias corrected)	0.966505	
Theta hat	53.6648	
Theta star	115.6538	
nu hat	20.82929	
nu star	9.665051	
5% Approximate Chi Square Value	3.7327	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	2.310219	
Anderson-Darling Test Statistic	0.325525	
Anderson-Darling 5% Critical Value	0.684299	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.230435	
Kolmogrov-Smirnov 5% Critical Value	0.360383	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	289.4311	
95% Adjusted Gamma UCL	467.6438	
Lognormal Statistics		
Minimum of log data	3.678829	
Maximum of log data	5.583496	
Mean of log data	4.457681	
Standard Deviation of log data	0.793603	
Variance of log data	0.629806	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.926885	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	118.2244	
MLE Standard Deviation	110.7307	
MLE Coefficient of Variation	0.936615	
MLE Skewness	3.631487	
MLE Median	86.28721	
MLE 80% Quantile	168.726	
MLE 90% Quantile	239.2387	
MLE 95% Quantile	318.3524	
MLE 99% Quantile	546.5376	
MVU Estimate of Median	80.96568	
MVU Estimate of Mean	109.9289	
MVU Estimate of Standard Deviation	85.44409	
MVU Estimate of SE of Mean	38.04965	
95% H-UCL	586.3657	
95% Chebyshev (MVUE) UCL	275.7835	
97.5% Chebyshev (MVUE) UCL	347.5489	
99% Chebyshev (MVUE) UCL	488.5182	
Non-parametric Statisitics		
95% CLT UCL	180.3169	
95% Adjusted-CLT UCL	210.5001	
95% Modified-t UCL	205.3167	
95% Jackknife UCL	200.6087	
95% Chebyshev (Mean, Sd) UCL	293.4044	
97.5% Chebyshev (Mean, Sd) UCL	371.9934	
99% Chebyshev (Mean, Sd) UCL	526.3664	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	175.2147	
95% Bootstrap-t UCL	319.6592	
95% Hall's Bootstrap UCL	489.2972	
95% Percentile Bootstrap UCL	176.6	
95% BCA Bootstrap UCL	165.52	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	200.6087	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	0.15	
Maximum	3	
Mean	0.981	
Standard Deviation	1.205593	
Variance	1.453455	
Coefficient of Variation	1.228943	
Skewness	1.652909	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.782562	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.130401	
Gamma Statistics		
k hat	0.926116	
k star (bias corrected)	0.50378	
Theta hat	1.059263	
Theta star	1.94728	
nu hat	9.261157	
nu star	5.037796	
5% Approximate Chi Square Value	1.169284	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	0.544792	
Anderson-Darling Test Statistic	0.393538	
Anderson-Darling 5% Critical Value	0.693382	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.286997	
Kolmogrov-Smirnov 5% Critical Value	0.365078	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4.226585	
95% Adjusted Gamma UCL	9.071495	
Lognormal Statistics		
Minimum of log data	-1.89712	
Maximum of log data	1.098612	
Mean of log data	-0.648209	
Standard Deviation of log data	1.255642	
Variance of log data	1.576637	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.922143	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.1504	
MLE Standard Deviation	2.253918	
MLE Coefficient of Variation	1.959248	
MLE Skewness	13.39862	
MLE Median	0.522982	
MLE 80% Quantile	1.511056	
MLE 90% Quantile	2.625551	
MLE 95% Quantile	4.126056	
MLE 99% Quantile	9.702796	
MVU Estimate of Median	0.444748	
MVU Estimate of Mean	0.929904	
MVU Estimate of Standard Deviation	1.110323	
MVU Estimate of SE of Mean	0.486549	
95% H-UCL	50.56998	
95% Chebyshev (MVUE) UCL	3.05072	
97.5% Chebyshev (MVUE) UCL	3.968399	
99% Chebyshev (MVUE) UCL	5.771002	
Non-parametric Statisitics		
95% CLT UCL	1.867835	
95% Adjusted-CLT UCL	2.293689	
95% Modified-t UCL	2.196826	
95% Jackknife UCL	2.130401	
95% Chebyshev (Mean, Sd) UCL	3.331134	
97.5% Chebyshev (Mean, Sd) UCL	4.348039	
99% Chebyshev (Mean, Sd) UCL	6.345551	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.778535	
95% Bootstrap-t UCL	10.92755	
95% Hall's Bootstrap UCL	7.070815	
95% Percentile Bootstrap UCL	1.884	
95% BCA Bootstrap UCL	1.749	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.130401	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	40	
Maximum	228	
Mean	97.72	
Standard Deviation	77.82642	
Variance	6056.952	
Coefficient of Variation	0.796423	
Skewness	1.617443	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.817959	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	171.919	
Gamma Statistics		
k hat	2.402357	
k star (bias corrected)	1.094276	
Theta hat	40.67671	
Theta star	89.30103	
nu hat	24.02357	
nu star	10.94276	
5% Approximate Chi Square Value	4.53831	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	2.921898	
Anderson-Darling Test Statistic	0.364967	
Anderson-Darling 5% Critical Value	0.683718	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.218091	
Kolmogrov-Smirnov 5% Critical Value	0.360048	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	235.6222	
95% Adjusted Gamma UCL	365.9699	
Lognormal Statistics		
Minimum of log data	3.688879	
Maximum of log data	5.429346	
Mean of log data	4.359771	
Standard Deviation of log data	0.721987	
Variance of log data	0.521266	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.916434	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	101.535	
MLE Standard Deviation	83.98351	
MLE Coefficient of Variation	0.827139	
MLE Skewness	3.047309	
MLE Median	78.23918	
MLE 80% Quantile	144.0053	
MLE 90% Quantile	197.853	
MLE 95% Quantile	256.5799	
MLE 99% Quantile	419.5209	
MVU Estimate of Median	74.23109	
MVU Estimate of Mean	95.7266	
MVU Estimate of Standard Deviation	67.93062	
MVU Estimate of SE of Mean	30.28802	
95% H-UCL	392.8146	
95% Chebyshev (MVUE) UCL	227.749	
97.5% Chebyshev (MVUE) UCL	284.8752	
99% Chebyshev (MVUE) UCL	397.0886	
Non-parametric Statisitics		
95% CLT UCL	154.9692	
95% Adjusted-CLT UCL	181.8701	
95% Modified-t UCL	176.115	
95% Jackknife UCL	171.919	
95% Chebyshev (Mean, Sd) UCL	249.4316	
97.5% Chebyshev (Mean, Sd) UCL	315.0774	
99% Chebyshev (Mean, Sd) UCL	444.0257	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	148.4181	
95% Bootstrap-t UCL	319.2669	
95% Hall's Bootstrap UCL	475.1969	
95% Percentile Bootstrap UCL	156	
95% BCA Bootstrap UCL	140.88	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	171.919	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	38.6	
Maximum	228	
Mean	96.72	
Standard Deviation	78.36078	
Variance	6140.412	
Coefficient of Variation	0.810182	
Skewness	1.613078	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.818099	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	171.4284	
Gamma Statistics		
k hat	2.296657	
k star (bias corrected)	1.051996	
Theta hat	42.11338	
Theta star	91.9395	
nu hat	22.96657	
nu star	10.51996	
5% Approximate Chi Square Value	4.268418	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	2.715111	
Anderson-Darling Test Statistic	0.36723	
Anderson-Darling 5% Critical Value	0.68391	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.230432	
Kolmogrov-Smirnov 5% Critical Value	0.360159	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	238.3765	
95% Adjusted Gamma UCL	374.751	
Lognormal Statistics		
Minimum of log data	3.653252	
Maximum of log data	5.429346	
Mean of log data	4.33859	
Standard Deviation of log data	0.743348	
Variance of log data	0.552567	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.909901	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	100.975	
MLE Standard Deviation	86.72735	
MLE Coefficient of Variation	0.858899	
MLE Skewness	3.210312	
MLE Median	76.59947	
MLE 80% Quantile	143.5552	
MLE 90% Quantile	199.0971	
MLE 95% Quantile	260.1863	
MLE 99% Quantile	431.6513	
MVU Estimate of Median	72.44409	
MVU Estimate of Mean	94.82434	
MVU Estimate of Standard Deviation	69.21036	
MVU Estimate of SE of Mean	30.84816	
95% H-UCL	419.5776	
95% Chebyshev (MVUE) UCL	229.2884	
97.5% Chebyshev (MVUE) UCL	287.471	
99% Chebyshev (MVUE) UCL	401.7597	
Non-parametric Statisitics		
95% CLT UCL	154.3623	
95% Adjusted-CLT UCL	181.3747	
95% Modified-t UCL	175.6418	
95% Jackknife UCL	171.4284	
95% Chebyshev (Mean, Sd) UCL	249.4733	
97.5% Chebyshev (Mean, Sd) UCL	315.5698	
99% Chebyshev (Mean, Sd) UCL	445.4035	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	150.552	
95% Bootstrap-t UCL	283.1953	
95% Hall's Bootstrap UCL	430.1015	
95% Percentile Bootstrap UCL	154.2	
95% BCA Bootstrap UCL	134.88	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	171.4284	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	111	
Maximum	830	
Mean	308	
Standard Deviation	302.5525	
Variance	91538	
Coefficient of Variation	0.982313	
Skewness	1.884345	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.749022	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	596.4507	
Gamma Statistics		
k hat	1.744569	
k star (bias corrected)	0.831161	
Theta hat	176.5479	
Theta star	370.566	
nu hat	17.44569	
nu star	8.311611	
5% Approximate Chi Square Value	2.916063	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	1.710333	
Anderson-Darling Test Statistic	0.490804	
Anderson-Darling 5% Critical Value	0.685441	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.280335	
Kolmogrov-Smirnov 5% Critical Value	0.361083	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	877.8877	
95% Adjusted Gamma UCL	1496.771	
Lognormal Statistics		
Minimum of log data	4.70953	
Maximum of log data	6.721426	
Mean of log data	5.416907	
Standard Deviation of log data	0.833898	
Variance of log data	0.695385	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.880408	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	318.8113	
MLE Standard Deviation	319.5248	
MLE Coefficient of Variation	1.002238	
MLE Skewness	4.013444	
MLE Median	225.1815	
MLE 80% Quantile	455.5703	
MLE 90% Quantile	657.5134	
MLE 95% Quantile	887.7305	
MLE 99% Quantile	1566.427	
MVU Estimate of Median	209.8815	
MVU Estimate of Mean	293.9009	
MVU Estimate of Standard Deviation	239.5285	
MVU Estimate of SE of Mean	106.578	
95% H-UCL	1837.743	
95% Chebyshev (MVUE) UCL	758.4635	
97.5% Chebyshev (MVUE) UCL	959.4801	
99% Chebyshev (MVUE) UCL	1354.338	
Non-parametric Statisitics		
95% CLT UCL	530.5579	
95% Adjusted-CLT UCL	652.3927	
95% Modified-t UCL	615.4544	
95% Jackknife UCL	596.4507	
95% Chebyshev (Mean, Sd) UCL	897.7834	
97.5% Chebyshev (Mean, Sd) UCL	1152.983	
99% Chebyshev (Mean, Sd) UCL	1654.274	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	508.0407	
95% Bootstrap-t UCL	2100.416	
95% Hall's Bootstrap UCL	2178.156	
95% Percentile Bootstrap UCL	553.6	
95% BCA Bootstrap UCL	489.8	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	877.8877	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	0.36	
Maximum	2	
Mean	0.804	
Standard Deviation	0.695219	
Variance	0.48333	
Coefficient of Variation	0.864701	
Skewness	1.863329	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.743008	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.466816	
Gamma Statistics		
k hat	2.253147	
k star (bias corrected)	1.034592	
Theta hat	0.356834	
Theta star	0.777118	
nu hat	22.53147	
nu star	10.34592	
5% Approximate Chi Square Value	4.158239	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	2.631209	
Anderson-Darling Test Statistic	0.56415	
Anderson-Darling 5% Critical Value	0.683989	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.312823	
Kolmogrov-Smirnov 5% Critical Value	0.360204	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.000395	
95% Adjusted Gamma UCL	3.16133	
Lognormal Statistics		
Minimum of log data	-1.021651	
Maximum of log data	0.693147	
Mean of log data	-0.456185	
Standard Deviation of log data	0.723231	
Variance of log data	0.523063	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.84313	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.82312	
MLE Standard Deviation	0.68234	
MLE Coefficient of Variation	0.828968	
MLE Skewness	3.05656	
MLE Median	0.633697	
MLE 80% Quantile	1.167594	
MLE 90% Quantile	1.605069	
MLE 95% Quantile	2.082418	
MLE 99% Quantile	3.407743	
MVU Estimate of Median	0.601123	
MVU Estimate of Mean	0.775858	
MVU Estimate of Standard Deviation	0.551489	
MVU Estimate of SE of Mean	0.245886	
95% H-UCL	3.197531	
95% Chebyshev (MVUE) UCL	1.847651	
97.5% Chebyshev (MVUE) UCL	2.311416	
99% Chebyshev (MVUE) UCL	3.222394	
Non-parametric Statisitics		
95% CLT UCL	1.315404	
95% Adjusted-CLT UCL	1.59224	
95% Modified-t UCL	1.509996	
95% Jackknife UCL	1.466816	
95% Chebyshev (Mean, Sd) UCL	2.159232	
97.5% Chebyshev (Mean, Sd) UCL	2.745642	
99% Chebyshev (Mean, Sd) UCL	3.897531	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.272618	
95% Bootstrap-t UCL	7.304643	
95% Hall's Bootstrap UCL	3.97542	
95% Percentile Bootstrap UCL	1.344	
95% BCA Bootstrap UCL	1.208	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	2.000395	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	8.7	
Maximum	31.8	
Mean	16.18	
Standard Deviation	9.418439	
Variance	88.707	
Coefficient of Variation	0.582104	
Skewness	1.511428	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.841789	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	25.15945	
Gamma Statistics		
k hat	4.357918	
k star (bias corrected)	1.8765	
Theta hat	3.712782	
Theta star	8.622433	
nu hat	43.57918	
nu star	18.765	
5% Approximate Chi Square Value	9.944556	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	7.305785	
Anderson-Darling Test Statistic	0.355988	
Anderson-Darling 5% Critical Value	0.68105	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.223653	
Kolmogrov-Smirnov 5% Critical Value	0.3584	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	30.53105	
95% Adjusted Gamma UCL	41.55854	
Lognormal Statistics		
Minimum of log data	2.163323	
Maximum of log data	3.459466	
Mean of log data	2.664677	
Standard Deviation of log data	0.529598	
Variance of log data	0.280474	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.915812	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	16.52565	
MLE Standard Deviation	9.403038	
MLE Coefficient of Variation	0.568997	
MLE Skewness	1.891206	
MLE Median	14.36331	
MLE 80% Quantile	22.47013	
MLE 90% Quantile	28.36654	
MLE 95% Quantile	34.32471	
MLE 99% Quantile	49.2309	
MVU Estimate of Median	13.9642	
MVU Estimate of Mean	16.03612	
MVU Estimate of Standard Deviation	8.41383	
MVU Estimate of SE of Mean	3.759217	
95% H-UCL	36.9923	
95% Chebyshev (MVUE) UCL	32.42217	
97.5% Chebyshev (MVUE) UCL	39.51243	
99% Chebyshev (MVUE) UCL	53.43986	
Non-parametric Statisitics		
95% CLT UCL	23.10821	
95% Adjusted-CLT UCL	26.15034	
95% Modified-t UCL	25.63396	
95% Jackknife UCL	25.15945	
95% Chebyshev (Mean, Sd) UCL	34.53992	
97.5% Chebyshev (Mean, Sd) UCL	42.48427	
99% Chebyshev (Mean, Sd) UCL	58.08941	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	22.52119	
95% Bootstrap-t UCL	32.97602	
95% Hall's Bootstrap UCL	52.85714	
95% Percentile Bootstrap UCL	22.56	
95% BCA Bootstrap UCL	21.3	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	25.15945	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - nr-so.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	110	
Maximum	708	
Mean	291	
Standard Deviation	245.876	
Variance	60455	
Coefficient of Variation	0.844935	
Skewness	1.719294	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.805506	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	525.4158	
Gamma Statistics		
k hat	2.189433	
k star (bias corrected)	1.009107	
Theta hat	132.9111	
Theta star	288.3739	
nu hat	21.89433	
nu star	10.09107	
5% Approximate Chi Square Value	3.997911	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	2.509682	
Anderson-Darling Test Statistic	0.359047	
Anderson-Darling 5% Critical Value	0.684105	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.206784	
Kolmogrov-Smirnov 5% Critical Value	0.360271	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	734.5087	
95% Adjusted Gamma UCL	1170.069	
Lognormal Statistics		
Minimum of log data	4.70048	
Maximum of log data	6.562444	
Mean of log data	5.427902	
Standard Deviation of log data	0.755318	
Variance of log data	0.570505	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.928244	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	302.8248	
MLE Standard Deviation	265.5826	
MLE Coefficient of Variation	0.877018	
MLE Skewness	3.305619	
MLE Median	227.6711	
MLE 80% Quantile	431.0161	
MLE 90% Quantile	600.934	
MLE 95% Quantile	788.7106	
MLE 99% Quantile	1319.187	
MVU Estimate of Median	214.927	
MVU Estimate of Mean	283.7319	
MVU Estimate of Standard Deviation	210.3016	
MVU Estimate of SE of Mean	93.71597	
95% H-UCL	1310.991	
95% Chebyshev (MVUE) UCL	692.2304	
97.5% Chebyshev (MVUE) UCL	868.988	
99% Chebyshev (MVUE) UCL	1216.194	
Non-parametric Statisitics		
95% CLT UCL	471.8666	
95% Adjusted-CLT UCL	562.2059	
95% Modified-t UCL	539.5069	
95% Jackknife UCL	525.4158	
95% Chebyshev (Mean, Sd) UCL	770.3005	
97.5% Chebyshev (Mean, Sd) UCL	977.6943	
99% Chebyshev (Mean, Sd) UCL	1385.079	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	454.0581	
95% Bootstrap-t UCL	985.5711	
95% Hall's Bootstrap UCL	1248.055	
95% Percentile Bootstrap UCL	471.6	
95% BCA Bootstrap UCL	427.6	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	525.4158	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	8.1	
Maximum	10.9	
Mean	8.93	
Standard Deviation	1.128938	
Variance	1.2745	
Coefficient of Variation	0.126421	
Skewness	1.966127	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.751553	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	10.00632	
Gamma Statistics		
k hat	85.44033	
k star (bias corrected)	34.30947	
Theta hat	0.104517	
Theta star	0.260278	
nu hat	854.4033	
nu star	343.0947	
5% Approximate Chi Square Value	301.1654	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	283.8059	
Anderson-Darling Test Statistic	0.696826	
Anderson-Darling 5% Critical Value	0.678132	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.380822	
Kolmogrov-Smirnov 5% Critical Value	0.356832	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	10.17326	
95% Adjusted Gamma UCL	10.79553	
Lognormal Statistics		
Minimum of log data	2.091864	
Maximum of log data	2.388763	
Mean of log data	2.183553	
Standard Deviation of log data	0.118461	
Variance of log data	0.014033	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.775778	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	8.940302	
MLE Standard Deviation	1.062801	
MLE Coefficient of Variation	0.118878	
MLE Skewness	0.358313	
MLE Median	8.877793	
MLE 80% Quantile	9.812453	
MLE 90% Quantile	10.33747	
MLE 95% Quantile	10.78785	
MLE 99% Quantile	11.6942	
MVU Estimate of Median	8.86534	
MVU Estimate of Mean	8.927719	
MVU Estimate of Standard Deviation	1.05709	
MVU Estimate of SE of Mean	0.472744	
95% H-UCL	10.10169	
95% Chebyshev (MVUE) UCL	10.98836	
97.5% Chebyshev (MVUE) UCL	11.88	
99% Chebyshev (MVUE) UCL	13.63146	
Non-parametric Statisitics		
95% CLT UCL	9.760447	
95% Adjusted-CLT UCL	10.23479	
95% Modified-t UCL	10.08031	
95% Jackknife UCL	10.00632	
95% Chebyshev (Mean, Sd) UCL	11.1307	
97.5% Chebyshev (Mean, Sd) UCL	12.08295	
99% Chebyshev (Mean, Sd) UCL	13.95345	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	9.664137	
95% Bootstrap-t UCL	12.14517	
95% Hall's Bootstrap UCL	13.89729	
95% Percentile Bootstrap UCL	9.82	
95% BCA Bootstrap UCL	10.02	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	10.00632	95% Student's-t UCL
2nd Recommended UCL	10.08031	95% Modified-t UCL
3rd Recommended UCL	10.10169	95% H-UCL
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	4	
Minimum	0.095	
Maximum	0.37	
Mean	0.195	
Standard Deviation	0.134071	
Variance	0.017975	
Coefficient of Variation	0.687543	
Skewness	0.720199	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.757904	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.322822	
Gamma Statistics		
k hat	2.785073	
k star (bias corrected)	1.247363	
Theta hat	0.070016	
Theta star	0.15633	
nu hat	27.85073	
nu star	12.47363	
5% Approximate Chi Square Value	5.539556	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	3.702701	
Anderson-Darling Test Statistic	0.77879	
Anderson-Darling 5% Critical Value	0.683021	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.386062	
Kolmogrov-Smirnov 5% Critical Value	0.359646	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.439089	
95% Adjusted Gamma UCL	0.656914	
Lognormal Statistics		
Minimum of log data	-2.353878	
Maximum of log data	-0.994252	
Mean of log data	-1.824897	
Standard Deviation of log data	0.680718	
Variance of log data	0.463376	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.746921	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.203272	
MLE Standard Deviation	0.156061	
MLE Coefficient of Variation	0.767744	
MLE Skewness	2.755766	
MLE Median	0.161234	
MLE 80% Quantile	0.286594	
MLE 90% Quantile	0.386673	
MLE 95% Quantile	0.494051	
MLE 99% Quantile	0.785411	
MVU Estimate of Median	0.153878	
MVU Estimate of Mean	0.193024	
MVU Estimate of Standard Deviation	0.129391	
MVU Estimate of SE of Mean	0.057725	
95% H-UCL	0.689111	
95% Chebyshev (MVUE) UCL	0.444642	
97.5% Chebyshev (MVUE) UCL	0.553517	
99% Chebyshev (MVUE) UCL	0.767382	
Non-parametric Statisitics		
95% CLT UCL	0.293623	
95% Adjusted-CLT UCL	0.314257	
95% Modified-t UCL	0.32604	
95% Jackknife UCL	0.322822	
95% Chebyshev (Mean, Sd) UCL	0.456352	
97.5% Chebyshev (Mean, Sd) UCL	0.56944	
99% Chebyshev (Mean, Sd) UCL	0.791578	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.456352	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	9.3	
Maximum	19.7	
Mean	13.48	
Standard Deviation	5.16062	
Variance	26.632	
Coefficient of Variation	0.382835	
Skewness	0.617082	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.770435	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	18.40009	
Gamma Statistics		
k hat	8.974786	
k star (bias corrected)	3.723248	
Theta hat	1.501986	
Theta star	3.620495	
nu hat	89.74786	
nu star	37.23248	
5% Approximate Chi Square Value	24.26055	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	19.81144	
Anderson-Darling Test Statistic	0.694837	
Anderson-Darling 5% Critical Value	0.679255	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.3446	
Kolmogrov-Smirnov 5% Critical Value	0.357738	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	20.68765	
95% Adjusted Gamma UCL	25.33354	
Lognormal Statistics		
Minimum of log data	2.230014	
Maximum of log data	2.980619	
Mean of log data	2.544462	
Standard Deviation of log data	0.371977	
Variance of log data	0.138367	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.780247	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	13.64872	
MLE Standard Deviation	5.257798	
MLE Coefficient of Variation	0.385223	
MLE Skewness	1.212834	
MLE Median	12.73638	
MLE 80% Quantile	17.44028	
MLE 90% Quantile	20.5416	
MLE 95% Quantile	23.48505	
MLE 99% Quantile	30.25557	
MVU Estimate of Median	12.56096	
MVU Estimate of Mean	13.45442	
MVU Estimate of Standard Deviation	4.981714	
MVU Estimate of SE of Mean	2.22735	
95% H-UCL	22.04044	
95% Chebyshev (MVUE) UCL	23.16321	
97.5% Chebyshev (MVUE) UCL	27.36421	
99% Chebyshev (MVUE) UCL	35.61627	
Non-parametric Statisitics		
95% CLT UCL	17.27616	
95% Adjusted-CLT UCL	17.9567	
95% Modified-t UCL	18.50624	
95% Jackknife UCL	18.40009	
95% Chebyshev (Mean, Sd) UCL	23.5399	
97.5% Chebyshev (Mean, Sd) UCL	27.89283	
99% Chebyshev (Mean, Sd) UCL	36.44331	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	16.88594	
95% Bootstrap-t UCL	52.4835	
95% Hall's Bootstrap UCL	105.6343	
95% Percentile Bootstrap UCL	17.2	
95% BCA Bootstrap UCL	16.9	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	18.40009	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	18.3	
Maximum	33.8	
Mean	26.74	
Standard Deviation	7.678737	
Variance	58.963	
Coefficient of Variation	0.287163	
Skewness	-0.531454	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.782259	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	34.06083	
Gamma Statistics		
k hat	13.83873	
k star (bias corrected)	5.668824	
Theta hat	1.932259	
Theta star	4.717028	
nu hat	138.3873	
nu star	56.68824	
5% Approximate Chi Square Value	40.37946	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	34.45609	
Anderson-Darling Test Statistic	0.715683	
Anderson-Darling 5% Critical Value	0.678807	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.342941	
Kolmogrov-Smirnov 5% Critical Value	0.357425	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	37.53997	
95% Adjusted Gamma UCL	43.99348	
Lognormal Statistics		
Minimum of log data	2.906901	
Maximum of log data	3.520461	
Mean of log data	3.249595	
Standard Deviation of log data	0.309431	
Variance of log data	0.095748	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.763489	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	27.0441	
MLE Standard Deviation	8.572654	
MLE Coefficient of Variation	0.316988	
MLE Skewness	0.982815	
MLE Median	25.7799	
MLE 80% Quantile	33.48389	
MLE 90% Quantile	38.36763	
MLE 95% Quantile	42.88875	
MLE 99% Quantile	52.94916	
MVU Estimate of Median	25.53385	
MVU Estimate of Mean	26.77993	
MVU Estimate of Standard Deviation	8.260148	
MVU Estimate of SE of Mean	3.693615	
95% H-UCL	39.34747	
95% Chebyshev (MVUE) UCL	42.88003	
97.5% Chebyshev (MVUE) UCL	49.84655	
99% Chebyshev (MVUE) UCL	63.53094	
Non-parametric Statisitics		
95% CLT UCL	32.38849	
95% Adjusted-CLT UCL	31.51639	
95% Modified-t UCL	33.9248	
95% Jackknife UCL	34.06083	
95% Chebyshev (Mean, Sd) UCL	41.70861	
97.5% Chebyshev (Mean, Sd) UCL	48.18554	
99% Chebyshev (Mean, Sd) UCL	60.90822	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	31.78246	
95% Bootstrap-t UCL	33.75753	
95% Hall's Bootstrap UCL	29.29902	
95% Percentile Bootstrap UCL	32.22	
95% BCA Bootstrap UCL	32.9	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	34.06083	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	90.6	
Maximum	204	
Mean	147.52	
Standard Deviation	43.81954	
Variance	1920.152	
Coefficient of Variation	0.297041	
Skewness	-0.012101	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.995249	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	189.2971	
Gamma Statistics		
k hat	13.36856	
k star (bias corrected)	5.480757	
Theta hat	11.03485	
Theta star	26.91599	
nu hat	133.6856	
nu star	54.80757	
5% Approximate Chi Square Value	38.793	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	32.99999	
Anderson-Darling Test Statistic	0.174728	
Anderson-Darling 5% Critical Value	0.678816	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.15444	
Kolmogrov-Smirnov 5% Critical Value	0.357445	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	208.4194	
95% Adjusted Gamma UCL	245.0065	
Lognormal Statistics		
Minimum of log data	4.506454	
Maximum of log data	5.31812	
Mean of log data	4.956097	
Standard Deviation of log data	0.313853	
Variance of log data	0.098504	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.981089	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	149.2091	
MLE Standard Deviation	48.00695	
MLE Coefficient of Variation	0.321743	
MLE Skewness	0.998535	
MLE Median	142.0383	
MLE 80% Quantile	185.1752	
MLE 90% Quantile	212.5968	
MLE 95% Quantile	238.0271	
MLE 99% Quantile	294.7474	
MVU Estimate of Median	140.6437	
MVU Estimate of Mean	147.7088	
MVU Estimate of Standard Deviation	46.20691	
MVU Estimate of SE of Mean	20.66178	
95% H-UCL	218.6074	
95% Chebyshev (MVUE) UCL	237.7714	
97.5% Chebyshev (MVUE) UCL	276.7416	
99% Chebyshev (MVUE) UCL	353.2909	
Non-parametric Statisitics		
95% CLT UCL	179.7537	
95% Adjusted-CLT UCL	179.6404	
95% Modified-t UCL	189.2795	
95% Jackknife UCL	189.2971	
95% Chebyshev (Mean, Sd) UCL	232.94	
97.5% Chebyshev (Mean, Sd) UCL	269.9013	
99% Chebyshev (Mean, Sd) UCL	342.5046	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	175.8136	
95% Bootstrap-t UCL	190.7465	
95% Hall's Bootstrap UCL	189.3539	
95% Percentile Bootstrap UCL	175.12	
95% BCA Bootstrap UCL	169.2	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	189.2971	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	3	
Minimum	0.09	
Maximum	0.13	
Mean	0.102	
Standard Deviation	0.016432	
Variance	0.00027	
Coefficient of Variation	0.161095	
Skewness	1.735582	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.778543	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.117666	
Gamma Statistics		
k hat	52.94226	
k star (bias corrected)	21.31024	
Theta hat	0.001927	
Theta star	0.004786	
nu hat	529.4226	
nu star	213.1024	
5% Approximate Chi Square Value	180.3127	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	167.042	
Anderson-Darling Test Statistic	0.605988	
Anderson-Darling 5% Critical Value	0.678249	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.338917	
Kolmogrov-Smirnov 5% Critical Value	0.356858	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.120549	
95% Adjusted Gamma UCL	0.130126	
Lognormal Statistics		
Minimum of log data	-2.407946	
Maximum of log data	-2.040221	
Mean of log data	-2.292256	
Standard Deviation of log data	0.150419	
Variance of log data	0.022626	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.804383	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.102188	
MLE Standard Deviation	0.015458	
MLE Coefficient of Variation	0.151274	
MLE Skewness	0.457283	
MLE Median	0.101038	
MLE 80% Quantile	0.114732	
MLE 90% Quantile	0.122583	
MLE 95% Quantile	0.129404	
MLE 99% Quantile	0.143362	
MVU Estimate of Median	0.10081	
MVU Estimate of Mean	0.101955	
MVU Estimate of Standard Deviation	0.015324	
MVU Estimate of SE of Mean	0.006853	
95% H-UCL	0.11978	
95% Chebyshev (MVUE) UCL	0.131828	
97.5% Chebyshev (MVUE) UCL	0.144754	
99% Chebyshev (MVUE) UCL	0.170144	
Non-parametric Statisitics		
95% CLT UCL	0.114087	
95% Adjusted-CLT UCL	0.120182	
95% Modified-t UCL	0.118616	
95% Jackknife UCL	0.117666	
95% Chebyshev (Mean, Sd) UCL	0.134031	
97.5% Chebyshev (Mean, Sd) UCL	0.147891	
99% Chebyshev (Mean, Sd) UCL	0.175116	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.117666	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	4	
Minimum	0.3	
Maximum	1.5	
Mean	0.77	
Standard Deviation	0.441022	
Variance	0.1945	
Coefficient of Variation	0.572755	
Skewness	1.373593	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.842452	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.190466	
Gamma Statistics		
k hat	4.091199	
k star (bias corrected)	1.769813	
Theta hat	0.188209	
Theta star	0.435074	
nu hat	40.91199	
nu star	17.69813	
5% Approximate Chi Square Value	9.171709	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	6.659226	
Anderson-Darling Test Statistic	0.445634	
Anderson-Darling 5% Critical Value	0.681192	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.309123	
Kolmogrov-Smirnov 5% Critical Value	0.358437	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.485826	
95% Adjusted Gamma UCL	2.046418	
Lognormal Statistics		
Minimum of log data	-1.203973	
Maximum of log data	0.405465	
Mean of log data	-0.388528	
Standard Deviation of log data	0.56991	
Variance of log data	0.324797	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.910327	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.797615	
MLE Standard Deviation	0.494103	
MLE Coefficient of Variation	0.619476	
MLE Skewness	2.096152	
MLE Median	0.678054	
MLE 80% Quantile	1.097512	
MLE 90% Quantile	1.410306	
MLE 95% Quantile	1.731476	
MLE 99% Quantile	2.552524	
MVU Estimate of Median	0.656268	
MVU Estimate of Mean	0.770045	
MVU Estimate of Standard Deviation	0.434144	
MVU Estimate of SE of Mean	0.193912	
95% H-UCL	1.97397	
95% Chebyshev (MVUE) UCL	1.615289	
97.5% Chebyshev (MVUE) UCL	1.981026	
99% Chebyshev (MVUE) UCL	2.699447	
Non-parametric Statisitics		
95% CLT UCL	1.094416	
95% Adjusted-CLT UCL	1.223874	
95% Modified-t UCL	1.210659	
95% Jackknife UCL	1.190466	
95% Chebyshev (Mean, Sd) UCL	1.629709	
97.5% Chebyshev (Mean, Sd) UCL	2.001706	
99% Chebyshev (Mean, Sd) UCL	2.732422	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.190466	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	13.1	
Maximum	24.3	
Mean	18.72	
Standard Deviation	5.252809	
Variance	27.592	
Coefficient of Variation	0.280599	
Skewness	0.122597	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.867364	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	23.72798	
Gamma Statistics		
k hat	15.61206	
k star (bias corrected)	6.378157	
Theta hat	1.199073	
Theta star	2.935017	
nu hat	156.1206	
nu star	63.78157	
5% Approximate Chi Square Value	46.40514	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	40.00827	
Anderson-Darling Test Statistic	0.415267	
Anderson-Darling 5% Critical Value	0.678773	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.261897	
Kolmogrov-Smirnov 5% Critical Value	0.357349	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	25.72972	
95% Adjusted Gamma UCL	29.8436	
Lognormal Statistics		
Minimum of log data	2.572612	
Maximum of log data	3.190476	
Mean of log data	2.897224	
Standard Deviation of log data	0.28611	
Variance of log data	0.081859	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.878268	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	18.88095	
MLE Standard Deviation	5.514496	
MLE Coefficient of Variation	0.292067	
MLE Skewness	0.901114	
MLE Median	18.12377	
MLE 80% Quantile	23.08048	
MLE 90% Quantile	26.17686	
MLE 95% Quantile	29.01682	
MLE 99% Quantile	35.25886	
MVU Estimate of Median	17.97581	
MVU Estimate of Mean	18.72372	
MVU Estimate of Standard Deviation	5.342454	
MVU Estimate of SE of Mean	2.389011	
95% H-UCL	26.50592	
95% Chebyshev (MVUE) UCL	29.13717	
97.5% Chebyshev (MVUE) UCL	33.64309	
99% Chebyshev (MVUE) UCL	42.49408	
Non-parametric Statisitics		
95% CLT UCL	22.58397	
95% Adjusted-CLT UCL	22.72159	
95% Modified-t UCL	23.74944	
95% Jackknife UCL	23.72798	
95% Chebyshev (Mean, Sd) UCL	28.95961	
97.5% Chebyshev (Mean, Sd) UCL	33.3903	
99% Chebyshev (Mean, Sd) UCL	42.09352	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	22.20041	
95% Bootstrap-t UCL	25.73933	
95% Hall's Bootstrap UCL	24.10531	
95% Percentile Bootstrap UCL	22.12	
95% BCA Bootstrap UCL	21.66	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	23.72798	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - wss.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	33.5	
Maximum	81.5	
Mean	54.04	
Standard Deviation	18.66837	
Variance	348.508	
Coefficient of Variation	0.345455	
Skewness	0.7519	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.944844	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	71.83825	
Gamma Statistics		
k hat	10.85584	
k star (bias corrected)	4.475671	
Theta hat	4.977964	
Theta star	12.07417	
nu hat	108.5584	
nu star	44.75671	
5% Approximate Chi Square Value	30.40886	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	25.35312	
Anderson-Darling Test Statistic	0.245964	
Anderson-Darling 5% Critical Value	0.678864	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.240684	
Kolmogrov-Smirnov 5% Critical Value	0.357553	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	79.53774	
95% Adjusted Gamma UCL	95.39862	
Lognormal Statistics		
Minimum of log data	3.511545	
Maximum of log data	4.400603	
Mean of log data	3.94296	
Standard Deviation of log data	0.340937	
Variance of log data	0.116238	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.973186	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	54.65708	
MLE Standard Deviation	19.18945	
MLE Coefficient of Variation	0.351088	
MLE Skewness	1.09654	
MLE Median	51.57102	
MLE 80% Quantile	68.78951	
MLE 90% Quantile	79.92297	
MLE 95% Quantile	90.35988	
MLE 99% Quantile	113.9749	
MVU Estimate of Median	50.97389	
MVU Estimate of Mean	54.00627	
MVU Estimate of Standard Deviation	18.34153	
MVU Estimate of SE of Mean	8.201167	
95% H-UCL	83.67935	
95% Chebyshev (MVUE) UCL	89.75433	
97.5% Chebyshev (MVUE) UCL	105.2225	
99% Chebyshev (MVUE) UCL	135.6069	
Non-parametric Statisitics		
95% CLT UCL	67.77247	
95% Adjusted-CLT UCL	70.77216	
95% Modified-t UCL	72.30614	
95% Jackknife UCL	71.83825	
95% Chebyshev (Mean, Sd) UCL	90.43135	
97.5% Chebyshev (Mean, Sd) UCL	106.1779	
99% Chebyshev (Mean, Sd) UCL	137.109	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	66.05599	
95% Bootstrap-t UCL	89.10751	
95% Hall's Bootstrap UCL	206.1554	
95% Percentile Bootstrap UCL	67.28	
95% BCA Bootstrap UCL	63.98	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	71.83825	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	16.8	
Maximum	86.3	
Mean	30.025	
Standard Deviation	21.61087	
Variance	467.0296	
Coefficient of Variation	0.719762	
Skewness	2.420942	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.616395	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	42.55241	
Gamma Statistics		
k hat	3.537386	
k star (bias corrected)	2.542837	
Theta hat	8.487906	
Theta star	11.80768	
nu hat	70.74772	
nu star	50.85674	
5% Approximate Chi Square Value	35.47727	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	33.25692	
Anderson-Darling Test Statistic	1.429585	
Anderson-Darling 5% Critical Value	0.730681	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.405856	
Kolmogrov-Smirnov 5% Critical Value	0.268111	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	43.0409	
95% Adjusted Gamma UCL	45.91446	
Lognormal Statistics		
Minimum of log data	2.821379	
Maximum of log data	4.45783	
Mean of log data	3.254075	
Standard Deviation of log data	0.510774	
Variance of log data	0.26089	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.741595	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	29.50382	
MLE Standard Deviation	16.10825	
MLE Coefficient of Variation	0.545972	
MLE Skewness	1.800661	
MLE Median	25.89564	
MLE 80% Quantile	39.87218	
MLE 90% Quantile	49.91989	
MLE 95% Quantile	59.99722	
MLE 99% Quantile	84.95616	
MVU Estimate of Median	25.55964	
MVU Estimate of Mean	29.08584	
MVU Estimate of Standard Deviation	15.16389	
MVU Estimate of SE of Mean	4.785282	
95% H-UCL	43.16666	
95% Chebyshev (MVUE) UCL	49.9444	
97.5% Chebyshev (MVUE) UCL	58.96992	
99% Chebyshev (MVUE) UCL	76.69879	
Non-parametric Statisitics		
95% CLT UCL	41.26586	
95% Adjusted-CLT UCL	46.85618	
95% Modified-t UCL	43.42439	
95% Jackknife UCL	42.55241	
95% Chebyshev (Mean, Sd) UCL	59.81352	
97.5% Chebyshev (Mean, Sd) UCL	72.70304	
99% Chebyshev (Mean, Sd) UCL	98.02201	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	40.64113	
95% Bootstrap-t UCL	111.0472	
95% Hall's Bootstrap UCL	121.9126	
95% Percentile Bootstrap UCL	41.15	
95% BCA Bootstrap UCL	40.42	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	59.81352	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.11	
Maximum	1.1	
Mean	0.494	
Standard Deviation	0.324695	
Variance	0.105427	
Coefficient of Variation	0.657277	
Skewness	0.933641	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.884484	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.682219	
Gamma Statistics		
k hat	2.615978	
k star (bias corrected)	1.897851	
Theta hat	0.18884	
Theta star	0.260294	
nu hat	52.31956	
nu star	37.95702	
5% Approximate Chi Square Value	24.84683	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	23.01786	
Anderson-Darling Test Statistic	0.318028	
Anderson-Darling 5% Critical Value	0.733486	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.218095	
Kolmogrov-Smirnov 5% Critical Value	0.268972	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.754654	
95% Adjusted Gamma UCL	0.814618	
Lognormal Statistics		
Minimum of log data	-2.207275	
Maximum of log data	0.09531	
Mean of log data	-0.908363	
Standard Deviation of log data	0.695056	
Variance of log data	0.483102	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.958841	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.513343	
MLE Standard Deviation	0.404563	
MLE Coefficient of Variation	0.788096	
MLE Skewness	2.853773	
MLE Median	0.403184	
MLE 80% Quantile	0.725393	
MLE 90% Quantile	0.984899	
MLE 95% Quantile	1.264913	
MLE 99% Quantile	2.03061	
MVU Estimate of Median	0.39354	
MVU Estimate of Mean	0.499034	
MVU Estimate of Standard Deviation	0.359837	
MVU Estimate of SE of Mean	0.113046	
95% H-UCL	0.921133	
95% Chebyshev (MVUE) UCL	0.991791	
97.5% Chebyshev (MVUE) UCL	1.205008	
99% Chebyshev (MVUE) UCL	1.623831	
Non-parametric Statisitics		
95% CLT UCL	0.662889	
95% Adjusted-CLT UCL	0.695281	
95% Modified-t UCL	0.687272	
95% Jackknife UCL	0.682219	
95% Chebyshev (Mean, Sd) UCL	0.941561	
97.5% Chebyshev (Mean, Sd) UCL	1.135221	
99% Chebyshev (Mean, Sd) UCL	1.515628	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.652949	
95% Bootstrap-t UCL	0.750463	
95% Hall's Bootstrap UCL	0.715138	
95% Percentile Bootstrap UCL	0.65	
95% BCA Bootstrap UCL	0.745	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.682219	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	13.4	
Maximum	211	
Mean	56.29	
Standard Deviation	67.97231	
Variance	4620.234	
Coefficient of Variation	1.207538	
Skewness	1.88989	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.652519	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	95.69227	
Gamma Statistics		
k hat	1.190116	
k star (bias corrected)	0.899748	
Theta hat	47.2979	
Theta star	62.56195	
nu hat	23.80233	
nu star	17.99496	
5% Approximate Chi Square Value	9.385848	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	8.326263	
Anderson-Darling Test Statistic	1.066463	
Anderson-Darling 5% Critical Value	0.744833	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.351936	
Kolmogrov-Smirnov 5% Critical Value	0.27275	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	107.9217	
95% Adjusted Gamma UCL	121.6556	
Lognormal Statistics		
Minimum of log data	2.595255	
Maximum of log data	5.351858	
Mean of log data	3.554827	
Standard Deviation of log data	0.93839	
Variance of log data	0.880576	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.846555	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	54.33207	
MLE Standard Deviation	64.56807	
MLE Coefficient of Variation	1.188397	
MLE Skewness	5.24355	
MLE Median	34.98176	
MLE 80% Quantile	77.30559	
MLE 90% Quantile	116.8228	
MLE 95% Quantile	163.7725	
MLE 99% Quantile	310.2945	
MVU Estimate of Median	33.46902	
MVU Estimate of Mean	51.30891	
MVU Estimate of Standard Deviation	51.30478	
MVU Estimate of SE of Mean	15.91812	
95% H-UCL	137.9173	
95% Chebyshev (MVUE) UCL	120.6944	
97.5% Chebyshev (MVUE) UCL	150.7175	
99% Chebyshev (MVUE) UCL	209.6922	
Non-parametric Statisitics		
95% CLT UCL	91.64569	
95% Adjusted-CLT UCL	105.3718	
95% Modified-t UCL	97.83327	
95% Jackknife UCL	95.69227	
95% Chebyshev (Mean, Sd) UCL	149.9834	
97.5% Chebyshev (Mean, Sd) UCL	190.5245	
99% Chebyshev (Mean, Sd) UCL	270.1599	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	89.85995	
95% Bootstrap-t UCL	294.8188	
95% Hall's Bootstrap UCL	357.3429	
95% Percentile Bootstrap UCL	93.9	
95% BCA Bootstrap UCL	117.49	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	137.9173	95% H-UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	26.5	
Maximum	82.9	
Mean	40.16	
Standard Deviation	17.64314	
Variance	311.2804	
Coefficient of Variation	0.439321	
Skewness	1.949457	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.748936	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	50.3874	
Gamma Statistics		
k hat	7.669301	
k star (bias corrected)	5.435177	
Theta hat	5.236461	
Theta star	7.388903	
nu hat	153.386	
nu star	108.7035	
5% Approximate Chi Square Value	85.63519	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	82.08232	
Anderson-Darling Test Statistic	0.79953	
Anderson-Darling 5% Critical Value	0.727106	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.267299	
Kolmogrov-Smirnov 5% Critical Value	0.267003	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	50.97828	
95% Adjusted Gamma UCL	53.18484	
Lognormal Statistics		
Minimum of log data	3.277145	
Maximum of log data	4.417635	
Mean of log data	3.626262	
Standard Deviation of log data	0.360875	
Variance of log data	0.130231	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.848695	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	40.10005	
MLE Standard Deviation	14.95529	
MLE Coefficient of Variation	0.37295	
MLE Skewness	1.170723	
MLE Median	37.57211	
MLE 80% Quantile	50.96818	
MLE 90% Quantile	59.7391	
MLE 95% Quantile	68.0268	
MLE 99% Quantile	86.97822	
MVU Estimate of Median	37.32811	
MVU Estimate of Mean	39.82749	
MVU Estimate of Standard Deviation	14.52354	
MVU Estimate of SE of Mean	4.59024	
95% H-UCL	51.27312	
95% Chebyshev (MVUE) UCL	59.83589	
97.5% Chebyshev (MVUE) UCL	68.49353	
99% Chebyshev (MVUE) UCL	85.4998	
Non-parametric Statisitics		
95% CLT UCL	49.33705	
95% Adjusted-CLT UCL	53.01216	
95% Modified-t UCL	50.96064	
95% Jackknife UCL	50.3874	
95% Chebyshev (Mean, Sd) UCL	64.47939	
97.5% Chebyshev (Mean, Sd) UCL	75.00241	
99% Chebyshev (Mean, Sd) UCL	95.67285	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	48.82113	
95% Bootstrap-t UCL	70.96007	
95% Hall's Bootstrap UCL	100.1974	
95% Percentile Bootstrap UCL	49.35	
95% BCA Bootstrap UCL	47.89	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	50.3874	95% Student's-t UCL
2nd Recommended UCL	50.96064	95% Modified-t UCL
3rd Recommended UCL	51.27312	95% H-UCL
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	128	
Maximum	309	
Mean	193.85	
Standard Deviation	55.34139	
Variance	3062.669	
Coefficient of Variation	0.285486	
Skewness	0.700626	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.908659	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	225.9304	
Gamma Statistics		
k hat	14.02319	
k star (bias corrected)	9.882897	
Theta hat	13.82353	
Theta star	19.61469	
nu hat	280.4637	
nu star	197.6579	
5% Approximate Chi Square Value	166.1236	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	161.0988	
Anderson-Darling Test Statistic	0.428157	
Anderson-Darling 5% Critical Value	0.724855	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.19795	
Kolmogrov-Smirnov 5% Critical Value	0.266445	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	230.6475	
95% Adjusted Gamma UCL	237.8416	
Lognormal Statistics		
Minimum of log data	4.85203	
Maximum of log data	5.733341	
Mean of log data	5.231006	
Standard Deviation of log data	0.283441	
Variance of log data	0.080339	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.917273	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	194.6446	
MLE Standard Deviation	56.29722	
MLE Coefficient of Variation	0.289231	
MLE Skewness	0.891888	
MLE Median	186.9808	
MLE 80% Quantile	237.5823	
MLE 90% Quantile	269.1391	
MLE 95% Quantile	298.0518	
MLE 99% Quantile	361.5104	
MVU Estimate of Median	186.2309	
MVU Estimate of Mean	193.8414	
MVU Estimate of Standard Deviation	55.30039	
MVU Estimate of SE of Mean	17.48381	
95% H-UCL	234.241	
95% Chebyshev (MVUE) UCL	270.0516	
97.5% Chebyshev (MVUE) UCL	303.0278	
99% Chebyshev (MVUE) UCL	367.8032	
Non-parametric Statisitics		
95% CLT UCL	222.6357	
95% Adjusted-CLT UCL	226.7788	
95% Modified-t UCL	226.5766	
95% Jackknife UCL	225.9304	
95% Chebyshev (Mean, Sd) UCL	270.1328	
97.5% Chebyshev (Mean, Sd) UCL	303.1405	
99% Chebyshev (Mean, Sd) UCL	367.9776	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	221.5738	
95% Bootstrap-t UCL	230.7243	
95% Hall's Bootstrap UCL	238.4249	
95% Percentile Bootstrap UCL	220.85	
95% BCA Bootstrap UCL	232.5	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	225.9304	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	8	
Minimum	0.07	
Maximum	0.6	
Mean	0.174	
Standard Deviation	0.160083	
Variance	0.025627	
Coefficient of Variation	0.920019	
Skewness	2.517282	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.654362	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.266797	
Gamma Statistics		
k hat	2.253629	
k star (bias corrected)	1.644207	
Theta hat	0.077209	
Theta star	0.105826	
nu hat	45.07257	
nu star	32.88414	
5% Approximate Chi Square Value	20.77229	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	19.11499	
Anderson-Darling Test Statistic	0.827778	
Anderson-Darling 5% Critical Value	0.734718	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.27484	
Kolmogrov-Smirnov 5% Critical Value	0.269465	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.275455	
95% Adjusted Gamma UCL	0.299338	
Lognormal Statistics		
Minimum of log data	-2.65926	
Maximum of log data	-0.510826	
Mean of log data	-1.986675	
Standard Deviation of log data	0.652604	
Variance of log data	0.425892	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.870468	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.169699	
MLE Standard Deviation	0.123654	
MLE Coefficient of Variation	0.728666	
MLE Skewness	2.572888	
MLE Median	0.137151	
MLE 80% Quantile	0.238062	
MLE 90% Quantile	0.317246	
MLE 95% Quantile	0.401262	
MLE 99% Quantile	0.625804	
MVU Estimate of Median	0.134255	
MVU Estimate of Mean	0.16559	
MVU Estimate of Standard Deviation	0.111652	
MVU Estimate of SE of Mean	0.035124	
95% H-UCL	0.289305	
95% Chebyshev (MVUE) UCL	0.318693	
97.5% Chebyshev (MVUE) UCL	0.384941	
99% Chebyshev (MVUE) UCL	0.515071	
Non-parametric Statisitics		
95% CLT UCL	0.257267	
95% Adjusted-CLT UCL	0.300326	
95% Modified-t UCL	0.273514	
95% Jackknife UCL	0.266797	
95% Chebyshev (Mean, Sd) UCL	0.39466	
97.5% Chebyshev (Mean, Sd) UCL	0.490139	
99% Chebyshev (Mean, Sd) UCL	0.67769	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.253063	
95% Bootstrap-t UCL	0.484581	
95% Hall's Bootstrap UCL	0.59487	
95% Percentile Bootstrap UCL	0.268	
95% BCA Bootstrap UCL	0.249	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	0.289305	95% H-UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.325	
Maximum	1.85	
Mean	0.781	
Standard Deviation	0.627016	
Variance	0.393149	
Coefficient of Variation	0.802837	
Skewness	1.102082	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.729448	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.144469	
Gamma Statistics		
k hat	2.080467	
k star (bias corrected)	1.522993	
Theta hat	0.375397	
Theta star	0.512806	
nu hat	41.60934	
nu star	30.45987	
5% Approximate Chi Square Value	18.85267	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	17.28198	
Anderson-Darling Test Statistic	1.162012	
Anderson-Darling 5% Critical Value	0.735306	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.334021	
Kolmogrov-Smirnov 5% Critical Value	0.269701	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1.261845	
95% Adjusted Gamma UCL	1.37653	
Lognormal Statistics		
Minimum of log data	-1.12393	
Maximum of log data	0.615186	
Mean of log data	-0.506359	
Standard Deviation of log data	0.728278	
Variance of log data	0.530388	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.774063	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.785712	
MLE Standard Deviation	0.657182	
MLE Coefficient of Variation	0.836416	
MLE Skewness	3.094399	
MLE Median	0.602686	
MLE 80% Quantile	1.115202	
MLE 90% Quantile	1.536455	
MLE 95% Quantile	1.997023	
MLE 99% Quantile	3.279249	
MVU Estimate of Median	0.586875	
MVU Estimate of Mean	0.761379	
MVU Estimate of Standard Deviation	0.577166	
MVU Estimate of SE of Mean	0.181102	
95% H-UCL	1.470166	
95% Chebyshev (MVUE) UCL	1.550786	
97.5% Chebyshev (MVUE) UCL	1.892363	
99% Chebyshev (MVUE) UCL	2.563325	
Non-parametric Statisitics		
95% CLT UCL	1.107141	
95% Adjusted-CLT UCL	1.180978	
95% Modified-t UCL	1.155986	
95% Jackknife UCL	1.144469	
95% Chebyshev (Mean, Sd) UCL	1.645282	
97.5% Chebyshev (Mean, Sd) UCL	2.019257	
99% Chebyshev (Mean, Sd) UCL	2.753859	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.096828	
95% Bootstrap-t UCL	1.300768	
95% Hall's Bootstrap UCL	1.065692	
95% Percentile Bootstrap UCL	1.102	
95% BCA Bootstrap UCL	1.031	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.645282	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	17.2	
Maximum	34.9	
Mean	22.72	
Standard Deviation	5.467439	
Variance	29.89289	
Coefficient of Variation	0.240644	
Skewness	1.366908	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.857495	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	25.88937	
Gamma Statistics		
k hat	21.73961	
k star (bias corrected)	15.28439	
Theta hat	1.045097	
Theta star	1.486484	
nu hat	434.7921	
nu star	305.6878	
5% Approximate Chi Square Value	266.1774	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	259.7642	
Anderson-Darling Test Statistic	0.528555	
Anderson-Darling 5% Critical Value	0.724541	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.238854	
Kolmogrov-Smirnov 5% Critical Value	0.266152	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	26.09247	
95% Adjusted Gamma UCL	26.73666	
Lognormal Statistics		
Minimum of log data	2.844909	
Maximum of log data	3.552487	
Mean of log data	3.10007	
Standard Deviation of log data	0.220713	
Variance of log data	0.048714	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904085	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	22.74685	
MLE Standard Deviation	5.082291	
MLE Coefficient of Variation	0.223428	
MLE Skewness	0.681438	
MLE Median	22.1995	
MLE 80% Quantile	26.75101	
MLE 90% Quantile	29.47923	
MLE 95% Quantile	31.91712	
MLE 99% Quantile	37.09373	
MVU Estimate of Median	22.14548	
MVU Estimate of Mean	22.69053	
MVU Estimate of Standard Deviation	5.027936	
MVU Estimate of SE of Mean	1.589847	
95% H-UCL	26.1585	
95% Chebyshev (MVUE) UCL	29.62051	
97.5% Chebyshev (MVUE) UCL	32.61912	
99% Chebyshev (MVUE) UCL	38.50931	
Non-parametric Statisitics		
95% CLT UCL	25.56388	
95% Adjusted-CLT UCL	26.36243	
95% Modified-t UCL	26.01393	
95% Jackknife UCL	25.88937	
95% Chebyshev (Mean, Sd) UCL	30.25634	
97.5% Chebyshev (Mean, Sd) UCL	33.51733	
99% Chebyshev (Mean, Sd) UCL	39.9229	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	25.35637	
95% Bootstrap-t UCL	27.61621	
95% Hall's Bootstrap UCL	26.83498	
95% Percentile Bootstrap UCL	25.58	
95% BCA Bootstrap UCL	25.18	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	25.88937	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - cb05.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	60.7	
Maximum	259	
Mean	129.67	
Standard Deviation	62.62208	
Variance	3921.525	
Coefficient of Variation	0.482934	
Skewness	1.171879	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.853121	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	165.9708	
Gamma Statistics		
k hat	5.50119	
k star (bias corrected)	3.9175	
Theta hat	23.57126	
Theta star	33.10019	
nu hat	110.0238	
nu star	78.35	
5% Approximate Chi Square Value	58.95409	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	56.0385	
Anderson-Darling Test Statistic	0.55421	
Anderson-Darling 5% Critical Value	0.72901	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.237145	
Kolmogrov-Smirnov 5% Critical Value	0.26735	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	172.3315	
95% Adjusted Gamma UCL	181.2976	
Lognormal Statistics		
Minimum of log data	4.105944	
Maximum of log data	5.556828	
Mean of log data	4.771359	
Standard Deviation of log data	0.445451	
Variance of log data	0.198426	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.930409	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	130.3955	
