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NIROP ABL ROCKET CENTER
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DRAFT TECHNICAL MEMORANDUM BACKGROUND METALS EVALUATION ABL ROCKET CENTER WV

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CH2MHILL

ABL Background Metals Evaluation

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ATT: *RAW.xls DUPES.xls RPD.xls ANLYZE.xls S.xls Q.xls SUM1.xls LSUM.xls MATRIX.doc BOXPLT.doc BOX.doc dSB.doc dSS.doc SITE5.xls UTLs.xls*

SUMMARY. This TM summarizes results from evaluation of background concentrations of metals in soils from the ABL site. Evaluation procedures and result are presented in five sections. Section 1 summarizes objectives to be met in the evaluation and establishes the regulatory background for calculations performed. Section 2 describes statistical methods used to accomplish those objectives, including exploratory analyses and goodness-of-fit tests, conducted prior to estimating upper limits of background concentrations. Section 3 describes available data and data management procedures key to development of a database which was consistent with the objectives of establishing background levels of metals from surface and subsurface soils in the area of the facility. Section 4 describes results from the preliminary procedures which determine the specific calculations appropriate to estimate upper bound of background concentrations. Section 5 documents parameter-specific estimates of background concentrations against which on-site concentrations may be compared. *UTLs.xls* summarizes preliminary and final results for the 23 - 24 parameters included in this background evaluation for surface soils [all sites], surface soils [excluding Site5] and subsurface soils. Statistical procedures were performed using SYSTAT, distributed by SPSS [Evanston IL]; S-plus, distributed by MATHSoft [Seattle WA]; and EnvironmentalStats for S-plus, distributed by PSI: Probability, Statistics and Information [Seattle WA].

1.0 OBJECTIVES

The objective to this evaluation is to estimate concentrations of naturally-occurring constituents which are an upper limit of metal concentrations which could reasonably be expected to represent background conditions for soils on and near the ABL facility. In this evaluation, background is interpreted to mean concentrations resulting from natural processes, independent of redistribution or incremental loading which could be attributable to human activities. These upper bounds are considered to represent levels above which concentrations would be indicative of contamination which is the result of activities on the site and, potentially, could require remediation.

The regulatory framework for comparisons to background has been described in several guidance and forum papers, particularly: *Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites* [Breckenridge, R.P. and A.B. Crockett. 1995. USEPA , Engineering Forum Issue, EPA/540/S-96/500] and *Statistical Analysis of Ground-water monitoring Data at RCRA Facilities – Interim Final Guidance* [April 1989] and its sequel: *Addendum to Interim Final Guidance* [April 1992].

The EPA forum paper specifically avoids explicit methods for determining background concentrations of inorganics in soils on the premise that the paper objective is *"to provide a discussion of the technical issues involved in establishing background and not to address agency policy-related decisions on how to use background data to achieve cleanup levels or applicable or*

relevant and appropriate requirements (ARARs)." The discussion defines background levels as the function of local, regional or global anthropogenic sources plus naturally occurring levels; as distinct from on-site concentrations which include the two former sources plus concentrations resulting from site-related activities.

Several methods are available to statistically test for differences between background and on-site concentrations. For example, population-to-population tests can be developed which explicitly test concentrations from on-site samples to background samples. Examples include t-tests which compare two means, or, where data do not follow theoretical, assumed distributions for the parametric test, the non-parametric analogue, the Mann-Whitney or rank sum test. Alternatives which are routinely used in groundwater comparisons involved calculation of an upper limit from the background sample results, against which on-site concentrations are compared. Exceedance of the upper limit on background levels in on-site concentrations is taken to indicate that site levels are elevated beyond what is expected to represent background conditions. The statistical tools used in such comparisons include: percentile estimates, upper tolerance limits [UTLs] and/or prediction limits. Percentile estimates involve estimation of some proportion of the background population, such as the 95th or 99th percentile which corresponds to the concentration which is greater than or equal to 95 or 99 percent of background observations. UTLs are similar but have the added advantage of an uncertainty interval about the limit; such as the 95t^{h} confidence interval on the 95th percentile of background levels. Prediction intervals are similar to UTLs but are intervals within which the next pre-specified number of observations should fall within; such as the 95 percent confidence interval on the next 7 observations from a population which is represented by background levels.

For purposes of this evaluation of background levels of metal concentrations in ABL soils, UTLs have been derived from areas on or near the facility where no prior site activities have been documented. The UTLs define the upper 95th confidence interval on the 95th percentile of background soil concentrations of metals. This level is 'conservative' in that it would be expected that the approximate highest 5% of values in true background would be found questionable in comparison to the limit. In contrast, a prior methodology [CH2M HILL, October 1996] involved calculation of background upper confidence limits on the mean concentration [UCLs]. This estimate was then compared to the maximum concentration observed and the highest value selected. UTL calculation is a more straight forward application of methods of comparing site to background levels.