MLE Standard Deviation	61.08887	
MLE Coefficient of Variation	0.468489	
MLE Skewness	1.508293	
MLE Median	118.0796	
MLE 80% Quantile	172.0465	
MLE 90% Quantile	209.2988	
MLE 95% Quantile	245.7034	
MLE 99% Quantile	332.7785	
MVU Estimate of Median	116.9128	
MVU Estimate of Mean	129.0163	
MVU Estimate of Standard Deviation	58.38183	
MVU Estimate of SE of Mean	18.43921	
95% H-UCL	179.3331	
95% Chebyshev (MVUE) UCL	209.3909	
97.5% Chebyshev (MVUE) UCL	244.1691	
99% Chebyshev (MVUE) UCL	312.4841	
Non-parametric Statisitics		
95% CLT UCL	162.2428	
95% Adjusted-CLT UCL	170.0841	
95% Modified-t UCL	167.1939	
95% Jackknife UCL	165.9708	
95% Chebyshev (Mean, Sd) UCL	215.9886	
97.5% Chebyshev (Mean, Sd) UCL	253.3387	
99% Chebyshev (Mean, Sd) UCL	326.7058	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	161.06	
95% Bootstrap-t UCL	180.4067	
95% Hall's Bootstrap UCL	165.9977	
95% Percentile Bootstrap UCL	162.36	
95% BCA Bootstrap UCL	180.94	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	165.9708	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	21.8	
Maximum	272	
Mean	98.63	
Standard Deviation	101.2825	
Variance	10258.14	
Coefficient of Variation	1.026893	
Skewness	1.803742	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.794713	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	195.1918	
Gamma Statistics		
k hat	1.467996	
k star (bias corrected)	0.720532	
Theta hat	67.18682	
Theta star	136.885	
nu hat	14.67996	
nu star	7.205318	
5% Approximate Chi Square Value	2.283313	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	1.264511	
Anderson-Darling Test Statistic	0.308196	
Anderson-Darling 5% Critical Value	0.686707	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.241904	
Kolmogrov-Smirnov 5% Critical Value	0.361845	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	311.241	
95% Adjusted Gamma UCL	562.0043	
Lognormal Statistics		
Minimum of log data	3.08191	
Maximum of log data	5.605802	
Mean of log data	4.213618	
Standard Deviation of log data	0.954432	
Variance of log data	0.910941	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.977445	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	106.6005	
MLE Standard Deviation	129.9765	
MLE Coefficient of Variation	1.219287	
MLE Skewness	5.470526	
MLE Median	67.60065	
MLE 80% Quantile	151.4284	
MLE 90% Quantile	230.4567	
MLE 95% Quantile	324.9458	
MLE 99% Quantile	622.4272	
MVU Estimate of Median	61.6268	
MVU Estimate of Mean	95.41297	
MVU Estimate of Standard Deviation	88.3885	
MVU Estimate of SE of Mean	39.20733	
95% H-UCL	1008.609	
95% Chebyshev (MVUE) UCL	266.3137	
97.5% Chebyshev (MVUE) UCL	340.2626	
99% Chebyshev (MVUE) UCL	485.5209	
Non-parametric Statisitics		
95% CLT UCL	173.1335	
95% Adjusted-CLT UCL	212.1743	
95% Modified-t UCL	201.2814	
95% Jackknife UCL	195.1918	
95% Chebyshev (Mean, Sd) UCL	296.0659	
97.5% Chebyshev (Mean, Sd) UCL	381.4966	
99% Chebyshev (Mean, Sd) UCL	549.3087	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	163.4165	
95% Bootstrap-t UCL	516.8375	
95% Hall's Bootstrap UCL	602.9453	
95% Percentile Bootstrap UCL	171.92	
95% BCA Bootstrap UCL	204	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	195.1918	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	0.115	
Maximum	4.6	
Mean	1.352	
Standard Deviation	1.884325	
Variance	3.550683	
Coefficient of Variation	1.393732	
Skewness	1.879907	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.741939	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	3.148498	
Gamma Statistics		
k hat	0.736135	
k star (bias corrected)	0.427787	
Theta hat	1.836619	
Theta star	3.160448	
nu hat	7.361352	
nu star	4.277874	
5% Approximate Chi Square Value	0.834132	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	0.355888	
Anderson-Darling Test Statistic	0.385166	
Anderson-Darling 5% Critical Value	0.698955	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.305136	
Kolmogrov-Smirnov 5% Critical Value	0.366945	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6.933781	
95% Adjusted Gamma UCL	16.25141	
Lognormal Statistics		
Minimum of log data	-2.162823	
Maximum of log data	1.526056	
Mean of log data	-0.513696	
Standard Deviation of log data	1.447631	
Variance of log data	2.095636	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.950933	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.70595	
MLE Standard Deviation	4.555434	
MLE Coefficient of Variation	2.67032	
MLE Skewness	27.05198	
MLE Median	0.59828	
MLE 80% Quantile	2.033082	
MLE 90% Quantile	3.843988	
MLE 95% Quantile	6.473117	
MLE 99% Quantile	17.3483	
MVU Estimate of Median	0.481361	
MVU Estimate of Mean	1.261237	
MVU Estimate of Standard Deviation	1.710337	
MVU Estimate of SE of Mean	0.741036	
95% H-UCL	248.7994	
95% Chebyshev (MVUE) UCL	4.491337	
97.5% Chebyshev (MVUE) UCL	5.889003	
99% Chebyshev (MVUE) UCL	8.634449	
Non-parametric Statisitics		
95% CLT UCL	2.738112	
95% Adjusted-CLT UCL	3.495123	
95% Modified-t UCL	3.266577	
95% Jackknife UCL	3.148498	
95% Chebyshev (Mean, Sd) UCL	5.025227	
97.5% Chebyshev (Mean, Sd) UCL	6.614635	
99% Chebyshev (Mean, Sd) UCL	9.736719	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.580562	
95% Bootstrap-t UCL	20.3014	
95% Hall's Bootstrap UCL	16.42901	
95% Percentile Bootstrap UCL	2.843	
95% BCA Bootstrap UCL	3.109	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	6.933781	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	32.6	
Maximum	550	
Mean	193.25	
Standard Deviation	207.5264	
Variance	43067.21	
Coefficient of Variation	1.073875	
Skewness	1.834401	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.792603	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	391.1037	
Gamma Statistics		
k hat	1.301865	
k star (bias corrected)	0.654079	
Theta hat	148.4409	
Theta star	295.4535	
nu hat	13.01865	
nu star	6.540793	
5% Approximate Chi Square Value	1.921635	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	1.01971	
Anderson-Darling Test Statistic	0.283685	
Anderson-Darling 5% Critical Value	0.688352	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.224252	
Kolmogrov-Smirnov 5% Critical Value	0.362756	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	657.7774	
95% Adjusted Gamma UCL	1239.576	
Lognormal Statistics		
Minimum of log data	3.484312	
Maximum of log data	6.309918	
Mean of log data	4.833109	
Standard Deviation of log data	1.043479	
Variance of log data	1.088847	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.986232	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	216.4875	
MLE Standard Deviation	303.9201	
MLE Coefficient of Variation	1.403869	
MLE Skewness	6.97842	
MLE Median	125.6009	
MLE 80% Quantile	303.3383	
MLE 90% Quantile	480.0927	
MLE 95% Quantile	698.9865	
MLE 99% Quantile	1422.598	
MVU Estimate of Median	112.4123	
MVU Estimate of Mean	188.8492	
MVU Estimate of Standard Deviation	190.1986	
MVU Estimate of SE of Mean	84.12292	
95% H-UCL	3085.864	
95% Chebyshev (MVUE) UCL	555.5325	
97.5% Chebyshev (MVUE) UCL	714.1967	
99% Chebyshev (MVUE) UCL	1025.862	
Non-parametric Statisitics		
95% CLT UCL	345.9066	
95% Adjusted-CLT UCL	427.2605	
95% Modified-t UCL	403.7933	
95% Jackknife UCL	391.1037	
95% Chebyshev (Mean, Sd) UCL	597.7934	
97.5% Chebyshev (Mean, Sd) UCL	772.8397	
99% Chebyshev (Mean, Sd) UCL	1116.684	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	331.5488	
95% Bootstrap-t UCL	953.8216	
95% Hall's Bootstrap UCL	1237.224	
95% Percentile Bootstrap UCL	353.66	
95% BCA Bootstrap UCL	406.8	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	391.1037	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	41.4	
Maximum	320	
Mean	145.18	
Standard Deviation	108.4424	
Variance	11759.76	
Coefficient of Variation	0.746952	
Skewness	1.290213	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.906639	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	248.568	
Gamma Statistics		
k hat	2.356883	
k star (bias corrected)	1.076086	
Theta hat	61.59832	
Theta star	134.9148	
nu hat	23.56883	
nu star	10.76086	
5% Approximate Chi Square Value	4.421816	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	2.832428	
Anderson-Darling Test Statistic	0.181749	
Anderson-Darling 5% Critical Value	0.6838	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.15818	
Kolmogrov-Smirnov 5% Critical Value	0.360095	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	353.3078	
95% Adjusted Gamma UCL	551.5628	
Lognormal Statistics		
Minimum of log data	3.723281	
Maximum of log data	5.768321	
Mean of log data	4.751078	
Standard Deviation of log data	0.76853	
Variance of log data	0.590638	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.999318	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	155.4614	
MLE Standard Deviation	139.4949	
MLE Coefficient of Variation	0.897296	
MLE Skewness	3.414339	
MLE Median	115.709	
MLE 80% Quantile	221.5141	
MLE 90% Quantile	310.6415	
MLE 95% Quantile	409.6529	
MLE 99% Quantile	691.3728	
MVU Estimate of Median	109.008	
MVU Estimate of Mean	145.2855	
MVU Estimate of Standard Deviation	109.4972	
MVU Estimate of SE of Mean	48.78358	
95% H-UCL	704.7725	
95% Chebyshev (MVUE) UCL	357.9282	
97.5% Chebyshev (MVUE) UCL	449.9388	
99% Chebyshev (MVUE) UCL	630.676	
Non-parametric Statisitics		
95% CLT UCL	224.9504	
95% Adjusted-CLT UCL	254.8503	
95% Modified-t UCL	253.2318	
95% Jackknife UCL	248.568	
95% Chebyshev (Mean, Sd) UCL	356.5732	
97.5% Chebyshev (Mean, Sd) UCL	448.0432	
99% Chebyshev (Mean, Sd) UCL	627.7184	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	217.5459	
95% Bootstrap-t UCL	362.2259	
95% Hall's Bootstrap UCL	692.3064	
95% Percentile Bootstrap UCL	218.6	
95% BCA Bootstrap UCL	260	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	248.568	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	58.1	
Maximum	2850	
Mean	791.28	
Standard Deviation	1193.962	
Variance	1425544	
Coefficient of Variation	1.508899	
Skewness	1.884817	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.727166	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1929.592	
Gamma Statistics		
k hat	0.583668	
k star (bias corrected)	0.366801	
Theta hat	1355.702	
Theta star	2157.249	
nu hat	5.83668	
nu star	3.668005	
5% Approximate Chi Square Value	0.594851	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	0.235055	
Anderson-Darling Test Statistic	0.448464	
Anderson-Darling 5% Critical Value	0.706706	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.302524	
Kolmogrov-Smirnov 5% Critical Value	0.369963	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4879.24	
95% Adjusted Gamma UCL	12347.81	
Lognormal Statistics		
Minimum of log data	4.062166	
Maximum of log data	7.955074	
Mean of log data	5.610705	
Standard Deviation of log data	1.669963	
Variance of log data	2.788776	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.898671	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1102.232	
MLE Standard Deviation	4305.921	
MLE Coefficient of Variation	3.906546	
MLE Skewness	71.33782	
MLE Median	273.3369	
MLE 80% Quantile	1120.829	
MLE 90% Quantile	2336.962	
MLE 95% Quantile	4263.278	
MLE 99% Quantile	13293.61	
MVU Estimate of Median	203.875	
MVU Estimate of Mean	715.2384	
MVU Estimate of Standard Deviation	1098.128	
MVU Estimate of SE of Mean	467.9933	
95% H-UCL	798603.7	
95% Chebyshev (MVUE) UCL	2755.174	
97.5% Chebyshev (MVUE) UCL	3637.856	
99% Chebyshev (MVUE) UCL	5371.713	
Non-parametric Statisitics		
95% CLT UCL	1669.559	
95% Adjusted-CLT UCL	2150.476	
95% Modified-t UCL	2004.605	
95% Jackknife UCL	1929.592	
95% Chebyshev (Mean, Sd) UCL	3118.74	
97.5% Chebyshev (Mean, Sd) UCL	4125.833	
99% Chebyshev (Mean, Sd) UCL	6104.073	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1552.63	
95% Bootstrap-t UCL	19307.21	
95% Hall's Bootstrap UCL	7929.334	
95% Percentile Bootstrap UCL	1736.58	
95% BCA Bootstrap UCL	2291.62	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	4879.24	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	0.31	
Maximum	3.4	
Mean	1.189	
Standard Deviation	1.27247	
Variance	1.61918	
Coefficient of Variation	1.070202	
Skewness	1.937987	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.756887	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2.402161	
Gamma Statistics		
k hat	1.455329	
k star (bias corrected)	0.715465	
Theta hat	0.816997	
Theta star	1.661856	
nu hat	14.55329	
nu star	7.154651	
5% Approximate Chi Square Value	2.25521	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	1.245195	
Anderson-Darling Test Statistic	0.381117	
Anderson-Darling 5% Critical Value	0.686832	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.225337	
Kolmogrov-Smirnov 5% Critical Value	0.361915	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	3.772101	
95% Adjusted Gamma UCL	6.831767	
Lognormal Statistics		
Minimum of log data	-1.171183	
Maximum of log data	1.223775	
Mean of log data	-0.208236	
Standard Deviation of log data	0.932964	
Variance of log data	0.870423	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.946728	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.254798	
MLE Standard Deviation	1.478278	
MLE Coefficient of Variation	1.1781	
MLE Skewness	5.169408	
MLE Median	0.812015	
MLE 80% Quantile	1.78625	
MLE 90% Quantile	2.692911	
MLE 95% Quantile	3.767796	
MLE 99% Quantile	7.112394	
MVU Estimate of Median	0.743357	
MVU Estimate of Mean	1.129517	
MVU Estimate of Standard Deviation	1.024144	
MVU Estimate of SE of Mean	0.454571	
95% H-UCL	10.81546	
95% Chebyshev (MVUE) UCL	3.110944	
97.5% Chebyshev (MVUE) UCL	3.968309	
99% Chebyshev (MVUE) UCL	5.652437	
Non-parametric Statisitics		
95% CLT UCL	2.12503	
95% Adjusted-CLT UCL	2.652028	
95% Modified-t UCL	2.484362	
95% Jackknife UCL	2.402161	
95% Chebyshev (Mean, Sd) UCL	3.669501	
97.5% Chebyshev (Mean, Sd) UCL	4.742815	
99% Chebyshev (Mean, Sd) UCL	6.851134	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.021773	
95% Bootstrap-t UCL	6.067249	
95% Hall's Bootstrap UCL	6.208976	
95% Percentile Bootstrap UCL	2.242	
95% BCA Bootstrap UCL	2.86	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	3.772101	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	4	
Minimum	0.75	
Maximum	3.4	
Mean	1.47	
Standard Deviation	1.136112	
Variance	1.29075	
Coefficient of Variation	0.772865	
Skewness	1.763467	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.748851	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2.553158	
Gamma Statistics		
k hat	2.731423	
k star (bias corrected)	1.225902	
Theta hat	0.538181	
Theta star	1.199117	
nu hat	27.31423	
nu star	12.25902	
5% Approximate Chi Square Value	5.397099	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	3.590428	
Anderson-Darling Test Statistic	0.604203	
Anderson-Darling 5% Critical Value	0.683119	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.331968	
Kolmogrov-Smirnov 5% Critical Value	0.359702	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	3.338973	
95% Adjusted Gamma UCL	5.019114	
Lognormal Statistics		
Minimum of log data	-0.287682	
Maximum of log data	1.223775	
Mean of log data	0.191179	
Standard Deviation of log data	0.657213	
Variance of log data	0.431929	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.815982	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.50252	
MLE Standard Deviation	1.104353	
MLE Coefficient of Variation	0.735001	
MLE Skewness	2.602069	
MLE Median	1.210676	
MLE 80% Quantile	2.109655	
MLE 90% Quantile	2.817072	
MLE 95% Quantile	3.569034	
MLE 99% Quantile	5.58373	
MVU Estimate of Median	1.159131	
MVU Estimate of Mean	1.432246	
MVU Estimate of Standard Deviation	0.927898	
MVU Estimate of SE of Mean	0.414084	
95% H-UCL	4.74157	
95% Chebyshev (MVUE) UCL	3.237198	
97.5% Chebyshev (MVUE) UCL	4.018203	
99% Chebyshev (MVUE) UCL	5.552334	
Non-parametric Statisitics		
95% CLT UCL	2.305725	
95% Adjusted-CLT UCL	2.733878	
95% Modified-t UCL	2.619941	
95% Jackknife UCL	2.553158	
95% Chebyshev (Mean, Sd) UCL	3.68469	
97.5% Chebyshev (Mean, Sd) UCL	4.642988	
99% Chebyshev (Mean, Sd) UCL	6.525378	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	3.338973	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	14.1	
Maximum	41.9	
Mean	26.66	
Standard Deviation	11.80733	
Variance	139.413	
Coefficient of Variation	0.442886	
Skewness	0.155307	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.929826	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	37.91699	
Gamma Statistics		
k hat	5.959491	
k star (bias corrected)	2.51713	
Theta hat	4.473536	
Theta star	10.59143	
nu hat	59.59491	
nu star	25.1713	
5% Approximate Chi Square Value	14.74103	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	11.40518	
Anderson-Darling Test Statistic	0.334089	
Anderson-Darling 5% Critical Value	0.680359	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.249095	
Kolmogrov-Smirnov 5% Critical Value	0.358172	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	45.52375	
95% Adjusted Gamma UCL	58.83877	
Lognormal Statistics		
Minimum of log data	2.646175	
Maximum of log data	3.735286	
Mean of log data	3.196925	
Standard Deviation of log data	0.474939	
Variance of log data	0.225567	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.909522	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	27.37714	
MLE Standard Deviation	13.77136	
MLE Coefficient of Variation	0.503024	
MLE Skewness	1.636354	
MLE Median	24.4572	
MLE 80% Quantile	36.53418	
MLE 90% Quantile	45.02516	
MLE 95% Quantile	53.42077	
MLE 99% Quantile	73.82025	
MVU Estimate of Median	23.90966	
MVU Estimate of Mean	26.73127	
MVU Estimate of Standard Deviation	12.60076	
MVU Estimate of SE of Mean	5.631712	
95% H-UCL	54.1018	
95% Chebyshev (MVUE) UCL	51.27933	
97.5% Chebyshev (MVUE) UCL	61.9013	
99% Chebyshev (MVUE) UCL	82.76609	
Non-parametric Statisitics		
95% CLT UCL	35.34548	
95% Adjusted-CLT UCL	35.73736	
95% Modified-t UCL	37.97812	
95% Jackknife UCL	37.91699	
95% Chebyshev (Mean, Sd) UCL	49.67672	
97.5% Chebyshev (Mean, Sd) UCL	59.63607	
99% Chebyshev (Mean, Sd) UCL	79.19929	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	34.45849	
95% Bootstrap-t UCL	37.89872	
95% Hall's Bootstrap UCL	32.81605	
95% Percentile Bootstrap UCL	34.64	
95% BCA Bootstrap UCL	37.44	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	37.91699	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - da.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	5	
Number of Missing Data	0	
Number of Valid Observations	5	
Number of Distinct Observations	5	
Minimum	53.1	
Maximum	843	
Mean	274.54	
Standard Deviation	333.8751	
Variance	111472.6	
Coefficient of Variation	1.216126	
Skewness	1.775018	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.766314	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	592.8534	
Gamma Statistics		
k hat	1.010672	
k star (bias corrected)	0.537602	
Theta hat	271.6411	
Theta star	510.6751	
nu hat	10.10672	
nu star	5.37602	
5% Approximate Chi Square Value	1.329326	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	0.640876	
Anderson-Darling Test Statistic	0.413335	
Anderson-Darling 5% Critical Value	0.691234	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.263556	
Kolmogrov-Smirnov 5% Critical Value	0.364352	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1110.286	
95% Adjusted Gamma UCL	2302.993	
Lognormal Statistics		
Minimum of log data	3.972177	
Maximum of log data	6.736967	
Mean of log data	5.044685	
Standard Deviation of log data	1.176202	
Variance of log data	1.383451	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904768	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	309.9497	
MLE Standard Deviation	535.8315	
MLE Coefficient of Variation	1.728769	
MLE Skewness	10.35298	
MLE Median	155.1954	
MLE 80% Quantile	419.2953	
MLE 90% Quantile	703.5255	
MLE 95% Quantile	1074.421	
MLE 99% Quantile	2393.544	
MVU Estimate of Median	134.6925	
MVU Estimate of Mean	258.4643	
MVU Estimate of Standard Deviation	290.7697	
MVU Estimate of SE of Mean	127.9107	
95% H-UCL	8715.374	
95% Chebyshev (MVUE) UCL	816.014	
97.5% Chebyshev (MVUE) UCL	1057.266	
99% Chebyshev (MVUE) UCL	1531.16	
Non-parametric Statisitics		
95% CLT UCL	520.1388	
95% Adjusted-CLT UCL	646.7866	
95% Modified-t UCL	612.6079	
95% Jackknife UCL	592.8534	
95% Chebyshev (Mean, Sd) UCL	925.3824	
97.5% Chebyshev (Mean, Sd) UCL	1207.002	
99% Chebyshev (Mean, Sd) UCL	1760.191	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	496.2363	
95% Bootstrap-t UCL	2307.563	
95% Hall's Bootstrap UCL	2527.484	
95% Percentile Bootstrap UCL	528.04	
95% BCA Bootstrap UCL	685.02	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	592.8534	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	19.9	
Maximum	53.3	
Mean	39.57	
Standard Deviation	10.7859	
Variance	116.3357	
Coefficient of Variation	0.272578	
Skewness	-0.487068	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.954791	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	45.82238	
Gamma Statistics		
k hat	12.87706	
k star (bias corrected)	9.080605	
Theta hat	3.072907	
Theta star	4.357639	
nu hat	257.5411	
nu star	181.6121	
5% Approximate Chi Square Value	151.4352	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	146.6466	
Anderson-Darling Test Statistic	0.319461	
Anderson-Darling 5% Critical Value	0.724913	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.151354	
Kolmogrov-Smirnov 5% Critical Value	0.266498	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	47.45521	
95% Adjusted Gamma UCL	49.00482	
Lognormal Statistics		
Minimum of log data	2.99072	
Maximum of log data	3.975936	
Mean of log data	3.63874	
Standard Deviation of log data	0.309434	
Variance of log data	0.09575	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.909542	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	39.90953	
MLE Standard Deviation	12.65098	
MLE Coefficient of Variation	0.316991	
MLE Skewness	0.982827	
MLE Median	38.04388	
MLE 80% Quantile	49.41294	
MLE 90% Quantile	56.62007	
MLE 95% Quantile	63.29206	
MLE 99% Quantile	78.13865	
MVU Estimate of Median	37.8621	
MVU Estimate of Mean	39.71227	
MVU Estimate of Standard Deviation	12.38352	
MVU Estimate of SE of Mean	3.914839	
95% H-UCL	48.98684	
95% Chebyshev (MVUE) UCL	56.77666	
97.5% Chebyshev (MVUE) UCL	64.16044	
99% Chebyshev (MVUE) UCL	78.66443	
Non-parametric Statisitics		
95% CLT UCL	45.18027	
95% Adjusted-CLT UCL	44.61893	
95% Modified-t UCL	45.73483	
95% Jackknife UCL	45.82238	
95% Chebyshev (Mean, Sd) UCL	54.43734	
97.5% Chebyshev (Mean, Sd) UCL	60.87045	
99% Chebyshev (Mean, Sd) UCL	73.50705	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	44.80592	
95% Bootstrap-t UCL	45.25351	
95% Hall's Bootstrap UCL	44.70306	
95% Percentile Bootstrap UCL	44.66	
95% BCA Bootstrap UCL	46.41	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	45.82238	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	0.22	
Maximum	2.1	
Mean	1.0485	
Standard Deviation	0.622674	
Variance	0.387723	
Coefficient of Variation	0.593871	
Skewness	-0.020694	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.932302	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.409452	
Gamma Statistics		
k hat	2.216401	
k star (bias corrected)	1.618147	
Theta hat	0.473064	
Theta star	0.647963	
nu hat	44.32802	
nu star	32.36295	
5% Approximate Chi Square Value	20.35796	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	18.71901	
Anderson-Darling Test Statistic	0.628804	
Anderson-Darling 5% Critical Value	0.734844	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.266	
Kolmogrov-Smirnov 5% Critical Value	0.269516	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.666795	
95% Adjusted Gamma UCL	1.812732	
Lognormal Statistics		
Minimum of log data	-1.514128	
Maximum of log data	0.741937	
Mean of log data	-0.194877	
Standard Deviation of log data	0.8244	
Variance of log data	0.679635	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.842511	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.155971	
MLE Standard Deviation	1.140351	
MLE Coefficient of Variation	0.986488	
MLE Skewness	3.919472	
MLE Median	0.822936	
MLE 80% Quantile	1.651594	
MLE 90% Quantile	2.373765	
MLE 95% Quantile	3.193959	
MLE 99% Quantile	5.599502	
MVU Estimate of Median	0.795357	
MVU Estimate of Mean	1.108436	
MVU Estimate of Standard Deviation	0.960948	
MVU Estimate of SE of Mean	0.300218	
95% H-UCL	2.464941	
95% Chebyshev (MVUE) UCL	2.417058	
97.5% Chebyshev (MVUE) UCL	2.983299	
99% Chebyshev (MVUE) UCL	4.095571	
Non-parametric Statisitics		
95% CLT UCL	1.372383	
95% Adjusted-CLT UCL	1.371006	
95% Modified-t UCL	1.409237	
95% Jackknife UCL	1.409452	
95% Chebyshev (Mean, Sd) UCL	1.906796	
97.5% Chebyshev (Mean, Sd) UCL	2.278182	
99% Chebyshev (Mean, Sd) UCL	3.007697	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.354756	
95% Bootstrap-t UCL	1.390774	
95% Hall's Bootstrap UCL	1.361371	
95% Percentile Bootstrap UCL	1.36	
95% BCA Bootstrap UCL	1.44	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.409452	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	48.4	
Maximum	141	
Mean	101.14	
Standard Deviation	31.40429	
Variance	986.2293	
Coefficient of Variation	0.310503	
Skewness	-0.763038	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.90325	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	119.3445	
Gamma Statistics		
k hat	9.152	
k star (bias corrected)	6.473067	
Theta hat	11.05114	
Theta star	15.62474	
nu hat	183.04	
nu star	129.4613	
5% Approximate Chi Square Value	104.1737	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	100.2353	
Anderson-Darling Test Statistic	0.699191	
Anderson-Darling 5% Critical Value	0.725805	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.238439	
Kolmogrov-Smirnov 5% Critical Value	0.266766	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	125.6912	
95% Adjusted Gamma UCL	130.6299	
Lognormal Statistics		
Minimum of log data	3.8795	
Maximum of log data	4.94876	
Mean of log data	4.560879	
Standard Deviation of log data	0.37537	
Variance of log data	0.140903	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.821436	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	102.6505	
MLE Standard Deviation	39.92994	
MLE Coefficient of Variation	0.388989	
MLE Skewness	1.225826	
MLE Median	95.66754	
MLE 80% Quantile	131.3764	
MLE 90% Quantile	154.9697	
MLE 95% Quantile	177.3921	
MLE 99% Quantile	229.0613	
MVU Estimate of Median	94.99549	
MVU Estimate of Mean	101.8931	
MVU Estimate of Standard Deviation	38.68122	
MVU Estimate of SE of Mean	12.2243	
95% H-UCL	132.8307	
95% Chebyshev (MVUE) UCL	155.1776	
97.5% Chebyshev (MVUE) UCL	178.2338	
99% Chebyshev (MVUE) UCL	223.5233	
Non-parametric Statisitics		
95% CLT UCL	117.4749	
95% Adjusted-CLT UCL	114.9144	
95% Modified-t UCL	118.9451	
95% Jackknife UCL	119.3445	
95% Chebyshev (Mean, Sd) UCL	144.4278	
97.5% Chebyshev (Mean, Sd) UCL	163.1585	
99% Chebyshev (Mean, Sd) UCL	199.9513	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	116.5497	
95% Bootstrap-t UCL	117.0514	
95% Hall's Bootstrap UCL	114.1219	
95% Percentile Bootstrap UCL	115.95	
95% BCA Bootstrap UCL	112.65	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	119.3445	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	50.6	
Maximum	146	
Mean	91.14	
Standard Deviation	29.56154	
Variance	873.8849	
Coefficient of Variation	0.324353	
Skewness	0.397471	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.941133	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	108.2763	
Gamma Statistics		
k hat	10.21763	
k star (bias corrected)	7.219008	
Theta hat	8.919876	
Theta star	12.625	
nu hat	204.3526	
nu star	144.3802	
5% Approximate Chi Square Value	117.6063	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	113.4095	
Anderson-Darling Test Statistic	0.343388	
Anderson-Darling 5% Critical Value	0.725049	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.158021	
Kolmogrov-Smirnov 5% Critical Value	0.26662	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	111.8887	
95% Adjusted Gamma UCL	116.0292	
Lognormal Statistics		
Minimum of log data	3.923952	
Maximum of log data	4.983607	
Mean of log data	4.462664	
Standard Deviation of log data	0.339109	
Variance of log data	0.114995	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.928299	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	91.85047	
MLE Standard Deviation	32.06463	
MLE Coefficient of Variation	0.349096	
MLE Skewness	1.089831	
MLE Median	86.71825	
MLE 80% Quantile	115.4932	
MLE 90% Quantile	134.0777	
MLE 95% Quantile	151.4869	
MLE 99% Quantile	190.8395	
MVU Estimate of Median	86.22081	
MVU Estimate of Mean	91.30187	
MVU Estimate of Standard Deviation	31.24864	
MVU Estimate of SE of Mean	9.877458	
95% H-UCL	115.3961	
95% Chebyshev (MVUE) UCL	134.3567	
97.5% Chebyshev (MVUE) UCL	152.9866	
99% Chebyshev (MVUE) UCL	189.5813	
Non-parametric Statisitics		
95% CLT UCL	106.5164	
95% Adjusted-CLT UCL	107.7719	
95% Modified-t UCL	108.4721	
95% Jackknife UCL	108.2763	
95% Chebyshev (Mean, Sd) UCL	131.8878	
97.5% Chebyshev (Mean, Sd) UCL	149.5194	
99% Chebyshev (Mean, Sd) UCL	184.1532	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	106.119	
95% Bootstrap-t UCL	110.223	
95% Hall's Bootstrap UCL	117.3779	
95% Percentile Bootstrap UCL	105.85	
95% BCA Bootstrap UCL	111.46	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	108.2763	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	245	
Maximum	1380	
Mean	642.3	
Standard Deviation	316.0949	
Variance	99916.01	
Coefficient of Variation	0.49213	
Skewness	1.370641	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.891781	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	825.5343	
Gamma Statistics		
k hat	5.060958	
k star (bias corrected)	3.609337	
Theta hat	126.9127	
Theta star	177.9551	
nu hat	101.2192	
nu star	72.18674	
5% Approximate Chi Square Value	53.61992	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	50.84803	
Anderson-Darling Test Statistic	0.235006	
Anderson-Darling 5% Critical Value	0.729396	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.138801	
Kolmogrov-Smirnov 5% Critical Value	0.26742	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	864.7075	
95% Adjusted Gamma UCL	911.8455	
Lognormal Statistics		
Minimum of log data	5.501258	
Maximum of log data	7.229839	
Mean of log data	6.363019	
Standard Deviation of log data	0.478489	
Variance of log data	0.228952	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.978201	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	650.3397	
MLE Standard Deviation	329.8714	
MLE Coefficient of Variation	0.507229	
MLE Skewness	1.652189	
MLE Median	579.9947	
MLE 80% Quantile	868.9993	
MLE 90% Quantile	1072.639	
MLE 95% Quantile	1274.276	
MLE 99% Quantile	1765.139	
MVU Estimate of Median	573.3861	
MVU Estimate of Mean	642.33	
MVU Estimate of Standard Deviation	312.9526	
MVU Estimate of SE of Mean	98.80393	
95% H-UCL	922.2594	
95% Chebyshev (MVUE) UCL	1073.006	
97.5% Chebyshev (MVUE) UCL	1259.36	
99% Chebyshev (MVUE) UCL	1625.417	
Non-parametric Statisitics		
95% CLT UCL	806.7163	
95% Adjusted-CLT UCL	853.01	
95% Modified-t UCL	832.7552	
95% Jackknife UCL	825.5343	
95% Chebyshev (Mean, Sd) UCL	1078.007	
97.5% Chebyshev (Mean, Sd) UCL	1266.537	
99% Chebyshev (Mean, Sd) UCL	1636.87	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	800.2721	
95% Bootstrap-t UCL	904.0353	
95% Hall's Bootstrap UCL	1520.223	
95% Percentile Bootstrap UCL	810.6	
95% BCA Bootstrap UCL	898.7	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	825.5343	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.27	
Maximum	0.84	
Mean	0.586	
Standard Deviation	0.178276	
Variance	0.031782	
Coefficient of Variation	0.304225	
Skewness	-0.687505	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.935506	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.689343	
Gamma Statistics		
k hat	9.671392	
k star (bias corrected)	6.836641	
Theta hat	0.060591	
Theta star	0.085715	
nu hat	193.4278	
nu star	136.7328	
5% Approximate Chi Square Value	110.7106	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	106.6445	
Anderson-Darling Test Statistic	0.574553	
Anderson-Darling 5% Critical Value	0.725349	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.221165	
Kolmogrov-Smirnov 5% Critical Value	0.266683	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.723738	
95% Adjusted Gamma UCL	0.751332	
Lognormal Statistics		
Minimum of log data	-1.309333	
Maximum of log data	-0.174353	
Mean of log data	-0.587024	
Standard Deviation of log data	0.364029	
Variance of log data	0.132517	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.858255	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.594065	
MLE Standard Deviation	0.223623	
MLE Coefficient of Variation	0.376428	
MLE Skewness	1.182625	
MLE Median	0.555979	
MLE 80% Quantile	0.756222	
MLE 90% Quantile	0.887588	
MLE 95% Quantile	1.011873	
MLE 99% Quantile	1.29655	
MVU Estimate of Median	0.552305	
MVU Estimate of Mean	0.589954	
MVU Estimate of Standard Deviation	0.217052	
MVU Estimate of SE of Mean	0.068599	
95% H-UCL	0.761555	
95% Chebyshev (MVUE) UCL	0.888971	
97.5% Chebyshev (MVUE) UCL	1.018355	
99% Chebyshev (MVUE) UCL	1.272507	
Non-parametric Statisitics		
95% CLT UCL	0.67873	
95% Adjusted-CLT UCL	0.665634	
95% Modified-t UCL	0.6873	
95% Jackknife UCL	0.689343	
95% Chebyshev (Mean, Sd) UCL	0.831736	
97.5% Chebyshev (Mean, Sd) UCL	0.938066	
99% Chebyshev (Mean, Sd) UCL	1.146931	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.672901	
95% Bootstrap-t UCL	0.670938	
95% Hall's Bootstrap UCL	0.669281	
95% Percentile Bootstrap UCL	0.669	
95% BCA Bootstrap UCL	0.695	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.689343	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	15.5	
Maximum	38.6	
Mean	25.3	
Standard Deviation	6.521418	
Variance	42.52889	
Coefficient of Variation	0.257764	
Skewness	0.629256	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.949053	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	29.08034	
Gamma Statistics		
k hat	16.9367	
k star (bias corrected)	11.92236	
Theta hat	1.493797	
Theta star	2.122063	
nu hat	338.7341	
nu star	238.4472	
5% Approximate Chi Square Value	203.6924	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	198.1072	
Anderson-Darling Test Statistic	0.283795	
Anderson-Darling 5% Critical Value	0.724706	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.187022	
Kolmogrov-Smirnov 5% Critical Value	0.266311	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	29.61678	
95% Adjusted Gamma UCL	30.45177	
Lognormal Statistics		
Minimum of log data	2.74084	
Maximum of log data	3.653252	
Mean of log data	3.200992	
Standard Deviation of log data	0.258868	
Variance of log data	0.067012	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.963218	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	25.39363	
MLE Standard Deviation	6.685271	
MLE Coefficient of Variation	0.263266	
MLE Skewness	0.808043	
MLE Median	24.55689	
MLE 80% Quantile	30.56133	
MLE 90% Quantile	34.24831	
MLE 95% Quantile	37.59344	
MLE 99% Quantile	44.8408	
MVU Estimate of Median	24.47472	
MVU Estimate of Mean	25.30661	
MVU Estimate of Standard Deviation	6.586692	
MVU Estimate of SE of Mean	2.082586	
95% H-UCL	30.0093	
95% Chebyshev (MVUE) UCL	34.38439	
97.5% Chebyshev (MVUE) UCL	38.31236	
99% Chebyshev (MVUE) UCL	46.02808	
Non-parametric Statisitics		
95% CLT UCL	28.6921	
95% Adjusted-CLT UCL	29.13058	
95% Modified-t UCL	29.14874	
95% Jackknife UCL	29.08034	
95% Chebyshev (Mean, Sd) UCL	34.28915	
97.5% Chebyshev (Mean, Sd) UCL	38.17877	
99% Chebyshev (Mean, Sd) UCL	45.81916	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	28.47789	
95% Bootstrap-t UCL	29.79367	
95% Hall's Bootstrap UCL	31.94824	
95% Percentile Bootstrap UCL	28.64	
95% BCA Bootstrap UCL	30.09	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	29.08034	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - kf-so.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	181	
Maximum	478	
Mean	332.9	
Standard Deviation	99.32377	
Variance	9865.211	
Coefficient of Variation	0.298359	
Skewness	0.00977	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.958191	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	390.4761	
Gamma Statistics		
k hat	11.71166	
k star (bias corrected)	8.264828	
Theta hat	28.42466	
Theta star	40.27912	
nu hat	234.2332	
nu star	165.2966	
5% Approximate Chi Square Value	136.5632	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	132.0257	
Anderson-Darling Test Statistic	0.254677	
Anderson-Darling 5% Critical Value	0.724973	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.175379	
Kolmogrov-Smirnov 5% Critical Value	0.266551	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	402.9434	
95% Adjusted Gamma UCL	416.7919	
Lognormal Statistics		
Minimum of log data	5.198497	
Maximum of log data	6.169611	
Mean of log data	5.764543	
Standard Deviation of log data	0.31723	
Variance of log data	0.100635	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.950602	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	335.2445	
MLE Standard Deviation	109.0822	
MLE Coefficient of Variation	0.325381	
MLE Skewness	1.010592	
MLE Median	318.7932	
MLE 80% Quantile	416.7981	
MLE 90% Quantile	479.2312	
MLE 95% Quantile	537.2084	
MLE 99% Quantile	666.753	
MVU Estimate of Median	317.1924	
MVU Estimate of Mean	333.5002	
MVU Estimate of Standard Deviation	106.657	
MVU Estimate of SE of Mean	33.71677	
95% H-UCL	413.987	
95% Chebyshev (MVUE) UCL	480.4682	
97.5% Chebyshev (MVUE) UCL	544.0614	
99% Chebyshev (MVUE) UCL	668.9778	
Non-parametric Statisitics		
95% CLT UCL	384.5631	
95% Adjusted-CLT UCL	384.6668	
95% Modified-t UCL	390.4923	
95% Jackknife UCL	390.4761	
95% Chebyshev (Mean, Sd) UCL	469.8084	
97.5% Chebyshev (Mean, Sd) UCL	529.0487	
99% Chebyshev (Mean, Sd) UCL	645.4149	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	381.6694	
95% Bootstrap-t UCL	393.1891	
95% Hall's Bootstrap UCL	383.6178	
95% Percentile Bootstrap UCL	380.9	
95% BCA Bootstrap UCL	400.2	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	390.4761	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	26	
Minimum	6.05	
Maximum	219	
Mean	33.20385	
Standard Deviation	42.0077	
Variance	1764.647	
Coefficient of Variation	1.265146	
Skewness	3.767259	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.552376	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	47.27617	
Gamma Statistics		
k hat	1.480106	
k star (bias corrected)	1.334965	
Theta hat	22.43343	
Theta star	24.87244	
nu hat	76.9655	
nu star	69.4182	
5% Approximate Chi Square Value	51.23537	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	50.2033	
Anderson-Darling Test Statistic	1.115165	
Anderson-Darling 5% Critical Value	0.762071	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.185033	
Kolmogrov-Smirnov 5% Critical Value	0.174334	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	44.9875	
95% Adjusted Gamma UCL	45.91234	
Lognormal Statistics		
Minimum of log data	1.800058	
Maximum of log data	5.389072	
Mean of log data	3.128279	
Standard Deviation of log data	0.790582	
Variance of log data	0.62502	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.955892	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	31.21157	
MLE Standard Deviation	29.08347	
MLE Coefficient of Variation	0.931817	
MLE Skewness	3.604531	
MLE Median	22.83465	
MLE 80% Quantile	44.53702	
MLE 90% Quantile	63.06568	
MLE 95% Quantile	83.8296	
MLE 99% Quantile	143.6202	
MVU Estimate of Median	22.56171	
MVU Estimate of Mean	30.73845	
MVU Estimate of Standard Deviation	27.11274	
MVU Estimate of SE of Mean	5.218525	
95% H-UCL	44.50463	
95% Chebyshev (MVUE) UCL	53.48547	
97.5% Chebyshev (MVUE) UCL	63.32812	
99% Chebyshev (MVUE) UCL	82.66211	
Non-parametric Statisitics		
95% CLT UCL	46.75479	
95% Adjusted-CLT UCL	53.2585	
95% Modified-t UCL	48.29062	
95% Jackknife UCL	47.27617	
95% Chebyshev (Mean, Sd) UCL	69.11415	
97.5% Chebyshev (Mean, Sd) UCL	84.65256	
99% Chebyshev (Mean, Sd) UCL	115.1748	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	46.37146	
95% Bootstrap-t UCL	67.28979	
95% Hall's Bootstrap UCL	98.16052	
95% Percentile Bootstrap UCL	48.06346	
95% BCA Bootstrap UCL	45.44808	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	44.50463	95% H-UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	9	
Minimum	0.05	
Maximum	0.6475	
Mean	0.090481	
Standard Deviation	0.115287	
Variance	0.013291	
Coefficient of Variation	1.274156	
Skewness	4.875533	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.306716	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.129101	
Gamma Statistics		
k hat	2.379905	
k star (bias corrected)	2.130941	
Theta hat	0.038019	
Theta star	0.04246	
nu hat	123.755	
nu star	110.8089	
5% Approximate Chi Square Value	87.50631	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	86.13904	
Anderson-Darling Test Statistic	5.553672	
Anderson-Darling 5% Critical Value	0.754732	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.408474	
Kolmogrov-Smirnov 5% Critical Value	0.17301	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.114575	
95% Adjusted Gamma UCL	0.116394	
Lognormal Statistics		
Minimum of log data	-2.995732	
Maximum of log data	-0.434636	
Mean of log data	-2.627182	
Standard Deviation of log data	0.50048	
Variance of log data	0.250481	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.52775	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.081926	
MLE Standard Deviation	0.043709	
MLE Coefficient of Variation	0.533519	
MLE Skewness	1.75242	
MLE Median	0.072282	
MLE 80% Quantile	0.11033	
MLE 90% Quantile	0.137509	
MLE 95% Quantile	0.164657	
MLE 99% Quantile	0.231526	
MVU Estimate of Median	0.071934	
MVU Estimate of Mean	0.081489	
MVU Estimate of Standard Deviation	0.042631	
MVU Estimate of SE of Mean	0.008332	
95% H-UCL	0.099673	
95% Chebyshev (MVUE) UCL	0.117809	
97.5% Chebyshev (MVUE) UCL	0.133524	
99% Chebyshev (MVUE) UCL	0.164395	
Non-parametric Statisitics		
95% CLT UCL	0.12767	
95% Adjusted-CLT UCL	0.15077	
95% Modified-t UCL	0.132704	
95% Jackknife UCL	0.129101	
95% Chebyshev (Mean, Sd) UCL	0.189034	
97.5% Chebyshev (Mean, Sd) UCL	0.231677	
99% Chebyshev (Mean, Sd) UCL	0.315443	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.125807	
95% Bootstrap-t UCL	0.320925	
95% Hall's Bootstrap UCL	0.270605	
95% Percentile Bootstrap UCL	0.134519	
95% BCA Bootstrap UCL	0.132212	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.189034	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	26	
Minimum	24.4	
Maximum	316	
Mean	109.7038	
Standard Deviation	76.26076	
Variance	5815.703	
Coefficient of Variation	0.695151	
Skewness	1.042874	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.899627	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	135.2507	
Gamma Statistics		
k hat	2.187336	
k star (bias corrected)	1.960592	
Theta hat	50.15408	
Theta star	55.95444	
nu hat	113.7415	
nu star	101.9508	
5% Approximate Chi Square Value	79.64964	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	78.348	
Anderson-Darling Test Statistic	0.349187	
Anderson-Darling 5% Critical Value	0.756034	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.134121	
Kolmogrov-Smirnov 5% Critical Value	0.173203	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	140.4199	
95% Adjusted Gamma UCL	142.7528	
Lognormal Statistics		
Minimum of log data	3.194583	
Maximum of log data	5.755742	
Mean of log data	4.452112	
Standard Deviation of log data	0.741496	
Variance of log data	0.549817	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.956716	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	112.9585	
MLE Standard Deviation	96.70566	
MLE Coefficient of Variation	0.856117	
MLE Skewness	3.195829	
MLE Median	85.80799	
MLE 80% Quantile	160.5614	
MLE 90% Quantile	222.5018	
MLE 95% Quantile	290.5785	
MLE 99% Quantile	481.4646	
MVU Estimate of Median	84.90513	
MVU Estimate of Mean	111.4884	
MVU Estimate of Standard Deviation	91.04267	
MVU Estimate of SE of Mean	17.59199	
95% H-UCL	156.3081	
95% Chebyshev (MVUE) UCL	188.1701	
97.5% Chebyshev (MVUE) UCL	221.3503	
99% Chebyshev (MVUE) UCL	286.5264	
Non-parametric Statisitics		
95% CLT UCL	134.3042	
95% Adjusted-CLT UCL	137.5727	
95% Modified-t UCL	135.7605	
95% Jackknife UCL	135.2507	
95% Chebyshev (Mean, Sd) UCL	174.8954	
97.5% Chebyshev (Mean, Sd) UCL	203.1038	
99% Chebyshev (Mean, Sd) UCL	258.5138	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	133.7529	
95% Bootstrap-t UCL	138.9436	
95% Hall's Bootstrap UCL	141.5008	
95% Percentile Bootstrap UCL	134.9346	
95% BCA Bootstrap UCL	130.4808	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	140.4199	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	26	
Minimum	20.8	
Maximum	298.5	
Mean	80.37692	
Standard Deviation	58.21595	
Variance	3389.097	
Coefficient of Variation	0.724287	
Skewness	2.16901	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.803486	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	99.87891	
Gamma Statistics		
k hat	2.512006	
k star (bias corrected)	2.2478	
Theta hat	31.99711	
Theta star	35.75804	
nu hat	130.6243	
nu star	116.8856	
5% Approximate Chi Square Value	92.91903	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	91.50825	
Anderson-Darling Test Statistic	0.339908	
Anderson-Darling 5% Critical Value	0.753839	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.093306	
Kolmogrov-Smirnov 5% Critical Value	0.172878	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	101.1085	
95% Adjusted Gamma UCL	102.6673	
Lognormal Statistics		
Minimum of log data	3.034953	
Maximum of log data	5.69877	
Mean of log data	4.174672	
Standard Deviation of log data	0.663977	
Variance of log data	0.440865	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.965842	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	81.05314	
MLE Standard Deviation	60.33161	
MLE Coefficient of Variation	0.744346	
MLE Skewness	2.645445	
MLE Median	65.01853	
MLE 80% Quantile	113.9469	
MLE 90% Quantile	152.6096	
MLE 95% Quantile	193.817	
MLE 99% Quantile	304.6254	
MVU Estimate of Median	64.46945	
MVU Estimate of Mean	80.23779	
MVU Estimate of Standard Deviation	57.57451	
MVU Estimate of SE of Mean	11.18041	
95% H-UCL	107.2606	
95% Chebyshev (MVUE) UCL	128.9721	
97.5% Chebyshev (MVUE) UCL	150.0594	
99% Chebyshev (MVUE) UCL	191.4815	
Non-parametric Statisitics		
95% CLT UCL	99.15636	
95% Adjusted-CLT UCL	104.3457	
95% Modified-t UCL	100.6883	
95% Jackknife UCL	99.87891	
95% Chebyshev (Mean, Sd) UCL	130.1429	
97.5% Chebyshev (Mean, Sd) UCL	151.6766	
99% Chebyshev (Mean, Sd) UCL	193.9755	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	99.28679	
95% Bootstrap-t UCL	108.2643	
95% Hall's Bootstrap UCL	125.6853	
95% Percentile Bootstrap UCL	100.9558	
95% BCA Bootstrap UCL	96.29231	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	101.1085	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	24	
Minimum	84.8	
Maximum	818	
Mean	264.1769	
Standard Deviation	178.553	
Variance	31881.16	
Coefficient of Variation	0.675884	
Skewness	1.411437	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.84967	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	323.9911	
Gamma Statistics		
k hat	2.707181	
k star (bias corrected)	2.420455	
Theta hat	97.58378	
Theta star	109.1435	
nu hat	140.7734	
nu star	125.8636	
5% Approximate Chi Square Value	100.9471	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	99.47404	
Anderson-Darling Test Statistic	0.640066	
Anderson-Darling 5% Critical Value	0.752519	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.149592	
Kolmogrov-Smirnov 5% Critical Value	0.172683	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	329.3831	
95% Adjusted Gamma UCL	334.2608	
Lognormal Statistics		
Minimum of log data	4.440296	
Maximum of log data	6.706862	
Mean of log data	5.380701	
Standard Deviation of log data	0.629995	
Variance of log data	0.396894	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.952326	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	264.8457	
MLE Standard Deviation	184.8612	
MLE Coefficient of Variation	0.697996	
MLE Skewness	2.434049	
MLE Median	217.1744	
MLE 80% Quantile	369.8311	
MLE 90% Quantile	487.9653	
MLE 95% Quantile	612.1899	
MLE 99% Quantile	940.1779	
MVU Estimate of Median	215.5226	
MVU Estimate of Mean	262.4839	
MVU Estimate of Standard Deviation	177.3421	
MVU Estimate of SE of Mean	34.49869	
95% H-UCL	344.0337	
95% Chebyshev (MVUE) UCL	412.8602	
97.5% Chebyshev (MVUE) UCL	477.9281	
99% Chebyshev (MVUE) UCL	605.7415	
Non-parametric Statisitics		
95% CLT UCL	321.775	
95% Adjusted-CLT UCL	332.132	
95% Modified-t UCL	325.6066	
95% Jackknife UCL	323.9911	
95% Chebyshev (Mean, Sd) UCL	416.813	
97.5% Chebyshev (Mean, Sd) UCL	482.8587	
99% Chebyshev (Mean, Sd) UCL	612.5928	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	321.5847	
95% Bootstrap-t UCL	340.7962	
95% Hall's Bootstrap UCL	336.6652	
95% Percentile Bootstrap UCL	325.4	
95% BCA Bootstrap UCL	309.3385	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	329.3831	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	20	
Minimum	0.065	
Maximum	2.35	
Mean	0.765577	
Standard Deviation	0.567576	
Variance	0.322143	
Coefficient of Variation	0.74137	
Skewness	0.84924	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.924958	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.955711	
Gamma Statistics		
k hat	1.475717	
k star (bias corrected)	1.331083	
Theta hat	0.518783	
Theta star	0.575153	
nu hat	76.73727	
nu star	69.21631	
5% Approximate Chi Square Value	51.06178	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	50.03156	
Anderson-Darling Test Statistic	0.462214	
Anderson-Darling 5% Critical Value	0.762175	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.112031	
Kolmogrov-Smirnov 5% Critical Value	0.174352	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.03777	
95% Adjusted Gamma UCL	1.05914	
Lognormal Statistics		
Minimum of log data	-2.733368	
Maximum of log data	0.854415	
Mean of log data	-0.642727	
Standard Deviation of log data	1.016904	
Variance of log data	1.034093	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.905364	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.881896	
MLE Standard Deviation	1.187307	
MLE Coefficient of Variation	1.346311	
MLE Skewness	6.479196	
MLE Median	0.525856	
MLE 80% Quantile	1.241793	
MLE 90% Quantile	1.942535	
MLE 95% Quantile	2.801288	
MLE 99% Quantile	5.599015	
MVU Estimate of Median	0.515495	
MVU Estimate of Mean	0.856992	
MVU Estimate of Standard Deviation	1.04252	
MVU Estimate of SE of Mean	0.195323	
95% H-UCL	1.47079	
95% Chebyshev (MVUE) UCL	1.708387	
97.5% Chebyshev (MVUE) UCL	2.076786	
99% Chebyshev (MVUE) UCL	2.800435	
Non-parametric Statisitics		
95% CLT UCL	0.948667	
95% Adjusted-CLT UCL	0.968476	
95% Modified-t UCL	0.958801	
95% Jackknife UCL	0.955711	
95% Chebyshev (Mean, Sd) UCL	1.25077	
97.5% Chebyshev (Mean, Sd) UCL	1.460713	
99% Chebyshev (Mean, Sd) UCL	1.873106	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.944527	
95% Bootstrap-t UCL	0.981342	
95% Hall's Bootstrap UCL	0.978564	
95% Percentile Bootstrap UCL	0.944615	
95% BCA Bootstrap UCL	0.915577	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.955711	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	17	
Minimum	0.8	
Maximum	3.6	
Mean	1.568269	
Standard Deviation	0.772385	
Variance	0.596578	
Coefficient of Variation	0.492508	
Skewness	1.086953	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.829642	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.827013	
Gamma Statistics		
k hat	5.032734	
k star (bias corrected)	4.477675	
Theta hat	0.311614	
Theta star	0.350242	
nu hat	261.7022	
nu star	232.8391	
5% Approximate Chi Square Value	198.5098	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	196.4191	
Anderson-Darling Test Statistic	1.587983	
Anderson-Darling 5% Critical Value	0.746316	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.27154	
Kolmogrov-Smirnov 5% Critical Value	0.171558	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1.839478	
95% Adjusted Gamma UCL	1.859058	
Lognormal Statistics		
Minimum of log data	-0.223144	
Maximum of log data	1.280934	
Mean of log data	0.347346	
Standard Deviation of log data	0.447936	
Variance of log data	0.200647	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.875016	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.564661	
MLE Standard Deviation	0.73754	
MLE Coefficient of Variation	0.471374	
MLE Skewness	1.518858	
MLE Median	1.415306	
MLE 80% Quantile	2.066491	
MLE 90% Quantile	2.516689	
MLE 95% Quantile	2.957077	
MLE 99% Quantile	4.011823	
MVU Estimate of Median	1.409855	
MVU Estimate of Mean	1.558103	
MVU Estimate of Standard Deviation	0.72318	
MVU Estimate of SE of Mean	0.141514	
95% H-UCL	1.857758	
95% Chebyshev (MVUE) UCL	2.174947	
97.5% Chebyshev (MVUE) UCL	2.441857	
99% Chebyshev (MVUE) UCL	2.966148	
Non-parametric Statisitics		
95% CLT UCL	1.817427	
95% Adjusted-CLT UCL	1.851929	
95% Modified-t UCL	1.832395	
95% Jackknife UCL	1.827013	
95% Chebyshev (Mean, Sd) UCL	2.228542	
97.5% Chebyshev (Mean, Sd) UCL	2.514243	
99% Chebyshev (Mean, Sd) UCL	3.075447	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.819861	
95% Bootstrap-t UCL	1.869301	
95% Hall's Bootstrap UCL	1.847246	
95% Percentile Bootstrap UCL	1.827885	
95% BCA Bootstrap UCL	1.948077	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.827013	95% Student's-t UCL
2nd Recommended UCL	1.832395	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\HH - June 2004\Soil stat - dp.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	26	
Minimum	15.6	
Maximum	58.1	
Mean	27.80769	
Standard Deviation	10.22584	
Variance	104.5677	
Coefficient of Variation	0.367734	
Skewness	1.102656	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.9102	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	31.23329	
Gamma Statistics		
k hat	8.536472	
k star (bias corrected)	7.577136	
Theta hat	3.257516	
Theta star	3.669948	
nu hat	443.8966	
nu star	394.0111	
5% Approximate Chi Square Value	348.9926	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	346.1998	
Anderson-Darling Test Statistic	0.350561	
Anderson-Darling 5% Critical Value	0.744774	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.108629	
Kolmogrov-Smirnov 5% Critical Value	0.171312	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	31.39476	
95% Adjusted Gamma UCL	31.64802	
Lognormal Statistics		
Minimum of log data	2.747271	
Maximum of log data	4.062166	
Mean of log data	3.265598	
Standard Deviation of log data	0.347851	
Variance of log data	0.121	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.961704	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	27.82955	
MLE Standard Deviation	9.980877	
MLE Coefficient of Variation	0.358643	
MLE Skewness	1.12206	
MLE Median	26.19578	
MLE 80% Quantile	35.14675	
MLE 90% Quantile	40.95961	
MLE 95% Quantile	46.42381	
MLE 99% Quantile	58.83276	
MVU Estimate of Median	26.13489	
MVU Estimate of Mean	27.76141	
MVU Estimate of Standard Deviation	9.866457	
MVU Estimate of SE of Mean	1.933371	
95% H-UCL	31.63869	
95% Chebyshev (MVUE) UCL	36.18878	
97.5% Chebyshev (MVUE) UCL	39.83531	
99% Chebyshev (MVUE) UCL	46.99821	
Non-parametric Statisitics		
95% CLT UCL	31.10637	
95% Adjusted-CLT UCL	31.56976	
95% Modified-t UCL	31.30556	
95% Jackknife UCL	31.23329	
95% Chebyshev (Mean, Sd) UCL	36.54925	
97.5% Chebyshev (Mean, Sd) UCL	40.33173	
99% Chebyshev (Mean, Sd) UCL	47.76168	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	31.02086	
95% Bootstrap-t UCL	31.8041	
95% Hall's Bootstrap UCL	31.92085	
95% Percentile Bootstrap UCL	31.06154	
95% BCA Bootstrap UCL	30.46154	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	31.39476	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\June 2004-revised\Soil stat - dp.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	26	
Number of Missing Data	0	
Number of Valid Observations	26	
Number of Distinct Observations	26	
Minimum	55.8	
Maximum	44800	
Mean	1923.894	
Standard Deviation	8745.708	
Variance	76487402	
Coefficient of Variation	4.545836	
Skewness	5.097764	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.211325	
Shapiro-Wilk 5% Critical Value	0.92	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	4853.653	
Gamma Statistics		
k hat	0.318394	
k star (bias corrected)	0.307297	
Theta hat	6042.498	
Theta star	6260.697	
nu hat	16.55648	
nu star	15.97945	
5% Approximate Chi Square Value	7.946424	
Adjusted Level of Significance	0.0398	
Adjusted Chi Square Value	7.573087	
Anderson-Darling Test Statistic	7.204746	
Anderson-Darling 5% Critical Value	0.847639	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.473829	
Kolmogrov-Smirnov 5% Critical Value	0.185345	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	3868.756	
95% Adjusted Gamma UCL	4059.477	
Lognormal Statistics		
Minimum of log data	4.021774	
Maximum of log data	10.70996	
Mean of log data	5.417281	
Standard Deviation of log data	1.205385	
Variance of log data	1.452954	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.633202	
Shapiro-Wilk 5% Critical Value	0.92	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	465.8005	
MLE Standard Deviation	843.0507	
MLE Coefficient of Variation	1.809896	
MLE Skewness	11.35841	
MLE Median	225.2657	
MLE 80% Quantile	623.8009	
MLE 90% Quantile	1060.187	
MLE 95% Quantile	1636.213	
MLE 99% Quantile	3718.244	
MVU Estimate of Median	219.0523	
MVU Estimate of Mean	445.3293	
MVU Estimate of Standard Deviation	688.6087	
MVU Estimate of SE of Mean	124.531	
95% H-UCL	907.5647	
95% Chebyshev (MVUE) UCL	988.1472	
97.5% Chebyshev (MVUE) UCL	1223.025	
99% Chebyshev (MVUE) UCL	1684.397	
Non-parametric Statisitics		
95% CLT UCL	4745.105	
95% Adjusted-CLT UCL	6577.342	
95% Modified-t UCL	5139.445	
95% Jackknife UCL	4853.653	
95% Chebyshev (Mean, Sd) UCL	9400.166	
97.5% Chebyshev (Mean, Sd) UCL	12635.15	
99% Chebyshev (Mean, Sd) UCL	18989.66	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	4702.783	
95% Bootstrap-t UCL	173546.3	
95% Hall's Bootstrap UCL	58034.18	
95% Percentile Bootstrap UCL	5358.658	
95% BCA Bootstrap UCL	7073.762	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	18989.66	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	4,4'-DDD	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.0013	
Maximum	0.0098	
Mean	0.004756	
Standard Deviation	0.003108	
Variance	9.66E-06	
Coefficient of Variation	0.653488	
Skewness	0.589538	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.898842	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.006682	
Gamma Statistics		
k hat	2.501019	
k star (bias corrected)	1.74142	
Theta hat	0.001901	
Theta star	0.002731	
nu hat	45.01835	
nu star	31.34557	
5% Approximate Chi Square Value	19.55172	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	17.61369	
Anderson-Darling Test Statistic	0.359556	
Anderson-Darling 5% Critical Value	0.728282	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.21749	
Kolmogrov-Smirnov 5% Critical Value	0.281909	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.007624	
95% Adjusted Gamma UCL	0.008463	
Lognormal Statistics		
Minimum of log data	-6.645391	
Maximum of log data	-4.625373	
Mean of log data	-5.561484	
Standard Deviation of log data	0.715906	
Variance of log data	0.512521	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.930208	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.004966	
MLE Standard Deviation	0.004063	
MLE Coefficient of Variation	0.818226	
MLE Skewness	3.002476	
MLE Median	0.003843	
MLE 80% Quantile	0.007037	
MLE 90% Quantile	0.009643	
MLE 95% Quantile	0.012478	
MLE 99% Quantile	0.020317	
MVU Estimate of Median	0.003735	
MVU Estimate of Mean	0.004802	
MVU Estimate of Standard Deviation	0.003547	
MVU Estimate of SE of Mean	0.001175	
95% H-UCL	0.009803	
95% Chebyshev (MVUE) UCL	0.009922	
97.5% Chebyshev (MVUE) UCL	0.012138	
99% Chebyshev (MVUE) UCL	0.016489	
Non-parametric Statisitics		
95% CLT UCL	0.006459	
95% Adjusted-CLT UCL	0.006677	
95% Modified-t UCL	0.006716	
95% Jackknife UCL	0.006682	
95% Chebyshev (Mean, Sd) UCL	0.009271	
97.5% Chebyshev (Mean, Sd) UCL	0.011225	
99% Chebyshev (Mean, Sd) UCL	0.015063	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.006348	
95% Bootstrap-t UCL	0.007132	
95% Hall's Bootstrap UCL	0.00677	
95% Percentile Bootstrap UCL	0.006389	
95% BCA Bootstrap UCL	0.006122	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.006682	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	4,4'-DDE	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.0038	
Maximum	0.026	
Mean	0.010178	
Standard Deviation	0.007215	
Variance	5.21E-05	
Coefficient of Variation	0.708902	
Skewness	1.530278	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.808594	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.01465	
Gamma Statistics		
k hat	2.800295	
k star (bias corrected)	1.940938	
Theta hat	0.003635	
Theta star	0.005244	
nu hat	50.40531	
nu star	34.93688	
5% Approximate Chi Square Value	22.41227	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	20.32161	
Anderson-Darling Test Statistic	0.515587	
Anderson-Darling 5% Critical Value	0.727393	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.277327	
Kolmogrov-Smirnov 5% Critical Value	0.281568	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.015865	
95% Adjusted Gamma UCL	0.017498	
Lognormal Statistics		
Minimum of log data	-5.572754	
Maximum of log data	-3.649659	
Mean of log data	-4.7766	
Standard Deviation of log data	0.6297	
Variance of log data	0.396522	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.925979	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.010272	
MLE Standard Deviation	0.007166	
MLE Coefficient of Variation	0.6976	
MLE Skewness	2.432284	
MLE Median	0.008425	
MLE 80% Quantile	0.014343	
MLE 90% Quantile	0.018922	
MLE 95% Quantile	0.023736	
MLE 99% Quantile	0.036446	
MVU Estimate of Median	0.008241	
MVU Estimate of Mean	0.010018	
MVU Estimate of Standard Deviation	0.006466	
MVU Estimate of SE of Mean	0.002146	
95% H-UCL	0.018014	
95% Chebyshev (MVUE) UCL	0.019374	
97.5% Chebyshev (MVUE) UCL	0.023422	
99% Chebyshev (MVUE) UCL	0.031374	
Non-parametric Statisitics		
95% CLT UCL	0.014134	
95% Adjusted-CLT UCL	0.015445	
95% Modified-t UCL	0.014854	
95% Jackknife UCL	0.01465	
95% Chebyshev (Mean, Sd) UCL	0.020661	
97.5% Chebyshev (Mean, Sd) UCL	0.025197	
99% Chebyshev (Mean, Sd) UCL	0.034107	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.013836	
95% Bootstrap-t UCL	0.017422	
95% Hall's Bootstrap UCL	0.015181	
95% Percentile Bootstrap UCL	0.014244	
95% BCA Bootstrap UCL	0.013533	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.015865	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	4,4'-DDT	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	7	
Minimum	0.00049	
Maximum	0.0046	
Mean	0.001791	
Standard Deviation	0.001527	
Variance	2.33E-06	
Coefficient of Variation	0.852346	
Skewness	0.960139	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.856548	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.002814	
Gamma Statistics		
k hat	1.57394	
k star (bias corrected)	1.067046	
Theta hat	0.001138	
Theta star	0.001679	
nu hat	25.18303	
nu star	17.07273	
5% Approximate Chi Square Value	8.722888	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	7.264836	
Anderson-Darling Test Statistic	0.48427	
Anderson-Darling 5% Critical Value	0.727762	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.224634	
Kolmogrov-Smirnov 5% Critical Value	0.298687	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.003506	
95% Adjusted Gamma UCL	0.00421	
Lognormal Statistics		
Minimum of log data	-7.621105	
Maximum of log data	-5.381699	
Mean of log data	-6.674989	
Standard Deviation of log data	0.915709	
Variance of log data	0.838522	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.872247	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.001919	
MLE Standard Deviation	0.002199	
MLE Coefficient of Variation	1.145839	
MLE Skewness	4.941941	
MLE Median	0.001262	
MLE 80% Quantile	0.002736	
MLE 90% Quantile	0.004094	
MLE 95% Quantile	0.005692	
MLE 99% Quantile	0.01062	
MVU Estimate of Median	0.001197	
MVU Estimate of Mean	0.001797	
MVU Estimate of Standard Deviation	0.001703	
MVU Estimate of SE of Mean	0.000594	
95% H-UCL	0.005986	
95% Chebyshev (MVUE) UCL	0.004384	
97.5% Chebyshev (MVUE) UCL	0.005504	
99% Chebyshev (MVUE) UCL	0.007703	
Non-parametric Statisitics		
95% CLT UCL	0.002679	
95% Adjusted-CLT UCL	0.002875	
95% Modified-t UCL	0.002844	
95% Jackknife UCL	0.002814	
95% Chebyshev (Mean, Sd) UCL	0.004144	
97.5% Chebyshev (Mean, Sd) UCL	0.005162	
99% Chebyshev (Mean, Sd) UCL	0.007162	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.002608	
95% Bootstrap-t UCL	0.003436	
95% Hall's Bootstrap UCL	0.002852	
95% Percentile Bootstrap UCL	0.002666	
95% BCA Bootstrap UCL	0.0025	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.002814	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Aldrin	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	5	
Minimum	0.00026	
Maximum	0.0013	
Mean	0.000464	
Standard Deviation	0.000353	
Variance	1.24E-07	
Coefficient of Variation	0.760542	
Skewness	2.400373	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.642075	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.0007	
Gamma Statistics		
k hat	3.167836	
k star (bias corrected)	2.063231	
Theta hat	0.000146	
Theta star	0.000225	
nu hat	50.68538	
nu star	33.0117	
5% Approximate Chi Square Value	20.87383	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	18.47187	
Anderson-Darling Test Statistic	0.947291	
Anderson-Darling 5% Critical Value	0.720983	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.29079	
Kolmogrov-Smirnov 5% Critical Value	0.296137	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	0.000733	
95% Adjusted Gamma UCL	0.000829	
Lognormal Statistics		
Minimum of log data	-8.254829	
Maximum of log data	-6.645391	
Mean of log data	-7.842226	
Standard Deviation of log data	0.55519	
Variance of log data	0.308236	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.77928	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.000458	
MLE Standard Deviation	0.000275	
MLE Coefficient of Variation	0.600852	
MLE Skewness	2.019476	
MLE Median	0.000393	
MLE 80% Quantile	0.000628	
MLE 90% Quantile	0.000802	
MLE 95% Quantile	0.000979	
MLE 99% Quantile	0.001429	
MVU Estimate of Median	0.000385	
MVU Estimate of Mean	0.000449	
MVU Estimate of Standard Deviation	0.000253	
MVU Estimate of SE of Mean	8.91E-05	
95% H-UCL	0.000772	
95% Chebyshev (MVUE) UCL	0.000837	
97.5% Chebyshev (MVUE) UCL	0.001005	
99% Chebyshev (MVUE) UCL	0.001335	
Non-parametric Statisitics		
95% CLT UCL	0.000669	
95% Adjusted-CLT UCL	0.000782	
95% Modified-t UCL	0.000718	
95% Jackknife UCL	0.0007	
95% Chebyshev (Mean, Sd) UCL	0.001007	
97.5% Chebyshev (Mean, Sd) UCL	0.001242	
99% Chebyshev (Mean, Sd) UCL	0.001704	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.000653	
95% Bootstrap-t UCL	0.001136	
95% Hall's Bootstrap UCL	0.001329	
95% Percentile Bootstrap UCL	0.00068	
95% BCA Bootstrap UCL	0.00065	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.000733	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	alpha-Chlordane	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	0.0013	
Maximum	0.0089	
Mean	0.004156	
Standard Deviation	0.002598	
Variance	6.75E-06	
Coefficient of Variation	0.625218	
Skewness	0.840928	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.897607	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.005766	
Gamma Statistics		
k hat	2.916594	
k star (bias corrected)	2.01847	
Theta hat	0.001425	
Theta star	0.002059	
nu hat	52.49868	
nu star	36.33246	
5% Approximate Chi Square Value	23.5342	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	21.38631	
Anderson-Darling Test Statistic	0.315296	
Anderson-Darling 5% Critical Value	0.727048	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.169046	
Kolmogrov-Smirnov 5% Critical Value	0.281435	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.006415	
95% Adjusted Gamma UCL	0.00706	
Lognormal Statistics		
Minimum of log data	-6.645391	
Maximum of log data	-4.721704	
Mean of log data	-5.664429	
Standard Deviation of log data	0.651106	
Variance of log data	0.423939	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.948943	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.004286	
MLE Standard Deviation	0.003114	
MLE Coefficient of Variation	0.726614	
MLE Skewness	2.563471	
MLE Median	0.003467	
MLE 80% Quantile	0.006011	
MLE 90% Quantile	0.008004	
MLE 95% Quantile	0.010119	
MLE 99% Quantile	0.015765	
MVU Estimate of Median	0.003386	
MVU Estimate of Mean	0.004172	
MVU Estimate of Standard Deviation	0.002788	
MVU Estimate of SE of Mean	0.000925	
95% H-UCL	0.007731	
95% Chebyshev (MVUE) UCL	0.008204	
97.5% Chebyshev (MVUE) UCL	0.009949	
99% Chebyshev (MVUE) UCL	0.013377	
Non-parametric Statisitics		
95% CLT UCL	0.00558	
95% Adjusted-CLT UCL	0.005839	
95% Modified-t UCL	0.005806	
95% Jackknife UCL	0.005766	
95% Chebyshev (Mean, Sd) UCL	0.007931	
97.5% Chebyshev (Mean, Sd) UCL	0.009564	
99% Chebyshev (Mean, Sd) UCL	0.012773	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.005525	
95% Bootstrap-t UCL	0.006388	
95% Hall's Bootstrap UCL	0.006819	
95% Percentile Bootstrap UCL	0.005567	
95% BCA Bootstrap UCL	0.006211	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.005766	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Aroclor-1254	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.00495	
Maximum	0.036	
Mean	0.015839	
Standard Deviation	0.009765	
Variance	9.54E-05	
Coefficient of Variation	0.616515	
Skewness	0.980276	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.915056	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.021892	
Gamma Statistics		
k hat	2.888128	
k star (bias corrected)	1.999493	
Theta hat	0.005484	
Theta star	0.007921	
nu hat	51.9863	
nu star	35.99087	
5% Approximate Chi Square Value	23.25909	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	21.12511	
Anderson-Darling Test Statistic	0.262272	
Anderson-Darling 5% Critical Value	0.727132	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.146458	
Kolmogrov-Smirnov 5% Critical Value	0.281468	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.024509	
95% Adjusted Gamma UCL	0.026985	
Lognormal Statistics		
Minimum of log data	-5.308368	
Maximum of log data	-3.324236	
Mean of log data	-4.328286	
Standard Deviation of log data	0.668878	
Variance of log data	0.447398	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.935517	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.016497	
MLE Standard Deviation	0.012392	
MLE Coefficient of Variation	0.751156	
MLE Skewness	2.677299	
MLE Median	0.01319	
MLE 80% Quantile	0.023212	
MLE 90% Quantile	0.031155	
MLE 95% Quantile	0.039637	
MLE 99% Quantile	0.062507	
MVU Estimate of Median	0.012866	
MVU Estimate of Mean	0.016031	
MVU Estimate of Standard Deviation	0.011022	
MVU Estimate of SE of Mean	0.003655	
95% H-UCL	0.030481	
95% Chebyshev (MVUE) UCL	0.031964	
97.5% Chebyshev (MVUE) UCL	0.038858	
99% Chebyshev (MVUE) UCL	0.0524	
Non-parametric Statisitics		
95% CLT UCL	0.021193	
95% Adjusted-CLT UCL	0.022329	
95% Modified-t UCL	0.022069	
95% Jackknife UCL	0.021892	
95% Chebyshev (Mean, Sd) UCL	0.030027	
97.5% Chebyshev (Mean, Sd) UCL	0.036166	
99% Chebyshev (Mean, Sd) UCL	0.048225	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.021015	
95% Bootstrap-t UCL	0.0234	
95% Hall's Bootstrap UCL	0.025216	
95% Percentile Bootstrap UCL	0.021067	
95% BCA Bootstrap UCL	0.020111	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.021892	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Aroclor-1260	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.014	
Maximum	0.11	
Mean	0.039778	
Standard Deviation	0.030091	
Variance	0.000905	
Coefficient of Variation	0.756468	
Skewness	1.876324	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.793352	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.058429	
Gamma Statistics		
k hat	2.654098	
k star (bias corrected)	1.843473	
Theta hat	0.014987	
Theta star	0.021578	
nu hat	47.77377	
nu star	33.18251	
5% Approximate Chi Square Value	21.00988	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	18.99277	
Anderson-Darling Test Statistic	0.381784	
Anderson-Darling 5% Critical Value	0.727827	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.165119	
Kolmogrov-Smirnov 5% Critical Value	0.281734	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.062824	
95% Adjusted Gamma UCL	0.069496	
Lognormal Statistics		
Minimum of log data	-4.268698	
Maximum of log data	-2.207275	
Mean of log data	-3.424507	
Standard Deviation of log data	0.640308	
Variance of log data	0.409994	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.956772	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.039975	
MLE Standard Deviation	0.028458	
MLE Coefficient of Variation	0.711905	
MLE Skewness	2.496516	
MLE Median	0.032565	
MLE 80% Quantile	0.055942	
MLE 90% Quantile	0.074147	
MLE 95% Quantile	0.093369	
MLE 99% Quantile	0.144403	
MVU Estimate of Median	0.03183	
MVU Estimate of Mean	0.03895	
MVU Estimate of Standard Deviation	0.025582	
MVU Estimate of SE of Mean	0.00849	
95% H-UCL	0.071082	
95% Chebyshev (MVUE) UCL	0.075956	
97.5% Chebyshev (MVUE) UCL	0.091969	
99% Chebyshev (MVUE) UCL	0.123423	
Non-parametric Statisitics		
95% CLT UCL	0.056276	
95% Adjusted-CLT UCL	0.062979	
95% Modified-t UCL	0.059475	
95% Jackknife UCL	0.058429	
95% Chebyshev (Mean, Sd) UCL	0.083498	
97.5% Chebyshev (Mean, Sd) UCL	0.102416	
99% Chebyshev (Mean, Sd) UCL	0.139577	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.055462	
95% Bootstrap-t UCL	0.079074	
95% Hall's Bootstrap UCL	0.129808	
95% Percentile Bootstrap UCL	0.057	
95% BCA Bootstrap UCL	0.054222	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.062824	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	delta-BHC	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	6	
Minimum	0.00026	
Maximum	0.0013	
Mean	0.00054	
Standard Deviation	0.000332	
Variance	1.1E-07	
Coefficient of Variation	0.614987	
Skewness	2.024029	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.759086	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.000762	
Gamma Statistics		
k hat	4.024653	
k star (bias corrected)	2.598742	
Theta hat	0.000134	
Theta star	0.000208	
nu hat	64.39445	
nu star	41.57986	
5% Approximate Chi Square Value	27.79748	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	24.98162	
Anderson-Darling Test Statistic	0.508309	
Anderson-Darling 5% Critical Value	0.718582	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.252847	
Kolmogrov-Smirnov 5% Critical Value	0.295328	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.000808	
95% Adjusted Gamma UCL	0.000899	
Lognormal Statistics		
Minimum of log data	-8.254829	
Maximum of log data	-6.645391	
Mean of log data	-7.65329	
Standard Deviation of log data	0.519488	
Variance of log data	0.269868	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.901383	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.000543	
MLE Standard Deviation	0.000302	
MLE Coefficient of Variation	0.556589	
MLE Skewness	1.842192	
MLE Median	0.000474	
MLE 80% Quantile	0.000736	
MLE 90% Quantile	0.000925	
MLE 95% Quantile	0.001115	
MLE 99% Quantile	0.001589	
MVU Estimate of Median	0.000467	
MVU Estimate of Mean	0.000533	
MVU Estimate of Standard Deviation	0.00028	
MVU Estimate of SE of Mean	9.9E-05	
95% H-UCL	0.000873	
95% Chebyshev (MVUE) UCL	0.000965	
97.5% Chebyshev (MVUE) UCL	0.001151	
99% Chebyshev (MVUE) UCL	0.001518	
Non-parametric Statisitics		
95% CLT UCL	0.000733	
95% Adjusted-CLT UCL	0.000823	
95% Modified-t UCL	0.000776	
95% Jackknife UCL	0.000762	
95% Chebyshev (Mean, Sd) UCL	0.001052	
97.5% Chebyshev (Mean, Sd) UCL	0.001273	
99% Chebyshev (Mean, Sd) UCL	0.001708	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.000716	
95% Bootstrap-t UCL	0.000954	
95% Hall's Bootstrap UCL	0.001562	
95% Percentile Bootstrap UCL	0.000745	
95% BCA Bootstrap UCL	0.000693	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.000808	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Dieldrin	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.00077	
Maximum	0.0029	
Mean	0.001763	
Standard Deviation	0.000736	
Variance	5.42E-07	
Coefficient of Variation	0.417643	
Skewness	0.288902	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.949773	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.00222	
Gamma Statistics		
k hat	6.077741	
k star (bias corrected)	4.125902	
Theta hat	0.00029	
Theta star	0.000427	
nu hat	109.3993	
nu star	74.26623	
5% Approximate Chi Square Value	55.41583	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	51.99583	
Anderson-Darling Test Statistic	0.229884	
Anderson-Darling 5% Critical Value	0.722542	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.162253	
Kolmogrov-Smirnov 5% Critical Value	0.279728	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.002363	
95% Adjusted Gamma UCL	0.002519	
Lognormal Statistics		
Minimum of log data	-7.16912	
Maximum of log data	-5.843045	
Mean of log data	-6.425067	
Standard Deviation of log data	0.448004	
Variance of log data	0.200708	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.955393	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.001791	
MLE Standard Deviation	0.000845	
MLE Coefficient of Variation	0.471453	
MLE Skewness	1.519146	
MLE Median	0.00162	
MLE 80% Quantile	0.002366	
MLE 90% Quantile	0.002882	
MLE 95% Quantile	0.003386	
MLE 99% Quantile	0.004594	
MVU Estimate of Median	0.001602	
MVU Estimate of Mean	0.00177	
MVU Estimate of Standard Deviation	0.000803	
MVU Estimate of SE of Mean	0.000267	
95% H-UCL	0.002547	
95% Chebyshev (MVUE) UCL	0.002936	
97.5% Chebyshev (MVUE) UCL	0.003441	
99% Chebyshev (MVUE) UCL	0.004432	
Non-parametric Statisitics		
95% CLT UCL	0.002167	
95% Adjusted-CLT UCL	0.002192	
95% Modified-t UCL	0.002224	
95% Jackknife UCL	0.00222	
95% Chebyshev (Mean, Sd) UCL	0.002833	
97.5% Chebyshev (Mean, Sd) UCL	0.003296	
99% Chebyshev (Mean, Sd) UCL	0.004206	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.002136	
95% Bootstrap-t UCL	0.0023	
95% Hall's Bootstrap UCL	0.002223	
95% Percentile Bootstrap UCL	0.002163	
95% BCA Bootstrap UCL	0.002063	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.00222	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Heptachlor epoxide	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	7	
Minimum	0.00026	
Maximum	0.0017	
Mean	0.000542	
Standard Deviation	0.00045	
Variance	2.03E-07	
Coefficient of Variation	0.830572	
Skewness	2.603672	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.627695	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.000821	
Gamma Statistics		
k hat	2.777785	
k star (bias corrected)	1.925931	
Theta hat	0.000195	
Theta star	0.000282	
nu hat	50.00013	
nu star	34.66675	
5% Approximate Chi Square Value	22.19575	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	20.11629	
Anderson-Darling Test Statistic	0.878155	
Anderson-Darling 5% Critical Value	0.72746	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.265701	
Kolmogrov-Smirnov 5% Critical Value	0.281593	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	0.000847	
95% Adjusted Gamma UCL	0.000934	
Lognormal Statistics		
Minimum of log data	-8.254829	
Maximum of log data	-6.377127	
Mean of log data	-7.710502	
Standard Deviation of log data	0.587375	
Variance of log data	0.345009	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.828379	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.000532	
MLE Standard Deviation	0.000342	
MLE Coefficient of Variation	0.641875	
MLE Skewness	2.190079	
MLE Median	0.000448	
MLE 80% Quantile	0.000736	
MLE 90% Quantile	0.000953	
MLE 95% Quantile	0.001178	
MLE 99% Quantile	0.001757	
MVU Estimate of Median	0.00044	
MVU Estimate of Mean	0.000521	
MVU Estimate of Standard Deviation	0.000313	
MVU Estimate of SE of Mean	0.000104	
95% H-UCL	0.000885	
95% Chebyshev (MVUE) UCL	0.000974	
97.5% Chebyshev (MVUE) UCL	0.00117	
99% Chebyshev (MVUE) UCL	0.001555	
Non-parametric Statisitics		
95% CLT UCL	0.000789	
95% Adjusted-CLT UCL	0.000928	
95% Modified-t UCL	0.000843	
95% Jackknife UCL	0.000821	
95% Chebyshev (Mean, Sd) UCL	0.001197	
97.5% Chebyshev (Mean, Sd) UCL	0.00148	
99% Chebyshev (Mean, Sd) UCL	0.002036	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.000771	
95% Bootstrap-t UCL	0.001252	
95% Hall's Bootstrap UCL	0.001775	
95% Percentile Bootstrap UCL	0.000822	
95% BCA Bootstrap UCL	0.00076	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.000847	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	7	
Minimum	0.041	
Maximum	0.16	
Mean	0.070056	
Standard Deviation	0.040137	
Variance	0.001611	
Coefficient of Variation	0.572929	
Skewness	1.692695	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.739126	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.094934	
Gamma Statistics		
k hat	4.523409	
k star (bias corrected)	3.08968	
Theta hat	0.015487	
Theta star	0.022674	
nu hat	81.42137	
nu star	55.61424	
5% Approximate Chi Square Value	39.47286	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	36.62344	
Anderson-Darling Test Statistic	0.98371	
Anderson-Darling 5% Critical Value	0.723808	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.364329	
Kolmogrov-Smirnov 5% Critical Value	0.280121	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.098703	
95% Adjusted Gamma UCL	0.106382	
Lognormal Statistics		
Minimum of log data	-3.194183	
Maximum of log data	-1.832581	
Mean of log data	-2.773056	
Standard Deviation of log data	0.477807	
Variance of log data	0.228299	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.802658	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.070025	
MLE Standard Deviation	0.035462	
MLE Coefficient of Variation	0.50642	
MLE Skewness	1.649138	
MLE Median	0.062471	
MLE 80% Quantile	0.093545	
MLE 90% Quantile	0.115432	
MLE 95% Quantile	0.137097	
MLE 99% Quantile	0.18982	
MVU Estimate of Median	0.061682	
MVU Estimate of Mean	0.069073	
MVU Estimate of Standard Deviation	0.033489	
MVU Estimate of SE of Mean	0.011147	
95% H-UCL	0.102699	
95% Chebyshev (MVUE) UCL	0.11766	
97.5% Chebyshev (MVUE) UCL	0.138683	
99% Chebyshev (MVUE) UCL	0.17998	
Non-parametric Statisitics		
95% CLT UCL	0.092062	
95% Adjusted-CLT UCL	0.100128	
95% Modified-t UCL	0.096192	
95% Jackknife UCL	0.094934	
95% Chebyshev (Mean, Sd) UCL	0.128373	
97.5% Chebyshev (Mean, Sd) UCL	0.153607	
99% Chebyshev (Mean, Sd) UCL	0.203174	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.091365	
95% Bootstrap-t UCL	0.117785	
95% Hall's Bootstrap UCL	0.09627	
95% Percentile Bootstrap UCL	0.093389	
95% BCA Bootstrap UCL	0.108056	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.094934	95% Student's-t UCL
2nd Recommended UCL	0.096192	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	0.16	
Maximum	0.62	
Mean	0.375556	
Standard Deviation	0.16318	
Variance	0.026628	
Coefficient of Variation	0.434503	
Skewness	0.085407	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.955906	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.476703	
Gamma Statistics		
k hat	5.290965	
k star (bias corrected)	3.601384	
Theta hat	0.070981	
Theta star	0.104281	
nu hat	95.23736	
nu star	64.82491	
5% Approximate Chi Square Value	47.29659	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	44.15522	
Anderson-Darling Test Statistic	0.252226	
Anderson-Darling 5% Critical Value	0.722701	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.149753	
Kolmogrov-Smirnov 5% Critical Value	0.27981	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.514738	
95% Adjusted Gamma UCL	0.551359	
Lognormal Statistics		
Minimum of log data	-1.832581	
Maximum of log data	-0.478036	
Mean of log data	-1.076816	
Standard Deviation of log data	0.488719	
Variance of log data	0.238846	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.926883	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.383892	
MLE Standard Deviation	0.199396	
MLE Coefficient of Variation	0.519406	
MLE Skewness	1.698346	
MLE Median	0.340679	
MLE 80% Quantile	0.514866	
MLE 90% Quantile	0.638386	
MLE 95% Quantile	0.761189	
MLE 99% Quantile	1.061777	
MVU Estimate of Median	0.336182	
MVU Estimate of Mean	0.378415	
MVU Estimate of Standard Deviation	0.187779	
MVU Estimate of SE of Mean	0.062494	
95% H-UCL	0.56963	
95% Chebyshev (MVUE) UCL	0.650819	
97.5% Chebyshev (MVUE) UCL	0.768688	
99% Chebyshev (MVUE) UCL	1.000219	
Non-parametric Statisitics		
95% CLT UCL	0.465025	
95% Adjusted-CLT UCL	0.466679	
95% Modified-t UCL	0.476961	
95% Jackknife UCL	0.476703	
95% Chebyshev (Mean, Sd) UCL	0.612651	
97.5% Chebyshev (Mean, Sd) UCL	0.715242	
99% Chebyshev (Mean, Sd) UCL	0.916763	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.459662	
95% Bootstrap-t UCL	0.483202	
95% Hall's Bootstrap UCL	0.469602	
95% Percentile Bootstrap UCL	0.46	
95% BCA Bootstrap UCL	0.492222	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.476703	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	0.0255	
Maximum	0.065	
Mean	0.039222	
Standard Deviation	0.014342	
Variance	0.000206	
Coefficient of Variation	0.365661	
Skewness	1.302356	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.794245	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.048112	
Gamma Statistics		
k hat	9.916337	
k star (bias corrected)	6.684966	
Theta hat	0.003955	
Theta star	0.005867	
nu hat	178.4941	
nu star	120.3294	
5% Approximate Chi Square Value	95.99424	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	91.41605	
Anderson-Darling Test Statistic	0.705036	
Anderson-Darling 5% Critical Value	0.721767	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.25867	
Kolmogrov-Smirnov 5% Critical Value	0.279329	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.049165	
95% Adjusted Gamma UCL	0.051628	
Lognormal Statistics		
Minimum of log data	-3.669077	
Maximum of log data	-2.733368	
Mean of log data	-3.28978	
Standard Deviation of log data	0.327378	
Variance of log data	0.107176	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.868804	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.039313	
MLE Standard Deviation	0.013223	
MLE Coefficient of Variation	0.336348	
MLE Skewness	1.047097	
MLE Median	0.037262	
MLE 80% Quantile	0.049137	
MLE 90% Quantile	0.05675	
MLE 95% Quantile	0.063848	
MLE 99% Quantile	0.079795	
MVU Estimate of Median	0.037041	
MVU Estimate of Mean	0.039071	
MVU Estimate of Standard Deviation	0.012881	
MVU Estimate of SE of Mean	0.004292	
95% H-UCL	0.049895	
95% Chebyshev (MVUE) UCL	0.05778	
97.5% Chebyshev (MVUE) UCL	0.065876	
99% Chebyshev (MVUE) UCL	0.081778	
Non-parametric Statisitics		
95% CLT UCL	0.047086	
95% Adjusted-CLT UCL	0.049303	
95% Modified-t UCL	0.048458	
95% Jackknife UCL	0.048112	
95% Chebyshev (Mean, Sd) UCL	0.060061	
97.5% Chebyshev (Mean, Sd) UCL	0.069078	
99% Chebyshev (Mean, Sd) UCL	0.086789	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.04666	
95% Bootstrap-t UCL	0.062619	
95% Hall's Bootstrap UCL	0.108255	
95% Percentile Bootstrap UCL	0.047278	
95% BCA Bootstrap UCL	0.046	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.049165	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	0.023	
Maximum	0.58	
Mean	0.100056	
Standard Deviation	0.18024	
Variance	0.032487	
Coefficient of Variation	1.801401	
Skewness	2.983223	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.441991	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.211777	
Gamma Statistics		
k hat	0.902533	
k star (bias corrected)	0.675763	
Theta hat	0.110861	
Theta star	0.148063	
nu hat	16.24559	
nu star	12.16373	
5% Approximate Chi Square Value	5.334047	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	4.41869	
Anderson-Darling Test Statistic	1.954365	
Anderson-Darling 5% Critical Value	0.746585	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.442705	
Kolmogrov-Smirnov 5% Critical Value	0.287828	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.228166	
95% Adjusted Gamma UCL	0.275432	
Lognormal Statistics		
Minimum of log data	-3.772261	
Maximum of log data	-0.544727	
Mean of log data	-2.949547	
Standard Deviation of log data	0.939877	
Variance of log data	0.883369	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.663242	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.081442	
MLE Standard Deviation	0.097017	
MLE Coefficient of Variation	1.191233	
MLE Skewness	5.2641	
MLE Median	0.052363	
MLE 80% Quantile	0.115863	
MLE 90% Quantile	0.175204	
MLE 95% Quantile	0.245748	
MLE 99% Quantile	0.466082	
MVU Estimate of Median	0.049844	
MVU Estimate of Mean	0.076448	
MVU Estimate of Standard Deviation	0.075599	
MVU Estimate of SE of Mean	0.024768	
95% H-UCL	0.233042	
95% Chebyshev (MVUE) UCL	0.184408	
97.5% Chebyshev (MVUE) UCL	0.231123	
99% Chebyshev (MVUE) UCL	0.322884	
Non-parametric Statisitics		
95% CLT UCL	0.198878	
95% Adjusted-CLT UCL	0.262716	
95% Modified-t UCL	0.221735	
95% Jackknife UCL	0.211777	
95% Chebyshev (Mean, Sd) UCL	0.361938	
97.5% Chebyshev (Mean, Sd) UCL	0.475255	
99% Chebyshev (Mean, Sd) UCL	0.697845	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.191989	
95% Bootstrap-t UCL	1.58059	
95% Hall's Bootstrap UCL	1.171515	
95% Percentile Bootstrap UCL	0.216111	
95% BCA Bootstrap UCL	0.2805	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.361938	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach3.xls	
Variable:	Selenium	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.27	
Maximum	0.78	
Mean	0.468889	
Standard Deviation	0.168259	
Variance	0.028311	
Coefficient of Variation	0.358846	
Skewness	0.828469	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.913681	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.573184	
Gamma Statistics		
k hat	9.376162	
k star (bias corrected)	6.324848	
Theta hat	0.050009	
Theta star	0.074134	
nu hat	168.7709	
nu star	113.8473	
5% Approximate Chi Square Value	90.21045	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	85.77987	
Anderson-Darling Test Statistic	0.333103	
Anderson-Darling 5% Critical Value	0.721876	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.224345	
Kolmogrov-Smirnov 5% Critical Value	0.279385	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.591747	
95% Adjusted Gamma UCL	0.622311	
Lognormal Statistics		
Minimum of log data	-1.309333	
Maximum of log data	-0.248461	
Mean of log data	-0.811663	
Standard Deviation of log data	0.345721	
Variance of log data	0.119523	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.955992	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.471469	
MLE Standard Deviation	0.167991	
MLE Coefficient of Variation	0.356313	
MLE Skewness	1.114177	
MLE Median	0.444119	
MLE 80% Quantile	0.594801	
MLE 90% Quantile	0.692525	
MLE 95% Quantile	0.784309	
MLE 99% Quantile	0.992512	
MVU Estimate of Median	0.441178	
MVU Estimate of Mean	0.468218	
MVU Estimate of Standard Deviation	0.163139	
MVU Estimate of SE of Mean	0.054357	
95% H-UCL	0.608106	
95% Chebyshev (MVUE) UCL	0.705155	
97.5% Chebyshev (MVUE) UCL	0.807678	
99% Chebyshev (MVUE) UCL	1.009064	
Non-parametric Statisitics		
95% CLT UCL	0.561143	
95% Adjusted-CLT UCL	0.577693	
95% Modified-t UCL	0.575766	
95% Jackknife UCL	0.573184	
95% Chebyshev (Mean, Sd) UCL	0.713364	
97.5% Chebyshev (Mean, Sd) UCL	0.819148	
99% Chebyshev (Mean, Sd) UCL	1.026941	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.556518	
95% Bootstrap-t UCL	0.605304	
95% Hall's Bootstrap UCL	0.578706	
95% Percentile Bootstrap UCL	0.556667	
95% BCA Bootstrap UCL	0.55	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.573184	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	4,4'-DDD	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	8	
Minimum	0.0021	
Maximum	0.0205	
Mean	0.00623	
Standard Deviation	0.006923	
Variance	4.79E-05	
Coefficient of Variation	1.111306	
Skewness	1.766551	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.60799	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.010243	
Gamma Statistics		
k hat	1.432076	
k star (bias corrected)	1.06912	
Theta hat	0.00435	
Theta star	0.005827	
nu hat	28.64151	
nu star	21.38239	
5% Approximate Chi Square Value	11.87485	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	10.66289	
Anderson-Darling Test Statistic	1.626042	
Anderson-Darling 5% Critical Value	0.740458	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.342751	
Kolmogrov-Smirnov 5% Critical Value	0.271477	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.011218	
95% Adjusted Gamma UCL	0.012493	
Lognormal Statistics		
Minimum of log data	-6.165818	
Maximum of log data	-3.88733	
Mean of log data	-5.466498	
Standard Deviation of log data	0.826865	
Variance of log data	0.683706	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.724125	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.005948	
MLE Standard Deviation	0.005892	
MLE Coefficient of Variation	0.990559	
MLE Skewness	3.943619	
MLE Median	0.004226	
MLE 80% Quantile	0.008499	
MLE 90% Quantile	0.012229	
MLE 95% Quantile	0.016469	
MLE 99% Quantile	0.02892	
MVU Estimate of Median	0.004084	
MVU Estimate of Mean	0.005702	
MVU Estimate of Standard Deviation	0.004959	
MVU Estimate of SE of Mean	0.001549	
95% H-UCL	0.012729	
95% Chebyshev (MVUE) UCL	0.012455	
97.5% Chebyshev (MVUE) UCL	0.015377	
99% Chebyshev (MVUE) UCL	0.021117	
Non-parametric Statisitics		
95% CLT UCL	0.009831	
95% Adjusted-CLT UCL	0.011138	
95% Modified-t UCL	0.010447	
95% Jackknife UCL	0.010243	
95% Chebyshev (Mean, Sd) UCL	0.015773	
97.5% Chebyshev (Mean, Sd) UCL	0.019903	
99% Chebyshev (Mean, Sd) UCL	0.028014	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.009678	
95% Bootstrap-t UCL	0.037596	
95% Hall's Bootstrap UCL	0.035971	
95% Percentile Bootstrap UCL	0.009825	
95% BCA Bootstrap UCL	0.009495	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.015773	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	4,4'-DDE	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.0057	
Maximum	0.12	
Mean	0.03038	
Standard Deviation	0.040297	
Variance	0.001624	
Coefficient of Variation	1.326424	
Skewness	1.877797	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.611473	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.053739	
Gamma Statistics		
k hat	1.027994	
k star (bias corrected)	0.786262	
Theta hat	0.029553	
Theta star	0.038639	
nu hat	20.55987	
nu star	15.72525	
5% Approximate Chi Square Value	7.767458	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	6.817725	
Anderson-Darling Test Statistic	1.453358	
Anderson-Darling 5% Critical Value	0.747764	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.376195	
Kolmogrov-Smirnov 5% Critical Value	0.273603	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.061504	
95% Adjusted Gamma UCL	0.070072	
Lognormal Statistics		
Minimum of log data	-5.167289	
Maximum of log data	-2.120264	
Mean of log data	-4.053667	
Standard Deviation of log data	0.993707	
Variance of log data	0.987453	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.793664	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.028441	
MLE Standard Deviation	0.036911	
MLE Coefficient of Variation	1.29784	
MLE Skewness	6.079588	
MLE Median	0.017359	
MLE 80% Quantile	0.040196	
MLE 90% Quantile	0.06224	
MLE 95% Quantile	0.089009	
MLE 99% Quantile	0.175116	
MVU Estimate of Median	0.016519	
MVU Estimate of Mean	0.026628	
MVU Estimate of Standard Deviation	0.028387	
MVU Estimate of SE of Mean	0.008771	
95% H-UCL	0.079151	
95% Chebyshev (MVUE) UCL	0.064861	
97.5% Chebyshev (MVUE) UCL	0.081405	
99% Chebyshev (MVUE) UCL	0.113902	
Non-parametric Statisitics		
95% CLT UCL	0.05134	
95% Adjusted-CLT UCL	0.059426	
95% Modified-t UCL	0.055	
95% Jackknife UCL	0.053739	
95% Chebyshev (Mean, Sd) UCL	0.085925	
97.5% Chebyshev (Mean, Sd) UCL	0.10996	
99% Chebyshev (Mean, Sd) UCL	0.157171	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.049843	
95% Bootstrap-t UCL	0.265342	
95% Hall's Bootstrap UCL	0.235422	
95% Percentile Bootstrap UCL	0.05174	
95% BCA Bootstrap UCL	0.04886	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.085925	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	4,4'-DDT	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	0.00064	
Maximum	0.0185	
Mean	0.003898	
Standard Deviation	0.005491	
Variance	3.01E-05	
Coefficient of Variation	1.408644	
Skewness	2.525668	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.631816	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.007081	
Gamma Statistics		
k hat	0.972947	
k star (bias corrected)	0.74773	
Theta hat	0.004006	
Theta star	0.005213	
nu hat	19.45895	
nu star	14.9546	
5% Approximate Chi Square Value	7.22879	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	6.318029	
Anderson-Darling Test Statistic	0.760662	
Anderson-Darling 5% Critical Value	0.749211	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.24105	
Kolmogrov-Smirnov 5% Critical Value	0.273991	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	0.008064	
95% Adjusted Gamma UCL	0.009226	
Lognormal Statistics		
Minimum of log data	-7.354042	
Maximum of log data	-3.989985	
Mean of log data	-6.142484	
Standard Deviation of log data	1.055097	
Variance of log data	1.113229	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.906929	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.00375	
MLE Standard Deviation	0.005362	
MLE Coefficient of Variation	1.429746	
MLE Skewness	7.211887	
MLE Median	0.00215	
MLE 80% Quantile	0.005243	
MLE 90% Quantile	0.00834	
MLE 95% Quantile	0.012194	
MLE 99% Quantile	0.025014	
MVU Estimate of Median	0.002033	
MVU Estimate of Mean	0.003475	
MVU Estimate of Standard Deviation	0.003964	
MVU Estimate of SE of Mean	0.001218	
95% H-UCL	0.011627	
95% Chebyshev (MVUE) UCL	0.008786	
97.5% Chebyshev (MVUE) UCL	0.011084	
99% Chebyshev (MVUE) UCL	0.015598	
Non-parametric Statisitics		
95% CLT UCL	0.006754	
95% Adjusted-CLT UCL	0.008236	
95% Modified-t UCL	0.007312	
95% Jackknife UCL	0.007081	
95% Chebyshev (Mean, Sd) UCL	0.011467	
97.5% Chebyshev (Mean, Sd) UCL	0.014742	
99% Chebyshev (Mean, Sd) UCL	0.021175	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.006648	
95% Bootstrap-t UCL	0.01585	
95% Hall's Bootstrap UCL	0.018609	
95% Percentile Bootstrap UCL	0.00691	
95% BCA Bootstrap UCL	0.006492	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.008064	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Aldrin	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	7	
Minimum	0.00026	
Maximum	0.00255	
Mean	0.000646	
Standard Deviation	0.000687	
Variance	4.71E-07	
Coefficient of Variation	1.062856	
Skewness	2.873866	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.566253	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.001044	
Gamma Statistics		
k hat	1.953556	
k star (bias corrected)	1.434156	
Theta hat	0.000331	
Theta star	0.00045	
nu hat	39.07111	
nu star	28.68311	
5% Approximate Chi Square Value	17.45883	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	15.95377	
Anderson-Darling Test Statistic	1.086262	
Anderson-Darling 5% Critical Value	0.735919	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.309422	
Kolmogrov-Smirnov 5% Critical Value	0.269932	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.001061	
95% Adjusted Gamma UCL	0.001161	
Lognormal Statistics		
Minimum of log data	-8.254829	
Maximum of log data	-5.971662	
Mean of log data	-7.621976	
Standard Deviation of log data	0.682558	
Variance of log data	0.465886	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.816177	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.000618	
MLE Standard Deviation	0.000476	
MLE Coefficient of Variation	0.770341	
MLE Skewness	2.768162	
MLE Median	0.00049	
MLE 80% Quantile	0.000872	
MLE 90% Quantile	0.001177	
MLE 95% Quantile	0.001505	
MLE 99% Quantile	0.002395	
MVU Estimate of Median	0.000478	
MVU Estimate of Mean	0.000601	
MVU Estimate of Standard Deviation	0.000425	
MVU Estimate of SE of Mean	0.000134	
95% H-UCL	0.001092	
95% Chebyshev (MVUE) UCL	0.001184	
97.5% Chebyshev (MVUE) UCL	0.001436	
99% Chebyshev (MVUE) UCL	0.001932	
Non-parametric Statisitics		
95% CLT UCL	0.001003	
95% Adjusted-CLT UCL	0.001214	
95% Modified-t UCL	0.001077	
95% Jackknife UCL	0.001044	
95% Chebyshev (Mean, Sd) UCL	0.001592	
97.5% Chebyshev (Mean, Sd) UCL	0.002002	
99% Chebyshev (Mean, Sd) UCL	0.002806	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.000997	
95% Bootstrap-t UCL	0.002156	
95% Hall's Bootstrap UCL	0.002742	
95% Percentile Bootstrap UCL	0.001053	
95% BCA Bootstrap UCL	0.000967	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.001592	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	alpha-Chlordane	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	8	
Minimum	0.00145	
Maximum	0.0042	
Mean	0.00202	
Standard Deviation	0.00089	
Variance	7.91E-07	
Coefficient of Variation	0.44035	
Skewness	2.09916	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.662056	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.002536	
Gamma Statistics		
k hat	7.946992	
k star (bias corrected)	5.629561	
Theta hat	0.000254	
Theta star	0.000359	
nu hat	158.9398	
nu star	112.5912	
5% Approximate Chi Square Value	89.092	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	85.4643	
Anderson-Darling Test Statistic	1.391269	
Anderson-Darling 5% Critical Value	0.726863	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.320631	
Kolmogrov-Smirnov 5% Critical Value	0.266958	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.002553	
95% Adjusted Gamma UCL	0.002661	
Lognormal Statistics		
Minimum of log data	-6.536192	
Maximum of log data	-5.472671	
Mean of log data	-6.268892	
Standard Deviation of log data	0.349549	
Variance of log data	0.122185	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.730833	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.002014	
MLE Standard Deviation	0.000726	
MLE Coefficient of Variation	0.360504	
MLE Skewness	1.128363	
MLE Median	0.001894	
MLE 80% Quantile	0.002545	
MLE 90% Quantile	0.002968	
MLE 95% Quantile	0.003366	
MLE 99% Quantile	0.004271	
MVU Estimate of Median	0.001883	
MVU Estimate of Mean	0.002001	
MVU Estimate of Standard Deviation	0.000706	
MVU Estimate of SE of Mean	0.000223	
95% H-UCL	0.002551	
95% Chebyshev (MVUE) UCL	0.002974	
97.5% Chebyshev (MVUE) UCL	0.003395	
99% Chebyshev (MVUE) UCL	0.004222	
Non-parametric Statisitics		
95% CLT UCL	0.002483	
95% Adjusted-CLT UCL	0.002682	
95% Modified-t UCL	0.002567	
95% Jackknife UCL	0.002536	
95% Chebyshev (Mean, Sd) UCL	0.003246	
97.5% Chebyshev (Mean, Sd) UCL	0.003777	
99% Chebyshev (Mean, Sd) UCL	0.004819	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.002463	
95% Bootstrap-t UCL	0.004579	
95% Hall's Bootstrap UCL	0.004892	
95% Percentile Bootstrap UCL	0.002475	
95% BCA Bootstrap UCL	0.00242	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.002536	95% Student's-t UCL
2nd Recommended UCL	0.002567	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Aroclor-1254	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.017	
Maximum	0.14	
Mean	0.0504	
Standard Deviation	0.040454	
Variance	0.001636	
Coefficient of Variation	0.80265	
Skewness	1.709847	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.728657	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.07385	
Gamma Statistics		
k hat	2.421175	
k star (bias corrected)	1.761489	
Theta hat	0.020816	
Theta star	0.028612	
nu hat	48.42349	
nu star	35.22978	
5% Approximate Chi Square Value	22.64729	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	20.90911	
Anderson-Darling Test Statistic	0.921358	
Anderson-Darling 5% Critical Value	0.734148	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.293508	
Kolmogrov-Smirnov 5% Critical Value	0.269237	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.078401	
95% Adjusted Gamma UCL	0.084919	
Lognormal Statistics		
Minimum of log data	-4.074542	
Maximum of log data	-1.966113	
Mean of log data	-3.208266	
Standard Deviation of log data	0.654499	
Variance of log data	0.428369	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.873089	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.050083	
MLE Standard Deviation	0.036624	
MLE Coefficient of Variation	0.731268	
MLE Skewness	2.584852	
MLE Median	0.040427	
MLE 80% Quantile	0.070284	
MLE 90% Quantile	0.09374	
MLE 95% Quantile	0.118646	
MLE 99% Quantile	0.185278	
MVU Estimate of Median	0.039568	
MVU Estimate of Mean	0.048862	
MVU Estimate of Standard Deviation	0.033048	
MVU Estimate of SE of Mean	0.010396	
95% H-UCL	0.085572	
95% Chebyshev (MVUE) UCL	0.094176	
97.5% Chebyshev (MVUE) UCL	0.113784	
99% Chebyshev (MVUE) UCL	0.152299	
Non-parametric Statisitics		
95% CLT UCL	0.071442	
95% Adjusted-CLT UCL	0.078833	
95% Modified-t UCL	0.075003	
95% Jackknife UCL	0.07385	
95% Chebyshev (Mean, Sd) UCL	0.106161	
97.5% Chebyshev (Mean, Sd) UCL	0.130289	
99% Chebyshev (Mean, Sd) UCL	0.177684	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.070425	
95% Bootstrap-t UCL	0.125868	
95% Hall's Bootstrap UCL	0.17845	
95% Percentile Bootstrap UCL	0.0712	
95% BCA Bootstrap UCL	0.0682	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	0.085572	95% H-UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Aroclor-1260	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	0.015	
Maximum	0.315	
Mean	0.0641	
Standard Deviation	0.090103	
Variance	0.008119	
Coefficient of Variation	1.405662	
Skewness	2.932042	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.523789	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.116331	
Gamma Statistics		
k hat	1.260446	
k star (bias corrected)	0.948979	
Theta hat	0.050855	
Theta star	0.067546	
nu hat	25.20891	
nu star	18.97957	
5% Approximate Chi Square Value	10.10103	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	8.995842	
Anderson-Darling Test Statistic	1.395902	
Anderson-Darling 5% Critical Value	0.743561	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.362689	
Kolmogrov-Smirnov 5% Critical Value	0.27238	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.120442	
95% Adjusted Gamma UCL	0.135239	
Lognormal Statistics		
Minimum of log data	-4.199705	
Maximum of log data	-1.155183	
Mean of log data	-3.193795	
Standard Deviation of log data	0.837472	
Variance of log data	0.701359	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.80751	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.058244	
MLE Standard Deviation	0.058722	
MLE Coefficient of Variation	1.008212	
MLE Skewness	4.049476	
MLE Median	0.041016	
MLE 80% Quantile	0.083231	
MLE 90% Quantile	0.120315	
MLE 95% Quantile	0.16265	
MLE 99% Quantile	0.287701	
MVU Estimate of Median	0.039598	
MVU Estimate of Mean	0.05576	
MVU Estimate of Standard Deviation	0.049179	
MVU Estimate of SE of Mean	0.015354	
95% H-UCL	0.126568	
95% Chebyshev (MVUE) UCL	0.122686	
97.5% Chebyshev (MVUE) UCL	0.151644	
99% Chebyshev (MVUE) UCL	0.208528	
Non-parametric Statisitics		
95% CLT UCL	0.110967	
95% Adjusted-CLT UCL	0.139196	
95% Modified-t UCL	0.120734	
95% Jackknife UCL	0.116331	
95% Chebyshev (Mean, Sd) UCL	0.188298	
97.5% Chebyshev (Mean, Sd) UCL	0.242039	
99% Chebyshev (Mean, Sd) UCL	0.347602	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.10897	
95% Bootstrap-t UCL	0.504531	
95% Hall's Bootstrap UCL	0.416574	
95% Percentile Bootstrap UCL	0.1155	
95% BCA Bootstrap UCL	0.1153	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.188298	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Dieldrin	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	0.0007	
Maximum	0.0049	
Mean	0.001475	
Standard Deviation	0.001234	
Variance	1.52E-06	
Coefficient of Variation	0.836618	
Skewness	2.878304	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.575746	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.00219	
Gamma Statistics		
k hat	2.977284	
k star (bias corrected)	2.150766	
Theta hat	0.000495	
Theta star	0.000686	
nu hat	59.54569	
nu star	43.01531	
5% Approximate Chi Square Value	28.97482	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	26.98558	
Anderson-Darling Test Statistic	1.125829	
Anderson-Darling 5% Critical Value	0.732257	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.311649	
Kolmogrov-Smirnov 5% Critical Value	0.268481	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.00219	
95% Adjusted Gamma UCL	0.002351	
Lognormal Statistics		
Minimum of log data	-7.26443	
Maximum of log data	-5.31852	
Mean of log data	-6.696336	
Standard Deviation of log data	0.546909	
Variance of log data	0.29911	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.803661	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.001435	
MLE Standard Deviation	0.000847	
MLE Coefficient of Variation	0.590472	
MLE Skewness	1.977289	
MLE Median	0.001235	
MLE 80% Quantile	0.001961	
MLE 90% Quantile	0.002495	
MLE 95% Quantile	0.003038	
MLE 99% Quantile	0.004408	
MVU Estimate of Median	0.001217	
MVU Estimate of Mean	0.001411	
MVU Estimate of Standard Deviation	0.00079	
MVU Estimate of SE of Mean	0.000249	
95% H-UCL	0.002177	
95% Chebyshev (MVUE) UCL	0.002497	
97.5% Chebyshev (MVUE) UCL	0.002967	
99% Chebyshev (MVUE) UCL	0.00389	
Non-parametric Statisitics		
95% CLT UCL	0.002117	
95% Adjusted-CLT UCL	0.002496	
95% Modified-t UCL	0.00225	
95% Jackknife UCL	0.00219	
95% Chebyshev (Mean, Sd) UCL	0.003176	
97.5% Chebyshev (Mean, Sd) UCL	0.003912	
99% Chebyshev (Mean, Sd) UCL	0.005358	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.002085	
95% Bootstrap-t UCL	0.003758	
95% Hall's Bootstrap UCL	0.004622	
95% Percentile Bootstrap UCL	0.002185	
95% BCA Bootstrap UCL	0.002129	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.003176	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	5	
Minimum	0.0445	
Maximum	0.14	
Mean	0.0603	
Standard Deviation	0.028228	
Variance	0.000797	
Coefficient of Variation	0.468133	
Skewness	3.067533	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.482571	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.076663	
Gamma Statistics		
k hat	8.370349	
k star (bias corrected)	5.925911	
Theta hat	0.007204	
Theta star	0.010176	
nu hat	167.407	
nu star	118.5182	
5% Approximate Chi Square Value	94.37626	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	90.6369	
Anderson-Darling Test Statistic	2.142898	
Anderson-Darling 5% Critical Value	0.726491	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.457947	
Kolmogrov-Smirnov 5% Critical Value	0.266891	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.075725	
95% Adjusted Gamma UCL	0.078849	
Lognormal Statistics		
Minimum of log data	-3.112266	
Maximum of log data	-1.966113	
Mean of log data	-2.869346	
Standard Deviation of log data	0.325102	
Variance of log data	0.105692	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.567992	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.059815	
MLE Standard Deviation	0.019971	
MLE Coefficient of Variation	0.333885	
MLE Skewness	1.038875	
MLE Median	0.056736	
MLE 80% Quantile	0.074673	
MLE 90% Quantile	0.086157	
MLE 95% Quantile	0.096854	
MLE 99% Quantile	0.120856	
MVU Estimate of Median	0.056437	
MVU Estimate of Mean	0.059488	
MVU Estimate of Standard Deviation	0.019505	
MVU Estimate of SE of Mean	0.006166	
95% H-UCL	0.07432	
95% Chebyshev (MVUE) UCL	0.086363	
97.5% Chebyshev (MVUE) UCL	0.097992	
99% Chebyshev (MVUE) UCL	0.120835	
Non-parametric Statisitics		
95% CLT UCL	0.074983	
95% Adjusted-CLT UCL	0.084235	
95% Modified-t UCL	0.078107	
95% Jackknife UCL	0.076663	
95% Chebyshev (Mean, Sd) UCL	0.09921	
97.5% Chebyshev (Mean, Sd) UCL	0.116047	
99% Chebyshev (Mean, Sd) UCL	0.149119	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.073919	
95% Bootstrap-t UCL	0.147062	
95% Hall's Bootstrap UCL	0.151828	
95% Percentile Bootstrap UCL	0.0778	
95% BCA Bootstrap UCL	0.0868	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.076663	95% Student's-t UCL
2nd Recommended UCL	0.078107	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	7	
Minimum	0.1175	
Maximum	0.24	
Mean	0.16375	
Standard Deviation	0.035064	
Variance	0.00123	
Coefficient of Variation	0.214134	
Skewness	0.825426	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.907965	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.184076	
Gamma Statistics		
k hat	25.24843	
k star (bias corrected)	17.74057	
Theta hat	0.006486	
Theta star	0.00923	
nu hat	504.9686	
nu star	354.8114	
5% Approximate Chi Square Value	312.1519	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	305.1903	
Anderson-Darling Test Statistic	0.393546	
Anderson-Darling 5% Critical Value	0.724522	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.191533	
Kolmogrov-Smirnov 5% Critical Value	0.266116	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.186128	
95% Adjusted Gamma UCL	0.190374	
Lognormal Statistics		
Minimum of log data	-2.141317	
Maximum of log data	-1.427116	
Mean of log data	-1.829348	
Standard Deviation of log data	0.209577	
Variance of log data	0.043923	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.931957	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.164082	
MLE Standard Deviation	0.034769	
MLE Coefficient of Variation	0.2119	
MLE Skewness	0.645213	
MLE Median	0.160518	
MLE 80% Quantile	0.191617	
MLE 90% Quantile	0.210127	
MLE 95% Quantile	0.226594	
MLE 99% Quantile	0.261356	
MVU Estimate of Median	0.160166	
MVU Estimate of Mean	0.163717	
MVU Estimate of Standard Deviation	0.034434	
MVU Estimate of SE of Mean	0.010888	
95% H-UCL	0.187235	
95% Chebyshev (MVUE) UCL	0.211177	
97.5% Chebyshev (MVUE) UCL	0.231714	
99% Chebyshev (MVUE) UCL	0.272053	
Non-parametric Statisitics		
95% CLT UCL	0.181989	
95% Adjusted-CLT UCL	0.185081	
95% Modified-t UCL	0.184559	
95% Jackknife UCL	0.184076	
95% Chebyshev (Mean, Sd) UCL	0.212083	
97.5% Chebyshev (Mean, Sd) UCL	0.232997	
99% Chebyshev (Mean, Sd) UCL	0.274078	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.181046	
95% Bootstrap-t UCL	0.187627	
95% Hall's Bootstrap UCL	0.196098	
95% Percentile Bootstrap UCL	0.182	
95% BCA Bootstrap UCL	0.18975	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.184076	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.0305	
Maximum	0.072	
Mean	0.04005	
Standard Deviation	0.012176	
Variance	0.000148	
Coefficient of Variation	0.304012	
Skewness	2.426943	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.6667	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.047108	
Gamma Statistics		
k hat	15.96641	
k star (bias corrected)	11.24315	
Theta hat	0.002508	
Theta star	0.003562	
nu hat	319.3281	
nu star	224.863	
5% Approximate Chi Square Value	191.1477	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	185.7434	
Anderson-Darling Test Statistic	1.262137	
Anderson-Darling 5% Critical Value	0.724756	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.369866	
Kolmogrov-Smirnov 5% Critical Value	0.266356	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.047114	
95% Adjusted Gamma UCL	0.048485	
Lognormal Statistics		
Minimum of log data	-3.490029	
Maximum of log data	-2.631089	
Mean of log data	-3.249269	
Standard Deviation of log data	0.247959	
Variance of log data	0.061484	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.751526	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.040014	
MLE Standard Deviation	0.010076	
MLE Coefficient of Variation	0.25182	
MLE Skewness	0.771428	
MLE Median	0.038803	
MLE 80% Quantile	0.047847	
MLE 90% Quantile	0.053363	
MLE 95% Quantile	0.058345	
MLE 99% Quantile	0.069078	
MVU Estimate of Median	0.038683	
MVU Estimate of Mean	0.039888	
MVU Estimate of Standard Deviation	0.00994	
MVU Estimate of SE of Mean	0.003143	
95% H-UCL	0.046915	
95% Chebyshev (MVUE) UCL	0.053588	
97.5% Chebyshev (MVUE) UCL	0.059516	
99% Chebyshev (MVUE) UCL	0.07116	
Non-parametric Statisitics		
95% CLT UCL	0.046383	
95% Adjusted-CLT UCL	0.049541	
95% Modified-t UCL	0.047601	
95% Jackknife UCL	0.047108	
95% Chebyshev (Mean, Sd) UCL	0.056833	
97.5% Chebyshev (Mean, Sd) UCL	0.064095	
99% Chebyshev (Mean, Sd) UCL	0.07836	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.046013	
95% Bootstrap-t UCL	0.068174	
95% Hall's Bootstrap UCL	0.087078	
95% Percentile Bootstrap UCL	0.04695	
95% BCA Bootstrap UCL	0.051	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.047108	95% Student's-t UCL
2nd Recommended UCL	0.047601	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	0.1	
Maximum	0.57	
Mean	0.206	
Standard Deviation	0.142922	
Variance	0.020427	
Coefficient of Variation	0.693796	
Skewness	2.245916	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.691653	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.288849	
Gamma Statistics		
k hat	3.557228	
k star (bias corrected)	2.556727	
Theta hat	0.05791	
Theta star	0.080572	
nu hat	71.14457	
nu star	51.13453	
5% Approximate Chi Square Value	35.70961	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	33.48141	
Anderson-Darling Test Statistic	0.922624	
Anderson-Darling 5% Critical Value	0.730625	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.288659	
Kolmogrov-Smirnov 5% Critical Value	0.268099	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.294983	
95% Adjusted Gamma UCL	0.314614	
Lognormal Statistics		
Minimum of log data	-2.302585	
Maximum of log data	-0.562119	
Mean of log data	-1.726973	
Standard Deviation of log data	0.520998	
Variance of log data	0.271439	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.853274	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.20367	
MLE Standard Deviation	0.113737	
MLE Coefficient of Variation	0.558436	
MLE Skewness	1.849455	
MLE Median	0.177822	
MLE 80% Quantile	0.276172	
MLE 90% Quantile	0.347326	
MLE 95% Quantile	0.41898	
MLE 99% Quantile	0.597421	
MVU Estimate of Median	0.175422	
MVU Estimate of Mean	0.200659	
MVU Estimate of Standard Deviation	0.106792	
MVU Estimate of SE of Mean	0.033695	
95% H-UCL	0.301024	
95% Chebyshev (MVUE) UCL	0.347532	
97.5% Chebyshev (MVUE) UCL	0.411084	
99% Chebyshev (MVUE) UCL	0.53592	
Non-parametric Statisitics		
95% CLT UCL	0.280341	
95% Adjusted-CLT UCL	0.314639	
95% Modified-t UCL	0.294199	
95% Jackknife UCL	0.288849	
95% Chebyshev (Mean, Sd) UCL	0.403004	
97.5% Chebyshev (Mean, Sd) UCL	0.488248	
99% Chebyshev (Mean, Sd) UCL	0.655693	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.275912	
95% Bootstrap-t UCL	0.510938	
95% Hall's Bootstrap UCL	0.679952	
95% Percentile Bootstrap UCL	0.28	
95% BCA Bootstrap UCL	0.325	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	0.301024	95% H-UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach45.xls	
Variable:	Selenium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	0.39	
Maximum	0.84	
Mean	0.596	
Standard Deviation	0.139539	
Variance	0.019471	
Coefficient of Variation	0.234126	
Skewness	0.026046	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.963205	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.676888	
Gamma Statistics		
k hat	19.34721	
k star (bias corrected)	13.60971	
Theta hat	0.030805	
Theta star	0.043792	
nu hat	386.9442	
nu star	272.1943	
5% Approximate Chi Square Value	234.979	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	228.9654	
Anderson-Darling Test Statistic	0.276919	
Anderson-Darling 5% Critical Value	0.724583	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.141399	
Kolmogrov-Smirnov 5% Critical Value	0.2662	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.690393	
95% Adjusted Gamma UCL	0.708525	
Lognormal Statistics		
Minimum of log data	-0.941609	
Maximum of log data	-0.174353	
Mean of log data	-0.543581	
Standard Deviation of log data	0.244786	
Variance of log data	0.05992	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.941945	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.598325	
MLE Standard Deviation	0.148683	
MLE Coefficient of Variation	0.248499	
MLE Skewness	0.760841	
MLE Median	0.580665	
MLE 80% Quantile	0.714097	
MLE 90% Quantile	0.795304	
MLE 95% Quantile	0.868569	
MLE 99% Quantile	1.026126	
MVU Estimate of Median	0.578928	
MVU Estimate of Mean	0.596496	
MVU Estimate of Standard Deviation	0.146724	
MVU Estimate of SE of Mean	0.046393	
95% H-UCL	0.69991	
95% Chebyshev (MVUE) UCL	0.798718	
97.5% Chebyshev (MVUE) UCL	0.886219	
99% Chebyshev (MVUE) UCL	1.058099	
Non-parametric Statisitics		
95% CLT UCL	0.668581	
95% Adjusted-CLT UCL	0.668969	
95% Modified-t UCL	0.676949	
95% Jackknife UCL	0.676888	
95% Chebyshev (Mean, Sd) UCL	0.788341	
97.5% Chebyshev (Mean, Sd) UCL	0.871567	
99% Chebyshev (Mean, Sd) UCL	1.035049	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.665591	
95% Bootstrap-t UCL	0.680262	
95% Hall's Bootstrap UCL	0.675355	
95% Percentile Bootstrap UCL	0.667	
95% BCA Bootstrap UCL	0.689	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.676888	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	4,4'-DDD	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.004	
Maximum	0.027	
Mean	0.012683	
Standard Deviation	0.008916	
Variance	7.95E-05	
Coefficient of Variation	0.702946	
Skewness	0.984363	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.885477	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.020018	
Gamma Statistics		
k hat	2.55303	
k star (bias corrected)	1.387626	
Theta hat	0.004968	
Theta star	0.00914	
nu hat	30.63636	
nu star	16.65151	
5% Approximate Chi Square Value	8.422468	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	6.423729	
Anderson-Darling Test Statistic	0.275733	
Anderson-Darling 5% Critical Value	0.702617	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.22684	
Kolmogrov-Smirnov 5% Critical Value	0.335122	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.025075	
95% Adjusted Gamma UCL	0.032878	
Lognormal Statistics		
Minimum of log data	-5.521461	
Maximum of log data	-3.611918	
Mean of log data	-4.575914	
Standard Deviation of log data	0.71324	
Variance of log data	0.508711	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.965202	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.013279	
MLE Standard Deviation	0.010814	
MLE Coefficient of Variation	0.814337	
MLE Skewness	2.983037	
MLE Median	0.010297	
MLE 80% Quantile	0.018813	
MLE 90% Quantile	0.025748	
MLE 95% Quantile	0.033285	
MLE 99% Quantile	0.0541	
MVU Estimate of Median	0.009867	
MVU Estimate of Mean	0.012651	
MVU Estimate of Standard Deviation	0.009013	
MVU Estimate of SE of Mean	0.003665	
95% H-UCL	0.038348	
95% Chebyshev (MVUE) UCL	0.028627	
97.5% Chebyshev (MVUE) UCL	0.035539	
99% Chebyshev (MVUE) UCL	0.049118	
Non-parametric Statisitics		
95% CLT UCL	0.01867	
95% Adjusted-CLT UCL	0.020233	
95% Modified-t UCL	0.020262	
95% Jackknife UCL	0.020018	
95% Chebyshev (Mean, Sd) UCL	0.028549	
97.5% Chebyshev (Mean, Sd) UCL	0.035414	
99% Chebyshev (Mean, Sd) UCL	0.048899	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.01804	
95% Bootstrap-t UCL	0.033128	
95% Hall's Bootstrap UCL	0.070478	
95% Percentile Bootstrap UCL	0.018533	
95% BCA Bootstrap UCL	0.0212	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.020018	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	4,4'-DDE	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.0061	
Maximum	0.083	
Mean	0.035517	
Standard Deviation	0.027487	
Variance	0.000756	
Coefficient of Variation	0.773911	
Skewness	1.149539	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.903875	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.058128	
Gamma Statistics		
k hat	1.888806	
k star (bias corrected)	1.055514	
Theta hat	0.018804	
Theta star	0.033649	
nu hat	22.66567	
nu star	12.66617	
5% Approximate Chi Square Value	5.66791	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	4.099376	
Anderson-Darling Test Statistic	0.228748	
Anderson-Darling 5% Critical Value	0.705006	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.210731	
Kolmogrov-Smirnov 5% Critical Value	0.33619	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.07937	
95% Adjusted Gamma UCL	0.109739	
Lognormal Statistics		
Minimum of log data	-5.099467	
Maximum of log data	-2.488915	
Mean of log data	-3.625244	
Standard Deviation of log data	0.89452	
Variance of log data	0.800167	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.956193	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.039749	
MLE Standard Deviation	0.044011	
MLE Coefficient of Variation	1.107209	
MLE Skewness	4.678968	
MLE Median	0.026643	
MLE 80% Quantile	0.056734	
MLE 90% Quantile	0.084097	
MLE 95% Quantile	0.116047	
MLE 99% Quantile	0.213399	
MVU Estimate of Median	0.024908	
MVU Estimate of Mean	0.036651	
MVU Estimate of Standard Deviation	0.032699	
MVU Estimate of SE of Mean	0.013232	
95% H-UCL	0.191472	
95% Chebyshev (MVUE) UCL	0.094328	
97.5% Chebyshev (MVUE) UCL	0.119285	
99% Chebyshev (MVUE) UCL	0.168308	
Non-parametric Statisitics		
95% CLT UCL	0.053974	
95% Adjusted-CLT UCL	0.059601	
95% Modified-t UCL	0.059006	
95% Jackknife UCL	0.058128	
95% Chebyshev (Mean, Sd) UCL	0.08443	
97.5% Chebyshev (Mean, Sd) UCL	0.105594	
99% Chebyshev (Mean, Sd) UCL	0.147168	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.052739	
95% Bootstrap-t UCL	0.088409	
95% Hall's Bootstrap UCL	0.203561	
95% Percentile Bootstrap UCL	0.052333	
95% BCA Bootstrap UCL	0.057667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.058128	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	4,4'-DDT	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.00055	
Maximum	0.0067	
Mean	0.002767	
Standard Deviation	0.002333	
Variance	5.44E-06	
Coefficient of Variation	0.843313	
Skewness	1.10714	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.895175	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.004686	
Gamma Statistics		
k hat	1.688997	
k star (bias corrected)	0.955609	
Theta hat	0.001638	
Theta star	0.002895	
nu hat	20.26796	
nu star	11.46731	
5% Approximate Chi Square Value	4.877328	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	3.449609	
Anderson-Darling Test Statistic	0.192806	
Anderson-Darling 5% Critical Value	0.706437	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.174579	
Kolmogrov-Smirnov 5% Critical Value	0.336838	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.006505	
95% Adjusted Gamma UCL	0.009197	
Lognormal Statistics		
Minimum of log data	-7.505592	
Maximum of log data	-5.005648	
Mean of log data	-6.214464	
Standard Deviation of log data	0.916026	
Variance of log data	0.839104	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.985301	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.003043	
MLE Standard Deviation	0.003489	
MLE Coefficient of Variation	1.146426	
MLE Skewness	4.946018	
MLE Median	0.002	
MLE 80% Quantile	0.004338	
MLE 90% Quantile	0.006491	
MLE 95% Quantile	0.009026	
MLE 99% Quantile	0.016844	
MVU Estimate of Median	0.001864	
MVU Estimate of Mean	0.002793	
MVU Estimate of Standard Deviation	0.002551	
MVU Estimate of SE of Mean	0.001032	
95% H-UCL	0.015696	
95% Chebyshev (MVUE) UCL	0.007289	
97.5% Chebyshev (MVUE) UCL	0.009235	
99% Chebyshev (MVUE) UCL	0.013056	
Non-parametric Statisitics		
95% CLT UCL	0.004333	
95% Adjusted-CLT UCL	0.004793	
95% Modified-t UCL	0.004758	
95% Jackknife UCL	0.004686	
95% Chebyshev (Mean, Sd) UCL	0.006919	
97.5% Chebyshev (Mean, Sd) UCL	0.008715	
99% Chebyshev (Mean, Sd) UCL	0.012244	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.004153	
95% Bootstrap-t UCL	0.006596	
95% Hall's Bootstrap UCL	0.013484	
95% Percentile Bootstrap UCL	0.004325	
95% BCA Bootstrap UCL	0.005192	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.004686	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Aldrin	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.00028	
Maximum	0.00255	
Mean	0.00106	
Standard Deviation	0.000836	
Variance	6.99E-07	
Coefficient of Variation	0.78876	
Skewness	1.294853	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.859546	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.001748	
Gamma Statistics		
k hat	2.06416	
k star (bias corrected)	1.143191	
Theta hat	0.000514	
Theta star	0.000927	
nu hat	24.76992	
nu star	13.71829	
5% Approximate Chi Square Value	6.377822	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	4.690443	
Anderson-Darling Test Statistic	0.325939	
Anderson-Darling 5% Critical Value	0.704025	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.241578	
Kolmogrov-Smirnov 5% Critical Value	0.335748	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.00228	
95% Adjusted Gamma UCL	0.0031	
Lognormal Statistics		
Minimum of log data	-8.180721	
Maximum of log data	-5.971662	
Mean of log data	-7.110857	
Standard Deviation of log data	0.80403	
Variance of log data	0.646464	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.950533	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.001128	
MLE Standard Deviation	0.001075	
MLE Coefficient of Variation	0.953299	
MLE Skewness	3.726236	
MLE Median	0.000816	
MLE 80% Quantile	0.00161	
MLE 90% Quantile	0.002293	
MLE 95% Quantile	0.003063	
MLE 99% Quantile	0.005297	
MVU Estimate of Median	0.000773	
MVU Estimate of Mean	0.001058	
MVU Estimate of Standard Deviation	0.000849	
MVU Estimate of SE of Mean	0.000345	
95% H-UCL	0.004147	
95% Chebyshev (MVUE) UCL	0.002561	
97.5% Chebyshev (MVUE) UCL	0.003211	
99% Chebyshev (MVUE) UCL	0.004488	
Non-parametric Statisitics		
95% CLT UCL	0.001621	
95% Adjusted-CLT UCL	0.001814	
95% Modified-t UCL	0.001778	
95% Jackknife UCL	0.001748	
95% Chebyshev (Mean, Sd) UCL	0.002548	
97.5% Chebyshev (Mean, Sd) UCL	0.003192	
99% Chebyshev (Mean, Sd) UCL	0.004456	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.00157	
95% Bootstrap-t UCL	0.00223	
95% Hall's Bootstrap UCL	0.002078	
95% Percentile Bootstrap UCL	0.001655	
95% BCA Bootstrap UCL	0.00183	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.001748	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	alpha-Chlordane	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.0035	
Maximum	0.011	
Mean	0.005442	
Standard Deviation	0.002827	
Variance	7.99E-06	
Coefficient of Variation	0.519461	
Skewness	2.072503	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.733465	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.007767	
Gamma Statistics		
k hat	5.997066	
k star (bias corrected)	3.109644	
Theta hat	0.000907	
Theta star	0.00175	
nu hat	71.9648	
nu star	37.31573	
5% Approximate Chi Square Value	24.32785	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	20.62482	
Anderson-Darling Test Statistic	0.607261	
Anderson-Darling 5% Critical Value	0.698106	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.268727	
Kolmogrov-Smirnov 5% Critical Value	0.332728	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.008347	
95% Adjusted Gamma UCL	0.009845	
Lognormal Statistics		
Minimum of log data	-5.654992	
Maximum of log data	-4.50986	
Mean of log data	-5.299355	
Standard Deviation of log data	0.423604	
Variance of log data	0.17944	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.839648	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.005464	
MLE Standard Deviation	0.002422	
MLE Coefficient of Variation	0.443337	
MLE Skewness	1.417147	
MLE Median	0.004995	
MLE 80% Quantile	0.007145	
MLE 90% Quantile	0.008608	
MLE 95% Quantile	0.010026	
MLE 99% Quantile	0.013379	
MVU Estimate of Median	0.004921	
MVU Estimate of Mean	0.005378	
MVU Estimate of Standard Deviation	0.002278	
MVU Estimate of SE of Mean	0.000929	
95% H-UCL	0.008806	
95% Chebyshev (MVUE) UCL	0.00943	
97.5% Chebyshev (MVUE) UCL	0.011183	
99% Chebyshev (MVUE) UCL	0.014626	
Non-parametric Statisitics		
95% CLT UCL	0.00734	
95% Adjusted-CLT UCL	0.008383	
95% Modified-t UCL	0.00793	
95% Jackknife UCL	0.007767	
95% Chebyshev (Mean, Sd) UCL	0.010472	
97.5% Chebyshev (Mean, Sd) UCL	0.012648	
99% Chebyshev (Mean, Sd) UCL	0.016924	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.007189	
95% Bootstrap-t UCL	0.012993	
95% Hall's Bootstrap UCL	0.014969	
95% Percentile Bootstrap UCL	0.007483	
95% BCA Bootstrap UCL	0.008833	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.008347	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Aroclor-1248	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.0025	
Maximum	0.025	
Mean	0.010892	
Standard Deviation	0.007986	
Variance	6.38E-05	
Coefficient of Variation	0.733234	
Skewness	1.17153	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.90528	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.017461	
Gamma Statistics		
k hat	2.185836	
k star (bias corrected)	1.204029	
Theta hat	0.004983	
Theta star	0.009046	
nu hat	26.23003	
nu star	14.44835	
5% Approximate Chi Square Value	6.87828	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	5.110803	
Anderson-Darling Test Statistic	0.206552	
Anderson-Darling 5% Critical Value	0.703675	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.167596	
Kolmogrov-Smirnov 5% Critical Value	0.335592	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.022879	
95% Adjusted Gamma UCL	0.030791	
Lognormal Statistics		
Minimum of log data	-5.991465	
Maximum of log data	-3.688879	
Mean of log data	-4.76561	
Standard Deviation of log data	0.807043	
Variance of log data	0.651319	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.973875	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.011797	
MLE Standard Deviation	0.011303	
MLE Coefficient of Variation	0.958159	
MLE Skewness	3.754133	
MLE Median	0.008518	
MLE 80% Quantile	0.016846	
MLE 90% Quantile	0.024027	
MLE 95% Quantile	0.032128	
MLE 99% Quantile	0.055664	
MVU Estimate of Median	0.008064	
MVU Estimate of Mean	0.011065	
MVU Estimate of Standard Deviation	0.008914	
MVU Estimate of SE of Mean	0.003617	
95% H-UCL	0.043758	
95% Chebyshev (MVUE) UCL	0.02683	
97.5% Chebyshev (MVUE) UCL	0.033651	
99% Chebyshev (MVUE) UCL	0.04705	
Non-parametric Statisitics		
95% CLT UCL	0.016254	
95% Adjusted-CLT UCL	0.017921	
95% Modified-t UCL	0.017721	
95% Jackknife UCL	0.017461	
95% Chebyshev (Mean, Sd) UCL	0.025103	
97.5% Chebyshev (Mean, Sd) UCL	0.031252	
99% Chebyshev (Mean, Sd) UCL	0.043332	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.015619	
95% Bootstrap-t UCL	0.020344	
95% Hall's Bootstrap UCL	0.022644	
95% Percentile Bootstrap UCL	0.016233	
95% BCA Bootstrap UCL	0.018808	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.017461	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Aroclor-1254	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.015	
Maximum	0.18	
Mean	0.076667	
Standard Deviation	0.062154	
Variance	0.003863	
Coefficient of Variation	0.810699	
Skewness	1.042058	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.906322	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.127797	
Gamma Statistics		
k hat	1.775878	
k star (bias corrected)	0.99905	
Theta hat	0.043171	
Theta star	0.07674	
nu hat	21.31053	
nu star	11.9886	
5% Approximate Chi Square Value	5.218515	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	3.72882	
Anderson-Darling Test Statistic	0.17833	
Anderson-Darling 5% Critical Value	0.705815	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.157773	
Kolmogrov-Smirnov 5% Critical Value	0.336556	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.176128	
95% Adjusted Gamma UCL	0.246492	
Lognormal Statistics		
Minimum of log data	-4.199705	
Maximum of log data	-1.714798	
Mean of log data	-2.875523	
Standard Deviation of log data	0.90106	
Variance of log data	0.811909	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.984778	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.084621	
MLE Standard Deviation	0.094693	
MLE Coefficient of Variation	1.119019	
MLE Skewness	4.758295	
MLE Median	0.056387	
MLE 80% Quantile	0.120739	
MLE 90% Quantile	0.179485	
MLE 95% Quantile	0.24826	
MLE 99% Quantile	0.458563	
MVU Estimate of Median	0.052663	
MVU Estimate of Mean	0.077917	
MVU Estimate of Standard Deviation	0.070019	
MVU Estimate of SE of Mean	0.028328	
95% H-UCL	0.416123	
95% Chebyshev (MVUE) UCL	0.201393	
97.5% Chebyshev (MVUE) UCL	0.254822	
99% Chebyshev (MVUE) UCL	0.359772	
Non-parametric Statisitics		
95% CLT UCL	0.118403	
95% Adjusted-CLT UCL	0.129938	
95% Modified-t UCL	0.129596	
95% Jackknife UCL	0.127797	
95% Chebyshev (Mean, Sd) UCL	0.18727	
97.5% Chebyshev (Mean, Sd) UCL	0.235128	
99% Chebyshev (Mean, Sd) UCL	0.329136	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.115169	
95% Bootstrap-t UCL	0.196323	
95% Hall's Bootstrap UCL	0.420036	
95% Percentile Bootstrap UCL	0.118333	
95% BCA Bootstrap UCL	0.1335	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.127797	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Aroclor-1260	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.025	
Maximum	0.11	
Mean	0.05175	
Standard Deviation	0.032202	
Variance	0.001037	
Coefficient of Variation	0.622263	
Skewness	1.45559	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.847311	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.078241	
Gamma Statistics		
k hat	3.683841	
k star (bias corrected)	1.953032	
Theta hat	0.014048	
Theta star	0.026497	
nu hat	44.2061	
nu star	23.43638	
5% Approximate Chi Square Value	13.41916	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	10.78534	
Anderson-Darling Test Statistic	0.334237	
Anderson-Darling 5% Critical Value	0.700407	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.216934	
Kolmogrov-Smirnov 5% Critical Value	0.333859	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.090381	
95% Adjusted Gamma UCL	0.112452	
Lognormal Statistics		
Minimum of log data	-3.688879	
Maximum of log data	-2.207275	
Mean of log data	-3.103156	
Standard Deviation of log data	0.56736	
Variance of log data	0.321897	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.930318	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.052749	
MLE Standard Deviation	0.032506	
MLE Coefficient of Variation	0.616233	
MLE Skewness	2.082708	
MLE Median	0.044907	
MLE 80% Quantile	0.072531	
MLE 90% Quantile	0.093098	
MLE 95% Quantile	0.114195	
MLE 99% Quantile	0.168053	
MVU Estimate of Median	0.043714	
MVU Estimate of Mean	0.051226	
MVU Estimate of Standard Deviation	0.029049	
MVU Estimate of SE of Mean	0.011839	
95% H-UCL	0.109729	
95% Chebyshev (MVUE) UCL	0.102832	
97.5% Chebyshev (MVUE) UCL	0.125163	
99% Chebyshev (MVUE) UCL	0.169026	
Non-parametric Statisitics		
95% CLT UCL	0.073374	
95% Adjusted-CLT UCL	0.081721	
95% Modified-t UCL	0.079543	
95% Jackknife UCL	0.078241	
95% Chebyshev (Mean, Sd) UCL	0.109054	
97.5% Chebyshev (Mean, Sd) UCL	0.13385	
99% Chebyshev (Mean, Sd) UCL	0.182556	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.071691	
95% Bootstrap-t UCL	0.119044	
95% Hall's Bootstrap UCL	0.199032	
95% Percentile Bootstrap UCL	0.073333	
95% BCA Bootstrap UCL	0.08425	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.078241	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Dieldrin	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.00055	
Maximum	0.0049	
Mean	0.002137	
Standard Deviation	0.001539	
Variance	2.37E-06	
Coefficient of Variation	0.72012	
Skewness	1.279402	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.899928	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.003402	
Gamma Statistics		
k hat	2.37117	
k star (bias corrected)	1.296696	
Theta hat	0.000901	
Theta star	0.001648	
nu hat	28.45404	
nu star	15.56035	
5% Approximate Chi Square Value	7.651703	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	5.76564	
Anderson-Darling Test Statistic	0.193369	
Anderson-Darling 5% Critical Value	0.703141	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.166409	
Kolmogrov-Smirnov 5% Critical Value	0.335355	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.004345	
95% Adjusted Gamma UCL	0.005766	
Lognormal Statistics		
Minimum of log data	-7.505592	
Maximum of log data	-5.31852	
Mean of log data	-6.373952	
Standard Deviation of log data	0.761951	
Variance of log data	0.580569	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.982285	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.00228	
MLE Standard Deviation	0.002023	
MLE Coefficient of Variation	0.887161	
MLE Skewness	3.35973	
MLE Median	0.001705	
MLE 80% Quantile	0.003247	
MLE 90% Quantile	0.00454	
MLE 95% Quantile	0.005973	
MLE 99% Quantile	0.010035	
MVU Estimate of Median	0.001624	
MVU Estimate of Mean	0.002155	
MVU Estimate of Standard Deviation	0.00164	
MVU Estimate of SE of Mean	0.000666	
95% H-UCL	0.007468	
95% Chebyshev (MVUE) UCL	0.005059	
97.5% Chebyshev (MVUE) UCL	0.006315	
99% Chebyshev (MVUE) UCL	0.008783	
Non-parametric Statisitics		
95% CLT UCL	0.00317	
95% Adjusted-CLT UCL	0.00352	
95% Modified-t UCL	0.003457	
95% Jackknife UCL	0.003402	
95% Chebyshev (Mean, Sd) UCL	0.004875	
97.5% Chebyshev (Mean, Sd) UCL	0.006059	
99% Chebyshev (Mean, Sd) UCL	0.008387	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.003063	
95% Bootstrap-t UCL	0.004087	
95% Hall's Bootstrap UCL	0.007714	
95% Percentile Bootstrap UCL	0.003195	
95% BCA Bootstrap UCL	0.00365	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.003402	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Heptachlor epoxide	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.00026	
Maximum	0.00255	
Mean	0.001057	
Standard Deviation	0.00084	
Variance	7.05E-07	
Coefficient of Variation	0.79481	
Skewness	1.276421	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.86455	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.001748	
Gamma Statistics		
k hat	1.998555	
k star (bias corrected)	1.110389	
Theta hat	0.000529	
Theta star	0.000952	
nu hat	23.98266	
nu star	13.32466	
5% Approximate Chi Square Value	6.110592	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	4.467188	
Anderson-Darling Test Statistic	0.310934	
Anderson-Darling 5% Critical Value	0.70422	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.234465	
Kolmogrov-Smirnov 5% Critical Value	0.335835	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.002304	
95% Adjusted Gamma UCL	0.003152	
Lognormal Statistics		
Minimum of log data	-8.254829	
Maximum of log data	-5.971662	
Mean of log data	-7.123208	
Standard Deviation of log data	0.824071	
Variance of log data	0.679093	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.954736	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.001132	
MLE Standard Deviation	0.001116	
MLE Coefficient of Variation	0.985946	
MLE Skewness	3.916265	
MLE Median	0.000806	
MLE 80% Quantile	0.001618	
MLE 90% Quantile	0.002324	
MLE 95% Quantile	0.003127	
MLE 99% Quantile	0.005481	
MVU Estimate of Median	0.000761	
MVU Estimate of Mean	0.001059	
MVU Estimate of Standard Deviation	0.000871	
MVU Estimate of SE of Mean	0.000353	
95% H-UCL	0.004409	
95% Chebyshev (MVUE) UCL	0.002598	
97.5% Chebyshev (MVUE) UCL	0.003264	
99% Chebyshev (MVUE) UCL	0.004572	
Non-parametric Statisitics		
95% CLT UCL	0.001621	
95% Adjusted-CLT UCL	0.001812	
95% Modified-t UCL	0.001777	
95% Jackknife UCL	0.001748	
95% Chebyshev (Mean, Sd) UCL	0.002551	
97.5% Chebyshev (Mean, Sd) UCL	0.003198	
99% Chebyshev (Mean, Sd) UCL	0.004468	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.001593	
95% Bootstrap-t UCL	0.002215	
95% Hall's Bootstrap UCL	0.002064	
95% Percentile Bootstrap UCL	0.00161	
95% BCA Bootstrap UCL	0.001872	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.001748	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	4	
Minimum	0.0385	
Maximum	0.05	
Mean	0.046917	
Standard Deviation	0.004641	
Variance	2.15E-05	
Coefficient of Variation	0.098926	
Skewness	-1.555624	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.763808	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.050735	
Gamma Statistics		
k hat	113.5553	
k star (bias corrected)	56.88875	
Theta hat	0.000413	
Theta star	0.000825	
nu hat	1362.663	
nu star	682.665	
5% Approximate Chi Square Value	623.0327	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	602.2276	
Anderson-Darling Test Statistic	0.773419	
Anderson-Darling 5% Critical Value	0.69621	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.317236	
Kolmogrov-Smirnov 5% Critical Value	0.33154	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	0.051407	
95% Adjusted Gamma UCL	0.053183	
Lognormal Statistics		
Minimum of log data	-3.257097	
Maximum of log data	-2.995732	
Mean of log data	-3.063792	
Standard Deviation of log data	0.104906	
Variance of log data	0.011005	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.752201	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.046968	
MLE Standard Deviation	0.004941	
MLE Coefficient of Variation	0.105196	
MLE Skewness	0.316751	
MLE Median	0.04671	
MLE 80% Quantile	0.05104	
MLE 90% Quantile	0.053451	
MLE 95% Quantile	0.055508	
MLE 99% Quantile	0.059619	
MVU Estimate of Median	0.046667	
MVU Estimate of Mean	0.046925	
MVU Estimate of Standard Deviation	0.004923	
MVU Estimate of SE of Mean	0.00201	
95% H-UCL	0.051507	
95% Chebyshev (MVUE) UCL	0.055685	
97.5% Chebyshev (MVUE) UCL	0.059475	
99% Chebyshev (MVUE) UCL	0.066921	
Non-parametric Statisitics		
95% CLT UCL	0.050033	
95% Adjusted-CLT UCL	0.048748	
95% Modified-t UCL	0.050534	
95% Jackknife UCL	0.050735	
95% Chebyshev (Mean, Sd) UCL	0.055176	
97.5% Chebyshev (Mean, Sd) UCL	0.05875	
99% Chebyshev (Mean, Sd) UCL	0.06577	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.051407	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.037	
Maximum	0.17	
Mean	0.065417	
Standard Deviation	0.051415	
Variance	0.002644	
Coefficient of Variation	0.785968	
Skewness	2.410315	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.57722	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.107713	
Gamma Statistics		
k hat	3.168271	
k star (bias corrected)	1.695247	
Theta hat	0.020647	
Theta star	0.038588	
nu hat	38.01925	
nu star	20.34296	
5% Approximate Chi Square Value	11.10285	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	8.746126	
Anderson-Darling Test Statistic	1.223402	
Anderson-Darling 5% Critical Value	0.701103	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.45681	
Kolmogrov-Smirnov 5% Critical Value	0.33438	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.119858	
95% Adjusted Gamma UCL	0.152155	
Lognormal Statistics		
Minimum of log data	-3.296837	
Maximum of log data	-1.771957	
Mean of log data	-2.893016	
Standard Deviation of log data	0.558437	
Variance of log data	0.311852	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.667874	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.064759	
MLE Standard Deviation	0.039175	
MLE Coefficient of Variation	0.60494	
MLE Skewness	2.036199	
MLE Median	0.055409	
MLE 80% Quantile	0.088821	
MLE 90% Quantile	0.11356	
MLE 95% Quantile	0.138846	
MLE 99% Quantile	0.203093	
MVU Estimate of Median	0.053982	
MVU Estimate of Mean	0.062951	
MVU Estimate of Standard Deviation	0.035137	
MVU Estimate of SE of Mean	0.014322	
95% H-UCL	0.132344	
95% Chebyshev (MVUE) UCL	0.125379	
97.5% Chebyshev (MVUE) UCL	0.152392	
99% Chebyshev (MVUE) UCL	0.205454	
Non-parametric Statisitics		
95% CLT UCL	0.099943	
95% Adjusted-CLT UCL	0.122012	
95% Modified-t UCL	0.111155	
95% Jackknife UCL	0.107713	
95% Chebyshev (Mean, Sd) UCL	0.156911	
97.5% Chebyshev (Mean, Sd) UCL	0.196501	
99% Chebyshev (Mean, Sd) UCL	0.274267	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.096145	
95% Bootstrap-t UCL	0.472898	
95% Hall's Bootstrap UCL	0.420916	
95% Percentile Bootstrap UCL	0.105417	
95% BCA Bootstrap UCL	0.0885	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.156911	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.12	
Maximum	0.8	
Mean	0.248333	
Standard Deviation	0.270807	
Variance	0.073337	
Coefficient of Variation	1.0905	
Skewness	2.427666	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.550793	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.47111	
Gamma Statistics		
k hat	1.811798	
k star (bias corrected)	1.01701	
Theta hat	0.137065	
Theta star	0.24418	
nu hat	21.74158	
nu star	12.20412	
5% Approximate Chi Square Value	5.360757	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	3.845779	
Anderson-Darling Test Statistic	1.309351	
Anderson-Darling 5% Critical Value	0.705558	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.421628	
Kolmogrov-Smirnov 5% Critical Value	0.33644	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.565347	
95% Adjusted Gamma UCL	0.788056	
Lognormal Statistics		
Minimum of log data	-2.120264	
Maximum of log data	-0.223144	
Mean of log data	-1.693653	
Standard Deviation of log data	0.730066	
Variance of log data	0.532996	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.635906	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.239991	
MLE Standard Deviation	0.201368	
MLE Coefficient of Variation	0.839065	
MLE Skewness	3.107921	
MLE Median	0.183847	
MLE 80% Quantile	0.340702	
MLE 90% Quantile	0.469767	
MLE 95% Quantile	0.610977	
MLE 99% Quantile	1.00449	
MVU Estimate of Median	0.175809	
MVU Estimate of Mean	0.228051	
MVU Estimate of Standard Deviation	0.166279	
MVU Estimate of SE of Mean	0.067593	
95% H-UCL	0.723184	
95% Chebyshev (MVUE) UCL	0.522683	
97.5% Chebyshev (MVUE) UCL	0.650171	
99% Chebyshev (MVUE) UCL	0.900596	
Non-parametric Statisitics		
95% CLT UCL	0.430183	
95% Adjusted-CLT UCL	0.547262	
95% Modified-t UCL	0.489372	
95% Jackknife UCL	0.47111	
95% Chebyshev (Mean, Sd) UCL	0.730239	
97.5% Chebyshev (Mean, Sd) UCL	0.93876	
99% Chebyshev (Mean, Sd) UCL	1.348358	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.412559	
95% Bootstrap-t UCL	4.445378	
95% Hall's Bootstrap UCL	2.13575	
95% Percentile Bootstrap UCL	0.465	
95% BCA Bootstrap UCL	0.368333	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.730239	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\June 2004-revised\Fish stat - reach6.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.0265	
Maximum	2.3	
Mean	0.416667	
Standard Deviation	0.92282	
Variance	0.851597	
Coefficient of Variation	2.214769	
Skewness	2.447366	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.510912	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.175816	
Gamma Statistics		
k hat	0.38226	
k star (bias corrected)	0.302241	
Theta hat	1.090008	
Theta star	1.37859	
nu hat	4.587122	
nu star	3.626894	
5% Approximate Chi Square Value	0.57985	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	0.271986	
Anderson-Darling Test Statistic	1.350007	
Anderson-Darling 5% Critical Value	0.754	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.434318	
Kolmogrov-Smirnov 5% Critical Value	0.35342	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	2.606203	
95% Adjusted Gamma UCL	5.556189	
Lognormal Statistics		
Minimum of log data	-3.630611	
Maximum of log data	0.832909	
Mean of log data	-2.609566	
Standard Deviation of log data	1.726723	
Variance of log data	2.981571	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.656866	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.326678	
MLE Standard Deviation	1.413378	
MLE Coefficient of Variation	4.326519	
MLE Skewness	93.96665	
MLE Median	0.073566	
MLE 80% Quantile	0.316483	
MLE 90% Quantile	0.676565	
MLE 95% Quantile	1.259724	
MLE 99% Quantile	4.082832	
MVU Estimate of Median	0.056837	
MVU Estimate of Mean	0.21629	
MVU Estimate of Standard Deviation	0.366262	
MVU Estimate of SE of Mean	0.139357	
95% H-UCL	73.61174	
95% Chebyshev (MVUE) UCL	0.823734	
97.5% Chebyshev (MVUE) UCL	1.086576	
99% Chebyshev (MVUE) UCL	1.602877	
Non-parametric Statisitics		
95% CLT UCL	1.036349	
95% Adjusted-CLT UCL	1.438551	
95% Modified-t UCL	1.238551	
95% Jackknife UCL	1.175816	
95% Chebyshev (Mean, Sd) UCL	2.058837	
97.5% Chebyshev (Mean, Sd) UCL	2.769406	
99% Chebyshev (Mean, Sd) UCL	4.165181	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.975245	
95% Bootstrap-t UCL	117.9495	
95% Hall's Bootstrap UCL	48.61392	
95% Percentile Bootstrap UCL	1.165167	
95% BCA Bootstrap UCL	0.803333	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	4.165181	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	YES	Cosider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.018	
Maximum	0.2	
Mean	0.146333	
Standard Deviation	0.068474	
Variance	0.004689	
Coefficient of Variation	0.467931	
Skewness	-1.678981	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.805061	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.202663	
Gamma Statistics		
k hat	2.368278	
k star (bias corrected)	1.29525	
Theta hat	0.061789	
Theta star	0.112977	
nu hat	28.41934	
nu star	15.543	
5% Approximate Chi Square Value	7.639537	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	5.755295	
Anderson-Darling Test Statistic	0.970533	
Anderson-Darling 5% Critical Value	0.703149	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.349963	
Kolmogrov-Smirnov 5% Critical Value	0.335359	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.297722	
95% Adjusted Gamma UCL	0.395194	
Lognormal Statistics		
Minimum of log data	-4.017384	
Maximum of log data	-1.609438	
Mean of log data	-2.147604	
Standard Deviation of log data	0.931028	
Variance of log data	0.866812	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.647899	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.180108	
MLE Standard Deviation	0.211527	
MLE Coefficient of Variation	1.174442	
MLE Skewness	5.143251	
MLE Median	0.116764	
MLE 80% Quantile	0.256434	
MLE 90% Quantile	0.386264	
MLE 95% Quantile	0.540066	
MLE 99% Quantile	1.018128	
MVU Estimate of Median	0.108544	
MVU Estimate of Mean	0.164754	
MVU Estimate of Standard Deviation	0.15293	
MVU Estimate of SE of Mean	0.061803	
95% H-UCL	0.975353	
95% Chebyshev (MVUE) UCL	0.434149	
97.5% Chebyshev (MVUE) UCL	0.550716	
99% Chebyshev (MVUE) UCL	0.779689	
Non-parametric Statisitics		
95% CLT UCL	0.192314	
95% Adjusted-CLT UCL	0.17184	
95% Modified-t UCL	0.199469	
95% Jackknife UCL	0.202663	
95% Chebyshev (Mean, Sd) UCL	0.268183	
97.5% Chebyshev (Mean, Sd) UCL	0.320908	
99% Chebyshev (Mean, Sd) UCL	0.424475	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.188088	
95% Bootstrap-t UCL	0.185586	
95% Hall's Bootstrap UCL	0.176863	
95% Percentile Bootstrap UCL	0.183333	
95% BCA Bootstrap UCL	0.185	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.202663	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-supplemental\HHRA\Statistics\HH - June 2004\Fish stat - reach6.xls	
Variable:	Selenium	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.45	
Maximum	0.65	
Mean	0.565833	
Standard Deviation	0.071443	
Variance	0.005104	
Coefficient of Variation	0.126262	
Skewness	-0.653361	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.966171	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.624606	
Gamma Statistics		
k hat	71.62218	
k star (bias corrected)	35.9222	
Theta hat	0.0079	
Theta star	0.015752	
nu hat	859.4661	
nu star	431.0664	
5% Approximate Chi Square Value	383.9238	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	367.71	
Anderson-Darling Test Statistic	0.23199	
Anderson-Darling 5% Critical Value	0.69659	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.147917	
Kolmogrov-Smirnov 5% Critical Value	0.331693	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.635313	
95% Adjusted Gamma UCL	0.663326	
Lognormal Statistics		
Minimum of log data	-0.798508	
Maximum of log data	-0.430783	
Mean of log data	-0.576453	
Standard Deviation of log data	0.13137	
Variance of log data	0.017258	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.946705	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.566757	
MLE Standard Deviation	0.074778	
MLE Coefficient of Variation	0.131939	
MLE Skewness	0.398115	
MLE Median	0.561888	
MLE 80% Quantile	0.627856	
MLE 90% Quantile	0.665217	
MLE 95% Quantile	0.697433	
MLE 99% Quantile	0.762704	
MVU Estimate of Median	0.56108	
MVU Estimate of Mean	0.565939	
MVU Estimate of Standard Deviation	0.074347	
MVU Estimate of SE of Mean	0.030352	
95% H-UCL	0.637386	
95% Chebyshev (MVUE) UCL	0.69824	
97.5% Chebyshev (MVUE) UCL	0.755487	
99% Chebyshev (MVUE) UCL	0.867938	
Non-parametric Statisitics		
95% CLT UCL	0.613808	
95% Adjusted-CLT UCL	0.605495	
95% Modified-t UCL	0.623309	
95% Jackknife UCL	0.624606	
95% Chebyshev (Mean, Sd) UCL	0.692968	
97.5% Chebyshev (Mean, Sd) UCL	0.747979	
99% Chebyshev (Mean, Sd) UCL	0.856038	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.609462	
95% Bootstrap-t UCL	0.613728	
95% Hall's Bootstrap UCL	0.61216	
95% Percentile Bootstrap UCL	0.6075	
95% BCA Bootstrap UCL	0.618333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.624606	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	NO	
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SD.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	5	
Minimum	9.5	
Maximum	29	
Mean	14.5	
Standard Deviation	7.27152	
Variance	52.875	
Coefficient of Variation	0.501484	
Skewness	1.27752	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.71167	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	19.00725	
Gamma Statistics		
k hat	5.461254	
k star (bias corrected)	3.71491	
Theta hat	2.655068	
Theta star	3.90319	
nu hat	98.30257	
nu star	66.86838	
5% Approximate Chi Square Value	49.04609	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	45.8428	
Anderson-Darling Test Statistic	1.401289	
Anderson-Darling 5% Critical Value	0.722667	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.4154	
Kolmogrov-Smirnov 5% Critical Value	0.279792	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	19.76899	
95% Adjusted Gamma UCL	21.15036	
Lognormal Statistics		
Minimum of log data	2.251292	
Maximum of log data	3.367296	
Mean of log data	2.57981	
Standard Deviation of log data	0.439698	
Variance of log data	0.193335	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.712608	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	14.5338	
MLE Standard Deviation	6.712172	
MLE Coefficient of Variation	0.461832	
MLE Skewness	1.483999	
MLE Median	13.19463	
MLE 80% Quantile	19.13186	
MLE 90% Quantile	23.21554	
MLE 95% Quantile	27.19718	
MLE 99% Quantile	36.6916	
MVU Estimate of Median	13.05351	
MVU Estimate of Mean	14.36812	
MVU Estimate of Standard Deviation	6.396704	
MVU Estimate of SE of Mean	2.129975	
95% H-UCL	20.49098	
95% Chebyshev (MVUE) UCL	23.65246	
97.5% Chebyshev (MVUE) UCL	27.66981	
99% Chebyshev (MVUE) UCL	35.5611	
Non-parametric Statisitics		
95% CLT UCL	18.48686	
95% Adjusted-CLT UCL	19.58975	
95% Modified-t UCL	19.17927	
95% Jackknife UCL	19.00725	
95% Chebyshev (Mean, Sd) UCL	25.06527	
97.5% Chebyshev (Mean, Sd) UCL	29.63688	
99% Chebyshev (Mean, Sd) UCL	38.6169	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	18.21642	
95% Bootstrap-t UCL	21.95818	
95% Hall's Bootstrap UCL	17.43986	
95% Percentile Bootstrap UCL	18.5	
95% BCA Bootstrap UCL	17.72222	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	19.00725	95% Student's-t UCL
2nd Recommended UCL	19.17927	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SD.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	7	
Minimum	78	
Maximum	470	
Mean	185.3333	
Standard Deviation	113.8244	
Variance	12956	
Coefficient of Variation	0.614161	
Skewness	2.320633	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.720917	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	255.8873	
Gamma Statistics		
k hat	4.289436	
k star (bias corrected)	2.933698	
Theta hat	43.20693	
Theta star	63.17397	
nu hat	77.20984	
nu star	52.80656	
5% Approximate Chi Square Value	37.11066	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	34.35492	
Anderson-Darling Test Statistic	0.641668	
Anderson-Darling 5% Critical Value	0.724323	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.224538	
Kolmogrov-Smirnov 5% Critical Value	0.280259	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	263.7198	
95% Adjusted Gamma UCL	284.8738	
Lognormal Statistics		
Minimum of log data	4.356709	
Maximum of log data	6.152733	
Mean of log data	5.101085	
Standard Deviation of log data	0.490171	
Variance of log data	0.240268	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904946	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	185.1598	
MLE Standard Deviation	96.4947	
MLE Coefficient of Variation	0.521143	
MLE Skewness	1.704965	
MLE Median	164.2	
MLE 80% Quantile	248.4596	
MLE 90% Quantile	308.2637	
MLE 95% Quantile	367.7551	
MLE 99% Quantile	513.4866	
MVU Estimate of Median	162.0199	
MVU Estimate of Mean	182.5013	
MVU Estimate of Standard Deviation	90.83873	
MVU Estimate of SE of Mean	30.23094	
95% H-UCL	275.1762	
95% Chebyshev (MVUE) UCL	314.2749	
97.5% Chebyshev (MVUE) UCL	371.2934	
99% Chebyshev (MVUE) UCL	483.2954	
Non-parametric Statisitics		
95% CLT UCL	247.7415	
95% Adjusted-CLT UCL	279.1018	
95% Modified-t UCL	260.7789	
95% Jackknife UCL	255.8873	
95% Chebyshev (Mean, Sd) UCL	350.7164	
97.5% Chebyshev (Mean, Sd) UCL	422.2778	
99% Chebyshev (Mean, Sd) UCL	562.8462	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	243.7468	
95% Bootstrap-t UCL	340.5486	
95% Hall's Bootstrap UCL	511.7186	
95% Percentile Bootstrap UCL	248.8889	
95% BCA Bootstrap UCL	288.6667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	263.7198	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SD.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	91	
Maximum	330	
Mean	188.4444	
Standard Deviation	69.73541	
Variance	4863.028	
Coefficient of Variation	0.370058	
Skewness	0.831786	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.957843	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	231.6699	
Gamma Statistics		
k hat	8.393692	
k star (bias corrected)	5.669869	
Theta hat	22.45072	
Theta star	33.23612	
nu hat	151.0865	
nu star	102.0576	
5% Approximate Chi Square Value	79.74415	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	75.5932	
Anderson-Darling Test Statistic	0.148073	
Anderson-Darling 5% Critical Value	0.722074	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.110885	
Kolmogrov-Smirnov 5% Critical Value	0.279487	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	241.1738	
95% Adjusted Gamma UCL	254.417	
Lognormal Statistics		
Minimum of log data	4.51086	
Maximum of log data	5.799093	
Mean of log data	5.178054	
Standard Deviation of log data	0.373787	
Variance of log data	0.139716	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.989608	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	190.1687	
MLE Standard Deviation	73.63917	
MLE Coefficient of Variation	0.387231	
MLE Skewness	1.219756	
MLE Median	177.3373	
MLE 80% Quantile	243.2046	
MLE 90% Quantile	286.6808	
MLE 95% Quantile	327.9734	
MLE 99% Quantile	423.046	
MVU Estimate of Median	175.9651	
MVU Estimate of Mean	188.6266	
MVU Estimate of Standard Deviation	71.14888	
MVU Estimate of SE of Mean	23.70288	
95% H-UCL	251.6009	
95% Chebyshev (MVUE) UCL	291.945	
97.5% Chebyshev (MVUE) UCL	336.651	
99% Chebyshev (MVUE) UCL	424.4672	
Non-parametric Statisitics		
95% CLT UCL	226.6793	
95% Adjusted-CLT UCL	233.5659	
95% Modified-t UCL	232.7441	
95% Jackknife UCL	231.6699	
95% Chebyshev (Mean, Sd) UCL	289.7676	
97.5% Chebyshev (Mean, Sd) UCL	333.6103	
99% Chebyshev (Mean, Sd) UCL	419.7306	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	225.0242	
95% Bootstrap-t UCL	239.5937	
95% Hall's Bootstrap UCL	252.7015	
95% Percentile Bootstrap UCL	226.6667	
95% BCA Bootstrap UCL	217.7778	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	231.6699	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SD.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.15	
Maximum	1.045	
Mean	0.526111	
Standard Deviation	0.279372	
Variance	0.078049	
Coefficient of Variation	0.531013	
Skewness	0.609369	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.962579	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	0.69928	
Gamma Statistics		
k hat	3.645888	
k star (bias corrected)	2.504666	
Theta hat	0.144303	
Theta star	0.210052	
nu hat	65.62599	
nu star	45.08399	
5% Approximate Chi Square Value	30.67906	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	28.19449	
Anderson-Darling Test Statistic	0.172583	
Anderson-Darling 5% Critical Value	0.725612	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.134826	
Kolmogrov-Smirnov 5% Critical Value	0.280752	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	0.773139	
95% Adjusted Gamma UCL	0.84127	
Lognormal Statistics		
Minimum of log data	-1.89712	
Maximum of log data	0.044017	
Mean of log data	-0.785607	
Standard Deviation of log data	0.599505	
Variance of log data	0.359406	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.963507	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.545581	
MLE Standard Deviation	0.358791	
MLE Coefficient of Variation	0.657631	
MLE Skewness	2.257303	
MLE Median	0.455843	
MLE 80% Quantile	0.75652	
MLE 90% Quantile	0.984872	
MLE 95% Quantile	1.222109	
MLE 99% Quantile	1.838299	
MVU Estimate of Median	0.446813	
MVU Estimate of Mean	0.533479	
MVU Estimate of Standard Deviation	0.327088	
MVU Estimate of SE of Mean	0.108655	
95% H-UCL	0.920693	
95% Chebyshev (MVUE) UCL	1.007097	
97.5% Chebyshev (MVUE) UCL	1.212032	
99% Chebyshev (MVUE) UCL	1.614587	
Non-parametric Statisitics		
95% CLT UCL	0.679286	
95% Adjusted-CLT UCL	0.699498	
95% Modified-t UCL	0.702432	
95% Jackknife UCL	0.69928	
95% Chebyshev (Mean, Sd) UCL	0.932029	
97.5% Chebyshev (Mean, Sd) UCL	1.10767	
99% Chebyshev (Mean, Sd) UCL	1.452683	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.673352	
95% Bootstrap-t UCL	0.723118	
95% Hall's Bootstrap UCL	0.732811	
95% Percentile Bootstrap UCL	0.671667	
95% BCA Bootstrap UCL	0.764444	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	0.69928	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SO.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	9.5	
Maximum	98	
Mean	46.38889	
Standard Deviation	33.55758	
Variance	1126.111	
Coefficient of Variation	0.723397	
Skewness	0.449852	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.889931	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	67.18953	
Gamma Statistics		
k hat	1.830882	
k star (bias corrected)	1.294662	
Theta hat	25.33691	
Theta star	35.83089	
nu hat	32.95587	
nu star	23.30391	
5% Approximate Chi Square Value	13.31886	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	11.75707	
Anderson-Darling Test Statistic	0.374433	
Anderson-Darling 5% Critical Value	0.731323	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.181306	
Kolmogrov-Smirnov 5% Critical Value	0.282987	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	81.16628	
95% Adjusted Gamma UCL	91.94831	
Lognormal Statistics		
Minimum of log data	2.251292	
Maximum of log data	4.584967	
Mean of log data	3.539766	
Standard Deviation of log data	0.878728	
Variance of log data	0.772164	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904544	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	50.69607	
MLE Standard Deviation	54.70583	
MLE Coefficient of Variation	1.079094	
MLE Skewness	4.493828	
MLE Median	34.45887	
MLE 80% Quantile	72.4062	
MLE 90% Quantile	106.5839	
MLE 95% Quantile	146.2438	
MLE 99% Quantile	266.0512	
MVU Estimate of Median	33.00578	
MVU Estimate of Mean	48.03804	
MVU Estimate of Standard Deviation	44.16304	
MVU Estimate of SE of Mean	14.5207	
95% H-UCL	129.8548	
95% Chebyshev (MVUE) UCL	111.3323	
97.5% Chebyshev (MVUE) UCL	138.7198	
99% Chebyshev (MVUE) UCL	192.5172	
Non-parametric Statisitics		
95% CLT UCL	64.78799	
95% Adjusted-CLT UCL	66.58024	
95% Modified-t UCL	67.46909	
95% Jackknife UCL	67.18953	
95% Chebyshev (Mean, Sd) UCL	95.14692	
97.5% Chebyshev (Mean, Sd) UCL	116.2446	
99% Chebyshev (Mean, Sd) UCL	157.6868	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	63.64378	
95% Bootstrap-t UCL	70.86248	
95% Hall's Bootstrap UCL	62.22648	
95% Percentile Bootstrap UCL	64.44444	
95% BCA Bootstrap UCL	71.16667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	67.18953	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SO.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	19	
Maximum	90	
Mean	39.94444	
Standard Deviation	21.8152	
Variance	475.9028	
Coefficient of Variation	0.546138	
Skewness	1.640527	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.843466	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	53.46658	
Gamma Statistics		
k hat	4.595557	
k star (bias corrected)	3.137779	
Theta hat	8.69197	
Theta star	12.73017	
nu hat	82.72002	
nu star	56.48002	
5% Approximate Chi Square Value	40.20356	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	37.32573	
Anderson-Darling Test Statistic	0.286883	
Anderson-Darling 5% Critical Value	0.72365	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.160813	
Kolmogrov-Smirnov 5% Critical Value	0.280079	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	56.11599	
95% Adjusted Gamma UCL	60.44257	
Lognormal Statistics		
Minimum of log data	2.944439	
Maximum of log data	4.49981	
Mean of log data	3.574761	
Standard Deviation of log data	0.489995	
Variance of log data	0.240095	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.956479	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	40.23788	
MLE Standard Deviation	20.96119	
MLE Coefficient of Variation	0.520932	
MLE Skewness	1.70416	
MLE Median	35.6861	
MLE 80% Quantile	53.99044	
MLE 90% Quantile	66.98071	
MLE 95% Quantile	79.90215	
MLE 99% Quantile	111.5518	
MVU Estimate of Median	35.21263	
MVU Estimate of Mean	39.66058	
MVU Estimate of Standard Deviation	19.73346	
MVU Estimate of SE of Mean	6.56727	
95% H-UCL	59.78833	
95% Chebyshev (MVUE) UCL	68.28664	
97.5% Chebyshev (MVUE) UCL	80.67316	
99% Chebyshev (MVUE) UCL	105.0041	
Non-parametric Statisitics		
95% CLT UCL	51.90538	
95% Adjusted-CLT UCL	56.15432	
95% Modified-t UCL	54.12933	
95% Jackknife UCL	53.46658	
95% Chebyshev (Mean, Sd) UCL	71.64119	
97.5% Chebyshev (Mean, Sd) UCL	85.3564	
99% Chebyshev (Mean, Sd) UCL	112.2973	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	51.42471	
95% Bootstrap-t UCL	62.21089	
95% Hall's Bootstrap UCL	104.6447	
95% Percentile Bootstrap UCL	52.27778	
95% BCA Bootstrap UCL	60.66667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	53.46658	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SO.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	88	
Maximum	930	
Mean	298.1111	
Standard Deviation	261.3754	
Variance	68317.11	
Coefficient of Variation	0.876772	
Skewness	2.068648	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.764107	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	460.1245	
Gamma Statistics		
k hat	2.015486	
k star (bias corrected)	1.417731	
Theta hat	147.9103	
Theta star	210.2733	
nu hat	36.27875	
nu star	25.51917	
5% Approximate Chi Square Value	15.00783	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	13.33685	
Anderson-Darling Test Statistic	0.367642	
Anderson-Darling 5% Critical Value	0.729724	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.154599	
Kolmogrov-Smirnov 5% Critical Value	0.282462	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	506.9051	
95% Adjusted Gamma UCL	570.4157	
Lognormal Statistics		
Minimum of log data	4.477337	
Maximum of log data	6.835185	
Mean of log data	5.42933	
Standard Deviation of log data	0.749041	
Variance of log data	0.561063	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.951523	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	301.8291	
MLE Standard Deviation	261.833	
MLE Coefficient of Variation	0.867488	
MLE Skewness	3.255277	
MLE Median	227.9963	
MLE 80% Quantile	429.3488	
MLE 90% Quantile	596.9586	
MLE 95% Quantile	781.7248	
MLE 99% Quantile	1301.926	
MVU Estimate of Median	220.9776	
MVU Estimate of Mean	290.8464	
MVU Estimate of Standard Deviation	225.3721	
MVU Estimate of SE of Mean	74.54206	
95% H-UCL	625.7731	
95% Chebyshev (MVUE) UCL	615.7677	
97.5% Chebyshev (MVUE) UCL	756.3614	
99% Chebyshev (MVUE) UCL	1032.53	
Non-parametric Statisitics		
95% CLT UCL	441.4192	
95% Adjusted-CLT UCL	505.6124	
95% Modified-t UCL	470.1373	
95% Jackknife UCL	460.1245	
95% Chebyshev (Mean, Sd) UCL	677.8808	
97.5% Chebyshev (Mean, Sd) UCL	842.2074	
99% Chebyshev (Mean, Sd) UCL	1164.995	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	433.6723	
95% Bootstrap-t UCL	622.3925	
95% Hall's Bootstrap UCL	1070.706	
95% Percentile Bootstrap UCL	444.7778	
95% BCA Bootstrap UCL	525.6667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	506.9051	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SO.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	63	
Maximum	600	
Mean	228.6667	
Standard Deviation	158.3501	
Variance	25074.75	
Coefficient of Variation	0.692493	
Skewness	1.851121	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.815657	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	326.8199	
Gamma Statistics		
k hat	2.927242	
k star (bias corrected)	2.025569	
Theta hat	78.11675	
Theta star	112.8901	
nu hat	52.69036	
nu star	36.46024	
5% Approximate Chi Square Value	23.6372	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	21.48412	
Anderson-Darling Test Statistic	0.32958	
Anderson-Darling 5% Critical Value	0.727016	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.225638	
Kolmogrov-Smirnov 5% Critical Value	0.281423	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	352.717	
95% Adjusted Gamma UCL	388.0654	
Lognormal Statistics		
Minimum of log data	4.143135	
Maximum of log data	6.39693	
Mean of log data	5.251839	
Standard Deviation of log data	0.631761	
Variance of log data	0.399122	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.971791	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	233.0842	
MLE Standard Deviation	163.2448	
MLE Coefficient of Variation	0.700368	
MLE Skewness	2.444647	
MLE Median	190.917	
MLE 80% Quantile	325.6024	
MLE 90% Quantile	429.9427	
MLE 95% Quantile	539.7391	
MLE 99% Quantile	829.9084	
MVU Estimate of Median	186.7211	
MVU Estimate of Mean	227.2835	
MVU Estimate of Standard Deviation	147.1911	
MVU Estimate of SE of Mean	48.85935	
95% H-UCL	409.8548	
95% Chebyshev (MVUE) UCL	440.2564	
97.5% Chebyshev (MVUE) UCL	532.41	
99% Chebyshev (MVUE) UCL	713.4278	
Non-parametric Statisitics		
95% CLT UCL	315.4876	
95% Adjusted-CLT UCL	350.2885	
95% Modified-t UCL	332.2481	
95% Jackknife UCL	326.8199	
95% Chebyshev (Mean, Sd) UCL	458.744	
97.5% Chebyshev (Mean, Sd) UCL	558.2987	
99% Chebyshev (Mean, Sd) UCL	753.8545	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	310.3858	
95% Bootstrap-t UCL	444.5326	
95% Hall's Bootstrap UCL	804.0799	
95% Percentile Bootstrap UCL	315.5556	
95% BCA Bootstrap UCL	367.7778	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	352.717	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SO.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	8	
Minimum	0.22	
Maximum	1.2	
Mean	0.432222	
Standard Deviation	0.316969	
Variance	0.100469	
Coefficient of Variation	0.733348	
Skewness	2.126718	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.71061	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.628695	
Gamma Statistics		
k hat	3.082819	
k star (bias corrected)	2.129287	
Theta hat	0.140204	
Theta star	0.202989	
nu hat	55.49074	
nu star	38.32716	
5% Approximate Chi Square Value	25.14684	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	22.91899	
Anderson-Darling Test Statistic	0.77339	
Anderson-Darling 5% Critical Value	0.726648	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.231702	
Kolmogrov-Smirnov 5% Critical Value	0.281265	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	0.658765	
95% Adjusted Gamma UCL	0.7228	
Lognormal Statistics		
Minimum of log data	-1.514128	
Maximum of log data	0.182322	
Mean of log data	-1.009685	
Standard Deviation of log data	0.573279	
Variance of log data	0.328649	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.841158	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.429403	
MLE Standard Deviation	0.267849	
MLE Coefficient of Variation	0.623771	
MLE Skewness	2.114017	
MLE Median	0.364334	
MLE 80% Quantile	0.591399	
MLE 90% Quantile	0.761077	
MLE 95% Quantile	0.935532	
MLE 99% Quantile	1.38232	
MVU Estimate of Median	0.35773	
MVU Estimate of Mean	0.420763	
MVU Estimate of Standard Deviation	0.246247	
MVU Estimate of SE of Mean	0.081844	
95% H-UCL	0.701675	
95% Chebyshev (MVUE) UCL	0.777513	
97.5% Chebyshev (MVUE) UCL	0.93188	
99% Chebyshev (MVUE) UCL	1.235102	
Non-parametric Statisitics		
95% CLT UCL	0.606012	
95% Adjusted-CLT UCL	0.686044	
95% Modified-t UCL	0.641179	
95% Jackknife UCL	0.628695	
95% Chebyshev (Mean, Sd) UCL	0.892768	
97.5% Chebyshev (Mean, Sd) UCL	1.092046	
99% Chebyshev (Mean, Sd) UCL	1.48349	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.601753	
95% Bootstrap-t UCL	0.858189	
95% Hall's Bootstrap UCL	1.148958	
95% Percentile Bootstrap UCL	0.618889	
95% BCA Bootstrap UCL	0.735556	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.658765	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\AJRW-SO.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	9	
Number of Missing Data	0	
Number of Valid Observations	9	
Number of Distinct Observations	9	
Minimum	29	
Maximum	70	
Mean	44.11111	
Standard Deviation	13.10004	
Variance	171.6111	
Coefficient of Variation	0.296978	
Skewness	0.803771	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.934239	
Shapiro-Wilk 5% Critical Value	0.829	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	52.23116	
Gamma Statistics		
k hat	13.45	
k star (bias corrected)	9.040738	
Theta hat	3.279638	
Theta star	4.879149	
nu hat	242.0999	
nu star	162.7333	
5% Approximate Chi Square Value	134.2331	
Adjusted Level of Significance	0.02308	
Adjusted Chi Square Value	128.7738	
Anderson-Darling Test Statistic	0.233848	
Anderson-Darling 5% Critical Value	0.721481	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.155099	
Kolmogrov-Smirnov 5% Critical Value	0.279158	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	53.47674	
95% Adjusted Gamma UCL	55.74383	
Lognormal Statistics		
Minimum of log data	3.367296	
Maximum of log data	4.248495	
Mean of log data	3.749077	
Standard Deviation of log data	0.289032	
Variance of log data	0.08354	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.960329	
Shapiro-Wilk 5% Critical Value	0.829	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	44.29387	
MLE Standard Deviation	13.07444	
MLE Coefficient of Variation	0.295175	
MLE Skewness	0.911243	
MLE Median	42.48183	
MLE 80% Quantile	54.23404	
MLE 90% Quantile	61.58898	
MLE 95% Quantile	68.34268	
MLE 99% Quantile	83.20982	
MVU Estimate of Median	42.28504	
MVU Estimate of Mean	44.08275	
MVU Estimate of Standard Deviation	12.81138	
MVU Estimate of SE of Mean	4.269576	
95% H-UCL	54.41274	
95% Chebyshev (MVUE) UCL	62.6934	
97.5% Chebyshev (MVUE) UCL	70.74625	
99% Chebyshev (MVUE) UCL	86.5645	
Non-parametric Statisitics		
95% CLT UCL	51.29366	
95% Adjusted-CLT UCL	52.54376	
95% Modified-t UCL	52.42615	
95% Jackknife UCL	52.23116	
95% Chebyshev (Mean, Sd) UCL	63.14503	
97.5% Chebyshev (Mean, Sd) UCL	71.38102	
99% Chebyshev (Mean, Sd) UCL	87.55904	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	50.84604	
95% Bootstrap-t UCL	53.79375	
95% Hall's Bootstrap UCL	54.18474	
95% Percentile Bootstrap UCL	51.11111	
95% BCA Bootstrap UCL	54	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	52.23116	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05base.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	11	
Number of Missing Data	0	
Number of Valid Observations	11	
Number of Distinct Observations	11	
Minimum	13	
Maximum	28	
Mean	21.25455	
Standard Deviation	4.647443	
Variance	21.59873	
Coefficient of Variation	0.218656	
Skewness	-0.530441	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.947759	
Shapiro-Wilk 5% Critical Value	0.85	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	23.79427	
Gamma Statistics		
k hat	20.59584	
k star (bias corrected)	15.0394	
Theta hat	1.031983	
Theta star	1.413258	
nu hat	453.1084	
nu star	330.8667	
5% Approximate Chi Square Value	289.713	
Adjusted Level of Significance	0.02783	
Adjusted Chi Square Value	283.4304	
Anderson-Darling Test Statistic	0.419934	
Anderson-Darling 5% Critical Value	0.728694	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.17897	
Kolmogrov-Smirnov 5% Critical Value	0.255022	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	24.27376	
95% Adjusted Gamma UCL	24.81181	
Lognormal Statistics		
Minimum of log data	2.564949	
Maximum of log data	3.332205	
Mean of log data	3.032098	
Standard Deviation of log data	0.239623	
Variance of log data	0.057419	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.906479	
Shapiro-Wilk 5% Critical Value	0.85	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	21.34478	
MLE Standard Deviation	5.189008	
MLE Coefficient of Variation	0.243104	
MLE Skewness	0.74368	
MLE Median	20.74069	
MLE 80% Quantile	25.39568	
MLE 90% Quantile	28.2195	
MLE 95% Quantile	30.76192	
MLE 99% Quantile	36.21455	
MVU Estimate of Median	20.68662	
MVU Estimate of Mean	21.28794	
MVU Estimate of Standard Deviation	5.128669	
MVU Estimate of SE of Mean	1.546168	
95% H-UCL	24.64204	
95% Chebyshev (MVUE) UCL	28.02753	
97.5% Chebyshev (MVUE) UCL	30.94376	
99% Chebyshev (MVUE) UCL	36.67212	
Non-parametric Statisitics		
95% CLT UCL	23.55941	
95% Adjusted-CLT UCL	23.31994	
95% Modified-t UCL	23.75692	
95% Jackknife UCL	23.79427	
95% Chebyshev (Mean, Sd) UCL	27.36248	
97.5% Chebyshev (Mean, Sd) UCL	30.00539	
99% Chebyshev (Mean, Sd) UCL	35.19687	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	23.46948	
95% Bootstrap-t UCL	23.58608	
95% Hall's Bootstrap UCL	23.28026	
95% Percentile Bootstrap UCL	23.27273	
95% BCA Bootstrap UCL	23.81818	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	23.79427	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05base.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	11	
Number of Missing Data	0	
Number of Valid Observations	11	
Number of Distinct Observations	11	
Minimum	2.85	
Maximum	14.2	
Mean	7.75	
Standard Deviation	3.297196	
Variance	10.8715	
Coefficient of Variation	0.425445	
Skewness	0.568981	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.964564	
Shapiro-Wilk 5% Critical Value	0.85	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	9.551844	
Gamma Statistics		
k hat	5.861886	
k star (bias corrected)	4.323796	
Theta hat	1.3221	
Theta star	1.792407	
nu hat	128.9615	
nu star	95.12351	
5% Approximate Chi Square Value	73.62443	
Adjusted Level of Significance	0.02783	
Adjusted Chi Square Value	70.54669	
Anderson-Darling Test Statistic	0.171409	
Anderson-Darling 5% Critical Value	0.731058	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.126414	
Kolmogrov-Smirnov 5% Critical Value	0.255893	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	10.01308	
95% Adjusted Gamma UCL	10.44992	
Lognormal Statistics		
Minimum of log data	1.047319	
Maximum of log data	2.653242	
Mean of log data	1.959978	
Standard Deviation of log data	0.452774	
Variance of log data	0.205004	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.973574	
Shapiro-Wilk 5% Critical Value	0.85	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	7.86545	
MLE Standard Deviation	3.751826	
MLE Coefficient of Variation	0.477001	
MLE Skewness	1.539534	
MLE Median	7.09917	
MLE 80% Quantile	10.40797	
MLE 90% Quantile	12.70241	
MLE 95% Quantile	14.95118	
MLE 99% Quantile	20.35098	
MVU Estimate of Median	7.033273	
MVU Estimate of Mean	7.786959	
MVU Estimate of Standard Deviation	3.592896	
MVU Estimate of SE of Mean	1.081756	
95% H-UCL	10.65526	
95% Chebyshev (MVUE) UCL	12.50222	
97.5% Chebyshev (MVUE) UCL	14.54252	
99% Chebyshev (MVUE) UCL	18.55029	
Non-parametric Statisitics		
95% CLT UCL	9.385218	
95% Adjusted-CLT UCL	9.567452	
95% Modified-t UCL	9.580268	
95% Jackknife UCL	9.551844	
95% Chebyshev (Mean, Sd) UCL	12.08336	
97.5% Chebyshev (Mean, Sd) UCL	13.95841	
99% Chebyshev (Mean, Sd) UCL	17.64159	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	9.257684	
95% Bootstrap-t UCL	9.757633	
95% Hall's Bootstrap UCL	9.786297	
95% Percentile Bootstrap UCL	9.427273	
95% BCA Bootstrap UCL	9.009091	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	9.551844	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05base.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	11	
Number of Missing Data	0	
Number of Valid Observations	11	
Number of Distinct Observations	10	
Minimum	462	
Maximum	764	
Mean	593.1818	
Standard Deviation	102.7374	
Variance	10554.96	
Coefficient of Variation	0.173197	
Skewness	0.463246	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.934559	
Shapiro-Wilk 5% Critical Value	0.85	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	649.3255	
Gamma Statistics		
k hat	37.48689	
k star (bias corrected)	27.3238	
Theta hat	15.82371	
Theta star	21.70934	
nu hat	824.7116	
nu star	601.1236	
5% Approximate Chi Square Value	545.2387	
Adjusted Level of Significance	0.02783	
Adjusted Chi Square Value	536.5507	
Anderson-Darling Test Statistic	0.26543	
Anderson-Darling 5% Critical Value	0.728525	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.138386	
Kolmogrov-Smirnov 5% Critical Value	0.254808	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	653.9807	
95% Adjusted Gamma UCL	664.5702	
Lognormal Statistics		
Minimum of log data	6.135565	
Maximum of log data	6.638568	
Mean of log data	6.372104	
Standard Deviation of log data	0.171088	
Variance of log data	0.029271	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.946853	
Shapiro-Wilk 5% Critical Value	0.85	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	593.9167	
MLE Standard Deviation	102.3599	
MLE Coefficient of Variation	0.172347	
MLE Skewness	0.522161	
MLE Median	585.2878	
MLE 80% Quantile	676.3243	
MLE 90% Quantile	729.2023	
MLE 95% Quantile	775.5269	
MLE 99% Quantile	871.3584	
MVU Estimate of Median	584.5095	
MVU Estimate of Mean	593.1183	
MVU Estimate of Standard Deviation	101.7557	
MVU Estimate of SE of Mean	30.67953	
95% H-UCL	656.0499	
95% Chebyshev (MVUE) UCL	726.8473	
97.5% Chebyshev (MVUE) UCL	784.7119	
99% Chebyshev (MVUE) UCL	898.3758	
Non-parametric Statisitics		
95% CLT UCL	644.1336	
95% Adjusted-CLT UCL	648.7566	
95% Modified-t UCL	650.0466	
95% Jackknife UCL	649.3255	
95% Chebyshev (Mean, Sd) UCL	728.2052	
97.5% Chebyshev (Mean, Sd) UCL	786.6299	
99% Chebyshev (Mean, Sd) UCL	901.3939	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	641.2237	
95% Bootstrap-t UCL	656.8851	
95% Hall's Bootstrap UCL	649.4282	
95% Percentile Bootstrap UCL	642.5455	
95% BCA Bootstrap UCL	635.1818	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	649.3255	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05base.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	11	
Number of Missing Data	0	
Number of Valid Observations	11	
Number of Distinct Observations	4	
Minimum	0.02	
Maximum	0.1	
Mean	0.054091	
Standard Deviation	0.019598	
Variance	0.000384	
Coefficient of Variation	0.36232	
Skewness	1.067298	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.733975	
Shapiro-Wilk 5% Critical Value	0.85	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.064801	
Gamma Statistics		
k hat	8.218742	
k star (bias corrected)	6.037873	
Theta hat	0.006581	
Theta star	0.008959	
nu hat	180.8123	
nu star	132.8332	
5% Approximate Chi Square Value	107.2024	
Adjusted Level of Significance	0.02783	
Adjusted Chi Square Value	103.452	
Anderson-Darling Test Statistic	1.655183	
Anderson-Darling 5% Critical Value	0.730097	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.367196	
Kolmogrov-Smirnov 5% Critical Value	0.255601	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.067023	
95% Adjusted Gamma UCL	0.069453	
Lognormal Statistics		
Minimum of log data	-3.912023	
Maximum of log data	-2.302585	
Mean of log data	-2.979158	
Standard Deviation of log data	0.384892	
Variance of log data	0.148142	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.724305	
Shapiro-Wilk 5% Critical Value	0.85	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.054744	
MLE Standard Deviation	0.021876	
MLE Coefficient of Variation	0.399597	
MLE Skewness	1.262598	
MLE Median	0.050836	
MLE 80% Quantile	0.070375	
MLE 90% Quantile	0.083361	
MLE 95% Quantile	0.09575	
MLE 99% Quantile	0.124444	
MVU Estimate of Median	0.050494	
MVU Estimate of Mean	0.054356	
MVU Estimate of Standard Deviation	0.021211	
MVU Estimate of SE of Mean	0.00639	
95% H-UCL	0.070178	
95% Chebyshev (MVUE) UCL	0.082212	
97.5% Chebyshev (MVUE) UCL	0.094265	
99% Chebyshev (MVUE) UCL	0.11794	
Non-parametric Statisitics		
95% CLT UCL	0.06381	
95% Adjusted-CLT UCL	0.065842	
95% Modified-t UCL	0.065118	
95% Jackknife UCL	0.064801	
95% Chebyshev (Mean, Sd) UCL	0.079848	
97.5% Chebyshev (Mean, Sd) UCL	0.090993	
99% Chebyshev (Mean, Sd) UCL	0.112886	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.064801	95% Student's-t UCL
2nd Recommended UCL	0.065118	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05storm.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.85	
Maximum	3.9	
Mean	1.758333	
Standard Deviation	1.124907	
Variance	1.265417	
Coefficient of Variation	0.639758	
Skewness	1.793274	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.798774	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.683727	
Gamma Statistics		
k hat	3.779523	
k star (bias corrected)	2.000873	
Theta hat	0.465226	
Theta star	0.878783	
nu hat	45.35428	
nu star	24.01047	
5% Approximate Chi Square Value	13.85491	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	11.1716	
Anderson-Darling Test Statistic	0.421603	
Anderson-Darling 5% Critical Value	0.700278	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.247797	
Kolmogrov-Smirnov 5% Critical Value	0.333763	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	3.047182	
95% Adjusted Gamma UCL	3.779083	
Lognormal Statistics		
Minimum of log data	-0.162519	
Maximum of log data	1.360977	
Mean of log data	0.42628	
Standard Deviation of log data	0.548328	
Variance of log data	0.300664	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.919771	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.779998	
MLE Standard Deviation	1.054197	
MLE Coefficient of Variation	0.592246	
MLE Skewness	1.984471	
MLE Median	1.53155	
MLE 80% Quantile	2.434199	
MLE 90% Quantile	3.098389	
MLE 95% Quantile	3.774547	
MLE 99% Quantile	5.483217	
MVU Estimate of Median	1.493519	
MVU Estimate of Mean	1.732204	
MVU Estimate of Standard Deviation	0.949396	
MVU Estimate of SE of Mean	0.387017	
95% H-UCL	3.566529	
95% Chebyshev (MVUE) UCL	3.41917	
97.5% Chebyshev (MVUE) UCL	4.149122	
99% Chebyshev (MVUE) UCL	5.58297	
Non-parametric Statisitics		
95% CLT UCL	2.513718	
95% Adjusted-CLT UCL	2.872965	
95% Modified-t UCL	2.739762	
95% Jackknife UCL	2.683727	
95% Chebyshev (Mean, Sd) UCL	3.760121	
97.5% Chebyshev (Mean, Sd) UCL	4.626296	
99% Chebyshev (Mean, Sd) UCL	6.327729	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.440128	
95% Bootstrap-t UCL	4.260169	
95% Hall's Bootstrap UCL	5.321136	
95% Percentile Bootstrap UCL	2.558333	
95% BCA Bootstrap UCL	2.925	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.683727	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05storm.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	11.5	
Maximum	23.3	
Mean	15.30833	
Standard Deviation	4.507374	
Variance	20.31642	
Coefficient of Variation	0.294439	
Skewness	1.341784	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.858311	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	19.01628	
Gamma Statistics		
k hat	15.62334	
k star (bias corrected)	7.92278	
Theta hat	0.979838	
Theta star	1.932192	
nu hat	187.4801	
nu star	95.07337	
5% Approximate Chi Square Value	73.58029	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	66.77902	
Anderson-Darling Test Statistic	0.39848	
Anderson-Darling 5% Critical Value	0.697633	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.245255	
Kolmogrov-Smirnov 5% Critical Value	0.332058	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	19.77996	
95% Adjusted Gamma UCL	21.79449	
Lognormal Statistics		
Minimum of log data	2.442347	
Maximum of log data	3.148453	
Mean of log data	2.696053	
Standard Deviation of log data	0.271166	
Variance of log data	0.073531	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.89906	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	15.37616	
MLE Standard Deviation	4.247327	
MLE Coefficient of Variation	0.276228	
MLE Skewness	0.849761	
MLE Median	14.82111	
MLE 80% Quantile	18.63773	
MLE 90% Quantile	20.99955	
MLE 95% Quantile	23.15292	
MLE 99% Quantile	27.84866	
MVU Estimate of Median	14.73049	
MVU Estimate of Mean	15.2802	
MVU Estimate of Standard Deviation	4.143351	
MVU Estimate of SE of Mean	1.691353	
95% H-UCL	20.10555	
95% Chebyshev (MVUE) UCL	22.65263	
97.5% Chebyshev (MVUE) UCL	25.84269	
99% Chebyshev (MVUE) UCL	32.10895	
Non-parametric Statisitics		
95% CLT UCL	18.33507	
95% Adjusted-CLT UCL	19.41212	
95% Modified-t UCL	19.18428	
95% Jackknife UCL	19.01628	
95% Chebyshev (Mean, Sd) UCL	23.32926	
97.5% Chebyshev (Mean, Sd) UCL	26.79993	
99% Chebyshev (Mean, Sd) UCL	33.61737	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	18.11123	
95% Bootstrap-t UCL	22.02023	
95% Hall's Bootstrap UCL	32.41326	
95% Percentile Bootstrap UCL	18.34167	
95% BCA Bootstrap UCL	19.975	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	19.01628	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05storm.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	1.3	
Maximum	12.1	
Mean	6.983333	
Standard Deviation	3.962533	
Variance	15.70167	
Coefficient of Variation	0.567427	
Skewness	-0.166984	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.985751	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	10.24307	
Gamma Statistics		
k hat	2.535795	
k star (bias corrected)	1.379009	
Theta hat	2.753903	
Theta star	5.064024	
nu hat	30.42954	
nu star	16.5481	
5% Approximate Chi Square Value	8.348954	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	6.360745	
Anderson-Darling Test Statistic	0.278801	
Anderson-Darling 5% Critical Value	0.702667	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.177463	
Kolmogrov-Smirnov 5% Critical Value	0.335144	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	13.84137	
95% Adjusted Gamma UCL	18.16783	
Lognormal Statistics		
Minimum of log data	0.262364	
Maximum of log data	2.493205	
Mean of log data	1.733579	
Standard Deviation of log data	0.812393	
Variance of log data	0.659982	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.882447	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	7.874025	
MLE Standard Deviation	7.61283	
MLE Coefficient of Variation	0.966828	
MLE Skewness	3.804234	
MLE Median	5.660875	
MLE 80% Quantile	11.24642	
MLE 90% Quantile	16.07882	
MLE 95% Quantile	21.54113	
MLE 99% Quantile	37.45738	
MVU Estimate of Median	5.355589	
MVU Estimate of Mean	7.378493	
MVU Estimate of Standard Deviation	5.983016	
MVU Estimate of SE of Mean	2.427252	
95% H-UCL	29.65466	
95% Chebyshev (MVUE) UCL	17.95864	
97.5% Chebyshev (MVUE) UCL	22.53668	
99% Chebyshev (MVUE) UCL	31.52935	
Non-parametric Statisitics		
95% CLT UCL	9.644209	
95% Adjusted-CLT UCL	9.526373	
95% Modified-t UCL	10.22469	
95% Jackknife UCL	10.24307	
95% Chebyshev (Mean, Sd) UCL	14.03471	
97.5% Chebyshev (Mean, Sd) UCL	17.08585	
99% Chebyshev (Mean, Sd) UCL	23.07922	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	9.434211	
95% Bootstrap-t UCL	10.11762	
95% Hall's Bootstrap UCL	10.00422	
95% Percentile Bootstrap UCL	9.383333	
95% BCA Bootstrap UCL	9.916667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	10.24307	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05storm.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	124	
Maximum	529	
Mean	237.5833	
Standard Deviation	148.9881	
Variance	22197.44	
Coefficient of Variation	0.627098	
Skewness	2.016761	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.748165	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	360.1469	
Gamma Statistics		
k hat	4.158562	
k star (bias corrected)	2.190392	
Theta hat	57.13112	
Theta star	108.4661	
nu hat	49.90275	
nu star	26.28471	
5% Approximate Chi Square Value	15.59693	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	12.72295	
Anderson-Darling Test Statistic	0.545851	
Anderson-Darling 5% Critical Value	0.699674	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.283614	
Kolmogrov-Smirnov 5% Critical Value	0.333421	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	400.3869	
95% Adjusted Gamma UCL	490.8303	
Lognormal Statistics		
Minimum of log data	4.820282	
Maximum of log data	6.270988	
Mean of log data	5.345493	
Standard Deviation of log data	0.513143	
Variance of log data	0.263316	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.88249	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	239.1643	
MLE Standard Deviation	131.2656	
MLE Coefficient of Variation	0.548851	
MLE Skewness	1.811888	
MLE Median	209.6612	
MLE 80% Quantile	323.4676	
MLE 90% Quantile	405.4031	
MLE 95% Quantile	487.6575	
MLE 99% Quantile	691.6387	
MVU Estimate of Median	205.0965	
MVU Estimate of Mean	233.5841	
MVU Estimate of Standard Deviation	119.8207	
MVU Estimate of SE of Mean	48.86039	
95% H-UCL	448.5178	
95% Chebyshev (MVUE) UCL	446.5616	
97.5% Chebyshev (MVUE) UCL	538.7171	
99% Chebyshev (MVUE) UCL	719.7388	
Non-parametric Statisitics		
95% CLT UCL	337.6301	
95% Adjusted-CLT UCL	391.1401	
95% Modified-t UCL	368.4933	
95% Jackknife UCL	360.1469	
95% Chebyshev (Mean, Sd) UCL	502.7095	
97.5% Chebyshev (Mean, Sd) UCL	617.4298	
99% Chebyshev (Mean, Sd) UCL	842.7757	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	329.239	
95% Bootstrap-t UCL	540.7505	
95% Hall's Bootstrap UCL	715.3657	
95% Percentile Bootstrap UCL	338.1667	
95% BCA Bootstrap UCL	315.5833	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	400.3869	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW05storm.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	2	
Minimum	0.05	
Maximum	0.13	
Mean	0.063333	
Standard Deviation	0.03266	
Variance	0.001067	
Coefficient of Variation	0.515682	
Skewness	2.44949	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.496293	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.090201	
Gamma Statistics		
k hat	6.644217	
k star (bias corrected)	3.43322	
Theta hat	0.009532	
Theta star	0.018447	
nu hat	79.73061	
nu star	41.19864	
5% Approximate Chi Square Value	27.48556	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	23.51991	
Anderson-Darling Test Statistic	1.724108	
Anderson-Darling 5% Critical Value	0.698142	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.508454	
Kolmogrov-Smirnov 5% Critical Value	0.332688	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.094932	
95% Adjusted Gamma UCL	0.110938	
Lognormal Statistics		
Minimum of log data	-2.995732	
Maximum of log data	-2.040221	
Mean of log data	-2.83648	
Standard Deviation of log data	0.390086	
Variance of log data	0.152167	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.496293	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.063267	
MLE Standard Deviation	0.025649	
MLE Coefficient of Variation	0.405407	
MLE Skewness	1.282851	
MLE Median	0.058632	
MLE 80% Quantile	0.081524	
MLE 90% Quantile	0.096789	
MLE 95% Quantile	0.111382	
MLE 99% Quantile	0.145273	
MVU Estimate of Median	0.057892	
MVU Estimate of Mean	0.062434	
MVU Estimate of Standard Deviation	0.024352	
MVU Estimate of SE of Mean	0.009938	
95% H-UCL	0.096918	
95% Chebyshev (MVUE) UCL	0.105751	
97.5% Chebyshev (MVUE) UCL	0.124495	
99% Chebyshev (MVUE) UCL	0.161312	
Non-parametric Statisitics		
95% CLT UCL	0.085265	
95% Adjusted-CLT UCL	0.099512	
95% Modified-t UCL	0.092423	
95% Jackknife UCL	0.090201	
95% Chebyshev (Mean, Sd) UCL	0.121452	
97.5% Chebyshev (Mean, Sd) UCL	0.1466	
99% Chebyshev (Mean, Sd) UCL	0.195998	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/A	Not enough distinct data error
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.090201	95% Student's-t UCL
2nd Recommended UCL	0.092423	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06base.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	6.6	
Maximum	18.9	
Mean	12.06	
Standard Deviation	3.931695	
Variance	15.45822	
Coefficient of Variation	0.326011	
Skewness	0.177382	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.952473	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	14.33913	
Gamma Statistics		
k hat	9.975532	
k star (bias corrected)	7.049539	
Theta hat	1.208958	
Theta star	1.71075	
nu hat	199.5106	
nu star	140.9908	
5% Approximate Chi Square Value	114.5475	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	110.4082	
Anderson-Darling Test Statistic	0.300112	
Anderson-Darling 5% Critical Value	0.725081	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.173534	
Kolmogrov-Smirnov 5% Critical Value	0.266634	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	14.84405	
95% Adjusted Gamma UCL	15.40056	
Lognormal Statistics		
Minimum of log data	1.88707	
Maximum of log data	2.939162	
Mean of log data	2.438935	
Standard Deviation of log data	0.342942	
Variance of log data	0.117609	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.947798	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	12.15499	
MLE Standard Deviation	4.294069	
MLE Coefficient of Variation	0.353276	
MLE Skewness	1.103919	
MLE Median	11.46083	
MLE 80% Quantile	15.31328	
MLE 90% Quantile	17.80741	
MLE 95% Quantile	20.14737	
MLE 99% Quantile	25.44749	
MVU Estimate of Median	11.3936	
MVU Estimate of Mean	12.08068	
MVU Estimate of Standard Deviation	4.182276	
MVU Estimate of SE of Mean	1.32196	
95% H-UCL	15.31774	
95% Chebyshev (MVUE) UCL	17.84297	
97.5% Chebyshev (MVUE) UCL	20.33631	
99% Chebyshev (MVUE) UCL	25.23401	
Non-parametric Statisitics		
95% CLT UCL	14.10506	
95% Adjusted-CLT UCL	14.17958	
95% Modified-t UCL	14.35075	
95% Jackknife UCL	14.33913	
95% Chebyshev (Mean, Sd) UCL	17.47947	
97.5% Chebyshev (Mean, Sd) UCL	19.82447	
99% Chebyshev (Mean, Sd) UCL	24.43079	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	14.00813	
95% Bootstrap-t UCL	14.41693	
95% Hall's Bootstrap UCL	14.21123	
95% Percentile Bootstrap UCL	13.95	
95% BCA Bootstrap UCL	14.78	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	14.33913	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06base.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	1.35	
Maximum	13.4	
Mean	4.13	
Standard Deviation	3.440543	
Variance	11.83733	
Coefficient of Variation	0.833061	
Skewness	2.575032	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.674209	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	6.124418	
Gamma Statistics		
k hat	2.60413	
k star (bias corrected)	1.889558	
Theta hat	1.585942	
Theta star	2.185696	
nu hat	52.08261	
nu star	37.79116	
5% Approximate Chi Square Value	24.7125	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	22.88896	
Anderson-Darling Test Statistic	0.626147	
Anderson-Darling 5% Critical Value	0.733526	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.219623	
Kolmogrov-Smirnov 5% Critical Value	0.268988	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6.315731	
95% Adjusted Gamma UCL	6.818897	
Lognormal Statistics		
Minimum of log data	0.300105	
Maximum of log data	2.595255	
Mean of log data	1.214156	
Standard Deviation of log data	0.622049	
Variance of log data	0.386945	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.929141	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	4.086255	
MLE Standard Deviation	2.808762	
MLE Coefficient of Variation	0.687368	
MLE Skewness	2.38687	
MLE Median	3.367452	
MLE 80% Quantile	5.696135	
MLE 90% Quantile	7.489405	
MLE 95% Quantile	9.369193	
MLE 99% Quantile	14.3112	
MVU Estimate of Median	3.302815	
MVU Estimate of Mean	3.997302	
MVU Estimate of Standard Deviation	2.561821	
MVU Estimate of SE of Mean	0.806594	
95% H-UCL	6.725092	
95% Chebyshev (MVUE) UCL	7.513165	
97.5% Chebyshev (MVUE) UCL	9.034482	
99% Chebyshev (MVUE) UCL	12.02281	
Non-parametric Statisitics		
95% CLT UCL	5.919593	
95% Adjusted-CLT UCL	6.866244	
95% Modified-t UCL	6.272076	
95% Jackknife UCL	6.124418	
95% Chebyshev (Mean, Sd) UCL	8.872461	
97.5% Chebyshev (Mean, Sd) UCL	10.92453	
99% Chebyshev (Mean, Sd) UCL	14.95541	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	5.814048	
95% Bootstrap-t UCL	9.108491	
95% Hall's Bootstrap UCL	13.15606	
95% Percentile Bootstrap UCL	5.985	
95% BCA Bootstrap UCL	7.32	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	6.315731	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06base.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	367	
Maximum	757	
Mean	506.5	
Standard Deviation	124.6	
Variance	15525.17	
Coefficient of Variation	0.246002	
Skewness	0.706411	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.920648	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	578.7283	
Gamma Statistics		
k hat	19.17443	
k star (bias corrected)	13.48877	
Theta hat	26.41539	
Theta star	37.54976	
nu hat	383.4886	
nu star	269.7753	
5% Approximate Chi Square Value	232.7311	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	226.7473	
Anderson-Darling Test Statistic	0.331068	
Anderson-Darling 5% Critical Value	0.724592	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.151374	
Kolmogrov-Smirnov 5% Critical Value	0.266208	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	587.1205	
95% Adjusted Gamma UCL	602.6145	
Lognormal Statistics		
Minimum of log data	5.905362	
Maximum of log data	6.629363	
Mean of log data	6.201221	
Standard Deviation of log data	0.240241	
Variance of log data	0.057716	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.934744	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	507.7957	
MLE Standard Deviation	123.775	
MLE Coefficient of Variation	0.24375	
MLE Skewness	0.745731	
MLE Median	493.3512	
MLE 80% Quantile	604.3933	
MLE 90% Quantile	671.7802	
MLE 95% Quantile	732.4668	
MLE 99% Quantile	862.6614	
MVU Estimate of Median	491.9292	
MVU Estimate of Mean	506.3016	
MVU Estimate of Standard Deviation	122.2049	
MVU Estimate of SE of Mean	38.64031	
95% H-UCL	592.0792	
95% Chebyshev (MVUE) UCL	674.7307	
97.5% Chebyshev (MVUE) UCL	747.6102	
99% Chebyshev (MVUE) UCL	890.7677	
Non-parametric Statisitics		
95% CLT UCL	571.3105	
95% Adjusted-CLT UCL	580.7154	
95% Modified-t UCL	580.1953	
95% Jackknife UCL	578.7283	
95% Chebyshev (Mean, Sd) UCL	678.2493	
97.5% Chebyshev (Mean, Sd) UCL	752.5653	
99% Chebyshev (Mean, Sd) UCL	898.5448	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	568.8258	
95% Bootstrap-t UCL	591.12	
95% Hall's Bootstrap UCL	595.2144	
95% Percentile Bootstrap UCL	569.3	
95% BCA Bootstrap UCL	598.3	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	578.7283	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06storm.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.75	
Maximum	3.9	
Mean	1.45	
Standard Deviation	1.218195	
Variance	1.484	
Coefficient of Variation	0.840135	
Skewness	2.29443	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.645159	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2.452136	
Gamma Statistics		
k hat	2.688635	
k star (bias corrected)	1.455428	
Theta hat	0.539307	
Theta star	0.99627	
nu hat	32.26362	
nu star	17.46514	
5% Approximate Chi Square Value	9.004126	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	6.923556	
Anderson-Darling Test Statistic	0.839391	
Anderson-Darling 5% Critical Value	0.702227	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.321112	
Kolmogrov-Smirnov 5% Critical Value	0.334949	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	2.812539	
95% Adjusted Gamma UCL	3.657724	
Lognormal Statistics		
Minimum of log data	-0.287682	
Maximum of log data	1.360977	
Mean of log data	0.174218	
Standard Deviation of log data	0.617581	
Variance of log data	0.381406	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.77926	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.4404	
MLE Standard Deviation	0.981527	
MLE Coefficient of Variation	0.681427	
MLE Skewness	2.360696	
MLE Median	1.190315	
MLE 80% Quantile	2.005862	
MLE 90% Quantile	2.632172	
MLE 95% Quantile	3.287537	
MLE 99% Quantile	5.006371	
MVU Estimate of Median	1.152909	
MVU Estimate of Mean	1.390537	
MVU Estimate of Standard Deviation	0.858175	
MVU Estimate of SE of Mean	0.34954	
95% H-UCL	3.327102	
95% Chebyshev (MVUE) UCL	2.914146	
97.5% Chebyshev (MVUE) UCL	3.573413	
99% Chebyshev (MVUE) UCL	4.868416	
Non-parametric Statisitics		
95% CLT UCL	2.268029	
95% Adjusted-CLT UCL	2.76579	
95% Modified-t UCL	2.529777	
95% Jackknife UCL	2.452136	
95% Chebyshev (Mean, Sd) UCL	3.617795	
97.5% Chebyshev (Mean, Sd) UCL	4.555801	
99% Chebyshev (Mean, Sd) UCL	6.398333	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.188234	
95% Bootstrap-t UCL	6.325319	
95% Hall's Bootstrap UCL	6.180274	
95% Percentile Bootstrap UCL	2.366667	
95% BCA Bootstrap UCL	2.875	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	2.812539	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06storm.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	15.2	
Maximum	25.5	
Mean	19.89167	
Standard Deviation	4.85061	
Variance	23.52842	
Coefficient of Variation	0.243851	
Skewness	0.300378	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.830611	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	23.88197	
Gamma Statistics		
k hat	20.37544	
k star (bias corrected)	10.29883	
Theta hat	0.976257	
Theta star	1.931449	
nu hat	244.5052	
nu star	123.5859	
5% Approximate Chi Square Value	98.90711	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	90.9397	
Anderson-Darling Test Statistic	0.535966	
Anderson-Darling 5% Critical Value	0.697087	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.247516	
Kolmogrov-Smirnov 5% Critical Value	0.331731	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	24.85494	
95% Adjusted Gamma UCL	27.03253	
Lognormal Statistics		
Minimum of log data	2.721295	
Maximum of log data	3.238678	
Mean of log data	2.965561	
Standard Deviation of log data	0.243335	
Variance of log data	0.059212	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.836709	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	19.98869	
MLE Standard Deviation	4.936845	
MLE Coefficient of Variation	0.246982	
MLE Skewness	0.756012	
MLE Median	19.40558	
MLE 80% Quantile	23.83557	
MLE 90% Quantile	26.52921	
MLE 95% Quantile	28.95801	
MLE 99% Quantile	34.17717	
MVU Estimate of Median	19.31	
MVU Estimate of Mean	19.88859	
MVU Estimate of Standard Deviation	4.839498	
MVU Estimate of SE of Mean	1.975592	
95% H-UCL	25.2959	
95% Chebyshev (MVUE) UCL	28.5	
97.5% Chebyshev (MVUE) UCL	32.22616	
99% Chebyshev (MVUE) UCL	39.54549	
Non-parametric Statisitics		
95% CLT UCL	23.14889	
95% Adjusted-CLT UCL	23.40837	
95% Modified-t UCL	23.92245	
95% Jackknife UCL	23.88197	
95% Chebyshev (Mean, Sd) UCL	28.52339	
97.5% Chebyshev (Mean, Sd) UCL	32.25834	
99% Chebyshev (Mean, Sd) UCL	39.59494	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	22.86293	
95% Bootstrap-t UCL	23.86895	
95% Hall's Bootstrap UCL	22.5749	
95% Percentile Bootstrap UCL	23.05	
95% BCA Bootstrap UCL	22.325	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	23.88197	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06storm.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	5.6	
Maximum	24.2	
Mean	14.26667	
Standard Deviation	7.344839	
Variance	53.94667	
Coefficient of Variation	0.514825	
Skewness	0.17544	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.937582	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	20.30883	
Gamma Statistics		
k hat	4.087962	
k star (bias corrected)	2.155092	
Theta hat	3.489922	
Theta star	6.61998	
nu hat	49.05554	
nu star	25.8611	
5% Approximate Chi Square Value	15.27063	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	12.43155	
Anderson-Darling Test Statistic	0.287171	
Anderson-Darling 5% Critical Value	0.69981	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.226656	
Kolmogrov-Smirnov 5% Critical Value	0.333474	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	24.16087	
95% Adjusted Gamma UCL	29.67866	
Lognormal Statistics		
Minimum of log data	1.722767	
Maximum of log data	3.186353	
Mean of log data	2.530658	
Standard Deviation of log data	0.573178	
Variance of log data	0.328533	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.938392	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	14.8044	
MLE Standard Deviation	9.232636	
MLE Coefficient of Variation	0.623641	
MLE Skewness	2.113476	
MLE Median	12.56177	
MLE 80% Quantile	20.38895	
MLE 90% Quantile	26.23754	
MLE 95% Quantile	32.25056	
MLE 99% Quantile	47.64937	
MVU Estimate of Median	12.2212	
MVU Estimate of Mean	14.36756	
MVU Estimate of Standard Deviation	8.230858	
MVU Estimate of SE of Mean	3.354366	
95% H-UCL	31.15858	
95% Chebyshev (MVUE) UCL	28.98891	
97.5% Chebyshev (MVUE) UCL	35.31557	
99% Chebyshev (MVUE) UCL	47.74309	
Non-parametric Statisitics		
95% CLT UCL	19.19879	
95% Adjusted-CLT UCL	19.42827	
95% Modified-t UCL	20.34462	
95% Jackknife UCL	20.30883	
95% Chebyshev (Mean, Sd) UCL	27.3369	
97.5% Chebyshev (Mean, Sd) UCL	32.99241	
99% Chebyshev (Mean, Sd) UCL	44.10155	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	18.74945	
95% Bootstrap-t UCL	21.30921	
95% Hall's Bootstrap UCL	18.30385	
95% Percentile Bootstrap UCL	18.6	
95% BCA Bootstrap UCL	17.86667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	20.30883	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06storm.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	3.55	
Maximum	16.25	
Mean	8.916667	
Standard Deviation	5.897937	
Variance	34.78567	
Coefficient of Variation	0.661451	
Skewness	0.212442	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.811376	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	13.76855	
Gamma Statistics		
k hat	2.470442	
k star (bias corrected)	1.346332	
Theta hat	3.60934	
Theta star	6.622932	
nu hat	29.64531	
nu star	16.15599	
5% Approximate Chi Square Value	8.071068	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	6.123067	
Anderson-Darling Test Statistic	0.71477	
Anderson-Darling 5% Critical Value	0.702855	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.31654	
Kolmogrov-Smirnov 5% Critical Value	0.335228	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	17.84863	
95% Adjusted Gamma UCL	23.52702	
Lognormal Statistics		
Minimum of log data	1.266948	
Maximum of log data	2.788093	
Mean of log data	1.972084	
Standard Deviation of log data	0.741136	
Variance of log data	0.549282	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.782222	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	9.45671	
MLE Standard Deviation	8.090927	
MLE Coefficient of Variation	0.855575	
MLE Skewness	3.193014	
MLE Median	7.185633	
MLE 80% Quantile	13.44145	
MLE 90% Quantile	18.62385	
MLE 95% Quantile	24.31885	
MLE 99% Quantile	40.28443	
MVU Estimate of Median	6.862053	
MVU Estimate of Mean	8.970462	
MVU Estimate of Standard Deviation	6.639364	
MVU Estimate of SE of Mean	2.698288	
95% H-UCL	29.322	
95% Chebyshev (MVUE) UCL	20.73203	
97.5% Chebyshev (MVUE) UCL	25.82127	
99% Chebyshev (MVUE) UCL	35.81809	
Non-parametric Statisitics		
95% CLT UCL	12.87718	
95% Adjusted-CLT UCL	13.10032	
95% Modified-t UCL	13.80335	
95% Jackknife UCL	13.76855	
95% Chebyshev (Mean, Sd) UCL	19.41212	
97.5% Chebyshev (Mean, Sd) UCL	23.95352	
99% Chebyshev (Mean, Sd) UCL	32.8742	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	12.47187	
95% Bootstrap-t UCL	13.66367	
95% Hall's Bootstrap UCL	11.03202	
95% Percentile Bootstrap UCL	12.5	
95% BCA Bootstrap UCL	11.43333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	13.76855	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06storm.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	177	
Maximum	490	
Mean	306.6667	
Standard Deviation	126.421	
Variance	15982.27	
Coefficient of Variation	0.412242	
Skewness	0.544268	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.902915	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	410.6656	
Gamma Statistics		
k hat	7.220773	
k star (bias corrected)	3.721498	
Theta hat	42.47006	
Theta star	82.4041	
nu hat	86.64928	
nu star	44.65797	
5% Approximate Chi Square Value	30.32739	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	26.13778	
Anderson-Darling Test Statistic	0.365025	
Anderson-Darling 5% Critical Value	0.698174	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.270363	
Kolmogrov-Smirnov 5% Critical Value	0.332652	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	451.5756	
95% Adjusted Gamma UCL	523.9585	
Lognormal Statistics		
Minimum of log data	5.17615	
Maximum of log data	6.194405	
Mean of log data	5.654921	
Standard Deviation of log data	0.411904	
Variance of log data	0.169665	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.917539	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	310.9879	
MLE Standard Deviation	133.7277	
MLE Coefficient of Variation	0.430009	
MLE Skewness	1.36954	
MLE Median	285.694	
MLE 80% Quantile	404.6331	
MLE 90% Quantile	485.0338	
MLE 95% Quantile	562.5636	
MLE 99% Quantile	744.722	
MVU Estimate of Median	281.675	
MVU Estimate of Mean	306.4075	
MVU Estimate of Standard Deviation	126.1919	
MVU Estimate of SE of Mean	51.49214	
95% H-UCL	492.2593	
95% Chebyshev (MVUE) UCL	530.8565	
97.5% Chebyshev (MVUE) UCL	627.9758	
99% Chebyshev (MVUE) UCL	818.7478	
Non-parametric Statisitics		
95% CLT UCL	391.5595	
95% Adjusted-CLT UCL	403.813	
95% Modified-t UCL	412.5769	
95% Jackknife UCL	410.6656	
95% Chebyshev (Mean, Sd) UCL	531.6345	
97.5% Chebyshev (Mean, Sd) UCL	628.9782	
99% Chebyshev (Mean, Sd) UCL	820.1912	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	385.03	
95% Bootstrap-t UCL	427.0969	
95% Hall's Bootstrap UCL	402.4533	
95% Percentile Bootstrap UCL	385	
95% BCA Bootstrap UCL	367.5	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	410.6656	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW06storm.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	3	
Minimum	0.05	
Maximum	0.16	
Mean	0.08	
Standard Deviation	0.048166	
Variance	0.00232	
Coefficient of Variation	0.60208	
Skewness	1.256421	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.704232	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.119624	
Gamma Statistics		
k hat	3.998315	
k star (bias corrected)	2.110269	
Theta hat	0.020008	
Theta star	0.03791	
nu hat	47.97978	
nu star	25.32322	
5% Approximate Chi Square Value	14.85748	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	12.06311	
Anderson-Darling Test Statistic	1.055871	
Anderson-Darling 5% Critical Value	0.699982	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.424174	
Kolmogrov-Smirnov 5% Critical Value	0.333542	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.136353	
95% Adjusted Gamma UCL	0.167938	
Lognormal Statistics		
Minimum of log data	-2.995732	
Maximum of log data	-1.832581	
Mean of log data	-2.655962	
Standard Deviation of log data	0.534173	
Variance of log data	0.285341	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.692083	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.081001	
MLE Standard Deviation	0.046547	
MLE Coefficient of Variation	0.574644	
MLE Skewness	1.913687	
MLE Median	0.070231	
MLE 80% Quantile	0.110296	
MLE 90% Quantile	0.13952	
MLE 95% Quantile	0.169103	
MLE 99% Quantile	0.243296	
MVU Estimate of Median	0.068575	
MVU Estimate of Mean	0.078944	
MVU Estimate of Standard Deviation	0.042153	
MVU Estimate of SE of Mean	0.017186	
95% H-UCL	0.15796	
95% Chebyshev (MVUE) UCL	0.153854	
97.5% Chebyshev (MVUE) UCL	0.186268	
99% Chebyshev (MVUE) UCL	0.249939	
Non-parametric Statisitics		
95% CLT UCL	0.112344	
95% Adjusted-CLT UCL	0.123121	
95% Modified-t UCL	0.121305	
95% Jackknife UCL	0.119624	
95% Chebyshev (Mean, Sd) UCL	0.165713	
97.5% Chebyshev (Mean, Sd) UCL	0.202801	
99% Chebyshev (Mean, Sd) UCL	0.275653	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.165713	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW07base.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	3.95	
Maximum	8.3	
Mean	5.695	
Standard Deviation	1.204955	
Variance	1.451917	
Coefficient of Variation	0.211581	
Skewness	0.902474	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.948213	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	6.39349	
Gamma Statistics		
k hat	26.14156	
k star (bias corrected)	18.36576	
Theta hat	0.217852	
Theta star	0.310088	
nu hat	522.8312	
nu star	367.3151	
5% Approximate Chi Square Value	323.8897	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	316.7946	
Anderson-Darling Test Statistic	0.191309	
Anderson-Darling 5% Critical Value	0.724517	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.124902	
Kolmogrov-Smirnov 5% Critical Value	0.266107	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6.458557	
95% Adjusted Gamma UCL	6.603206	
Lognormal Statistics		
Minimum of log data	1.373716	
Maximum of log data	2.116256	
Mean of log data	1.72034	
Standard Deviation of log data	0.20531	
Variance of log data	0.042152	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.982516	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	5.705418	
MLE Standard Deviation	1.183835	
MLE Coefficient of Variation	0.207493	
MLE Skewness	0.631412	
MLE Median	5.586428	
MLE 80% Quantile	6.644751	
MLE 90% Quantile	7.272963	
MLE 95% Quantile	7.830885	
MLE 99% Quantile	9.006008	
MVU Estimate of Median	5.574664	
MVU Estimate of Mean	5.69322	
MVU Estimate of Standard Deviation	1.172888	
MVU Estimate of SE of Mean	0.370878	
95% H-UCL	6.491317	
95% Chebyshev (MVUE) UCL	7.309838	
97.5% Chebyshev (MVUE) UCL	8.00935	
99% Chebyshev (MVUE) UCL	9.383406	
Non-parametric Statisitics		
95% CLT UCL	6.321755	
95% Adjusted-CLT UCL	6.43795	
95% Modified-t UCL	6.411614	
95% Jackknife UCL	6.39349	
95% Chebyshev (Mean, Sd) UCL	7.355916	
97.5% Chebyshev (Mean, Sd) UCL	8.074596	
99% Chebyshev (Mean, Sd) UCL	9.486303	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	6.29956	
95% Bootstrap-t UCL	6.595199	
95% Hall's Bootstrap UCL	6.874562	
95% Percentile Bootstrap UCL	6.33	
95% BCA Bootstrap UCL	6.53	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	6.39349	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW07base.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	234	
Maximum	591	
Mean	374.5	
Standard Deviation	113.9193	
Variance	12977.61	
Coefficient of Variation	0.30419	
Skewness	0.621396	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.925236	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	440.5369	
Gamma Statistics		
k hat	12.44073	
k star (bias corrected)	8.775176	
Theta hat	30.10274	
Theta star	42.67721	
nu hat	248.8145	
nu star	175.5035	
5% Approximate Chi Square Value	145.8591	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	141.1632	
Anderson-Darling Test Statistic	0.340438	
Anderson-Darling 5% Critical Value	0.724936	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.193717	
Kolmogrov-Smirnov 5% Critical Value	0.266518	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	450.6133	
95% Adjusted Gamma UCL	465.6035	
Lognormal Statistics		
Minimum of log data	5.455321	
Maximum of log data	6.381816	
Mean of log data	5.884863	
Standard Deviation of log data	0.299937	
Variance of log data	0.089962	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.95003	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	376.0959	
MLE Standard Deviation	115.3902	
MLE Coefficient of Variation	0.30681	
MLE Skewness	0.949312	
MLE Median	359.5536	
MLE 80% Quantile	463.2698	
MLE 90% Quantile	528.6263	
MLE 95% Quantile	588.9014	
MLE 99% Quantile	722.3542	
MVU Estimate of Median	357.9392	
MVU Estimate of Mean	374.3526	
MVU Estimate of Standard Deviation	113.0996	
MVU Estimate of SE of Mean	35.75578	
95% H-UCL	458.287	
95% Chebyshev (MVUE) UCL	530.2085	
97.5% Chebyshev (MVUE) UCL	597.6474	
99% Chebyshev (MVUE) UCL	730.1181	
Non-parametric Statisitics		
95% CLT UCL	433.7549	
95% Adjusted-CLT UCL	441.3189	
95% Modified-t UCL	441.7167	
95% Jackknife UCL	440.5369	
95% Chebyshev (Mean, Sd) UCL	531.5269	
97.5% Chebyshev (Mean, Sd) UCL	599.4726	
99% Chebyshev (Mean, Sd) UCL	732.9388	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	430.5764	
95% Bootstrap-t UCL	446.4749	
95% Hall's Bootstrap UCL	441.0315	
95% Percentile Bootstrap UCL	433.7	
95% BCA Bootstrap UCL	461	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	440.5369	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW07storm.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	4.8	
Maximum	18.1	
Mean	9.733333	
Standard Deviation	5.014745	
Variance	25.14767	
Coefficient of Variation	0.515214	
Skewness	0.896454	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.907254	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	13.85866	
Gamma Statistics		
k hat	4.73901	
k star (bias corrected)	2.480616	
Theta hat	2.053875	
Theta star	3.923756	
nu hat	56.86812	
nu star	29.76739	
5% Approximate Chi Square Value	18.30806	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	15.15676	
Anderson-Darling Test Statistic	0.289957	
Anderson-Darling 5% Critical Value	0.698554	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.180529	
Kolmogrov-Smirnov 5% Critical Value	0.332986	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	15.8256	
95% Adjusted Gamma UCL	19.11596	
Lognormal Statistics		
Minimum of log data	1.568616	
Maximum of log data	2.895912	
Mean of log data	2.166355	
Standard Deviation of log data	0.51216	
Variance of log data	0.262308	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.941472	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	9.949366	
MLE Standard Deviation	5.44883	
MLE Coefficient of Variation	0.547656	
MLE Skewness	1.807225	
MLE Median	8.726416	
MLE 80% Quantile	13.45203	
MLE 90% Quantile	16.85219	
MLE 95% Quantile	20.26425	
MLE 99% Quantile	28.72132	
MVU Estimate of Median	8.537148	
MVU Estimate of Mean	9.718162	
MVU Estimate of Standard Deviation	4.975554	
MVU Estimate of SE of Mean	2.028944	
95% H-UCL	18.62518	
95% Chebyshev (MVUE) UCL	18.56212	
97.5% Chebyshev (MVUE) UCL	22.38891	
99% Chebyshev (MVUE) UCL	29.9059	
Non-parametric Statisitics		
95% CLT UCL	13.10078	
95% Adjusted-CLT UCL	13.90136	
95% Modified-t UCL	13.98354	
95% Jackknife UCL	13.85866	
95% Chebyshev (Mean, Sd) UCL	18.65714	
97.5% Chebyshev (Mean, Sd) UCL	22.51847	
99% Chebyshev (Mean, Sd) UCL	30.10332	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	12.7934	
95% Bootstrap-t UCL	15.6425	
95% Hall's Bootstrap UCL	13.64199	
95% Percentile Bootstrap UCL	13.00833	
95% BCA Bootstrap UCL	14.15833	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	13.85866	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW07storm.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	1.65	
Maximum	13.2	
Mean	5.8	
Standard Deviation	4.501222	
Variance	20.261	
Coefficient of Variation	0.776073	
Skewness	0.889986	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.8917	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	9.502885	
Gamma Statistics		
k hat	1.946409	
k star (bias corrected)	1.084316	
Theta hat	2.979846	
Theta star	5.348995	
nu hat	23.35691	
nu star	13.01179	
5% Approximate Chi Square Value	5.899558	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	4.291519	
Anderson-Darling Test Statistic	0.325646	
Anderson-Darling 5% Critical Value	0.704594	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.224429	
Kolmogrov-Smirnov 5% Critical Value	0.336004	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	12.79221	
95% Adjusted Gamma UCL	17.58547	
Lognormal Statistics		
Minimum of log data	0.500775	
Maximum of log data	2.580217	
Mean of log data	1.4795	
Standard Deviation of log data	0.83994	
Variance of log data	0.7055	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.924923	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	6.247929	
MLE Standard Deviation	6.325108	
MLE Coefficient of Variation	1.012353	
MLE Skewness	4.074576	
MLE Median	4.390751	
MLE 80% Quantile	8.928511	
MLE 90% Quantile	12.92061	
MLE 95% Quantile	17.48253	
MLE 99% Quantile	30.97564	
MVU Estimate of Median	4.137973	
MVU Estimate of Mean	5.82458	
MVU Estimate of Standard Deviation	4.882005	
MVU Estimate of SE of Mean	1.979018	
95% H-UCL	25.486	
95% Chebyshev (MVUE) UCL	14.45092	
97.5% Chebyshev (MVUE) UCL	18.18354	
99% Chebyshev (MVUE) UCL	25.51556	
Non-parametric Statisitics		
95% CLT UCL	8.82261	
95% Adjusted-CLT UCL	9.536025	
95% Modified-t UCL	9.614164	
95% Jackknife UCL	9.502885	
95% Chebyshev (Mean, Sd) UCL	13.80998	
97.5% Chebyshev (Mean, Sd) UCL	17.27591	
99% Chebyshev (Mean, Sd) UCL	24.08405	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	8.547232	
95% Bootstrap-t UCL	10.59971	
95% Hall's Bootstrap UCL	9.520321	
95% Percentile Bootstrap UCL	8.566667	
95% BCA Bootstrap UCL	8.308333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	9.502885	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW07storm.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	1.85	
Maximum	17	
Mean	7.033333	
Standard Deviation	5.678175	
Variance	32.24167	
Coefficient of Variation	0.807323	
Skewness	1.217426	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.875731	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	11.70443	
Gamma Statistics		
k hat	1.935405	
k star (bias corrected)	1.078814	
Theta hat	3.634037	
Theta star	6.519508	
nu hat	23.22486	
nu star	12.94576	
5% Approximate Chi Square Value	5.855184	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	4.254656	
Anderson-Darling Test Statistic	0.281757	
Anderson-Darling 5% Critical Value	0.704673	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.231428	
Kolmogrov-Smirnov 5% Critical Value	0.336039	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	15.55064	
95% Adjusted Gamma UCL	21.40052	
Lognormal Statistics		
Minimum of log data	0.615186	
Maximum of log data	2.833213	
Mean of log data	1.670603	
Standard Deviation of log data	0.833637	
Variance of log data	0.694951	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.956853	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	7.523854	
MLE Standard Deviation	7.537424	
MLE Coefficient of Variation	1.001804	
MLE Skewness	4.010832	
MLE Median	5.315372	
MLE 80% Quantile	10.7513	
MLE 90% Quantile	15.5153	
MLE 95% Quantile	20.94576	
MLE 99% Quantile	36.95286	
MVU Estimate of Median	5.013844	
MVU Estimate of Mean	7.022499	
MVU Estimate of Standard Deviation	5.842218	
MVU Estimate of SE of Mean	2.368701	
95% H-UCL	30.12794	
95% Chebyshev (MVUE) UCL	17.34743	
97.5% Chebyshev (MVUE) UCL	21.81503	
99% Chebyshev (MVUE) UCL	30.59078	
Non-parametric Statisitics		
95% CLT UCL	10.84628	
95% Adjusted-CLT UCL	12.07734	
95% Modified-t UCL	11.89645	
95% Jackknife UCL	11.70443	
95% Chebyshev (Mean, Sd) UCL	17.13772	
97.5% Chebyshev (Mean, Sd) UCL	21.50989	
99% Chebyshev (Mean, Sd) UCL	30.09819	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	10.39643	
95% Bootstrap-t UCL	15.60848	
95% Hall's Bootstrap UCL	12.73486	
95% Percentile Bootstrap UCL	10.76667	
95% BCA Bootstrap UCL	13.125	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	11.70443	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW07storm.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	114.5	
Maximum	308	
Mean	181.25	
Standard Deviation	72.6772	
Variance	5281.975	
Coefficient of Variation	0.400978	
Skewness	1.278275	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.868676	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	241.0372	
Gamma Statistics		
k hat	8.524198	
k star (bias corrected)	4.37321	
Theta hat	21.263	
Theta star	41.44553	
nu hat	102.2904	
nu star	52.47852	
5% Approximate Chi Square Value	36.83544	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	32.16892	
Anderson-Darling Test Statistic	0.370046	
Anderson-Darling 5% Critical Value	0.698247	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.282197	
Kolmogrov-Smirnov 5% Critical Value	0.332571	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	258.2223	
95% Adjusted Gamma UCL	295.6808	
Lognormal Statistics		
Minimum of log data	4.740575	
Maximum of log data	5.7301	
Mean of log data	5.140075	
Standard Deviation of log data	0.368678	
Variance of log data	0.135923	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.927519	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	182.735	
MLE Standard Deviation	69.72584	
MLE Coefficient of Variation	0.381568	
MLE Skewness	1.200258	
MLE Median	170.7287	
MLE 80% Quantile	233.1328	
MLE 90% Quantile	274.1914	
MLE 95% Quantile	313.1088	
MLE 99% Quantile	402.4699	
MVU Estimate of Median	168.8026	
MVU Estimate of Mean	180.5955	
MVU Estimate of Standard Deviation	66.57514	
MVU Estimate of SE of Mean	27.17045	
95% H-UCL	271.4052	
95% Chebyshev (MVUE) UCL	299.0287	
97.5% Chebyshev (MVUE) UCL	350.2749	
99% Chebyshev (MVUE) UCL	450.938	
Non-parametric Statisitics		
95% CLT UCL	230.0534	
95% Adjusted-CLT UCL	246.5978	
95% Modified-t UCL	243.6178	
95% Jackknife UCL	241.0372	
95% Chebyshev (Mean, Sd) UCL	310.58	
97.5% Chebyshev (Mean, Sd) UCL	366.5412	
99% Chebyshev (Mean, Sd) UCL	476.4662	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	225.5596	
95% Bootstrap-t UCL	329.986	
95% Hall's Bootstrap UCL	571.5012	
95% Percentile Bootstrap UCL	229.5	
95% BCA Bootstrap UCL	218.3333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	241.0372	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW07storm.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	2	
Minimum	0.05	
Maximum	0.11	
Mean	0.06	
Standard Deviation	0.024495	
Variance	0.0006	
Coefficient of Variation	0.408248	
Skewness	2.44949	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.496293	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.08015	
Gamma Statistics		
k hat	9.984637	
k star (bias corrected)	5.10343	
Theta hat	0.006009	
Theta star	0.011757	
nu hat	119.8156	
nu star	61.24116	
5% Approximate Chi Square Value	44.23987	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	39.07885	
Anderson-Darling Test Statistic	1.722078	
Anderson-Darling 5% Critical Value	0.698329	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.507649	
Kolmogrov-Smirnov 5% Critical Value	0.332481	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.083058	
95% Adjusted Gamma UCL	0.094027	
Lognormal Statistics		
Minimum of log data	-2.995732	
Maximum of log data	-2.207275	
Mean of log data	-2.864323	
Standard Deviation of log data	0.321886	
Variance of log data	0.103611	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.496293	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.060054	
MLE Standard Deviation	0.019842	
MLE Coefficient of Variation	0.330407	
MLE Skewness	1.027291	
MLE Median	0.057022	
MLE 80% Quantile	0.074846	
MLE 90% Quantile	0.086233	
MLE 95% Quantile	0.096828	
MLE 99% Quantile	0.120559	
MVU Estimate of Median	0.056531	
MVU Estimate of Mean	0.059522	
MVU Estimate of Standard Deviation	0.019158	
MVU Estimate of SE of Mean	0.00782	
95% H-UCL	0.083684	
95% Chebyshev (MVUE) UCL	0.093607	
97.5% Chebyshev (MVUE) UCL	0.108356	
99% Chebyshev (MVUE) UCL	0.137328	
Non-parametric Statisitics		
95% CLT UCL	0.076449	
95% Adjusted-CLT UCL	0.087134	
95% Modified-t UCL	0.081817	
95% Jackknife UCL	0.08015	
95% Chebyshev (Mean, Sd) UCL	0.103589	
97.5% Chebyshev (Mean, Sd) UCL	0.12245	
99% Chebyshev (Mean, Sd) UCL	0.159499	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/A	Not enough distinct data error
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.08015	95% Student's-t UCL
2nd Recommended UCL	0.081817	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08base.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	9	
Minimum	1.5	
Maximum	6.35	
Mean	3.525	
Standard Deviation	1.690044	
Variance	2.85625	
Coefficient of Variation	0.479445	
Skewness	0.490063	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.935072	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	4.504687	
Gamma Statistics		
k hat	4.67057	
k star (bias corrected)	3.336066	
Theta hat	0.754726	
Theta star	1.056634	
nu hat	93.41141	
nu star	66.72132	
5% Approximate Chi Square Value	48.92003	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	46.28076	
Anderson-Darling Test Statistic	0.226864	
Anderson-Darling 5% Critical Value	0.72943	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.126928	
Kolmogrov-Smirnov 5% Critical Value	0.267558	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4.807696	
95% Adjusted Gamma UCL	5.081867	
Lognormal Statistics		
Minimum of log data	0.405465	
Maximum of log data	1.848455	
Mean of log data	1.149024	
Standard Deviation of log data	0.50858	
Variance of log data	0.258653	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.943211	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	3.590713	
MLE Standard Deviation	1.950867	
MLE Coefficient of Variation	0.543309	
MLE Skewness	1.790304	
MLE Median	3.155112	
MLE 80% Quantile	4.849007	
MLE 90% Quantile	6.065088	
MLE 95% Quantile	7.283691	
MLE 99% Quantile	10.29832	
MVU Estimate of Median	3.114524	
MVU Estimate of Mean	3.540313	
MVU Estimate of Standard Deviation	1.8375	
MVU Estimate of SE of Mean	0.579881	
95% H-UCL	5.24219	
95% Chebyshev (MVUE) UCL	6.067955	
97.5% Chebyshev (MVUE) UCL	7.161668	
99% Chebyshev (MVUE) UCL	9.310055	
Non-parametric Statisitics		
95% CLT UCL	4.404074	
95% Adjusted-CLT UCL	4.492571	
95% Modified-t UCL	4.518491	
95% Jackknife UCL	4.504687	
95% Chebyshev (Mean, Sd) UCL	5.854565	
97.5% Chebyshev (Mean, Sd) UCL	6.86257	
99% Chebyshev (Mean, Sd) UCL	8.8426	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	4.346559	
95% Bootstrap-t UCL	4.660451	
95% Hall's Bootstrap UCL	4.62748	
95% Percentile Bootstrap UCL	4.38	
95% BCA Bootstrap UCL	4.785	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	4.504687	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08base.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	147	
Maximum	425	
Mean	250.8	
Standard Deviation	78.97369	
Variance	6236.844	
Coefficient of Variation	0.314887	
Skewness	1.070407	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.918897	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	296.5796	
Gamma Statistics		
k hat	12.13838	
k star (bias corrected)	8.563531	
Theta hat	20.66174	
Theta star	29.28698	
nu hat	242.7676	
nu star	171.2706	
5% Approximate Chi Square Value	142.0007	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	137.3699	
Anderson-Darling Test Statistic	0.266873	
Anderson-Darling 5% Critical Value	0.724951	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.15376	
Kolmogrov-Smirnov 5% Critical Value	0.266532	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	302.4961	
95% Adjusted Gamma UCL	312.6935	
Lognormal Statistics		
Minimum of log data	4.990433	
Maximum of log data	6.052089	
Mean of log data	5.482899	
Standard Deviation of log data	0.301703	
Variance of log data	0.091025	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.971388	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	251.7436	
MLE Standard Deviation	77.71335	
MLE Coefficient of Variation	0.3087	
MLE Skewness	0.955519	
MLE Median	240.543	
MLE 80% Quantile	310.3925	
MLE 90% Quantile	354.457	
MLE 95% Quantile	395.1241	
MLE 99% Quantile	485.2478	
MVU Estimate of Median	239.4503	
MVU Estimate of Mean	250.5626	
MVU Estimate of Standard Deviation	76.15231	
MVU Estimate of SE of Mean	24.07495	
95% H-UCL	307.1732	
95% Chebyshev (MVUE) UCL	355.5029	
97.5% Chebyshev (MVUE) UCL	400.9106	
99% Chebyshev (MVUE) UCL	490.1053	
Non-parametric Statisitics		
95% CLT UCL	291.878	
95% Adjusted-CLT UCL	300.9106	
95% Modified-t UCL	297.9885	
95% Jackknife UCL	296.5796	
95% Chebyshev (Mean, Sd) UCL	359.6577	
97.5% Chebyshev (Mean, Sd) UCL	406.7606	
99% Chebyshev (Mean, Sd) UCL	499.2849	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	289.5913	
95% Bootstrap-t UCL	313.0346	
95% Hall's Bootstrap UCL	319.218	
95% Percentile Bootstrap UCL	289.05	
95% BCA Bootstrap UCL	285.45	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	296.5796	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08storm.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.815973	
Maximum	1.835229	
Mean	1.16691	
Standard Deviation	0.353412	
Variance	0.1249	
Coefficient of Variation	0.302862	
Skewness	1.670852	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.841112	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.457641	
Gamma Statistics		
k hat	15.22054	
k star (bias corrected)	7.721379	
Theta hat	0.076667	
Theta star	0.151127	
nu hat	182.6464	
nu star	92.65655	
5% Approximate Chi Square Value	71.45438	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	64.75951	
Anderson-Darling Test Statistic	0.420259	
Anderson-Darling 5% Critical Value	0.697683	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.251099	
Kolmogrov-Smirnov 5% Critical Value	0.332088	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.51316	
95% Adjusted Gamma UCL	1.669591	
Lognormal Statistics		
Minimum of log data	-0.203374	
Maximum of log data	0.607169	
Mean of log data	0.12115	
Standard Deviation of log data	0.273341	
Variance of log data	0.074716	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.917611	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.17176	
MLE Standard Deviation	0.326367	
MLE Coefficient of Variation	0.278527	
MLE Skewness	0.85719	
MLE Median	1.128794	
MLE 80% Quantile	1.422083	
MLE 90% Quantile	1.603828	
MLE 95% Quantile	1.769675	
MLE 99% Quantile	2.131747	
MVU Estimate of Median	1.121781	
MVU Estimate of Mean	1.164328	
MVU Estimate of Standard Deviation	0.318249	
MVU Estimate of SE of Mean	0.129912	
95% H-UCL	1.536189	
95% Chebyshev (MVUE) UCL	1.7306	
97.5% Chebyshev (MVUE) UCL	1.975627	
99% Chebyshev (MVUE) UCL	2.456934	
Non-parametric Statisitics		
95% CLT UCL	1.40423	
95% Adjusted-CLT UCL	1.509389	
95% Modified-t UCL	1.474044	
95% Jackknife UCL	1.457641	
95% Chebyshev (Mean, Sd) UCL	1.795812	
97.5% Chebyshev (Mean, Sd) UCL	2.067939	
99% Chebyshev (Mean, Sd) UCL	2.602478	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.379542	
95% Bootstrap-t UCL	1.744622	
95% Hall's Bootstrap UCL	2.608309	
95% Percentile Bootstrap UCL	1.397239	
95% BCA Bootstrap UCL	1.499673	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.457641	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08storm.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	4.462236	
Maximum	29.86236	
Mean	10.57917	
Standard Deviation	9.553179	
Variance	91.26324	
Coefficient of Variation	0.903017	
Skewness	2.326688	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.642779	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	18.438	
Gamma Statistics		
k hat	2.372191	
k star (bias corrected)	1.297207	
Theta hat	4.459664	
Theta star	8.155351	
nu hat	28.46629	
nu star	15.56648	
5% Approximate Chi Square Value	7.655998	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	5.769294	
Anderson-Darling Test Statistic	0.820116	
Anderson-Darling 5% Critical Value	0.703138	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.376213	
Kolmogrov-Smirnov 5% Critical Value	0.335354	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	21.51	
95% Adjusted Gamma UCL	28.54431	
Lognormal Statistics		
Minimum of log data	1.49565	
Maximum of log data	3.396599	
Mean of log data	2.133547	
Standard Deviation of log data	0.659073	
Variance of log data	0.434377	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.817444	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	10.49329	
MLE Standard Deviation	7.739469	
MLE Coefficient of Variation	0.737564	
MLE Skewness	2.613927	
MLE Median	8.444768	
MLE 80% Quantile	14.73851	
MLE 90% Quantile	19.69679	
MLE 95% Quantile	24.97116	
MLE 99% Quantile	39.11673	
MVU Estimate of Median	8.14301	
MVU Estimate of Mean	10.07537	
MVU Estimate of Standard Deviation	6.63456	
MVU Estimate of SE of Mean	2.700593	
95% H-UCL	26.59712	
95% Chebyshev (MVUE) UCL	21.84698	
97.5% Chebyshev (MVUE) UCL	26.94056	
99% Chebyshev (MVUE) UCL	36.94593	
Non-parametric Statisitics		
95% CLT UCL	16.99422	
95% Adjusted-CLT UCL	20.95258	
95% Modified-t UCL	19.05543	
95% Jackknife UCL	18.438	
95% Chebyshev (Mean, Sd) UCL	27.57918	
97.5% Chebyshev (Mean, Sd) UCL	34.9351	
99% Chebyshev (Mean, Sd) UCL	49.38437	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	16.26327	
95% Bootstrap-t UCL	45.75756	
95% Hall's Bootstrap UCL	52.50759	
95% Percentile Bootstrap UCL	17.79982	
95% BCA Bootstrap UCL	19.1685	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	26.59712	95% H-UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08storm.xls	
Variable:	Chromium	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	3.073702	
Maximum	59.10161	
Mean	15.11686	
Standard Deviation	21.74224	
Variance	472.7252	
Coefficient of Variation	1.438278	
Skewness	2.353336	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.617542	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	33.0029	
Gamma Statistics		
k hat	0.975518	
k star (bias corrected)	0.59887	
Theta hat	15.49623	
Theta star	25.2423	
nu hat	11.70622	
nu star	7.186444	
5% Approximate Chi Square Value	2.272834	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	1.40697	
Anderson-Darling Test Statistic	0.709589	
Anderson-Darling 5% Critical Value	0.715677	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.313636	
Kolmogrov-Smirnov 5% Critical Value	0.341105	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	47.79779	
95% Adjusted Gamma UCL	77.21306	
Lognormal Statistics		
Minimum of log data	1.122883	
Maximum of log data	4.079258	
Mean of log data	2.122374	
Standard Deviation of log data	1.073807	
Variance of log data	1.153062	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.867445	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	14.86345	
MLE Standard Deviation	21.88452	
MLE Coefficient of Variation	1.472372	
MLE Skewness	7.609037	
MLE Median	8.350939	
MLE 80% Quantile	20.69188	
MLE 90% Quantile	33.18893	
MLE 95% Quantile	48.85159	
MLE 99% Quantile	101.4991	
MVU Estimate of Median	7.575563	
MVU Estimate of Mean	13.11624	
MVU Estimate of Standard Deviation	14.01622	
MVU Estimate of SE of Mean	5.628698	
95% H-UCL	133.1772	
95% Chebyshev (MVUE) UCL	37.65116	
97.5% Chebyshev (MVUE) UCL	48.26744	
99% Chebyshev (MVUE) UCL	69.12107	
Non-parametric Statisitics		
95% CLT UCL	29.71697	
95% Adjusted-CLT UCL	38.82904	
95% Modified-t UCL	34.4242	
95% Jackknife UCL	33.0029	
95% Chebyshev (Mean, Sd) UCL	53.80747	
97.5% Chebyshev (Mean, Sd) UCL	70.54893	
99% Chebyshev (Mean, Sd) UCL	103.4343	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	28.51822	
95% Bootstrap-t UCL	121.843	
95% Hall's Bootstrap UCL	112.0693	
95% Percentile Bootstrap UCL	32.32697	
95% BCA Bootstrap UCL	40.48165	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	47.79779	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08storm.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	3.859222	
Maximum	82.96712	
Mean	23.24625	
Standard Deviation	29.92947	
Variance	895.773	
Coefficient of Variation	1.287497	
Skewness	2.206387	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.683482	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	47.86742	
Gamma Statistics		
k hat	1.020425	
k star (bias corrected)	0.621323	
Theta hat	22.78096	
Theta star	37.41409	
nu hat	12.24509	
nu star	7.455881	
5% Approximate Chi Square Value	2.423484	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	1.518997	
Anderson-Darling Test Statistic	0.478456	
Anderson-Darling 5% Critical Value	0.714801	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.289096	
Kolmogrov-Smirnov 5% Critical Value	0.340711	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	71.51739	
95% Adjusted Gamma UCL	114.1024	
Lognormal Statistics		
Minimum of log data	1.350466	
Maximum of log data	4.418444	
Mean of log data	2.581814	
Standard Deviation of log data	1.135777	
Variance of log data	1.28999	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.910577	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	25.19912	
MLE Standard Deviation	40.88748	
MLE Coefficient of Variation	1.622576	
MLE Skewness	9.139565	
MLE Median	13.2211	
MLE 80% Quantile	34.52024	
MLE 90% Quantile	56.89957	
MLE 95% Quantile	85.64131	
MLE 99% Quantile	185.6071	
MVU Estimate of Median	11.85333	
MVU Estimate of Mean	21.83596	
MVU Estimate of Standard Deviation	24.65714	
MVU Estimate of SE of Mean	9.868867	
95% H-UCL	287.2957	
95% Chebyshev (MVUE) UCL	64.85335	
97.5% Chebyshev (MVUE) UCL	83.46701	
99% Chebyshev (MVUE) UCL	120.0299	
Non-parametric Statisitics		
95% CLT UCL	43.34414	
95% Adjusted-CLT UCL	55.10421	
95% Modified-t UCL	49.70176	
95% Jackknife UCL	47.86742	
95% Chebyshev (Mean, Sd) UCL	76.50612	
97.5% Chebyshev (Mean, Sd) UCL	99.55171	
99% Chebyshev (Mean, Sd) UCL	144.8203	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	41.51211	
95% Bootstrap-t UCL	97.71949	
95% Hall's Bootstrap UCL	139.4263	
95% Percentile Bootstrap UCL	45.75237	
95% BCA Bootstrap UCL	50.42883	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	71.51739	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08storm.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	154.5943	
Maximum	807.0306	
Mean	337.7472	
Standard Deviation	241.8932	
Variance	58512.3	
Coefficient of Variation	0.716196	
Skewness	1.93824	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.772499	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	536.7382	
Gamma Statistics		
k hat	3.136794	
k star (bias corrected)	1.679508	
Theta hat	107.6727	
Theta star	201.0989	
nu hat	37.64153	
nu star	20.1541	
5% Approximate Chi Square Value	10.96332	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	8.624137	
Anderson-Darling Test Statistic	0.420965	
Anderson-Darling 5% Critical Value	0.701145	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.23789	
Kolmogrov-Smirnov 5% Critical Value	0.334412	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	620.8877	
95% Adjusted Gamma UCL	789.2952	
Lognormal Statistics		
Minimum of log data	5.040804	
Maximum of log data	6.693362	
Mean of log data	5.654512	
Standard Deviation of log data	0.601061	
Variance of log data	0.361274	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.916577	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	342.1158	
MLE Standard Deviation	225.6814	
MLE Coefficient of Variation	0.659664	
MLE Skewness	2.266049	
MLE Median	285.5771	
MLE 80% Quantile	474.5697	
MLE 90% Quantile	618.239	
MLE 95% Quantile	767.591	
MLE 99% Quantile	1155.836	
MVU Estimate of Median	277.0714	
MVU Estimate of Mean	330.9419	
MVU Estimate of Standard Deviation	198.7918	
MVU Estimate of SE of Mean	80.98712	
95% H-UCL	762.8059	
95% Chebyshev (MVUE) UCL	683.9566	
97.5% Chebyshev (MVUE) UCL	836.7064	
99% Chebyshev (MVUE) UCL	1136.754	
Non-parametric Statisitics		
95% CLT UCL	500.1805	
95% Adjusted-CLT UCL	583.6755	
95% Modified-t UCL	549.7617	
95% Jackknife UCL	536.7382	
95% Chebyshev (Mean, Sd) UCL	768.1992	
97.5% Chebyshev (Mean, Sd) UCL	954.4561	
99% Chebyshev (Mean, Sd) UCL	1320.322	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	481.6879	
95% Bootstrap-t UCL	797.4899	
95% Hall's Bootstrap UCL	1163.99	
95% Percentile Bootstrap UCL	508.0128	
95% BCA Bootstrap UCL	604.5513	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	620.8877	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08storm.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	0.053619	
Maximum	0.241693	
Mean	0.094872	
Standard Deviation	0.072829	
Variance	0.005304	
Coefficient of Variation	0.767655	
Skewness	2.319657	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.634145	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.154784	
Gamma Statistics		
k hat	3.194082	
k star (bias corrected)	1.708152	
Theta hat	0.029702	
Theta star	0.055541	
nu hat	38.32898	
nu star	20.49783	
5% Approximate Chi Square Value	11.21743	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	8.846387	
Anderson-Darling Test Statistic	0.917001	
Anderson-Darling 5% Critical Value	0.701068	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.328263	
Kolmogrov-Smirnov 5% Critical Value	0.334354	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	0.173362	
95% Adjusted Gamma UCL	0.219827	
Lognormal Statistics		
Minimum of log data	-2.92585	
Maximum of log data	-1.420087	
Mean of log data	-2.519856	
Standard Deviation of log data	0.56375	
Variance of log data	0.317814	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.751952	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.094331	
MLE Standard Deviation	0.057698	
MLE Coefficient of Variation	0.611654	
MLE Skewness	2.063793	
MLE Median	0.080471	
MLE 80% Quantile	0.129576	
MLE 90% Quantile	0.166055	
MLE 95% Quantile	0.203419	
MLE 99% Quantile	0.298623	
MVU Estimate of Median	0.07836	
MVU Estimate of Mean	0.091644	
MVU Estimate of Standard Deviation	0.051639	
MVU Estimate of SE of Mean	0.021047	
95% H-UCL	0.194818	
95% Chebyshev (MVUE) UCL	0.183385	
97.5% Chebyshev (MVUE) UCL	0.223082	
99% Chebyshev (MVUE) UCL	0.301058	
Non-parametric Statisitics		
95% CLT UCL	0.143778	
95% Adjusted-CLT UCL	0.173863	
95% Modified-t UCL	0.159477	
95% Jackknife UCL	0.154784	
95% Chebyshev (Mean, Sd) UCL	0.224473	
97.5% Chebyshev (Mean, Sd) UCL	0.280551	
99% Chebyshev (Mean, Sd) UCL	0.390706	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.139269	
95% Bootstrap-t UCL	0.516601	
95% Hall's Bootstrap UCL	0.388616	
95% Percentile Bootstrap UCL	0.150243	
95% BCA Bootstrap UCL	0.180412	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	0.173362	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW08storm.xls	
Variable:	Thallium	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	1.158016	
Maximum	2.152675	
Mean	1.516906	
Standard Deviation	0.387341	
Variance	0.150033	
Coefficient of Variation	0.255349	
Skewness	0.965846	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.898537	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.835548	
Gamma Statistics		
k hat	19.79951	
k star (bias corrected)	10.01086	
Theta hat	0.076613	
Theta star	0.151526	
nu hat	237.5941	
nu star	120.1304	
5% Approximate Chi Square Value	95.81639	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	87.98262	
Anderson-Darling Test Statistic	0.327293	
Anderson-Darling 5% Critical Value	0.697115	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.223569	
Kolmogrov-Smirnov 5% Critical Value	0.331745	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.90183	
95% Adjusted Gamma UCL	2.071164	
Lognormal Statistics		
Minimum of log data	0.146708	
Maximum of log data	0.766711	
Mean of log data	0.391207	
Standard Deviation of log data	0.243307	
Variance of log data	0.059198	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.922648	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.523189	
MLE Standard Deviation	0.376156	
MLE Coefficient of Variation	0.246953	
MLE Skewness	0.75592	
MLE Median	1.478765	
MLE 80% Quantile	1.8163	
MLE 90% Quantile	2.021535	
MLE 95% Quantile	2.206588	
MLE 99% Quantile	2.604237	
MVU Estimate of Median	1.471482	
MVU Estimate of Mean	1.515563	
MVU Estimate of Standard Deviation	0.368741	
MVU Estimate of SE of Mean	0.150528	
95% H-UCL	1.92755	
95% Chebyshev (MVUE) UCL	2.1717	
97.5% Chebyshev (MVUE) UCL	2.455611	
99% Chebyshev (MVUE) UCL	3.0133	
Non-parametric Statisitics		
95% CLT UCL	1.777008	
95% Adjusted-CLT UCL	1.843632	
95% Modified-t UCL	1.84594	
95% Jackknife UCL	1.835548	
95% Chebyshev (Mean, Sd) UCL	2.206184	
97.5% Chebyshev (Mean, Sd) UCL	2.504435	
99% Chebyshev (Mean, Sd) UCL	3.090291	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.751692	
95% Bootstrap-t UCL	2.018183	
95% Hall's Bootstrap UCL	2.075123	
95% Percentile Bootstrap UCL	1.772659	
95% BCA Bootstrap UCL	1.86845	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.835548	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW09base.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	7	
Minimum	0.95	
Maximum	3.8	
Mean	1.98	
Standard Deviation	1.010555	
Variance	1.021222	
Coefficient of Variation	0.510382	
Skewness	0.935048	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.815281	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2.5658	
Gamma Statistics		
k hat	4.771988	
k star (bias corrected)	3.407058	
Theta hat	0.414921	
Theta star	0.581147	
nu hat	95.43976	
nu star	68.14116	
5% Approximate Chi Square Value	50.13806	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	47.46383	
Anderson-Darling Test Statistic	0.787296	
Anderson-Darling 5% Critical Value	0.729436	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.267377	
Kolmogrov-Smirnov 5% Critical Value	0.267519	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	2.69096	
95% Adjusted Gamma UCL	2.842575	
Lognormal Statistics		
Minimum of log data	-0.051293	
Maximum of log data	1.335001	
Mean of log data	0.574675	
Standard Deviation of log data	0.482006	
Variance of log data	0.23233	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.874908	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.995391	
MLE Standard Deviation	1.020455	
MLE Coefficient of Variation	0.511406	
MLE Skewness	1.66797	
MLE Median	1.776553	
MLE 80% Quantile	2.669712	
MLE 90% Quantile	3.300432	
MLE 95% Quantile	3.925821	
MLE 99% Quantile	5.451125	
MVU Estimate of Median	1.756013	
MVU Estimate of Mean	1.970428	
MVU Estimate of Standard Deviation	0.967327	
MVU Estimate of SE of Mean	0.305386	
95% H-UCL	2.839172	
95% Chebyshev (MVUE) UCL	3.301574	
97.5% Chebyshev (MVUE) UCL	3.877562	
99% Chebyshev (MVUE) UCL	5.008979	
Non-parametric Statisitics		
95% CLT UCL	2.505639	
95% Adjusted-CLT UCL	2.606605	
95% Modified-t UCL	2.581549	
95% Jackknife UCL	2.5658	
95% Chebyshev (Mean, Sd) UCL	3.372954	
97.5% Chebyshev (Mean, Sd) UCL	3.975687	
99% Chebyshev (Mean, Sd) UCL	5.159638	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2.475156	
95% Bootstrap-t UCL	2.711353	
95% Hall's Bootstrap UCL	2.445962	
95% Percentile Bootstrap UCL	2.515	
95% BCA Bootstrap UCL	2.745	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	2.69096	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW09base.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	10	
Minimum	15.7	
Maximum	98.4	
Mean	39.83	
Standard Deviation	24.94634	
Variance	622.3201	
Coefficient of Variation	0.62632	
Skewness	1.649675	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.839598	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	54.29093	
Gamma Statistics		
k hat	3.522953	
k star (bias corrected)	2.532734	
Theta hat	11.30586	
Theta star	15.72609	
nu hat	70.45906	
nu star	50.65468	
5% Approximate Chi Square Value	35.30835	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	33.09372	
Anderson-Darling Test Statistic	0.289727	
Anderson-Darling 5% Critical Value	0.730721	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.156725	
Kolmogrov-Smirnov 5% Critical Value	0.268121	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	57.14161	
95% Adjusted Gamma UCL	60.96551	
Lognormal Statistics		
Minimum of log data	2.753661	
Maximum of log data	4.589041	
Mean of log data	3.536032	
Standard Deviation of log data	0.559449	
Variance of log data	0.312983	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.969829	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	40.14602	
MLE Standard Deviation	24.33718	
MLE Coefficient of Variation	0.606217	
MLE Skewness	2.041433	
MLE Median	34.33042	
MLE 80% Quantile	55.07887	
MLE 90% Quantile	70.45145	
MLE 95% Quantile	86.17029	
MLE 99% Quantile	126.1296	
MVU Estimate of Median	33.7966	
MVU Estimate of Mean	39.45344	
MVU Estimate of Standard Deviation	22.61726	
MVU Estimate of SE of Mean	7.131255	
95% H-UCL	61.71587	
95% Chebyshev (MVUE) UCL	70.53786	
97.5% Chebyshev (MVUE) UCL	83.98811	
99% Chebyshev (MVUE) UCL	110.4085	
Non-parametric Statisitics		
95% CLT UCL	52.8058	
95% Adjusted-CLT UCL	57.2031	
95% Modified-t UCL	54.97682	
95% Jackknife UCL	54.29093	
95% Chebyshev (Mean, Sd) UCL	74.21616	
97.5% Chebyshev (Mean, Sd) UCL	89.09508	
99% Chebyshev (Mean, Sd) UCL	118.3218	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	52.14414	
95% Bootstrap-t UCL	67.17668	
95% Hall's Bootstrap UCL	126.8033	
95% Percentile Bootstrap UCL	52.43	
95% BCA Bootstrap UCL	61.2	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	57.14161	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW09storm.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.6	
Maximum	2.5	
Mean	1.2	
Standard Deviation	0.695701	
Variance	0.484	
Coefficient of Variation	0.579751	
Skewness	1.657167	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.829121	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.772312	
Gamma Statistics		
k hat	4.427463	
k star (bias corrected)	2.324842	
Theta hat	0.271036	
Theta star	0.516164	
nu hat	53.12955	
nu star	27.89811	
5% Approximate Chi Square Value	16.84683	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	13.84232	
Anderson-Darling Test Statistic	0.370282	
Anderson-Darling 5% Critical Value	0.699155	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.237364	
Kolmogrov-Smirnov 5% Critical Value	0.333219	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.987182	
95% Adjusted Gamma UCL	2.418506	
Lognormal Statistics		
Minimum of log data	-0.510826	
Maximum of log data	0.916291	
Mean of log data	0.06516	
Standard Deviation of log data	0.509302	
Variance of log data	0.259388	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.937502	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.215134	
MLE Standard Deviation	0.661257	
MLE Coefficient of Variation	0.544184	
MLE Skewness	1.793706	
MLE Median	1.06733	
MLE 80% Quantile	1.641351	
MLE 90% Quantile	2.053637	
MLE 95% Quantile	2.466897	
MLE 99% Quantile	3.489629	
MVU Estimate of Median	1.044436	
MVU Estimate of Mean	1.187228	
MVU Estimate of Standard Deviation	0.604455	
MVU Estimate of SE of Mean	0.246492	
95% H-UCL	2.262938	
95% Chebyshev (MVUE) UCL	2.261661	
97.5% Chebyshev (MVUE) UCL	2.726569	
99% Chebyshev (MVUE) UCL	3.639792	
Non-parametric Statisitics		
95% CLT UCL	1.667169	
95% Adjusted-CLT UCL	1.872483	
95% Modified-t UCL	1.804336	
95% Jackknife UCL	1.772312	
95% Chebyshev (Mean, Sd) UCL	2.438009	
97.5% Chebyshev (Mean, Sd) UCL	2.973697	
99% Chebyshev (Mean, Sd) UCL	4.025951	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.630683	
95% Bootstrap-t UCL	2.547219	
95% Hall's Bootstrap UCL	3.69858	
95% Percentile Bootstrap UCL	1.7	
95% BCA Bootstrap UCL	1.983333	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.772312	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW09storm.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	6	
Minimum	1	
Maximum	4.65	
Mean	2.608333	
Standard Deviation	1.484391	
Variance	2.203417	
Coefficient of Variation	0.569096	
Skewness	0.616233	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.8949	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	3.829453	
Gamma Statistics		
k hat	3.676968	
k star (bias corrected)	1.949595	
Theta hat	0.709371	
Theta star	1.337885	
nu hat	44.12361	
nu star	23.39514	
5% Approximate Chi Square Value	13.38793	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	10.75768	
Anderson-Darling Test Statistic	0.286711	
Anderson-Darling 5% Critical Value	0.700416	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.210235	
Kolmogrov-Smirnov 5% Critical Value	0.333866	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4.558011	
95% Adjusted Gamma UCL	5.672443	
Lognormal Statistics		
Minimum of log data	0	
Maximum of log data	1.536867	
Mean of log data	0.81661	
Standard Deviation of log data	0.59342	
Variance of log data	0.352148	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.950393	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	2.698468	
MLE Standard Deviation	1.753212	
MLE Coefficient of Variation	0.649706	
MLE Skewness	2.223372	
MLE Median	2.262816	
MLE 80% Quantile	3.73613	
MLE 90% Quantile	4.850857	
MLE 95% Quantile	6.006166	
MLE 99% Quantile	8.997132	
MVU Estimate of Median	2.197105	
MVU Estimate of Mean	2.612715	
MVU Estimate of Standard Deviation	1.549514	
MVU Estimate of SE of Mean	0.631328	
95% H-UCL	5.920775	
95% Chebyshev (MVUE) UCL	5.364612	
97.5% Chebyshev (MVUE) UCL	6.55536	
99% Chebyshev (MVUE) UCL	8.894353	
Non-parametric Statisitics		
95% CLT UCL	3.605115	
95% Adjusted-CLT UCL	3.768015	
95% Modified-t UCL	3.854862	
95% Jackknife UCL	3.829453	
95% Chebyshev (Mean, Sd) UCL	5.249826	
97.5% Chebyshev (Mean, Sd) UCL	6.392803	
99% Chebyshev (Mean, Sd) UCL	8.637958	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	3.513964	
95% Bootstrap-t UCL	5.19941	
95% Hall's Bootstrap UCL	13.08493	
95% Percentile Bootstrap UCL	3.583333	
95% BCA Bootstrap UCL	3.975	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	3.829453	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW10base.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	7	
Minimum	0.6	
Maximum	2.9	
Mean	1.34	
Standard Deviation	0.77165	
Variance	0.595444	
Coefficient of Variation	0.575859	
Skewness	1.164381	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.86021	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.787311	
Gamma Statistics		
k hat	3.819925	
k star (bias corrected)	2.740614	
Theta hat	0.350792	
Theta star	0.488941	
nu hat	76.3985	
nu star	54.81228	
5% Approximate Chi Square Value	38.79697	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	36.46673	
Anderson-Darling Test Statistic	0.383449	
Anderson-Darling 5% Critical Value	0.729892	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.160421	
Kolmogrov-Smirnov 5% Critical Value	0.267933	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.89315	
95% Adjusted Gamma UCL	2.014123	
Lognormal Statistics		
Minimum of log data	-0.510826	
Maximum of log data	1.064711	
Mean of log data	0.156104	
Standard Deviation of log data	0.542679	
Variance of log data	0.294501	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.930011	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.354394	
MLE Standard Deviation	0.792588	
MLE Coefficient of Variation	0.585197	
MLE Skewness	1.955996	
MLE Median	1.168948	
MLE 80% Quantile	1.849042	
MLE 90% Quantile	2.347725	
MLE 95% Quantile	2.854256	
MLE 99% Quantile	4.130406	
MVU Estimate of Median	1.151838	
MVU Estimate of Mean	1.332524	
MVU Estimate of Standard Deviation	0.73997	
MVU Estimate of SE of Mean	0.233388	
95% H-UCL	2.046205	
95% Chebyshev (MVUE) UCL	2.349838	
97.5% Chebyshev (MVUE) UCL	2.790031	
99% Chebyshev (MVUE) UCL	3.654704	
Non-parametric Statisitics		
95% CLT UCL	1.741373	
95% Adjusted-CLT UCL	1.837378	
95% Modified-t UCL	1.802286	
95% Jackknife UCL	1.787311	
95% Chebyshev (Mean, Sd) UCL	2.403647	
97.5% Chebyshev (Mean, Sd) UCL	2.863888	
99% Chebyshev (Mean, Sd) UCL	3.767942	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.73008	
95% Bootstrap-t UCL	2.066405	
95% Hall's Bootstrap UCL	2.477916	
95% Percentile Bootstrap UCL	1.745	
95% BCA Bootstrap UCL	1.65	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.787311	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW10base.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	10	
Number of Missing Data	0	
Number of Valid Observations	10	
Number of Distinct Observations	3	
Minimum	0.05	
Maximum	0.36	
Mean	0.0835	
Standard Deviation	0.097469	
Variance	0.0095	
Coefficient of Variation	1.167298	
Skewness	3.125447	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.405214	
Shapiro-Wilk 5% Critical Value	0.842	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.140001	
Gamma Statistics		
k hat	1.969414	
k star (bias corrected)	1.445257	
Theta hat	0.042398	
Theta star	0.057775	
nu hat	39.38829	
nu star	28.90513	
5% Approximate Chi Square Value	17.63236	
Adjusted Level of Significance	0.0267	
Adjusted Chi Square Value	16.11899	
Anderson-Darling Test Statistic	2.817747	
Anderson-Darling 5% Critical Value	0.735803	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.460919	
Kolmogrov-Smirnov 5% Critical Value	0.26989	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.136883	
95% Adjusted Gamma UCL	0.149735	
Lognormal Statistics		
Minimum of log data	-2.995732	
Maximum of log data	-1.021651	
Mean of log data	-2.757778	
Standard Deviation of log data	0.623179	
Variance of log data	0.388353	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.458826	
Shapiro-Wilk 5% Critical Value	0.842	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.077027	
MLE Standard Deviation	0.053062	
MLE Coefficient of Variation	0.688876	
MLE Skewness	2.393533	
MLE Median	0.063433	
MLE 80% Quantile	0.1074	
MLE 90% Quantile	0.141283	
MLE 95% Quantile	0.176816	
MLE 99% Quantile	0.270289	
MVU Estimate of Median	0.062211	
MVU Estimate of Mean	0.075343	
MVU Estimate of Standard Deviation	0.048379	
MVU Estimate of SE of Mean	0.015232	
95% H-UCL	0.126932	
95% Chebyshev (MVUE) UCL	0.141737	
97.5% Chebyshev (MVUE) UCL	0.170466	
99% Chebyshev (MVUE) UCL	0.226899	
Non-parametric Statisitics		
95% CLT UCL	0.134199	
95% Adjusted-CLT UCL	0.166749	
95% Modified-t UCL	0.145078	
95% Jackknife UCL	0.140001	
95% Chebyshev (Mean, Sd) UCL	0.217852	
97.5% Chebyshev (Mean, Sd) UCL	0.275987	
99% Chebyshev (Mean, Sd) UCL	0.39018	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.217852	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW10storm.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	5	
Minimum	0.65	
Maximum	2.775	
Mean	1.3625	
Standard Deviation	0.747956	
Variance	0.559438	
Coefficient of Variation	0.548958	
Skewness	1.693713	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.835523	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.977798	
Gamma Statistics		
k hat	4.866747	
k star (bias corrected)	2.544485	
Theta hat	0.279961	
Theta star	0.535472	
nu hat	58.40096	
nu star	30.53381	
5% Approximate Chi Square Value	18.91093	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	15.70074	
Anderson-Darling Test Statistic	0.351427	
Anderson-Darling 5% Critical Value	0.698307	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.190471	
Kolmogrov-Smirnov 5% Critical Value	0.33289	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.199909	
95% Adjusted Gamma UCL	2.649705	
Lognormal Statistics		
Minimum of log data	-0.430783	
Maximum of log data	1.020651	
Mean of log data	0.203079	
Standard Deviation of log data	0.488682	
Variance of log data	0.23881	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.952961	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.380553	
MLE Standard Deviation	0.717007	
MLE Coefficient of Variation	0.519362	
MLE Skewness	1.698178	
MLE Median	1.22517	
MLE 80% Quantile	1.851536	
MLE 90% Quantile	2.295695	
MLE 95% Quantile	2.73727	
MLE 99% Quantile	3.818101	
MVU Estimate of Median	1.200961	
MVU Estimate of Mean	1.351492	
MVU Estimate of Standard Deviation	0.660261	
MVU Estimate of SE of Mean	0.269293	
95% H-UCL	2.478226	
95% Chebyshev (MVUE) UCL	2.525314	
97.5% Chebyshev (MVUE) UCL	3.033227	
99% Chebyshev (MVUE) UCL	4.030925	
Non-parametric Statisitics		
95% CLT UCL	1.864759	
95% Adjusted-CLT UCL	2.090362	
95% Modified-t UCL	2.012988	
95% Jackknife UCL	1.977798	
95% Chebyshev (Mean, Sd) UCL	2.693497	
97.5% Chebyshev (Mean, Sd) UCL	3.26942	
99% Chebyshev (Mean, Sd) UCL	4.40071	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.823583	
95% Bootstrap-t UCL	2.760998	
95% Hall's Bootstrap UCL	4.494575	
95% Percentile Bootstrap UCL	1.870833	
95% BCA Bootstrap UCL	2.066667	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.977798	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\SW10storm.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	6	
Number of Missing Data	0	
Number of Valid Observations	6	
Number of Distinct Observations	2	
Minimum	0.05	
Maximum	0.1	
Mean	0.058333	
Standard Deviation	0.020412	
Variance	0.000417	
Coefficient of Variation	0.349927	
Skewness	2.44949	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.496293	
Shapiro-Wilk 5% Critical Value	0.788	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.075125	
Gamma Statistics		
k hat	13.10908	
k star (bias corrected)	6.66565	
Theta hat	0.00445	
Theta star	0.008751	
nu hat	157.3089	
nu star	79.9878	
5% Approximate Chi Square Value	60.37714	
Adjusted Level of Significance	0.01222	
Adjusted Chi Square Value	54.26399	
Anderson-Darling Test Statistic	1.721064	
Anderson-Darling 5% Critical Value	0.697944	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.50726	
Kolmogrov-Smirnov 5% Critical Value	0.332247	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.07728	
95% Adjusted Gamma UCL	0.085986	
Lognormal Statistics		
Minimum of log data	-2.995732	
Maximum of log data	-2.302585	
Mean of log data	-2.880208	
Standard Deviation of log data	0.282976	
Variance of log data	0.080076	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.496293	
Shapiro-Wilk 5% Critical Value	0.788	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.058416	
MLE Standard Deviation	0.016867	
MLE Coefficient of Variation	0.288737	
MLE Skewness	0.890282	
MLE Median	0.056123	
MLE 80% Quantile	0.071283	
MLE 90% Quantile	0.080735	
MLE 95% Quantile	0.089393	
MLE 99% Quantile	0.108392	
MVU Estimate of Median	0.055749	
MVU Estimate of Mean	0.058018	
MVU Estimate of Standard Deviation	0.016417	
MVU Estimate of SE of Mean	0.006702	
95% H-UCL	0.077486	
95% Chebyshev (MVUE) UCL	0.087229	
97.5% Chebyshev (MVUE) UCL	0.099869	
99% Chebyshev (MVUE) UCL	0.124697	
Non-parametric Statisitics		
95% CLT UCL	0.07204	
95% Adjusted-CLT UCL	0.080945	
95% Modified-t UCL	0.076514	
95% Jackknife UCL	0.075125	
95% Chebyshev (Mean, Sd) UCL	0.094657	
97.5% Chebyshev (Mean, Sd) UCL	0.110375	
99% Chebyshev (Mean, Sd) UCL	0.141249	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/A	Not enough distinct data error
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.075125	95% Student's-t UCL
2nd Recommended UCL	0.076514	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Antimony	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	4.1	
Maximum	13	
Mean	7.275	
Standard Deviation	3.920353	
Variance	15.36917	
Coefficient of Variation	0.53888	
Skewness	1.676157	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.811287	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	11.88801	
Gamma Statistics		
k hat	5.447729	
k star (bias corrected)	1.528599	
Theta hat	1.335419	
Theta star	4.75926	
nu hat	43.58183	
nu star	12.22879	
5% Approximate Chi Square Value	5.377081	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.471305	
Anderson-Darling 5% Critical Value	0.658857	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.364167	
Kolmogrov-Smirnov 5% Critical Value	0.395804	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	16.54512	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.410987	
Maximum of log data	2.564949	
Mean of log data	1.889864	
Standard Deviation of log data	0.484532	
Variance of log data	0.234771	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.892862	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	7.442816	
MLE Standard Deviation	3.828668	
MLE Coefficient of Variation	0.514411	
MLE Skewness	1.679357	
MLE Median	6.618467	
MLE 80% Quantile	9.967133	
MLE 90% Quantile	12.33557	
MLE 95% Quantile	14.68635	
MLE 99% Quantile	20.42754	
MVU Estimate of Median	6.425942	
MVU Estimate of Mean	7.216736	
MVU Estimate of Standard Deviation	3.437138	
MVU Estimate of SE of Mean	1.717864	
95% H-UCL	26.89668	
95% Chebyshev (MVUE) UCL	14.70473	
97.5% Chebyshev (MVUE) UCL	17.94479	
99% Chebyshev (MVUE) UCL	24.30926	
Non-parametric Statisitics		
95% CLT UCL	10.4992	
95% Adjusted-CLT UCL	12.25454	
95% Modified-t UCL	12.1618	
95% Jackknife UCL	11.88801	
95% Chebyshev (Mean, Sd) UCL	15.81921	
97.5% Chebyshev (Mean, Sd) UCL	19.5163	
99% Chebyshev (Mean, Sd) UCL	26.77851	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	11.88801	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	210	
Maximum	900	
Mean	535	
Standard Deviation	351.0461	
Variance	123233.3	
Coefficient of Variation	0.656161	
Skewness	0.09986	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.847332	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	948.0694	
Gamma Statistics		
k hat	2.744288	
k star (bias corrected)	0.852739	
Theta hat	194.9504	
Theta star	627.3904	
nu hat	21.9543	
nu star	6.821909	
5% Approximate Chi Square Value	2.072767	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.485734	
Anderson-Darling 5% Critical Value	0.659702	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.303694	
Kolmogrov-Smirnov 5% Critical Value	0.396903	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1760.797	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.347108	
Maximum of log data	6.802395	
Mean of log data	6.089144	
Standard Deviation of log data	0.741427	
Variance of log data	0.549714	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.847393	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	580.5642	
MLE Standard Deviation	496.97	
MLE Coefficient of Variation	0.856012	
MLE Skewness	3.195285	
MLE Median	441.0435	
MLE 80% Quantile	825.2193	
MLE 90% Quantile	1143.532	
MLE 95% Quantile	1493.37	
MLE 99% Quantile	2474.274	
MVU Estimate of Median	411.3562	
MVU Estimate of Mean	537.7525	
MVU Estimate of Standard Deviation	383.4465	
MVU Estimate of SE of Mean	191.3313	
95% H-UCL	10412.88	
95% Chebyshev (MVUE) UCL	1371.746	
97.5% Chebyshev (MVUE) UCL	1732.616	
99% Chebyshev (MVUE) UCL	2441.474	
Non-parametric Statisitics		
95% CLT UCL	823.7097	
95% Adjusted-CLT UCL	833.074	
95% Modified-t UCL	949.5301	
95% Jackknife UCL	948.0694	
95% Chebyshev (Mean, Sd) UCL	1300.087	
97.5% Chebyshev (Mean, Sd) UCL	1631.141	
99% Chebyshev (Mean, Sd) UCL	2281.432	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	948.0694	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	4.2	
Maximum	24	
Mean	12.05	
Standard Deviation	9.033825	
Variance	81.61	
Coefficient of Variation	0.749695	
Skewness	0.912149	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.912664	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	22.67994	
Gamma Statistics		
k hat	2.345413	
k star (bias corrected)	0.75302	
Theta hat	5.137688	
Theta star	16.00223	
nu hat	18.7633	
nu star	6.024159	
5% Approximate Chi Square Value	1.651725	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.286927	
Anderson-Darling 5% Critical Value	0.660156	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.266501	
Kolmogrov-Smirnov 5% Critical Value	0.397437	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	43.94867	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.435085	
Maximum of log data	3.178054	
Mean of log data	2.260989	
Standard Deviation of log data	0.792935	
Variance of log data	0.628746	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.951749	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	13.13607	
MLE Standard Deviation	12.28948	
MLE Coefficient of Variation	0.935552	
MLE Skewness	3.625505	
MLE Median	9.59257	
MLE 80% Quantile	18.74672	
MLE 90% Quantile	26.57339	
MLE 95% Quantile	35.35243	
MLE 99% Quantile	60.66432	
MVU Estimate of Median	8.856236	
MVU Estimate of Mean	12.01978	
MVU Estimate of Standard Deviation	9.11799	
MVU Estimate of SE of Mean	4.547078	
95% H-UCL	352.4015	
95% Chebyshev (MVUE) UCL	31.84004	
97.5% Chebyshev (MVUE) UCL	40.41628	
99% Chebyshev (MVUE) UCL	57.26264	
Non-parametric Statisitics		
95% CLT UCL	19.47966	
95% Adjusted-CLT UCL	21.68085	
95% Modified-t UCL	23.02328	
95% Jackknife UCL	22.67994	
95% Chebyshev (Mean, Sd) UCL	31.73877	
97.5% Chebyshev (Mean, Sd) UCL	40.25811	
99% Chebyshev (Mean, Sd) UCL	56.99271	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	22.67994	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	450	
Maximum	1600	
Mean	990	
Standard Deviation	595.035	
Variance	354066.7	
Coefficient of Variation	0.601045	
Skewness	0.088114	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.831032	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1690.167	
Gamma Statistics		
k hat	3.356596	
k star (bias corrected)	1.005816	
Theta hat	294.9417	
Theta star	984.2759	
nu hat	26.85276	
nu star	8.046525	
5% Approximate Chi Square Value	2.761306	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.526696	
Anderson-Darling 5% Critical Value	0.659221	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.31676	
Kolmogrov-Smirnov 5% Critical Value	0.396417	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2884.888	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	6.109248	
Maximum of log data	7.377759	
Mean of log data	6.741411	
Standard Deviation of log data	0.661927	
Variance of log data	0.438148	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.824548	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1054.145	
MLE Standard Deviation	781.6565	
MLE Coefficient of Variation	0.741508	
MLE Skewness	2.632229	
MLE Median	846.7548	
MLE 80% Quantile	1481.395	
MLE 90% Quantile	1982.25	
MLE 95% Quantile	2515.637	
MLE 99% Quantile	3948.353	
MVU Estimate of Median	801.1354	
MVU Estimate of Mean	992.9021	
MVU Estimate of Standard Deviation	636.8868	
MVU Estimate of SE of Mean	318.0158	
95% H-UCL	10713.73	
95% Chebyshev (MVUE) UCL	2379.101	
97.5% Chebyshev (MVUE) UCL	2978.91	
99% Chebyshev (MVUE) UCL	4157.119	
Non-parametric Statisitics		
95% CLT UCL	1479.373	
95% Adjusted-CLT UCL	1493.379	
95% Modified-t UCL	1692.351	
95% Jackknife UCL	1690.167	
95% Chebyshev (Mean, Sd) UCL	2286.849	
97.5% Chebyshev (Mean, Sd) UCL	2847.996	
99% Chebyshev (Mean, Sd) UCL	3950.262	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1690.167	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	240	
Maximum	640	
Mean	397.5	
Standard Deviation	172.8921	
Variance	29891.67	
Coefficient of Variation	0.434949	
Skewness	1.275486	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.916091	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	600.9389	
Gamma Statistics		
k hat	7.732768	
k star (bias corrected)	2.099859	
Theta hat	51.40462	
Theta star	189.2985	
nu hat	61.86214	
nu star	16.79887	
5% Approximate Chi Square Value	8.52739	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.262471	
Anderson-Darling 5% Critical Value	0.657975	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.22305	
Kolmogrov-Smirnov 5% Critical Value	0.395365	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	783.0708	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.480639	
Maximum of log data	6.461468	
Mean of log data	5.919144	
Standard Deviation of log data	0.41286	
Variance of log data	0.170453	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.978048	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	405.1957	
MLE Standard Deviation	174.6774	
MLE Coefficient of Variation	0.431094	
MLE Skewness	1.373397	
MLE Median	372.093	
MLE 80% Quantile	527.4268	
MLE 90% Quantile	632.4924	
MLE 95% Quantile	733.8449	
MLE 99% Quantile	972.0965	
MVU Estimate of Median	364.2154	
MVU Estimate of Mean	396.3374	
MVU Estimate of Standard Deviation	161.5889	
MVU Estimate of SE of Mean	80.77661	
95% H-UCL	1059.045	
95% Chebyshev (MVUE) UCL	748.4344	
97.5% Chebyshev (MVUE) UCL	900.7871	
99% Chebyshev (MVUE) UCL	1200.054	
Non-parametric Statisitics		
95% CLT UCL	539.6911	
95% Adjusted-CLT UCL	598.5986	
95% Modified-t UCL	610.1273	
95% Jackknife UCL	600.9389	
95% Chebyshev (Mean, Sd) UCL	774.3095	
97.5% Chebyshev (Mean, Sd) UCL	937.3553	
99% Chebyshev (Mean, Sd) UCL	1257.627	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	600.9389	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	2	
Minimum	250	
Maximum	390	
Mean	355	
Standard Deviation	70	
Variance	4900	
Coefficient of Variation	0.197183	
Skewness	-2	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.629658	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	437.3677	
Gamma Statistics		
k hat	29.33297	
k star (bias corrected)	7.499909	
Theta hat	12.10242	
Theta star	47.33391	
nu hat	234.6638	
nu star	59.99927	
5% Approximate Chi Square Value	43.18423	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.960719	
Anderson-Darling 5% Critical Value	0.656732	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.468528	
Kolmogrov-Smirnov 5% Critical Value	0.394109	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	493.2296	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.521461	
Maximum of log data	5.966147	
Mean of log data	5.854975	
Standard Deviation of log data	0.222343	
Variance of log data	0.049436	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.629658	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	357.6996	
MLE Standard Deviation	80.52511	
MLE Coefficient of Variation	0.225119	
MLE Skewness	0.686767	
MLE Median	348.9663	
MLE 80% Quantile	421.0936	
MLE 90% Quantile	464.372	
MLE 95% Quantile	503.07	
MLE 99% Quantile	585.3119	
MVU Estimate of Median	346.8138	
MVU Estimate of Mean	355.4717	
MVU Estimate of Standard Deviation	78.7456	
MVU Estimate of SE of Mean	39.37204	
95% H-UCL	515.4981	
95% Chebyshev (MVUE) UCL	527.0904	
97.5% Chebyshev (MVUE) UCL	601.35	
99% Chebyshev (MVUE) UCL	747.2185	
Non-parametric Statisitics		
95% CLT UCL	412.5699	
95% Adjusted-CLT UCL	375.1719	
95% Modified-t UCL	431.5344	
95% Jackknife UCL	437.3677	
95% Chebyshev (Mean, Sd) UCL	507.5615	
97.5% Chebyshev (Mean, Sd) UCL	573.5749	
99% Chebyshev (Mean, Sd) UCL	703.2456	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/A	Not enough distinct data error
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	437.3677	95% Student's-t UCL
2nd Recommended UCL	431.5344	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	3.5	
Maximum	26	
Mean	11.325	
Standard Deviation	10.00612	
Variance	100.1225	
Coefficient of Variation	0.883543	
Skewness	1.728537	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.809809	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	23.09902	
Gamma Statistics		
k hat	2.026978	
k star (bias corrected)	0.673411	
Theta hat	5.587136	
Theta star	16.81737	
nu hat	16.21582	
nu star	5.387289	
5% Approximate Chi Square Value	1.334761	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.377001	
Anderson-Darling 5% Critical Value	0.660519	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.321088	
Kolmogrov-Smirnov 5% Critical Value	0.397864	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	45.70936	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.252763	
Maximum of log data	3.258097	
Mean of log data	2.160505	
Standard Deviation of log data	0.827015	
Variance of log data	0.683954	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.948504	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	12.21276	
MLE Standard Deviation	12.10048	
MLE Coefficient of Variation	0.990806	
MLE Skewness	3.94509	
MLE Median	8.675513	
MLE 80% Quantile	17.44987	
MLE 90% Quantile	25.10881	
MLE 95% Quantile	33.81633	
MLE 99% Quantile	59.3909	
MVU Estimate of Median	7.9526	
MVU Estimate of Mean	11.07825	
MVU Estimate of Standard Deviation	8.733146	
MVU Estimate of SE of Mean	4.35328	
95% H-UCL	434.0775	
95% Chebyshev (MVUE) UCL	30.05376	
97.5% Chebyshev (MVUE) UCL	38.26448	
99% Chebyshev (MVUE) UCL	54.39284	
Non-parametric Statisitics		
95% CLT UCL	19.5543	
95% Adjusted-CLT UCL	24.17455	
95% Modified-t UCL	23.81969	
95% Jackknife UCL	23.09902	
95% Chebyshev (Mean, Sd) UCL	33.13284	
97.5% Chebyshev (Mean, Sd) UCL	42.56911	
99% Chebyshev (Mean, Sd) UCL	61.10483	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	23.09902	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC05-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	34	
Maximum	61	
Mean	44.5	
Standard Deviation	11.61895	
Variance	135	
Coefficient of Variation	0.2611	
Skewness	1.377061	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.896761	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	58.17181	
Gamma Statistics		
k hat	21.29743	
k star (bias corrected)	5.491023	
Theta hat	2.089454	
Theta star	8.104137	
nu hat	170.3794	
nu star	43.92818	
5% Approximate Chi Square Value	29.72581	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.333643	
Anderson-Darling 5% Critical Value	0.65704	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.283801	
Kolmogrov-Smirnov 5% Critical Value	0.394222	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	65.76118	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.526361	
Maximum of log data	4.110874	
Mean of log data	3.771828	
Standard Deviation of log data	0.246441	
Variance of log data	0.060733	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.939821	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	44.79942	
MLE Standard Deviation	11.21019	
MLE Coefficient of Variation	0.250231	
MLE Skewness	0.766361	
MLE Median	43.45946	
MLE 80% Quantile	53.52085	
MLE 90% Quantile	59.65067	
MLE 95% Quantile	65.18467	
MLE 99% Quantile	77.09595	
MVU Estimate of Median	43.13028	
MVU Estimate of Mean	44.45603	
MVU Estimate of Standard Deviation	10.90632	
MVU Estimate of SE of Mean	5.453	
95% H-UCL	68.29701	
95% Chebyshev (MVUE) UCL	68.22511	
97.5% Chebyshev (MVUE) UCL	78.51001	
99% Chebyshev (MVUE) UCL	98.7127	
Non-parametric Statisitics		
95% CLT UCL	54.05574	
95% Adjusted-CLT UCL	58.32979	
95% Modified-t UCL	58.83847	
95% Jackknife UCL	58.17181	
95% Chebyshev (Mean, Sd) UCL	69.82291	
97.5% Chebyshev (Mean, Sd) UCL	80.78016	
99% Chebyshev (Mean, Sd) UCL	102.3035	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	58.17181	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	66	
Maximum	1700	
Mean	859	
Standard Deviation	768.0564	
Variance	589910.7	
Coefficient of Variation	0.894129	
Skewness	0.095614	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.924121	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1762.758	
Gamma Statistics		
k hat	0.999012	
k star (bias corrected)	0.41642	
Theta hat	859.8498	
Theta star	2062.823	
nu hat	7.992094	
nu star	3.331357	
5% Approximate Chi Square Value	0.476783	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.31202	
Anderson-Darling 5% Critical Value	0.666625	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.279821	
Kolmogrov-Smirnov 5% Critical Value	0.40246	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	6001.962	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.189655	
Maximum of log data	7.438384	
Mean of log data	6.177915	
Standard Deviation of log data	1.482829	
Variance of log data	2.198781	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.904975	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1447.084	
MLE Standard Deviation	4096.556	
MLE Coefficient of Variation	2.830904	
MLE Skewness	31.17964	
MLE Median	481.9861	
MLE 80% Quantile	1687.335	
MLE 90% Quantile	3240.07	
MLE 95% Quantile	5525.718	
MLE 99% Quantile	15168.48	
MVU Estimate of Median	360.0171	
MVU Estimate of Mean	990.1231	
MVU Estimate of Standard Deviation	1282.837	
MVU Estimate of SE of Mean	627.5988	
95% H-UCL	1.18E+08	
95% Chebyshev (MVUE) UCL	3725.763	
97.5% Chebyshev (MVUE) UCL	4909.476	
99% Chebyshev (MVUE) UCL	7234.652	
Non-parametric Statisitics		
95% CLT UCL	1490.67	
95% Adjusted-CLT UCL	1510.287	
95% Modified-t UCL	1765.818	
95% Jackknife UCL	1762.758	
95% Chebyshev (Mean, Sd) UCL	2532.94	
97.5% Chebyshev (Mean, Sd) UCL	3257.255	
99% Chebyshev (Mean, Sd) UCL	4680.032	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1762.758	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.8	
Maximum	48	
Mean	18.675	
Standard Deviation	20.96209	
Variance	439.4092	
Coefficient of Variation	1.122468	
Skewness	1.2937	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.901086	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	43.3407	
Gamma Statistics		
k hat	0.751657	
k star (bias corrected)	0.354581	
Theta hat	24.84511	
Theta star	52.66782	
nu hat	6.013255	
nu star	2.836647	
5% Approximate Chi Square Value	0.325561	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.19228	
Anderson-Darling 5% Critical Value	0.670276	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.168921	
Kolmogrov-Smirnov 5% Critical Value	0.404973	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	162.717	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-0.223144	
Maximum of log data	3.871201	
Mean of log data	2.131004	
Standard Deviation of log data	1.758007	
Variance of log data	3.090589	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.960041	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	39.49993	
MLE Standard Deviation	180.9684	
MLE Coefficient of Variation	4.581487	
MLE Skewness	109.91	
MLE Median	8.423323	
MLE 80% Quantile	37.20787	
MLE 90% Quantile	80.64393	
MLE 95% Quantile	151.855	
MLE 99% Quantile	502.768	
MVU Estimate of Median	5.526181	
MVU Estimate of Mean	22.19986	
MVU Estimate of Standard Deviation	32.69209	
MVU Estimate of SE of Mean	15.76753	
95% H-UCL	3.07E+08	
95% Chebyshev (MVUE) UCL	90.92891	
97.5% Chebyshev (MVUE) UCL	120.668	
99% Chebyshev (MVUE) UCL	179.0848	
Non-parametric Statisitics		
95% CLT UCL	35.91478	
95% Adjusted-CLT UCL	43.15895	
95% Modified-t UCL	44.47065	
95% Jackknife UCL	43.3407	
95% Chebyshev (Mean, Sd) UCL	64.36081	
97.5% Chebyshev (Mean, Sd) UCL	84.1291	
99% Chebyshev (Mean, Sd) UCL	122.9601	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	43.3407	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	41	
Maximum	950	
Mean	500.25	
Standard Deviation	429.6048	
Variance	184560.3	
Coefficient of Variation	0.85878	
Skewness	-0.032673	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.919569	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1005.758	
Gamma Statistics		
k hat	1.060093	
k star (bias corrected)	0.43169	
Theta hat	471.8926	
Theta star	1158.818	
nu hat	8.480743	
nu star	3.453519	
5% Approximate Chi Square Value	0.518339	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.331465	
Anderson-Darling 5% Critical Value	0.6661	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.286688	
Kolmogrov-Smirnov 5% Critical Value	0.402094	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	3332.999	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.713572	
Maximum of log data	6.856462	
Mean of log data	5.674266	
Standard Deviation of log data	1.44042	
Variance of log data	2.074809	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.89123	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	821.9422	
MLE Standard Deviation	2168.903	
MLE Coefficient of Variation	2.638754	
MLE Skewness	26.28996	
MLE Median	291.2744	
MLE 80% Quantile	983.7978	
MLE 90% Quantile	1854.193	
MLE 95% Quantile	3114.289	
MLE 99% Quantile	8305.571	
MVU Estimate of Median	221.3966	
MVU Estimate of Mean	577.0774	
MVU Estimate of Standard Deviation	730.906	
MVU Estimate of SE of Mean	358.2461	
95% H-UCL	35561456	
95% Chebyshev (MVUE) UCL	2138.636	
97.5% Chebyshev (MVUE) UCL	2814.324	
99% Chebyshev (MVUE) UCL	4141.581	
Non-parametric Statisitics		
95% CLT UCL	853.5685	
95% Adjusted-CLT UCL	849.819	
95% Modified-t UCL	1005.173	
95% Jackknife UCL	1005.758	
95% Chebyshev (Mean, Sd) UCL	1436.552	
97.5% Chebyshev (Mean, Sd) UCL	1841.69	
99% Chebyshev (Mean, Sd) UCL	2637.507	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1005.758	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	22	
Maximum	620	
Mean	343	
Standard Deviation	306.5877	
Variance	93996	
Coefficient of Variation	0.893842	
Skewness	-0.118408	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.839026	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	703.7561	
Gamma Statistics		
k hat	0.928651	
k star (bias corrected)	0.39883	
Theta hat	369.3528	
Theta star	860.0165	
nu hat	7.429212	
nu star	3.190636	
5% Approximate Chi Square Value	0.430868	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.410417	
Anderson-Darling 5% Critical Value	0.667663	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.318518	
Kolmogrov-Smirnov 5% Critical Value	0.403175	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2539.965	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.091042	
Maximum of log data	6.429719	
Mean of log data	5.210632	
Standard Deviation of log data	1.572567	
Variance of log data	2.472966	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.866588	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	630.8794	
MLE Standard Deviation	2078.799	
MLE Coefficient of Variation	3.295082	
MLE Skewness	45.6618	
MLE Median	183.2098	
MLE 80% Quantile	691.9063	
MLE 90% Quantile	1382.128	
MLE 95% Quantile	2434.518	
MLE 99% Quantile	7104.06	
MVU Estimate of Median	131.6018	
MVU Estimate of Mean	407.1511	
MVU Estimate of Standard Deviation	551.9042	
MVU Estimate of SE of Mean	268.8636	
95% H-UCL	2.09E+08	
95% Chebyshev (MVUE) UCL	1579.1	
97.5% Chebyshev (MVUE) UCL	2086.204	
99% Chebyshev (MVUE) UCL	3082.31	
Non-parametric Statisitics		
95% CLT UCL	595.1459	
95% Adjusted-CLT UCL	585.4485	
95% Modified-t UCL	702.2435	
95% Jackknife UCL	703.7561	
95% Chebyshev (Mean, Sd) UCL	1011.192	
97.5% Chebyshev (Mean, Sd) UCL	1300.32	
99% Chebyshev (Mean, Sd) UCL	1868.254	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	703.7561	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	110	
Maximum	1800	
Mean	775	
Standard Deviation	747.8191	
Variance	559233.3	
Coefficient of Variation	0.964928	
Skewness	1.125954	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.921735	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1654.945	
Gamma Statistics		
k hat	1.236502	
k star (bias corrected)	0.475792	
Theta hat	626.7682	
Theta star	1628.863	
nu hat	9.892015	
nu star	3.806337	
5% Approximate Chi Square Value	0.646439	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.197595	
Anderson-Darling 5% Critical Value	0.664604	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.178378	
Kolmogrov-Smirnov 5% Critical Value	0.40105	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4563.322	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.70048	
Maximum of log data	7.495542	
Mean of log data	6.196839	
Standard Deviation of log data	1.201177	
Variance of log data	1.442825	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.987622	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1010.552	
MLE Standard Deviation	1816.925	
MLE Coefficient of Variation	1.797953	
MLE Skewness	11.20599	
MLE Median	491.1941	
MLE 80% Quantile	1355.375	
MLE 90% Quantile	2299.28	
MLE 95% Quantile	3543.162	
MLE 99% Quantile	8028.685	
MVU Estimate of Median	407.2772	
MVU Estimate of Mean	803.5869	
MVU Estimate of Standard Deviation	878.3515	
MVU Estimate of SE of Mean	434.3143	
95% H-UCL	1730435	
95% Chebyshev (MVUE) UCL	2696.719	
97.5% Chebyshev (MVUE) UCL	3515.879	
99% Chebyshev (MVUE) UCL	5124.96	
Non-parametric Statisitics		
95% CLT UCL	1390.026	
95% Adjusted-CLT UCL	1614.951	
95% Modified-t UCL	1690.029	
95% Jackknife UCL	1654.945	
95% Chebyshev (Mean, Sd) UCL	2404.834	
97.5% Chebyshev (Mean, Sd) UCL	3110.064	
99% Chebyshev (Mean, Sd) UCL	4495.353	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1654.945	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.31	
Maximum	8.2	
Mean	4.7775	
Standard Deviation	3.949602	
Variance	15.59936	
Coefficient of Variation	0.826709	
Skewness	-0.280641	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.855556	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	9.424924	
Gamma Statistics		
k hat	1.008252	
k star (bias corrected)	0.41873	
Theta hat	4.738401	
Theta star	11.40951	
nu hat	8.066012	
nu star	3.349836	
5% Approximate Chi Square Value	0.482971	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.430224	
Anderson-Darling 5% Critical Value	0.66654	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.312863	
Kolmogrov-Smirnov 5% Critical Value	0.402401	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	33.13625	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-1.171183	
Maximum of log data	2.104134	
Mean of log data	0.991976	
Standard Deviation of log data	1.538404	
Variance of log data	2.366688	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.838034	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	8.805002	
MLE Standard Deviation	27.36928	
MLE Coefficient of Variation	3.108379	
MLE Skewness	39.35835	
MLE Median	2.696558	
MLE 80% Quantile	9.893992	
MLE 90% Quantile	19.46904	
MLE 95% Quantile	33.87411	
MLE 99% Quantile	96.57351	
MVU Estimate of Median	1.966699	
MVU Estimate of Mean	5.814037	
MVU Estimate of Standard Deviation	7.750005	
MVU Estimate of SE of Mean	3.781745	
95% H-UCL	1692138	
95% Chebyshev (MVUE) UCL	22.29828	
97.5% Chebyshev (MVUE) UCL	29.43103	
99% Chebyshev (MVUE) UCL	43.44192	
Non-parametric Statisitics		
95% CLT UCL	8.025759	
95% Adjusted-CLT UCL	7.729668	
95% Modified-t UCL	9.37874	
95% Jackknife UCL	9.424924	
95% Chebyshev (Mean, Sd) UCL	13.38546	
97.5% Chebyshev (Mean, Sd) UCL	17.11013	
99% Chebyshev (Mean, Sd) UCL	24.42652	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	9.424924	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	5.3	
Maximum	64	
Mean	35.325	
Standard Deviation	26.5623	
Variance	705.5558	
Coefficient of Variation	0.751941	
Skewness	-0.095866	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.958149	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	66.58037	
Gamma Statistics		
k hat	1.545434	
k star (bias corrected)	0.553025	
Theta hat	22.85766	
Theta star	63.87595	
nu hat	12.36347	
nu star	4.424201	
5% Approximate Chi Square Value	0.895758	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.29972	
Anderson-Darling 5% Critical Value	0.662205	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.264782	
Kolmogrov-Smirnov 5% Critical Value	0.399346	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	174.4722	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.667707	
Maximum of log data	4.158883	
Mean of log data	3.207414	
Standard Deviation of log data	1.123389	
Variance of log data	1.262003	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.90361	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	46.4518	
MLE Standard Deviation	73.92243	
MLE Coefficient of Variation	1.591379	
MLE Skewness	8.804289	
MLE Median	24.71509	
MLE 80% Quantile	63.859	
MLE 90% Quantile	104.6863	
MLE 95% Quantile	156.8655	
MLE 99% Quantile	337.1124	
MVU Estimate of Median	20.99668	
MVU Estimate of Mean	38.18894	
MVU Estimate of Standard Deviation	39.45075	
MVU Estimate of SE of Mean	19.55053	
95% H-UCL	31558.33	
95% Chebyshev (MVUE) UCL	123.4077	
97.5% Chebyshev (MVUE) UCL	160.282	
99% Chebyshev (MVUE) UCL	232.7142	
Non-parametric Statisitics		
95% CLT UCL	57.17055	
95% Adjusted-CLT UCL	56.49033	
95% Modified-t UCL	66.47427	
95% Jackknife UCL	66.58037	
95% Chebyshev (Mean, Sd) UCL	93.21619	
97.5% Chebyshev (Mean, Sd) UCL	118.2658	
99% Chebyshev (Mean, Sd) UCL	167.4708	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	66.58037	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC06-f.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	200	
Maximum	4600	
Mean	1950	
Standard Deviation	1913.984	
Variance	3663333	
Coefficient of Variation	0.98153	
Skewness	1.17834	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.926743	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	4202.149	
Gamma Statistics		
k hat	1.107064	
k star (bias corrected)	0.443433	
Theta hat	1761.416	
Theta star	4397.512	
nu hat	8.856509	
nu star	3.54746	
5% Approximate Chi Square Value	0.55131	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.191741	
Anderson-Darling 5% Critical Value	0.665702	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.169258	
Kolmogrov-Smirnov 5% Critical Value	0.401816	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	12547.47	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.298317	
Maximum of log data	8.433812	
Mean of log data	7.060197	
Standard Deviation of log data	1.329992	
Variance of log data	1.768879	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.971844	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	2820.406	
MLE Standard Deviation	6220.437	
MLE Coefficient of Variation	2.205511	
MLE Skewness	17.34475	
MLE Median	1164.674	
MLE 80% Quantile	3583.302	
MLE 90% Quantile	6433.26	
MLE 95% Quantile	10384.13	
MLE 99% Quantile	25687.47	
MVU Estimate of Median	923.7056	
MVU Estimate of Mean	2106.38	
MVU Estimate of Standard Deviation	2503.455	
MVU Estimate of SE of Mean	1232.479	
95% H-UCL	25570202	
95% Chebyshev (MVUE) UCL	7478.633	
97.5% Chebyshev (MVUE) UCL	9803.211	
99% Chebyshev (MVUE) UCL	14369.39	
Non-parametric Statisitics		
95% CLT UCL	3524.111	
95% Adjusted-CLT UCL	4126.573	
95% Modified-t UCL	4296.121	
95% Jackknife UCL	4202.149	
95% Chebyshev (Mean, Sd) UCL	6121.431	
97.5% Chebyshev (Mean, Sd) UCL	7926.412	
99% Chebyshev (Mean, Sd) UCL	11471.95	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	4202.149	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	61	
Maximum	440	
Mean	207.75	
Standard Deviation	162.8709	
Variance	26526.92	
Coefficient of Variation	0.783975	
Skewness	1.41239	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.885635	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	399.3971	
Gamma Statistics		
k hat	2.2711	
k star (bias corrected)	0.734442	
Theta hat	91.47548	
Theta star	282.8679	
nu hat	18.1688	
nu star	5.875534	
5% Approximate Chi Square Value	1.576108	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.266923	
Anderson-Darling 5% Critical Value	0.660241	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.244255	
Kolmogrov-Smirnov 5% Critical Value	0.397537	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	774.4659	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.110874	
Maximum of log data	6.086775	
Mean of log data	5.10031	
Standard Deviation of log data	0.810087	
Variance of log data	0.656241	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.979161	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	227.7914	
MLE Standard Deviation	219.3824	
MLE Coefficient of Variation	0.963085	
MLE Skewness	3.782546	
MLE Median	164.0728	
MLE 80% Quantile	325.3279	
MLE 90% Quantile	464.644	
MLE 95% Quantile	621.9768	
MLE 99% Quantile	1079.844	
MVU Estimate of Median	150.9412	
MVU Estimate of Mean	207.5374	
MVU Estimate of Standard Deviation	160.5478	
MVU Estimate of SE of Mean	80.04714	
95% H-UCL	7030.094	
95% Chebyshev (MVUE) UCL	556.4548	
97.5% Chebyshev (MVUE) UCL	707.4316	
99% Chebyshev (MVUE) UCL	1003.996	
Non-parametric Statisitics		
95% CLT UCL	341.6994	
95% Adjusted-CLT UCL	403.1489	
95% Modified-t UCL	408.982	
95% Jackknife UCL	399.3971	
95% Chebyshev (Mean, Sd) UCL	562.7188	
97.5% Chebyshev (Mean, Sd) UCL	716.3141	
99% Chebyshev (Mean, Sd) UCL	1018.022	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	399.3971	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	2.7	
Maximum	25	
Mean	10.575	
Standard Deviation	9.870284	
Variance	97.4225	
Coefficient of Variation	0.93336	
Skewness	1.688779	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.82476	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	22.18918	
Gamma Statistics		
k hat	1.74444	
k star (bias corrected)	0.602777	
Theta hat	6.062117	
Theta star	17.54381	
nu hat	13.95552	
nu star	4.822213	
5% Approximate Chi Square Value	1.070567	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.327444	
Anderson-Darling 5% Critical Value	0.66148	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.292673	
Kolmogrov-Smirnov 5% Critical Value	0.398713	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	47.63355	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	0.993252	
Maximum of log data	3.218876	
Mean of log data	2.045274	
Standard Deviation of log data	0.913793	
Variance of log data	0.835018	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.96784	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	11.73744	
MLE Standard Deviation	13.40771	
MLE Coefficient of Variation	1.142303	
MLE Skewness	4.91745	
MLE Median	7.73128	
MLE 80% Quantile	16.73379	
MLE 90% Quantile	25.01558	
MLE 95% Quantile	34.7599	
MLE 99% Quantile	64.76451	
MVU Estimate of Median	6.949206	
MVU Estimate of Mean	10.39005	
MVU Estimate of Standard Deviation	8.962205	
MVU Estimate of SE of Mean	4.461617	
95% H-UCL	901.4	
95% Chebyshev (MVUE) UCL	29.83779	
97.5% Chebyshev (MVUE) UCL	38.25284	
99% Chebyshev (MVUE) UCL	54.78258	
Non-parametric Statisitics		
95% CLT UCL	18.69259	
95% Adjusted-CLT UCL	23.14528	
95% Modified-t UCL	22.88371	
95% Jackknife UCL	22.18918	
95% Chebyshev (Mean, Sd) UCL	32.08678	
97.5% Chebyshev (Mean, Sd) UCL	41.39495	
99% Chebyshev (Mean, Sd) UCL	59.67904	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	22.18918	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	77	
Maximum	910	
Mean	401.75	
Standard Deviation	357.0326	
Variance	127472.3	
Coefficient of Variation	0.888693	
Skewness	1.391597	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.887267	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	821.8637	
Gamma Statistics		
k hat	1.614589	
k star (bias corrected)	0.570314	
Theta hat	248.825	
Theta star	704.4367	
nu hat	12.91671	
nu star	4.562511	
5% Approximate Chi Square Value	0.955352	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.25864	
Anderson-Darling 5% Critical Value	0.661953	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.225307	
Kolmogrov-Smirnov 5% Critical Value	0.399126	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1918.653	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.343805	
Maximum of log data	6.813445	
Mean of log data	5.655246	
Standard Deviation of log data	1.0152	
Variance of log data	1.03063	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.967644	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	478.4546	
MLE Standard Deviation	642.4189	
MLE Coefficient of Variation	1.342696	
MLE Skewness	6.448741	
MLE Median	285.7869	
MLE 80% Quantile	673.9055	
MLE 90% Quantile	1053.399	
MLE 95% Quantile	1518.153	
MLE 99% Quantile	3030.856	
MVU Estimate of Median	250.3663	
MVU Estimate of Mean	409.7765	
MVU Estimate of Standard Deviation	387.9126	
MVU Estimate of SE of Mean	192.7381	
95% H-UCL	99715.36	
95% Chebyshev (MVUE) UCL	1249.902	
97.5% Chebyshev (MVUE) UCL	1613.426	
99% Chebyshev (MVUE) UCL	2327.497	
Non-parametric Statisitics		
95% CLT UCL	695.3832	
95% Adjusted-CLT UCL	828.1048	
95% Modified-t UCL	842.5656	
95% Jackknife UCL	821.8637	
95% Chebyshev (Mean, Sd) UCL	1179.884	
97.5% Chebyshev (Mean, Sd) UCL	1516.584	
99% Chebyshev (Mean, Sd) UCL	2177.965	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	821.8637	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	36	
Maximum	570	
Mean	236.5	
Standard Deviation	231.7089	
Variance	53689	
Coefficient of Variation	0.979742	
Skewness	1.515767	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.866915	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	509.1476	
Gamma Statistics		
k hat	1.334699	
k star (bias corrected)	0.500341	
Theta hat	177.1936	
Theta star	472.6773	
nu hat	10.67759	
nu star	4.002731	
5% Approximate Chi Square Value	0.722484	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.256608	
Anderson-Darling 5% Critical Value	0.663772	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.22916	
Kolmogrov-Smirnov 5% Critical Value	0.400469	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1310.266	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.583519	
Maximum of log data	6.345636	
Mean of log data	5.046704	
Standard Deviation of log data	1.135718	
Variance of log data	1.289855	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.970381	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	296.3767	
MLE Standard Deviation	480.8486	
MLE Coefficient of Variation	1.622424	
MLE Skewness	9.137913	
MLE Median	155.509	
MLE 80% Quantile	406.013	
MLE 90% Quantile	669.2121	
MLE 95% Quantile	1007.23	
MLE 99% Quantile	2182.843	
MVU Estimate of Median	131.6212	
MVU Estimate of Mean	242.4284	
MVU Estimate of Standard Deviation	252.7725	
MVU Estimate of SE of Mean	125.2243	
95% H-UCL	232151.2	
95% Chebyshev (MVUE) UCL	788.2684	
97.5% Chebyshev (MVUE) UCL	1024.454	
99% Chebyshev (MVUE) UCL	1488.394	
Non-parametric Statisitics		
95% CLT UCL	427.0636	
95% Adjusted-CLT UCL	520.8836	
95% Modified-t UCL	523.7816	
95% Jackknife UCL	509.1476	
95% Chebyshev (Mean, Sd) UCL	741.4978	
97.5% Chebyshev (Mean, Sd) UCL	960.0107	
99% Chebyshev (Mean, Sd) UCL	1389.237	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	509.1476	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	270	
Maximum	2600	
Mean	1060	
Standard Deviation	1045.785	
Variance	1093667	
Coefficient of Variation	0.98659	
Skewness	1.777326	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.796198	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2290.556	
Gamma Statistics		
k hat	1.630524	
k star (bias corrected)	0.574298	
Theta hat	650.0978	
Theta star	1845.733	
nu hat	13.04419	
nu star	4.594381	
5% Approximate Chi Square Value	0.969262	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.375355	
Anderson-Darling 5% Critical Value	0.661895	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.320587	
Kolmogrov-Smirnov 5% Critical Value	0.399075	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	5024.484	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.598422	
Maximum of log data	7.863267	
Mean of log data	6.62905	
Standard Deviation of log data	0.933607	
Variance of log data	0.871622	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.952843	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1170.12	
MLE Standard Deviation	1379.94	
MLE Coefficient of Variation	1.179315	
MLE Skewness	5.17812	
MLE Median	756.7632	
MLE 80% Quantile	1665.612	
MLE 90% Quantile	2511.75	
MLE 95% Quantile	3515.136	
MLE 99% Quantile	6638.357	
MVU Estimate of Median	676.9652	
MVU Estimate of Mean	1029.536	
MVU Estimate of Standard Deviation	905.203	
MVU Estimate of SE of Mean	450.4786	
95% H-UCL	108310.2	
95% Chebyshev (MVUE) UCL	2993.127	
97.5% Chebyshev (MVUE) UCL	3842.774	
99% Chebyshev (MVUE) UCL	5511.742	
Non-parametric Statisitics		
95% CLT UCL	1920.082	
95% Adjusted-CLT UCL	2416.594	
95% Modified-t UCL	2368.002	
95% Jackknife UCL	2290.556	
95% Chebyshev (Mean, Sd) UCL	3339.236	
97.5% Chebyshev (Mean, Sd) UCL	4325.463	
99% Chebyshev (Mean, Sd) UCL	6262.716	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2290.556	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.41	
Maximum	3.7	
Mean	1.6425	
Standard Deviation	1.456763	
Variance	2.122158	
Coefficient of Variation	0.886918	
Skewness	1.371205	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.893455	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	3.356646	
Gamma Statistics		
k hat	1.749495	
k star (bias corrected)	0.60404	
Theta hat	0.938842	
Theta star	2.719189	
nu hat	13.99596	
nu star	4.832324	
5% Approximate Chi Square Value	1.075136	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.221442	
Anderson-Darling 5% Critical Value	0.661462	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.194075	
Kolmogrov-Smirnov 5% Critical Value	0.398697	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	7.382406	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-0.891598	
Maximum of log data	1.308333	
Mean of log data	0.183979	
Standard Deviation of log data	0.93362	
Variance of log data	0.871647	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.99855	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.85856	
MLE Standard Deviation	2.191876	
MLE Coefficient of Variation	1.179341	
MLE Skewness	5.178302	
MLE Median	1.20199	
MLE 80% Quantile	2.645574	
MLE 90% Quantile	3.989559	
MLE 95% Quantile	5.583323	
MLE 99% Quantile	10.54424	
MVU Estimate of Median	1.075241	
MVU Estimate of Mean	1.635258	
MVU Estimate of Standard Deviation	1.437792	
MVU Estimate of SE of Mean	0.715524	
95% H-UCL	172.0565	
95% Chebyshev (MVUE) UCL	4.754155	
97.5% Chebyshev (MVUE) UCL	6.103704	
99% Chebyshev (MVUE) UCL	8.754633	
Non-parametric Statisitics		
95% CLT UCL	2.840581	
95% Adjusted-CLT UCL	3.374176	
95% Modified-t UCL	3.439876	
95% Jackknife UCL	3.356646	
95% Chebyshev (Mean, Sd) UCL	4.817441	
97.5% Chebyshev (Mean, Sd) UCL	6.191241	
99% Chebyshev (Mean, Sd) UCL	8.889804	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	3.356646	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	30	
Maximum	72	
Mean	44.25	
Standard Deviation	18.87459	
Variance	356.25	
Coefficient of Variation	0.426544	
Skewness	1.761767	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.806861	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	66.45938	
Gamma Statistics		
k hat	8.692927	
k star (bias corrected)	2.339898	
Theta hat	5.090345	
Theta star	18.91108	
nu hat	69.54342	
nu star	18.71919	
5% Approximate Chi Square Value	9.911188	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.479171	
Anderson-Darling 5% Critical Value	0.657605	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.348779	
Kolmogrov-Smirnov 5% Critical Value	0.395181	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	83.57465	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.401197	
Maximum of log data	4.276666	
Mean of log data	3.731236	
Standard Deviation of log data	0.379833	
Variance of log data	0.144273	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.873991	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	44.8522	
MLE Standard Deviation	17.6697	
MLE Coefficient of Variation	0.393954	
MLE Skewness	1.243003	
MLE Median	41.73066	
MLE 80% Quantile	57.52358	
MLE 90% Quantile	67.98735	
MLE 95% Quantile	77.94953	
MLE 99% Quantile	100.9604	
MVU Estimate of Median	40.98214	
MVU Estimate of Mean	44.02532	
MVU Estimate of Standard Deviation	16.54494	
MVU Estimate of SE of Mean	8.271149	
95% H-UCL	102.8553	
95% Chebyshev (MVUE) UCL	80.07842	
97.5% Chebyshev (MVUE) UCL	95.67863	
99% Chebyshev (MVUE) UCL	126.3222	
Non-parametric Statisitics		
95% CLT UCL	59.77297	
95% Adjusted-CLT UCL	68.6557	
95% Modified-t UCL	67.84491	
95% Jackknife UCL	66.45938	
95% Chebyshev (Mean, Sd) UCL	85.38621	
97.5% Chebyshev (Mean, Sd) UCL	103.1859	
99% Chebyshev (Mean, Sd) UCL	138.1499	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	66.45938	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC07-f.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	460	
Maximum	4800	
Mean	2115	
Standard Deviation	1884.914	
Variance	3552900	
Coefficient of Variation	0.891212	
Skewness	1.420795	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.891789	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	4332.943	
Gamma Statistics		
k hat	1.685987	
k star (bias corrected)	0.588164	
Theta hat	1254.458	
Theta star	3595.939	
nu hat	13.4879	
nu star	4.705308	
5% Approximate Chi Square Value	1.018184	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.222833	
Anderson-Darling 5% Critical Value	0.661693	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.200418	
Kolmogrov-Smirnov 5% Critical Value	0.398899	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	9773.998	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	6.131226	
Maximum of log data	8.476371	
Mean of log data	7.331832	
Standard Deviation of log data	0.970395	
Variance of log data	0.941667	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.993407	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	2447.115	
MLE Standard Deviation	3060.609	
MLE Coefficient of Variation	1.250701	
MLE Skewness	5.708515	
MLE Median	1528.178	
MLE 80% Quantile	3469.673	
MLE 90% Quantile	5317.665	
MLE 95% Quantile	7541.165	
MLE 99% Quantile	14602.84	
MVU Estimate of Median	1354.545	
MVU Estimate of Mean	2127.955	
MVU Estimate of Standard Deviation	1936.153	
MVU Estimate of SE of Mean	962.8775	
95% H-UCL	323841.3	
95% Chebyshev (MVUE) UCL	6325.04	
97.5% Chebyshev (MVUE) UCL	8141.123	
99% Chebyshev (MVUE) UCL	11708.46	
Non-parametric Statisitics		
95% CLT UCL	3665.204	
95% Adjusted-CLT UCL	4380.594	
95% Modified-t UCL	4444.53	
95% Jackknife UCL	4332.943	
95% Chebyshev (Mean, Sd) UCL	6223.074	
97.5% Chebyshev (Mean, Sd) UCL	8000.641	
99% Chebyshev (Mean, Sd) UCL	11492.33	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	4332.943	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	10	
Maximum	1250	
Mean	352.5	
Standard Deviation	601.4635	
Variance	361758.3	
Coefficient of Variation	1.706279	
Skewness	1.939451	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.70374	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1060.231	
Gamma Statistics		
k hat	0.389715	
k star (bias corrected)	0.264095	
Theta hat	904.5079	
Theta star	1334.745	
nu hat	3.117717	
nu star	2.112763	
5% Approximate Chi Square Value	0.166799	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.446558	
Anderson-Darling 5% Critical Value	0.693714	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.305973	
Kolmogrov-Smirnov 5% Critical Value	0.414567	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4464.949	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	2.302585	
Maximum of log data	7.130899	
Mean of log data	4.169428	
Standard Deviation of log data	2.333583	
Variance of log data	5.44561	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.865652	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	984.5973	
MLE Standard Deviation	14956.11	
MLE Coefficient of Variation	15.19008	
MLE Skewness	3550.508	
MLE Median	64.67844	
MLE 80% Quantile	464.6598	
MLE 90% Quantile	1297.354	
MLE 95% Quantile	3005.418	
MLE 99% Quantile	14725.59	
MVU Estimate of Median	28.81597	
MVU Estimate of Mean	305.7824	
MVU Estimate of Standard Deviation	546.2951	
MVU Estimate of SE of Mean	253.0794	
95% H-UCL	1.29E+15	
95% Chebyshev (MVUE) UCL	1408.93	
97.5% Chebyshev (MVUE) UCL	1886.263	
99% Chebyshev (MVUE) UCL	2823.891	
Non-parametric Statisitics		
95% CLT UCL	847.1597	
95% Adjusted-CLT UCL	1158.768	
95% Modified-t UCL	1108.836	
95% Jackknife UCL	1060.231	
95% Chebyshev (Mean, Sd) UCL	1663.359	
97.5% Chebyshev (Mean, Sd) UCL	2230.569	
99% Chebyshev (Mean, Sd) UCL	3344.743	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	4464.949	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.7	
Maximum	22.4	
Mean	6.8625	
Standard Deviation	10.44664	
Variance	109.1323	
Coefficient of Variation	1.522279	
Skewness	1.902717	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.723458	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	19.15487	
Gamma Statistics		
k hat	0.621163	
k star (bias corrected)	0.321958	
Theta hat	11.04782	
Theta star	21.31492	
nu hat	4.969307	
nu star	2.57566	
5% Approximate Chi Square Value	0.258544	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.46771	
Anderson-Darling 5% Critical Value	0.675768	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.295451	
Kolmogrov-Smirnov 5% Critical Value	0.407706	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	68.36548	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-0.356675	
Maximum of log data	3.109061	
Mean of log data	0.936409	
Standard Deviation of log data	1.633971	
Variance of log data	2.66986	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.873266	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	9.692373	
MLE Standard Deviation	35.53011	
MLE Coefficient of Variation	3.66578	
MLE Skewness	60.25788	
MLE Median	2.550806	
MLE 80% Quantile	10.14636	
MLE 90% Quantile	20.82307	
MLE 95% Quantile	37.49813	
MLE 99% Quantile	114.0943	
MVU Estimate of Median	1.780797	
MVU Estimate of Mean	5.991129	
MVU Estimate of Standard Deviation	8.359269	
MVU Estimate of SE of Mean	4.059534	
95% H-UCL	8765574	
95% Chebyshev (MVUE) UCL	23.68623	
97.5% Chebyshev (MVUE) UCL	31.34291	
99% Chebyshev (MVUE) UCL	46.38298	
Non-parametric Statisitics		
95% CLT UCL	15.4541	
95% Adjusted-CLT UCL	20.76381	
95% Modified-t UCL	19.98308	
95% Jackknife UCL	19.15487	
95% Chebyshev (Mean, Sd) UCL	29.63042	
97.5% Chebyshev (Mean, Sd) UCL	39.48212	
99% Chebyshev (Mean, Sd) UCL	58.83388	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	68.36548	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	1.45	
Maximum	1410	
Mean	385.7375	
Standard Deviation	685.5243	
Variance	469943.6	
Coefficient of Variation	1.777178	
Skewness	1.954247	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.694495	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1192.381	
Gamma Statistics		
k hat	0.258643	
k star (bias corrected)	0.231327	
Theta hat	1491.389	
Theta star	1667.496	
nu hat	2.069145	
nu star	1.850619	
5% Approximate Chi Square Value	0.133718	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.413062	
Anderson-Darling 5% Critical Value	0.715871	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.314587	
Kolmogrov-Smirnov 5% Critical Value	0.420684	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	5338.499	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	0.371564	
Maximum of log data	7.251345	
Mean of log data	3.223977	
Standard Deviation of log data	3.415711	
Variance of log data	11.66708	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.856752	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	8582.821	
MLE Standard Deviation	2931587	
MLE Coefficient of Variation	341.5645	
MLE Skewness	39850109	
MLE Median	25.12786	
MLE 80% Quantile	450.4526	
MLE 90% Quantile	2024.678	
MLE 95% Quantile	6924.504	
MLE 99% Quantile	70892.57	
MVU Estimate of Median	1.55003	
MVU Estimate of Mean	411.7886	
MVU Estimate of Standard Deviation	921.4483	
MVU Estimate of SE of Mean	387.0048	
95% H-UCL	7.29E+29	
95% Chebyshev (MVUE) UCL	2098.703	
97.5% Chebyshev (MVUE) UCL	2828.633	
99% Chebyshev (MVUE) UCL	4262.438	
Non-parametric Statisitics		
95% CLT UCL	949.5311	
95% Adjusted-CLT UCL	1307.399	
95% Modified-t UCL	1248.201	
95% Jackknife UCL	1192.381	
95% Chebyshev (Mean, Sd) UCL	1879.803	
97.5% Chebyshev (Mean, Sd) UCL	2526.286	
99% Chebyshev (Mean, Sd) UCL	3796.178	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	5338.499	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	4.9	
Maximum	676	
Mean	185.475	
Standard Deviation	327.901	
Variance	107519	
Coefficient of Variation	1.767898	
Skewness	1.968306	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.684061	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	571.31	
Gamma Statistics		
k hat	0.372346	
k star (bias corrected)	0.259753	
Theta hat	498.1251	
Theta star	714.0431	
nu hat	2.97877	
nu star	2.078026	
5% Approximate Chi Square Value	0.161543	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.474912	
Anderson-Darling 5% Critical Value	0.695731	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.297804	
Kolmogrov-Smirnov 5% Critical Value	0.415245	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2385.871	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.589235	
Maximum of log data	6.516193	
Mean of log data	3.435054	
Standard Deviation of log data	2.351013	
Variance of log data	5.527263	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.866694	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	492.1021	
MLE Standard Deviation	7787.893	
MLE Coefficient of Variation	15.82577	
MLE Skewness	4011.117	
MLE Median	31.0331	
MLE 80% Quantile	226.2546	
MLE 90% Quantile	636.5777	
MLE 95% Quantile	1483.963	
MLE 99% Quantile	7357.764	
MVU Estimate of Median	13.6219	
MVU Estimate of Mean	149.4931	
MVU Estimate of Standard Deviation	268.3487	
MVU Estimate of SE of Mean	124.1427	
95% H-UCL	9.78E+14	
95% Chebyshev (MVUE) UCL	690.6188	
97.5% Chebyshev (MVUE) UCL	924.7643	
99% Chebyshev (MVUE) UCL	1384.698	
Non-parametric Statisitics		
95% CLT UCL	455.1495	
95% Adjusted-CLT UCL	627.5569	
95% Modified-t UCL	598.2021	
95% Jackknife UCL	571.31	
95% Chebyshev (Mean, Sd) UCL	900.1186	
97.5% Chebyshev (Mean, Sd) UCL	1209.345	
99% Chebyshev (Mean, Sd) UCL	1816.762	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	2385.871	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	25	
Maximum	591	
Mean	205.25	
Standard Deviation	265.5314	
Variance	70506.92	
Coefficient of Variation	1.293697	
Skewness	1.658172	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.800915	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	517.6959	
Gamma Statistics		
k hat	0.791148	
k star (bias corrected)	0.364454	
Theta hat	259.4333	
Theta star	563.1719	
nu hat	6.32918	
nu star	2.915628	
5% Approximate Chi Square Value	0.347704	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.356377	
Anderson-Darling 5% Critical Value	0.669693	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.291954	
Kolmogrov-Smirnov 5% Critical Value	0.404572	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1721.099	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.218876	
Maximum of log data	6.381816	
Mean of log data	4.57296	
Standard Deviation of log data	1.467177	
Variance of log data	2.152608	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.920873	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	284.0822	
MLE Standard Deviation	783.5357	
MLE Coefficient of Variation	2.75813	
MLE Skewness	29.25626	
MLE Median	96.83026	
MLE 80% Quantile	334.5292	
MLE 90% Quantile	637.9641	
MLE 95% Quantile	1081.891	
MLE 99% Quantile	2938.379	
MVU Estimate of Median	72.79971	
MVU Estimate of Mean	196.2596	
MVU Estimate of Standard Deviation	252.1864	
MVU Estimate of SE of Mean	123.4627	
95% H-UCL	18289049	
95% Chebyshev (MVUE) UCL	734.4209	
97.5% Chebyshev (MVUE) UCL	967.2837	
99% Chebyshev (MVUE) UCL	1424.698	
Non-parametric Statisitics		
95% CLT UCL	423.6301	
95% Adjusted-CLT UCL	541.246	
95% Modified-t UCL	536.0416	
95% Jackknife UCL	517.6959	
95% Chebyshev (Mean, Sd) UCL	783.9622	
97.5% Chebyshev (Mean, Sd) UCL	1034.371	
99% Chebyshev (Mean, Sd) UCL	1526.252	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	517.6959	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	0.0125	
Maximum	14	
Mean	3.75625	
Standard Deviation	6.845014	
Variance	46.85422	
Coefficient of Variation	1.8223	
Skewness	1.972743	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.680164	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	11.81065	
Gamma Statistics		
k hat	0.248981	
k star (bias corrected)	0.228912	
Theta hat	15.08651	
Theta star	16.40916	
nu hat	1.991846	
nu star	1.831295	
5% Approximate Chi Square Value	0.131916	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.42267	
Anderson-Darling 5% Critical Value	0.718614	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.311536	
Kolmogrov-Smirnov 5% Critical Value	0.421294	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	52.14549	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-4.382027	
Maximum of log data	2.639057	
Mean of log data	-1.531249	
Standard Deviation of log data	3.463623	
Variance of log data	11.99668	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.858873	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	87.10304	
MLE Standard Deviation	35081.51	
MLE Coefficient of Variation	402.7587	
MLE Skewness	65334551	
MLE Median	0.216265	
MLE 80% Quantile	4.037041	
MLE 90% Quantile	18.53213	
MLE 95% Quantile	64.48355	
MLE 99% Quantile	682.0733	
MVU Estimate of Median	0.010204	
MVU Estimate of Mean	3.75552	
MVU Estimate of Standard Deviation	8.468132	
MVU Estimate of SE of Mean	3.540147	
95% H-UCL	3.99E+28	
95% Chebyshev (MVUE) UCL	19.18666	
97.5% Chebyshev (MVUE) UCL	25.86373	
99% Chebyshev (MVUE) UCL	38.97954	
Non-parametric Statisitics		
95% CLT UCL	9.385773	
95% Adjusted-CLT UCL	12.99293	
95% Modified-t UCL	12.3733	
95% Jackknife UCL	11.81065	
95% Chebyshev (Mean, Sd) UCL	18.67461	
97.5% Chebyshev (Mean, Sd) UCL	25.1298	
99% Chebyshev (Mean, Sd) UCL	37.80977	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	52.14549	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	1.45	
Maximum	66.9	
Mean	20.4625	
Standard Deviation	31.3534	
Variance	983.0356	
Coefficient of Variation	1.532237	
Skewness	1.856771	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.740715	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	57.35547	
Gamma Statistics		
k hat	0.544115	
k star (bias corrected)	0.302695	
Theta hat	37.60694	
Theta star	67.60096	
nu hat	4.352919	
nu star	2.421563	
5% Approximate Chi Square Value	0.223832	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.434376	
Anderson-Darling 5% Critical Value	0.679038	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.3077	
Kolmogrov-Smirnov 5% Critical Value	0.40933	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	221.3768	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	0.371564	
Maximum of log data	4.203199	
Mean of log data	1.866284	
Standard Deviation of log data	1.844997	
Variance of log data	3.404016	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.870664	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	35.45596	
MLE Standard Deviation	191.2147	
MLE Coefficient of Variation	5.39302	
MLE Skewness	173.0332	
MLE Median	6.464228	
MLE 80% Quantile	30.73206	
MLE 90% Quantile	69.20723	
MLE 95% Quantile	134.4651	
MLE 99% Quantile	472.3629	
MVU Estimate of Median	4.044192	
MVU Estimate of Mean	18.51786	
MVU Estimate of Standard Deviation	28.23291	
MVU Estimate of SE of Mean	13.54562	
95% H-UCL	1.37E+09	
95% Chebyshev (MVUE) UCL	77.56184	
97.5% Chebyshev (MVUE) UCL	103.1102	
99% Chebyshev (MVUE) UCL	153.2951	
Non-parametric Statisitics		
95% CLT UCL	46.24838	
95% Adjusted-CLT UCL	61.79955	
95% Modified-t UCL	59.78114	
95% Jackknife UCL	57.35547	
95% Chebyshev (Mean, Sd) UCL	88.79565	
97.5% Chebyshev (Mean, Sd) UCL	118.3635	
99% Chebyshev (Mean, Sd) UCL	176.4437	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	221.3768	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC08-f.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	43	
Maximum	2650	
Mean	859.25	
Standard Deviation	1229.851	
Variance	1512534	
Coefficient of Variation	1.431308	
Skewness	1.680837	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.791254	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2306.393	
Gamma Statistics		
k hat	0.535009	
k star (bias corrected)	0.300419	
Theta hat	1606.048	
Theta star	2860.173	
nu hat	4.280072	
nu star	2.403351	
5% Approximate Chi Square Value	0.219989	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.359423	
Anderson-Darling 5% Critical Value	0.679424	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.301909	
Kolmogrov-Smirnov 5% Critical Value	0.409522	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	9387.216	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.7612	
Maximum of log data	7.882315	
Mean of log data	5.581123	
Standard Deviation of log data	1.959234	
Variance of log data	3.838598	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.905034	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1808.805	
MLE Standard Deviation	12195.73	
MLE Coefficient of Variation	6.742425	
MLE Skewness	326.7399	
MLE Median	265.3694	
MLE 80% Quantile	1389.467	
MLE 90% Quantile	3290.315	
MLE 95% Quantile	6661.252	
MLE 99% Quantile	25293.46	
MVU Estimate of Median	155.1601	
MVU Estimate of Mean	850.6517	
MVU Estimate of Standard Deviation	1352.77	
MVU Estimate of SE of Mean	644.259	
95% H-UCL	6.42E+11	
95% Chebyshev (MVUE) UCL	3658.912	
97.5% Chebyshev (MVUE) UCL	4874.048	
99% Chebyshev (MVUE) UCL	7260.948	
Non-parametric Statisitics		
95% CLT UCL	1870.713	
95% Adjusted-CLT UCL	2422.916	
95% Modified-t UCL	2392.526	
95% Jackknife UCL	2306.393	
95% Chebyshev (Mean, Sd) UCL	3539.649	
97.5% Chebyshev (Mean, Sd) UCL	4699.459	
99% Chebyshev (Mean, Sd) UCL	6977.683	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2306.393	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC09-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	31	
Maximum	89	
Mean	48	
Standard Deviation	27.62849	
Variance	763.3333	
Coefficient of Variation	0.575593	
Skewness	1.87769	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.741211	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	80.50993	
Gamma Statistics		
k hat	5.067954	
k star (bias corrected)	1.433655	
Theta hat	9.471278	
Theta star	33.48085	
nu hat	40.54363	
nu star	11.46924	
5% Approximate Chi Square Value	4.878582	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.605446	
Anderson-Darling 5% Critical Value	0.659004	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.347748	
Kolmogrov-Smirnov 5% Critical Value	0.395877	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	112.845	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.433987	
Maximum of log data	4.488636	
Mean of log data	3.76931	
Standard Deviation of log data	0.492781	
Variance of log data	0.242833	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.797411	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	48.94641	
MLE Standard Deviation	25.66096	
MLE Coefficient of Variation	0.524266	
MLE Skewness	1.716897	
MLE Median	43.35013	
MLE 80% Quantile	65.74012	
MLE 90% Quantile	81.65743	
MLE 95% Quantile	97.50794	
MLE 99% Quantile	136.3899	
MVU Estimate of Median	42.04621	
MVU Estimate of Mean	47.40695	
MVU Estimate of Standard Deviation	22.94984	
MVU Estimate of SE of Mean	11.46989	
95% H-UCL	184.3331	
95% Chebyshev (MVUE) UCL	97.40305	
97.5% Chebyshev (MVUE) UCL	119.0364	
99% Chebyshev (MVUE) UCL	161.5309	
Non-parametric Statisitics		
95% CLT UCL	70.72241	
95% Adjusted-CLT UCL	84.58044	
95% Modified-t UCL	82.67151	
95% Jackknife UCL	80.50993	
95% Chebyshev (Mean, Sd) UCL	108.2149	
97.5% Chebyshev (Mean, Sd) UCL	134.2699	
99% Chebyshev (Mean, Sd) UCL	185.45	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	112.845	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC09-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.28	
Maximum	1.2	
Mean	0.5625	
Standard Deviation	0.428048	
Variance	0.183225	
Coefficient of Variation	0.760974	
Skewness	1.913528	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.738789	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.066176	
Gamma Statistics		
k hat	3.014608	
k star (bias corrected)	0.920319	
Theta hat	0.186591	
Theta star	0.611201	
nu hat	24.11687	
nu star	7.36255	
5% Approximate Chi Square Value	2.371043	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.588899	
Anderson-Darling 5% Critical Value	0.659402	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.391328	
Kolmogrov-Smirnov 5% Critical Value	0.396554	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1.746672	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-1.272966	
Maximum of log data	0.182322	
Mean of log data	-0.750297	
Standard Deviation of log data	0.64032	
Variance of log data	0.410009	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.834508	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	0.579672	
MLE Standard Deviation	0.412681	
MLE Coefficient of Variation	0.711921	
MLE Skewness	2.496588	
MLE Median	0.472226	
MLE 80% Quantile	0.811211	
MLE 90% Quantile	1.075208	
MLE 95% Quantile	1.353954	
MLE 99% Quantile	2.094023	
MVU Estimate of Median	0.448394	
MVU Estimate of Mean	0.548256	
MVU Estimate of Standard Deviation	0.340853	
MVU Estimate of SE of Mean	0.170225	
95% H-UCL	5.105791	
95% Chebyshev (MVUE) UCL	1.290248	
97.5% Chebyshev (MVUE) UCL	1.611309	
99% Chebyshev (MVUE) UCL	2.24197	
Non-parametric Statisitics		
95% CLT UCL	0.914538	
95% Adjusted-CLT UCL	1.133338	
95% Modified-t UCL	1.100304	
95% Jackknife UCL	1.066176	
95% Chebyshev (Mean, Sd) UCL	1.495409	
97.5% Chebyshev (Mean, Sd) UCL	1.899079	
99% Chebyshev (Mean, Sd) UCL	2.692011	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	1.746672	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC10-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	9.5	
Maximum	67	
Mean	26.875	
Standard Deviation	27.2714	
Variance	743.7292	
Coefficient of Variation	1.01475	
Skewness	1.786375	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.766651	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	58.96475	
Gamma Statistics		
k hat	1.615289	
k star (bias corrected)	0.570489	
Theta hat	16.63789	
Theta star	47.10872	
nu hat	12.92231	
nu star	4.563911	
5% Approximate Chi Square Value	0.955962	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.480124	
Anderson-Darling 5% Critical Value	0.66195	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.287856	
Kolmogrov-Smirnov 5% Critical Value	0.399123	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	128.3055	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	2.251292	
Maximum of log data	4.204693	
Mean of log data	2.950773	
Standard Deviation of log data	0.911139	
Variance of log data	0.830175	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.863875	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	28.9584	
MLE Standard Deviation	32.93781	
MLE Coefficient of Variation	1.137418	
MLE Skewness	4.883755	
MLE Median	19.12073	
MLE 80% Quantile	41.2927	
MLE 90% Quantile	61.65702	
MLE 95% Quantile	85.59247	
MLE 99% Quantile	159.1876	
MVU Estimate of Median	17.1974	
MVU Estimate of Mean	25.65463	
MVU Estimate of Standard Deviation	22.07159	
MVU Estimate of SE of Mean	10.9883	
95% H-UCL	2169.651	
95% Chebyshev (MVUE) UCL	73.55151	
97.5% Chebyshev (MVUE) UCL	94.27652	
99% Chebyshev (MVUE) UCL	134.9868	
Non-parametric Statisitics		
95% CLT UCL	49.30373	
95% Adjusted-CLT UCL	62.31742	
95% Modified-t UCL	60.99463	
95% Jackknife UCL	58.96475	
95% Chebyshev (Mean, Sd) UCL	86.31163	
97.5% Chebyshev (Mean, Sd) UCL	112.0299	
99% Chebyshev (Mean, Sd) UCL	162.5485	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	58.96475	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC11-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	97	
Maximum	110	
Mean	100.75	
Standard Deviation	6.238322	
Variance	38.91667	
Coefficient of Variation	0.061919	
Skewness	1.869017	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.735883	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	108.0905	
Gamma Statistics		
k hat	360.7459	
k star (bias corrected)	90.35313	
Theta hat	0.279282	
Theta star	1.115069	
nu hat	2885.967	
nu star	722.8251	
5% Approximate Chi Square Value	661.4296	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.686216	
Anderson-Darling 5% Critical Value	0.65652	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.373339	
Kolmogrov-Smirnov 5% Critical Value	0.39399	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	110.1019	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.574711	
Maximum of log data	4.70048	
Mean of log data	4.611256	
Standard Deviation of log data	0.060256	
Variance of log data	0.003631	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.74118	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	100.7932	
MLE Standard Deviation	6.078936	
MLE Coefficient of Variation	0.060311	
MLE Skewness	0.181152	
MLE Median	100.6104	
MLE 80% Quantile	105.8658	
MLE 90% Quantile	108.7101	
MLE 95% Quantile	111.094	
MLE 99% Quantile	115.7476	
MVU Estimate of Median	100.5647	
MVU Estimate of Mean	100.7474	
MVU Estimate of Standard Deviation	6.069008	
MVU Estimate of SE of Mean	3.034504	
95% H-UCL	N/A	
95% Chebyshev (MVUE) UCL	113.9745	
97.5% Chebyshev (MVUE) UCL	119.6979	
99% Chebyshev (MVUE) UCL	130.9404	
Non-parametric Statisitics		
95% CLT UCL	105.8806	
95% Adjusted-CLT UCL	108.9952	
95% Modified-t UCL	108.5763	
95% Jackknife UCL	108.0905	
95% Chebyshev (Mean, Sd) UCL	114.3461	
97.5% Chebyshev (Mean, Sd) UCL	120.2292	
99% Chebyshev (Mean, Sd) UCL	131.7853	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	110.1019	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC11-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	4.2	
Maximum	7.2	
Mean	5.9	
Standard Deviation	1.249	
Variance	1.56	
Coefficient of Variation	0.211695	
Skewness	-0.91971	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.937951	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	7.369675	
Gamma Statistics		
k hat	27.07082	
k star (bias corrected)	6.934371	
Theta hat	0.217947	
Theta star	0.850834	
nu hat	216.5665	
nu star	55.47497	
5% Approximate Chi Square Value	39.35541	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.365317	
Anderson-Darling 5% Critical Value	0.656819	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.310298	
Kolmogrov-Smirnov 5% Critical Value	0.394141	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	8.316577	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.435085	
Maximum of log data	1.974081	
Mean of log data	1.756369	
Standard Deviation of log data	0.228417	
Variance of log data	0.052174	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.902733	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	5.944437	
MLE Standard Deviation	1.375717	
MLE Coefficient of Variation	0.231429	
MLE Skewness	0.706683	
MLE Median	5.791368	
MLE 80% Quantile	7.024339	
MLE 90% Quantile	7.767006	
MLE 95% Quantile	8.432682	
MLE 99% Quantile	9.851927	
MVU Estimate of Median	5.753672	
MVU Estimate of Mean	5.905346	
MVU Estimate of Standard Deviation	1.343643	
MVU Estimate of SE of Mean	0.671807	
95% H-UCL	8.685469	
95% Chebyshev (MVUE) UCL	8.833685	
97.5% Chebyshev (MVUE) UCL	10.10078	
99% Chebyshev (MVUE) UCL	12.58974	
Non-parametric Statisitics		
95% CLT UCL	6.927211	
95% Adjusted-CLT UCL	6.620355	
95% Modified-t UCL	7.321812	
95% Jackknife UCL	7.369675	
95% Chebyshev (Mean, Sd) UCL	8.622132	
97.5% Chebyshev (Mean, Sd) UCL	9.8	
99% Chebyshev (Mean, Sd) UCL	12.11369	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	7.369675	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC11-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	215	
Maximum	340	
Mean	261.25	
Standard Deviation	54.52446	
Variance	2972.917	
Coefficient of Variation	0.208706	
Skewness	1.556363	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.859956	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	325.4079	
Gamma Statistics		
k hat	33.37312	
k star (bias corrected)	8.509947	
Theta hat	7.828156	
Theta star	30.69937	
nu hat	266.985	
nu star	68.07957	
5% Approximate Chi Square Value	50.08518	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.417104	
Anderson-Darling 5% Critical Value	0.656577	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.3271	
Kolmogrov-Smirnov 5% Critical Value	0.394053	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	355.1108	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.370638	
Maximum of log data	5.828946	
Mean of log data	5.550421	
Standard Deviation of log data	0.196304	
Variance of log data	0.038535	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.89573	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	262.3524	
MLE Standard Deviation	52.00105	
MLE Coefficient of Variation	0.198211	
MLE Skewness	0.602419	
MLE Median	257.3458	
MLE 80% Quantile	303.7782	
MLE 90% Quantile	331.1833	
MLE 95% Quantile	355.4346	
MLE 99% Quantile	406.2727	
MVU Estimate of Median	256.108	
MVU Estimate of Mean	261.0808	
MVU Estimate of Standard Deviation	51.10396	
MVU Estimate of SE of Mean	25.55168	
95% H-UCL	357.5129	
95% Chebyshev (MVUE) UCL	372.458	
97.5% Chebyshev (MVUE) UCL	420.651	
99% Chebyshev (MVUE) UCL	515.3168	
Non-parametric Statisitics		
95% CLT UCL	306.0924	
95% Adjusted-CLT UCL	328.7609	
95% Modified-t UCL	328.9438	
95% Jackknife UCL	325.4079	
95% Chebyshev (Mean, Sd) UCL	380.0833	
97.5% Chebyshev (Mean, Sd) UCL	431.5026	
99% Chebyshev (Mean, Sd) UCL	532.5058	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	325.4079	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC11-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	250	
Maximum	1200	
Mean	577.5	
Standard Deviation	424.2935	
Variance	180025	
Coefficient of Variation	0.734707	
Skewness	1.735818	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.813663	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1076.758	
Gamma Statistics		
k hat	3.011028	
k star (bias corrected)	0.919424	
Theta hat	191.795	
Theta star	628.1109	
nu hat	24.08822	
nu star	7.355389	
5% Approximate Chi Square Value	2.367031	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.396842	
Anderson-Darling 5% Critical Value	0.659404	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.322842	
Kolmogrov-Smirnov 5% Critical Value	0.396556	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1794.542	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.521461	
Maximum of log data	7.090077	
Mean of log data	6.183557	
Standard Deviation of log data	0.658227	
Variance of log data	0.433262	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.933277	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	601.9585	
MLE Standard Deviation	443.2806	
MLE Coefficient of Variation	0.736397	
MLE Skewness	2.608526	
MLE Median	484.7131	
MLE 80% Quantile	845.3568	
MLE 90% Quantile	1129.329	
MLE 95% Quantile	1431.303	
MLE 99% Quantile	2240.81	
MVU Estimate of Median	458.8853	
MVU Estimate of Mean	567.395	
MVU Estimate of Standard Deviation	362.0365	
MVU Estimate of SE of Mean	180.7802	
95% H-UCL	5967.76	
95% Chebyshev (MVUE) UCL	1355.398	
97.5% Chebyshev (MVUE) UCL	1696.367	
99% Chebyshev (MVUE) UCL	2366.135	
Non-parametric Statisitics		
95% CLT UCL	926.4504	
95% Adjusted-CLT UCL	1123.19	
95% Modified-t UCL	1107.446	
95% Jackknife UCL	1076.758	
95% Chebyshev (Mean, Sd) UCL	1502.226	
97.5% Chebyshev (Mean, Sd) UCL	1902.356	
99% Chebyshev (Mean, Sd) UCL	2688.334	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1076.758	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC11-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	440	
Maximum	630	
Mean	518.75	
Standard Deviation	81.8917	
Variance	6706.25	
Coefficient of Variation	0.157864	
Skewness	1.008253	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.948151	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	615.1105	
Gamma Statistics		
k hat	55.70726	
k star (bias corrected)	14.09348	
Theta hat	9.312072	
Theta star	36.8078	
nu hat	445.6581	
nu star	112.7479	
5% Approximate Chi Square Value	89.23143	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.255556	
Anderson-Darling 5% Critical Value	0.656006	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.200934	
Kolmogrov-Smirnov 5% Critical Value	0.393839	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	655.4635	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	6.086775	
Maximum of log data	6.44572	
Mean of log data	6.24242	
Standard Deviation of log data	0.153522	
Variance of log data	0.023569	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.968565	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	520.1953	
MLE Standard Deviation	80.33427	
MLE Coefficient of Variation	0.154431	
MLE Skewness	0.466976	
MLE Median	514.101	
MLE 80% Quantile	585.3124	
MLE 90% Quantile	626.216	
MLE 95% Quantile	661.8	
MLE 99% Quantile	734.7364	
MVU Estimate of Median	512.5877	
MVU Estimate of Mean	518.6569	
MVU Estimate of Standard Deviation	79.48493	
MVU Estimate of SE of Mean	39.74229	
95% H-UCL	652.8521	
95% Chebyshev (MVUE) UCL	691.8895	
97.5% Chebyshev (MVUE) UCL	766.8474	
99% Chebyshev (MVUE) UCL	914.0876	
Non-parametric Statisitics		
95% CLT UCL	586.0999	
95% Adjusted-CLT UCL	608.1561	
95% Modified-t UCL	618.5508	
95% Jackknife UCL	615.1105	
95% Chebyshev (Mean, Sd) UCL	697.2288	
97.5% Chebyshev (Mean, Sd) UCL	774.4567	
99% Chebyshev (Mean, Sd) UCL	926.156	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	615.1105	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC11-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	1.7	
Maximum	2.2	
Mean	1.85	
Standard Deviation	0.238048	
Variance	0.056667	
Coefficient of Variation	0.128674	
Skewness	1.779179	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.763921	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.130106	
Gamma Statistics		
k hat	86.21735	
k star (bias corrected)	21.721	
Theta hat	0.021457	
Theta star	0.085171	
nu hat	689.7388	
nu star	173.768	
5% Approximate Chi Square Value	144.2766	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.611537	
Anderson-Darling 5% Critical Value	0.65636	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.335998	
Kolmogrov-Smirnov 5% Critical Value	0.393943	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.228156	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	0.530628	
Maximum of log data	0.788457	
Mean of log data	0.609375	
Standard Deviation of log data	0.122391	
Variance of log data	0.01498	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.7762	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.853109	
MLE Standard Deviation	0.227656	
MLE Coefficient of Variation	0.122851	
MLE Skewness	0.370406	
MLE Median	1.839282	
MLE 80% Quantile	2.039685	
MLE 90% Quantile	2.152538	
MLE 95% Quantile	2.249501	
MLE 99% Quantile	2.445028	
MVU Estimate of Median	1.83584	
MVU Estimate of Mean	1.849631	
MVU Estimate of Standard Deviation	0.226124	
MVU Estimate of SE of Mean	0.113062	
95% H-UCL	2.204662	
95% Chebyshev (MVUE) UCL	2.342457	
97.5% Chebyshev (MVUE) UCL	2.555703	
99% Chebyshev (MVUE) UCL	2.974583	
Non-parametric Statisitics		
95% CLT UCL	2.045777	
95% Adjusted-CLT UCL	2.158914	
95% Modified-t UCL	2.147753	
95% Jackknife UCL	2.130106	
95% Chebyshev (Mean, Sd) UCL	2.368813	
97.5% Chebyshev (Mean, Sd) UCL	2.593303	
99% Chebyshev (Mean, Sd) UCL	3.034272	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.130106	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC11-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	47.5	
Maximum	71	
Mean	58.125	
Standard Deviation	9.715752	
Variance	94.39583	
Coefficient of Variation	0.167153	
Skewness	0.672515	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.959583	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	69.55735	
Gamma Statistics		
k hat	48.73434	
k star (bias corrected)	12.35025	
Theta hat	1.192691	
Theta star	4.706382	
nu hat	389.8747	
nu star	98.80201	
5% Approximate Chi Square Value	76.86732	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.263462	
Anderson-Darling 5% Critical Value	0.655989	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.236934	
Kolmogrov-Smirnov 5% Critical Value	0.393838	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	74.71143	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.86073	
Maximum of log data	4.26268	
Mean of log data	4.052301	
Standard Deviation of log data	0.165077	
Variance of log data	0.02725	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.973478	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	58.3189	
MLE Standard Deviation	9.693078	
MLE Coefficient of Variation	0.166208	
MLE Skewness	0.503216	
MLE Median	57.52968	
MLE 80% Quantile	66.14116	
MLE 90% Quantile	71.12403	
MLE 95% Quantile	75.47889	
MLE 99% Quantile	84.45936	
MVU Estimate of Median	57.33392	
MVU Estimate of Mean	58.11938	
MVU Estimate of Standard Deviation	9.574648	
MVU Estimate of SE of Mean	4.787296	
95% H-UCL	74.75579	
95% Chebyshev (MVUE) UCL	78.98672	
97.5% Chebyshev (MVUE) UCL	88.01603	
99% Chebyshev (MVUE) UCL	105.7524	
Non-parametric Statisitics		
95% CLT UCL	66.11549	
95% Adjusted-CLT UCL	67.86091	
95% Modified-t UCL	69.8296	
95% Jackknife UCL	69.55735	
95% Chebyshev (Mean, Sd) UCL	79.29999	
97.5% Chebyshev (Mean, Sd) UCL	88.46243	
99% Chebyshev (Mean, Sd) UCL	106.4603	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	69.55735	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC12-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	100	
Maximum	130	
Mean	112.5	
Standard Deviation	15	
Variance	225	
Coefficient of Variation	0.133333	
Skewness	0.37037	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.851201	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	130.1502	
Gamma Statistics		
k hat	75.79118	
k star (bias corrected)	19.11446	
Theta hat	1.484342	
Theta star	5.885596	
nu hat	606.3295	
nu star	152.9157	
5% Approximate Chi Square Value	125.326	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.476766	
Anderson-Darling 5% Critical Value	0.656239	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.333225	
Kolmogrov-Smirnov 5% Critical Value	0.393908	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	137.2661	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.60517	
Maximum of log data	4.867534	
Mean of log data	4.716342	
Standard Deviation of log data	0.132464	
Variance of log data	0.017547	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.844742	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	112.7435	
MLE Standard Deviation	15.00015	
MLE Coefficient of Variation	0.133047	
MLE Skewness	0.401495	
MLE Median	111.7587	
MLE 80% Quantile	124.995	
MLE 90% Quantile	132.4966	
MLE 95% Quantile	138.9681	
MLE 99% Quantile	152.0869	
MVU Estimate of Median	111.5137	
MVU Estimate of Mean	112.4955	
MVU Estimate of Standard Deviation	14.88199	
MVU Estimate of SE of Mean	7.440976	
95% H-UCL	136.3981	
95% Chebyshev (MVUE) UCL	144.9299	
97.5% Chebyshev (MVUE) UCL	158.9644	
99% Chebyshev (MVUE) UCL	186.5323	
Non-parametric Statisitics		
95% CLT UCL	124.8364	
95% Adjusted-CLT UCL	126.3205	
95% Modified-t UCL	130.3817	
95% Jackknife UCL	130.1502	
95% Chebyshev (Mean, Sd) UCL	145.1917	
97.5% Chebyshev (Mean, Sd) UCL	159.3375	
99% Chebyshev (Mean, Sd) UCL	187.1241	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	130.1502	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC12-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	9.3	
Maximum	11	
Mean	10.325	
Standard Deviation	0.830161	
Variance	0.689167	
Coefficient of Variation	0.080403	
Skewness	-0.578114	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.863234	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	11.30183	
Gamma Statistics		
k hat	202.5441	
k star (bias corrected)	50.8027	
Theta hat	0.050977	
Theta star	0.203237	
nu hat	1620.353	
nu star	406.4216	
5% Approximate Chi Square Value	360.681	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.434322	
Anderson-Darling 5% Critical Value	0.65652	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.324892	
Kolmogrov-Smirnov 5% Critical Value	0.39399	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	11.63439	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	2.230014	
Maximum of log data	2.397895	
Mean of log data	2.332098	
Standard Deviation of log data	0.081549	
Variance of log data	0.00665	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.864792	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	10.33383	
MLE Standard Deviation	0.844114	
MLE Coefficient of Variation	0.081685	
MLE Skewness	0.245599	
MLE Median	10.29952	
MLE 80% Quantile	11.03427	
MLE 90% Quantile	11.43739	
MLE 95% Quantile	11.77814	
MLE 99% Quantile	12.45074	
MVU Estimate of Median	10.29096	
MVU Estimate of Mean	10.32523	
MVU Estimate of Standard Deviation	0.841591	
MVU Estimate of SE of Mean	0.420795	
95% H-UCL	N/A	
95% Chebyshev (MVUE) UCL	12.15943	
97.5% Chebyshev (MVUE) UCL	12.95309	
99% Chebyshev (MVUE) UCL	14.51209	
Non-parametric Statisitics		
95% CLT UCL	11.00775	
95% Adjusted-CLT UCL	10.87954	
95% Modified-t UCL	11.28184	
95% Jackknife UCL	11.30183	
95% Chebyshev (Mean, Sd) UCL	12.13429	
97.5% Chebyshev (Mean, Sd) UCL	12.91718	
99% Chebyshev (Mean, Sd) UCL	14.455	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	11.30183	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC12-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	3	
Minimum	370	
Maximum	460	
Mean	397.5	
Standard Deviation	41.93249	
Variance	1758.333	
Coefficient of Variation	0.105491	
Skewness	1.922522	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.725152	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	446.8412	
Gamma Statistics		
k hat	127.4922	
k star (bias corrected)	32.03973	
Theta hat	3.117837	
Theta star	12.40647	
nu hat	1019.938	
nu star	256.3178	
5% Approximate Chi Square Value	220.2398	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.737209	
Anderson-Darling 5% Critical Value	0.65652	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.432589	
Kolmogrov-Smirnov 5% Critical Value	0.39399	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	462.6154	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.913503	
Maximum of log data	6.131226	
Mean of log data	5.981268	
Standard Deviation of log data	0.10076	
Variance of log data	0.010153	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.734991	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	397.9571	
MLE Standard Deviation	40.20001	
MLE Coefficient of Variation	0.101016	
MLE Skewness	0.304079	
MLE Median	395.9421	
MLE 80% Quantile	431.1301	
MLE 90% Quantile	450.674	
MLE 95% Quantile	467.3216	
MLE 99% Quantile	500.5137	
MVU Estimate of Median	395.4398	
MVU Estimate of Mean	397.4513	
MVU Estimate of Standard Deviation	40.0166	
MVU Estimate of SE of Mean	20.00829	
95% H-UCL	457.4406	
95% Chebyshev (MVUE) UCL	484.6653	
97.5% Chebyshev (MVUE) UCL	522.403	
99% Chebyshev (MVUE) UCL	596.5312	
Non-parametric Statisitics		
95% CLT UCL	431.9864	
95% Adjusted-CLT UCL	453.5213	
95% Modified-t UCL	450.2002	
95% Jackknife UCL	446.8412	
95% Chebyshev (Mean, Sd) UCL	488.8897	
97.5% Chebyshev (Mean, Sd) UCL	528.4341	
99% Chebyshev (Mean, Sd) UCL	606.1115	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	446.8412	95% Student's-t UCL
2nd Recommended UCL	450.2002	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC12-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	520	
Maximum	1300	
Mean	955	
Standard Deviation	361.6167	
Variance	130766.7	
Coefficient of Variation	0.378656	
Skewness	-0.42671	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.92716	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1380.508	
Gamma Statistics		
k hat	8.220863	
k star (bias corrected)	2.221882	
Theta hat	116.1678	
Theta star	429.8157	
nu hat	65.76691	
nu star	17.77506	
5% Approximate Chi Square Value	9.22714	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.330166	
Anderson-Darling 5% Critical Value	0.657787	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.286684	
Kolmogrov-Smirnov 5% Critical Value	0.395272	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1839.701	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	6.253829	
Maximum of log data	7.17012	
Mean of log data	6.799659	
Standard Deviation of log data	0.421406	
Variance of log data	0.177583	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.913647	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	980.8808	
MLE Standard Deviation	432.3978	
MLE Coefficient of Variation	0.440826	
MLE Skewness	1.408143	
MLE Median	897.5414	
MLE 80% Quantile	1281.45	
MLE 90% Quantile	1542.51	
MLE 95% Quantile	1795.202	
MLE 99% Quantile	2391.917	
MVU Estimate of Median	877.7501	
MVU Estimate of Mean	958.5176	
MVU Estimate of Standard Deviation	398.677	
MVU Estimate of SE of Mean	199.2908	
95% H-UCL	2656.342	
95% Chebyshev (MVUE) UCL	1827.206	
97.5% Chebyshev (MVUE) UCL	2203.088	
99% Chebyshev (MVUE) UCL	2941.436	
Non-parametric Statisitics		
95% CLT UCL	1252.403	
95% Adjusted-CLT UCL	1211.184	
95% Modified-t UCL	1374.078	
95% Jackknife UCL	1380.508	
95% Chebyshev (Mean, Sd) UCL	1743.125	
97.5% Chebyshev (Mean, Sd) UCL	2084.148	
99% Chebyshev (Mean, Sd) UCL	2754.021	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1380.508	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC12-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	470	
Maximum	960	
Mean	642.5	
Standard Deviation	224.258	
Variance	50291.67	
Coefficient of Variation	0.34904	
Skewness	1.417433	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.859973	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	906.3803	
Gamma Statistics		
k hat	12.2325	
k star (bias corrected)	3.224792	
Theta hat	52.524	
Theta star	199.2376	
nu hat	97.86002	
nu star	25.79834	
5% Approximate Chi Square Value	15.22235	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.384657	
Anderson-Darling 5% Critical Value	0.657098	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.271711	
Kolmogrov-Smirnov 5% Critical Value	0.394776	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1088.888	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	6.152733	
Maximum of log data	6.866933	
Mean of log data	6.423936	
Standard Deviation of log data	0.32405	
Variance of log data	0.105008	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.899084	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	649.6538	
MLE Standard Deviation	216.1696	
MLE Coefficient of Variation	0.332746	
MLE Skewness	1.035079	
MLE Median	616.4243	
MLE 80% Quantile	810.5861	
MLE 90% Quantile	934.8064	
MLE 95% Quantile	1050.475	
MLE 99% Quantile	1309.86	
MVU Estimate of Median	608.3649	
MVU Estimate of Mean	640.9863	
MVU Estimate of Standard Deviation	206.0994	
MVU Estimate of SE of Mean	103.0409	
95% H-UCL	1228.054	
95% Chebyshev (MVUE) UCL	1090.131	
97.5% Chebyshev (MVUE) UCL	1284.477	
99% Chebyshev (MVUE) UCL	1666.23	
Non-parametric Statisitics		
95% CLT UCL	826.9358	
95% Adjusted-CLT UCL	911.8482	
95% Modified-t UCL	919.6249	
95% Jackknife UCL	906.3803	
95% Chebyshev (Mean, Sd) UCL	1131.259	
97.5% Chebyshev (Mean, Sd) UCL	1342.745	
99% Chebyshev (Mean, Sd) UCL	1758.17	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	906.3803	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC12-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	2.4	
Maximum	2.7	
Mean	2.55	
Standard Deviation	0.129099	
Variance	0.016667	
Coefficient of Variation	0.050627	
Skewness	1.03E-14	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.993956	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.701909	
Gamma Statistics		
k hat	519.546	
k star (bias corrected)	130.0532	
Theta hat	0.004908	
Theta star	0.019607	
nu hat	4156.368	
nu star	1040.425	
5% Approximate Chi Square Value	966.5318	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.200882	
Anderson-Darling 5% Critical Value	0.65652	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.176756	
Kolmogrov-Smirnov 5% Critical Value	0.39399	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.744954	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	0.875469	
Maximum of log data	0.993252	
Mean of log data	0.935131	
Standard Deviation of log data	0.050688	
Variance of log data	0.002569	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.9937	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	2.550821	
MLE Standard Deviation	0.12938	
MLE Coefficient of Variation	0.050721	
MLE Skewness	0.152293	
MLE Median	2.547546	
MLE 80% Quantile	2.659032	
MLE 90% Quantile	2.719003	
MLE 95% Quantile	2.769074	
MLE 99% Quantile	2.866328	
MVU Estimate of Median	2.546728	
MVU Estimate of Mean	2.550002	
MVU Estimate of Standard Deviation	0.12923	
MVU Estimate of SE of Mean	0.064615	
95% H-UCL	N/A	
95% Chebyshev (MVUE) UCL	2.831653	
97.5% Chebyshev (MVUE) UCL	2.953524	
99% Chebyshev (MVUE) UCL	3.192915	
Non-parametric Statisitics		
95% CLT UCL	2.656175	
95% Adjusted-CLT UCL	2.656175	
95% Modified-t UCL	2.701909	
95% Jackknife UCL	2.701909	
95% Chebyshev (Mean, Sd) UCL	2.831366	
97.5% Chebyshev (Mean, Sd) UCL	2.953113	
99% Chebyshev (Mean, Sd) UCL	3.192262	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.701909	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC12-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	64	
Maximum	86	
Mean	71.25	
Standard Deviation	9.979145	
Variance	99.58333	
Coefficient of Variation	0.140058	
Skewness	1.82263	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.782142	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	82.99228	
Gamma Statistics		
k hat	73.29625	
k star (bias corrected)	18.49073	
Theta hat	0.972083	
Theta star	3.853283	
nu hat	586.37	
nu star	147.9258	
5% Approximate Chi Square Value	120.8102	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.59567	
Anderson-Darling 5% Critical Value	0.65621	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.389649	
Kolmogrov-Smirnov 5% Critical Value	0.393899	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	87.24193	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.158883	
Maximum of log data	4.454347	
Mean of log data	4.259358	
Standard Deviation of log data	0.13253	
Variance of log data	0.017564	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.801663	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	71.38871	
MLE Standard Deviation	9.502823	
MLE Coefficient of Variation	0.133114	
MLE Skewness	0.4017	
MLE Median	70.76452	
MLE 80% Quantile	79.15004	
MLE 90% Quantile	83.90275	
MLE 95% Quantile	88.00284	
MLE 99% Quantile	96.31478	
MVU Estimate of Median	70.60925	
MVU Estimate of Mean	71.23153	
MVU Estimate of Standard Deviation	9.42789	
MVU Estimate of SE of Mean	4.713933	
95% H-UCL	86.37637	
95% Chebyshev (MVUE) UCL	91.77909	
97.5% Chebyshev (MVUE) UCL	100.67	
99% Chebyshev (MVUE) UCL	118.1346	
Non-parametric Statisitics		
95% CLT UCL	79.45712	
95% Adjusted-CLT UCL	84.31573	
95% Modified-t UCL	83.75012	
95% Jackknife UCL	82.99228	
95% Chebyshev (Mean, Sd) UCL	92.99904	
97.5% Chebyshev (Mean, Sd) UCL	102.4099	
99% Chebyshev (Mean, Sd) UCL	120.8956	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	82.99228	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Arsenic	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	45	
Maximum	120	
Mean	78.25	
Standard Deviation	33.34042	
Variance	1111.583	
Coefficient of Variation	0.426076	
Skewness	0.541848	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.959676	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	117.4811	
Gamma Statistics		
k hat	7.323236	
k star (bias corrected)	1.997476	
Theta hat	10.68517	
Theta star	39.17444	
nu hat	58.58589	
nu star	15.97981	
5% Approximate Chi Square Value	7.946674	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.238104	
Anderson-Darling 5% Critical Value	0.658133	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.226932	
Kolmogrov-Smirnov 5% Critical Value	0.395444	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	157.3513	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.806662	
Maximum of log data	4.787492	
Mean of log data	4.290082	
Standard Deviation of log data	0.434246	
Variance of log data	0.18857	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.975765	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	80.18745	
MLE Standard Deviation	36.52902	
MLE Coefficient of Variation	0.455545	
MLE Skewness	1.461172	
MLE Median	72.97245	
MLE 80% Quantile	105.3218	
MLE 90% Quantile	127.4965	
MLE 95% Quantile	149.0702	
MLE 99% Quantile	200.3647	
MVU Estimate of Median	71.26452	
MVU Estimate of Mean	78.24319	
MVU Estimate of Standard Deviation	33.50874	
MVU Estimate of SE of Mean	16.74987	
95% H-UCL	229.4099	
95% Chebyshev (MVUE) UCL	151.2542	
97.5% Chebyshev (MVUE) UCL	182.8461	
99% Chebyshev (MVUE) UCL	244.9023	
Non-parametric Statisitics		
95% CLT UCL	105.6701	
95% Adjusted-CLT UCL	110.4959	
95% Modified-t UCL	118.2338	
95% Jackknife UCL	117.4811	
95% Chebyshev (Mean, Sd) UCL	150.9138	
97.5% Chebyshev (Mean, Sd) UCL	182.3554	
99% Chebyshev (Mean, Sd) UCL	244.1165	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	117.4811	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Cadmium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	3.95	
Maximum	12	
Mean	7.1625	
Standard Deviation	3.805561	
Variance	14.48229	
Coefficient of Variation	0.531317	
Skewness	0.707523	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.890341	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	11.64043	
Gamma Statistics		
k hat	4.811944	
k star (bias corrected)	1.369653	
Theta hat	1.488484	
Theta star	5.229428	
nu hat	38.49555	
nu star	10.95722	
5% Approximate Chi Square Value	4.547594	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.384393	
Anderson-Darling 5% Critical Value	0.659002	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.30877	
Kolmogrov-Smirnov 5% Critical Value	0.395941	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	17.25772	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	1.373716	
Maximum of log data	2.484907	
Mean of log data	1.861367	
Standard Deviation of log data	0.535422	
Variance of log data	0.286677	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.892072	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	7.42391	
MLE Standard Deviation	4.277578	
MLE Coefficient of Variation	0.576189	
MLE Skewness	1.919859	
MLE Median	6.432526	
MLE 80% Quantile	10.11277	
MLE 90% Quantile	12.79923	
MLE 95% Quantile	15.52012	
MLE 99% Quantile	22.34851	
MVU Estimate of Median	6.204484	
MVU Estimate of Mean	7.146695	
MVU Estimate of Standard Deviation	3.747423	
MVU Estimate of SE of Mean	1.872583	
95% H-UCL	34.92162	
95% Chebyshev (MVUE) UCL	15.3091	
97.5% Chebyshev (MVUE) UCL	18.84097	
99% Chebyshev (MVUE) UCL	25.77866	
Non-parametric Statisitics		
95% CLT UCL	10.2923	
95% Adjusted-CLT UCL	11.01155	
95% Modified-t UCL	11.75262	
95% Jackknife UCL	11.64043	
95% Chebyshev (Mean, Sd) UCL	15.45653	
97.5% Chebyshev (Mean, Sd) UCL	19.04536	
99% Chebyshev (Mean, Sd) UCL	26.09493	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	11.64043	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Copper	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	210	
Maximum	460	
Mean	332.5	
Standard Deviation	121.2092	
Variance	14691.67	
Coefficient of Variation	0.364539	
Skewness	0.051804	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.895171	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	475.1246	
Gamma Statistics		
k hat	9.660013	
k star (bias corrected)	2.58167	
Theta hat	34.42024	
Theta star	128.7926	
nu hat	77.28011	
nu star	20.65336	
5% Approximate Chi Square Value	11.33267	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.387115	
Anderson-Darling 5% Critical Value	0.657231	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.2824	
Kolmogrov-Smirnov 5% Critical Value	0.394995	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	605.9686	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.347108	
Maximum of log data	6.131226	
Mean of log data	5.753988	
Standard Deviation of log data	0.378885	
Variance of log data	0.143554	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.89779	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	338.9203	
MLE Standard Deviation	133.1613	
MLE Coefficient of Variation	0.392898	
MLE Skewness	1.239347	
MLE Median	315.4462	
MLE 80% Quantile	434.4783	
MLE 90% Quantile	513.2975	
MLE 95% Quantile	588.3101	
MLE 99% Quantile	761.4885	
MVU Estimate of Median	309.8161	
MVU Estimate of Mean	332.7039	
MVU Estimate of Standard Deviation	124.7263	
MVU Estimate of SE of Mean	62.35331	
95% H-UCL	774.4324	
95% Chebyshev (MVUE) UCL	604.4956	
97.5% Chebyshev (MVUE) UCL	722.1001	
99% Chebyshev (MVUE) UCL	953.1114	
Non-parametric Statisitics		
95% CLT UCL	432.1857	
95% Adjusted-CLT UCL	433.863	
95% Modified-t UCL	475.3862	
95% Jackknife UCL	475.1246	
95% Chebyshev (Mean, Sd) UCL	596.6693	
97.5% Chebyshev (Mean, Sd) UCL	710.9756	
99% Chebyshev (Mean, Sd) UCL	935.5081	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	475.1246	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Lead	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	130	
Maximum	810	
Mean	370	
Standard Deviation	306.0501	
Variance	93666.67	
Coefficient of Variation	0.827162	
Skewness	1.54465	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.85715	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	730.1235	
Gamma Statistics		
k hat	2.231025	
k star (bias corrected)	0.724423	
Theta hat	165.8431	
Theta star	510.7515	
nu hat	17.8482	
nu star	5.795382	
5% Approximate Chi Square Value	1.53573	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.289324	
Anderson-Darling 5% Critical Value	0.660287	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.225476	
Kolmogrov-Smirnov 5% Critical Value	0.39759	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	1396.268	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	4.867534	
Maximum of log data	6.697034	
Mean of log data	5.672958	
Standard Deviation of log data	0.787851	
Variance of log data	0.620709	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.973244	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	396.7524	
MLE Standard Deviation	367.9858	
MLE Coefficient of Variation	0.927495	
MLE Skewness	3.580358	
MLE Median	290.8937	
MLE 80% Quantile	566.0554	
MLE 90% Quantile	800.5879	
MLE 95% Quantile	1063.13	
MLE 99% Quantile	1818.012	
MVU Estimate of Median	268.8432	
MVU Estimate of Mean	363.4923	
MVU Estimate of Standard Deviation	274.1166	
MVU Estimate of SE of Mean	136.7084	
95% H-UCL	10216.45	
95% Chebyshev (MVUE) UCL	959.3903	
97.5% Chebyshev (MVUE) UCL	1217.236	
99% Chebyshev (MVUE) UCL	1723.723	
Non-parametric Statisitics		
95% CLT UCL	621.7038	
95% Adjusted-CLT UCL	747.9863	
95% Modified-t UCL	749.821	
95% Jackknife UCL	730.1235	
95% Chebyshev (Mean, Sd) UCL	1037.021	
97.5% Chebyshev (Mean, Sd) UCL	1325.641	
99% Chebyshev (Mean, Sd) UCL	1892.58	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	730.1235	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Manganese	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	180	
Maximum	370	
Mean	250	
Standard Deviation	83.666	
Variance	7000	
Coefficient of Variation	0.334664	
Skewness	1.502573	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.875576	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	348.4482	
Gamma Statistics		
k hat	13.35388	
k star (bias corrected)	3.505137	
Theta hat	18.72115	
Theta star	71.32388	
nu hat	106.8311	
nu star	28.0411	
5% Approximate Chi Square Value	16.95813	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.349244	
Anderson-Darling 5% Critical Value	0.657097	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.272523	
Kolmogrov-Smirnov 5% Critical Value	0.394699	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	413.3873	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	5.192957	
Maximum of log data	5.913503	
Mean of log data	5.483552	
Standard Deviation of log data	0.3098	
Variance of log data	0.095976	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.930301	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	252.5324	
MLE Standard Deviation	80.14992	
MLE Coefficient of Variation	0.317385	
MLE Skewness	0.984125	
MLE Median	240.7001	
MLE 80% Quantile	312.7277	
MLE 90% Quantile	358.3984	
MLE 95% Quantile	400.6841	
MLE 99% Quantile	494.7969	
MVU Estimate of Median	237.8227	
MVU Estimate of Mean	249.4571	
MVU Estimate of Standard Deviation	76.73307	
MVU Estimate of SE of Mean	38.36379	
95% H-UCL	456.8694	
95% Chebyshev (MVUE) UCL	416.681	
97.5% Chebyshev (MVUE) UCL	489.0389	
99% Chebyshev (MVUE) UCL	631.172	
Non-parametric Statisitics		
95% CLT UCL	318.8092	
95% Adjusted-CLT UCL	352.391	
95% Modified-t UCL	353.6863	
95% Jackknife UCL	348.4482	
95% Chebyshev (Mean, Sd) UCL	432.3458	
97.5% Chebyshev (Mean, Sd) UCL	511.247	
99% Chebyshev (Mean, Sd) UCL	666.2331	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	348.4482	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Mercury	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	0.95	
Maximum	2.1	
Mean	1.5375	
Standard Deviation	0.596343	
Variance	0.355625	
Coefficient of Variation	0.387865	
Skewness	-0.030208	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.830347	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2.239206	
Gamma Statistics		
k hat	8.44378	
k star (bias corrected)	2.277612	
Theta hat	0.182087	
Theta star	0.675049	
nu hat	67.55024	
nu star	18.22089	
5% Approximate Chi Square Value	9.549303	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.505167	
Anderson-Darling 5% Critical Value	0.657701	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.319019	
Kolmogrov-Smirnov 5% Critical Value	0.395229	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	2.933683	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	-0.051293	
Maximum of log data	0.741937	
Mean of log data	0.369775	
Standard Deviation of log data	0.406491	
Variance of log data	0.165235	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.840212	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1.572069	
MLE Standard Deviation	0.66636	
MLE Coefficient of Variation	0.423875	
MLE Skewness	1.347782	
MLE Median	1.447409	
MLE 80% Quantile	2.040633	
MLE 90% Quantile	2.440287	
MLE 95% Quantile	2.824842	
MLE 99% Quantile	3.725766	
MVU Estimate of Median	1.417699	
MVU Estimate of Mean	1.538777	
MVU Estimate of Standard Deviation	0.617923	
MVU Estimate of SE of Mean	0.308897	
95% H-UCL	4.0037	
95% Chebyshev (MVUE) UCL	2.88523	
97.5% Chebyshev (MVUE) UCL	3.467841	
99% Chebyshev (MVUE) UCL	4.612268	
Non-parametric Statisitics		
95% CLT UCL	2.027948	
95% Adjusted-CLT UCL	2.023136	
95% Modified-t UCL	2.238455	
95% Jackknife UCL	2.239206	
95% Chebyshev (Mean, Sd) UCL	2.837199	
97.5% Chebyshev (Mean, Sd) UCL	3.39958	
99% Chebyshev (Mean, Sd) UCL	4.504269	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2.239206	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Vanadium	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	30	
Maximum	87	
Mean	48.25	
Standard Deviation	26.22181	
Variance	687.5833	
Coefficient of Variation	0.543457	
Skewness	1.826613	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.782528	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	79.10472	
Gamma Statistics		
k hat	5.573204	
k star (bias corrected)	1.559968	
Theta hat	8.657498	
Theta star	30.93013	
nu hat	44.58563	
nu star	12.47974	
5% Approximate Chi Square Value	5.543625	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.505169	
Anderson-Darling 5% Critical Value	0.658809	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.341213	
Kolmogrov-Smirnov 5% Critical Value	0.39578	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	108.6198	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	3.401197	
Maximum of log data	4.465908	
Mean of log data	3.784006	
Standard Deviation of log data	0.472151	
Variance of log data	0.222926	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.859586	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	49.17914	
MLE Standard Deviation	24.5762	
MLE Coefficient of Variation	0.499728	
MLE Skewness	1.623981	
MLE Median	43.99194	
MLE 80% Quantile	65.56051	
MLE 90% Quantile	80.69849	
MLE 95% Quantile	95.64984	
MLE 99% Quantile	131.9243	
MVU Estimate of Median	42.77628	
MVU Estimate of Mean	47.76289	
MVU Estimate of Standard Deviation	22.18571	
MVU Estimate of SE of Mean	11.08874	
95% H-UCL	167.3144	
95% Chebyshev (MVUE) UCL	96.09756	
97.5% Chebyshev (MVUE) UCL	117.012	
99% Chebyshev (MVUE) UCL	158.0944	
Non-parametric Statisitics		
95% CLT UCL	69.81552	
95% Adjusted-CLT UCL	82.61021	
95% Modified-t UCL	81.10044	
95% Jackknife UCL	79.10472	
95% Chebyshev (Mean, Sd) UCL	105.3991	
97.5% Chebyshev (Mean, Sd) UCL	130.1276	
99% Chebyshev (Mean, Sd) UCL	178.7019	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	79.10472	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Data File	J:\NE\WELLSG&H\OU3-2004\HHRA\Statistics\July 2004\Sed-SC13-f.xls	
Variable:	Zinc	
Raw Statistics		
Number of Observations	4	
Number of Missing Data	0	
Number of Valid Observations	4	
Number of Distinct Observations	4	
Minimum	815	
Maximum	2500	
Mean	1628.75	
Standard Deviation	845.1664	
Variance	714306.3	
Coefficient of Variation	0.518905	
Skewness	0.066634	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.862071	
Shapiro-Wilk 5% Critical Value	0.748	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	2623.242	
Gamma Statistics		
k hat	4.594009	
k star (bias corrected)	1.315169	
Theta hat	354.5378	
Theta star	1238.434	
nu hat	36.75207	
nu star	10.52135	
5% Approximate Chi Square Value	4.2693	
Adjusted Level of Significance	N/A	
Adjusted Chi Square Value	N/A	
Anderson-Darling Test Statistic	0.451017	
Anderson-Darling 5% Critical Value	0.658969	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.296897	
Kolmogrov-Smirnov 5% Critical Value	0.396	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	4013.925	
95% Adjusted Gamma UCL	N/A	
Lognormal Statistics		
Minimum of log data	6.703188	
Maximum of log data	7.824046	
Mean of log data	7.282801	
Standard Deviation of log data	0.559901	
Variance of log data	0.313489	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.866024	
Shapiro-Wilk 5% Critical Value	0.748	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1701.975	
MLE Standard Deviation	1032.736	
MLE Coefficient of Variation	0.606786	
MLE Skewness	2.043772	
MLE Median	1455.057	
MLE 80% Quantile	2335.349	
MLE 90% Quantile	2987.74	
MLE 95% Quantile	3654.947	
MLE 99% Quantile	5351.484	
MVU Estimate of Median	1398.706	
MVU Estimate of Mean	1632.246	
MVU Estimate of Standard Deviation	893.3172	
MVU Estimate of SE of Mean	446.3396	
95% H-UCL	9172.986	
95% Chebyshev (MVUE) UCL	3577.796	
97.5% Chebyshev (MVUE) UCL	4419.636	
99% Chebyshev (MVUE) UCL	6073.269	
Non-parametric Statisitics		
95% CLT UCL	2323.838	
95% Adjusted-CLT UCL	2338.881	
95% Modified-t UCL	2625.588	
95% Jackknife UCL	2623.242	
95% Chebyshev (Mean, Sd) UCL	3470.747	
97.5% Chebyshev (Mean, Sd) UCL	4267.781	
99% Chebyshev (Mean, Sd) UCL	5833.4	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NORMAL	
1st Recommended UCL	2623.242	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

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