Prior to estimating UTLs, preliminary evaluations have been conducted to establish that:

- sampling depths represent populations which are substantively different in levels of metal concentrations;
- anomalous values or *outliers* do not exist which represent concentrations not within the limits of expectable background concentrations; and
- UTLs are calculated using appropriate theoretical distributions or, alternatively, nonparametric methods which assume no theoretical distribution.

Available data have been collected at various locations and sampling depths. Because the constituents being evaluated are naturally-occurring, spatial differences [vertical] have been examined through use of boxplots. Assuming different depths represent different concentrations of naturally-occurring metals, it is appropriate to establish surface and

subsurface estimates for each parameter. However, if differences among locations or soil depths were not significant, it would be more efficient to pool surface and subsurface results into a single background estimate.

Because data considered representative of background conditions have been collected on the ABL facility, there is the potential that undocumented activities on the property have resulted in elevated concentrations at specific locations. Examination of anomalous values or, outliers, has been used to identify individual sample results which could artificially inflate background estimates. Outlier-identification is a difficult process as infrequent or *rare* events would be expected to occur occasionally when sampling a single population. Eliminating these rare events which are particularly high or low is artificially truncating the distribution of the true population, potentially biasing estimates and understimating true parameter variability. Additionally, Site5 was, a priori, considered a potentially impacted area. Consequently, independent of exploratory results, it was determined that calculations would be performed two ways: including and excluding Site5 data.

UTLs are calculated in different ways, each appropriate to the distribution assumed. Where data are normally distributed, the normal estimates are appropriate. If data are not normally distributed, but, rather, log normally distributed, the more appropriate calcualtion is based upon log normal estimates. If neither theoretical distribution is followed by the observations, a non parametric method is preferred. In this evaluation, observations were tested in terms of the normal and lognormal theoretical distributions using the Shapiro-Wilk test. If the observations followed a theoretical distribution, the appropriate calculation methods were used. Where observations followed neither the normal nor lognormal distribution, nonparametric methods, which are based upon rank [or order] statistics and assume no theoretical distribution, were applied.

2.0 STATISTICAL METHODS

Statistical methods used to describe and characterize the available background data from soils on the facility include: relative percent difference [RPD], frequency of detection [FD], boxplots, Dixon test for outliers and the Shapiro-Wilk goodness-of-fit test. Each of these methods is briefly described, as follows:

RPD Relative percent difference is the ratio of the difference between two observations, standardized by the mean of the same two observations. The RPD between two samples that differ in reported concentration by a fixed amount can differ widely, depending upon the concentration range of the results. *For example*, the RPD for a 100 mg/kg difference between a surface sample reported at 10 mg/kg and a subsurface sample reported at 110 mg/kg is –167 percent. The same 100 mg/kg difference between reported surface and subsurface concentrations of 1,100 and 1,000 mg/kg, respectively, results in a calculated RPD of +9.5 percent. While there are performance specifications for laboratory duplicates, RPD from duplicate samples collected at the same point in time and space are used as an estimate of relative small-scale spatial variability and are neither 'acceptable' nor 'unacceptable.' Acceptable laboratory duplicate RPDs are considered a lower bound which would indicate minor small-scale spatial differences.

FD The frequency of detection is the percentage of observations which have been reported by the analytical laboratory as detectable concentrations. Frequency of detection is a rough indicator of distribution in that FDs which are less than 80 percent are unlikely to

exhibit either a normal or lognormal distribution. FDs less than 50 percent indicate extremely rare detections at the limits of analytical methods used in quantification.

Boxplots Boxplots are statistical graphics that allow visual comparison of different data subsets. *BOXPLT.doc* is a generic boxplot that defines each of the components of the plot and includes a brief explanation of boxplot interpretation. Boxes of different data subsets that overlap completely indicate that samples represented in the different subsets are likely drawn from a common population. Boxes with marginal overlap indicate that subsets could well represent different populations. Boxplot displays presented throughout this document have been supplemented with an overlay of dot density, which plots each individual point in the data subset. With the overlay, the exact count of observations represented in the boxplot can be verified.

Dixon Test for Outliers USEPA *Statistical Analysis of Ground-water Monitoring Data at RCRA Facilities – Interim Final Guidance* [1989] suggests application of the Dixon test for identification of outliers. An outlier is a reported observation which is anomalous enough to be considered as unrepresentative of the population sampled. Here, where samples have been collected in areas for which there is no documented contamination process, minor releases could have occurred. Because background estimates will be used to compare to on-site levels, Dixon's test was applied to all parameters prior to estimating UTLs. The test finds the difference between the log transformation of the maximum value and the mean of the log transformed observations, then standardizes that difference to the standard normal by dividing by the standard deviation of the log transformed observations; that is, the Z-score of the maximum value, assuming log normally distributed data. The value is compared to tabled values which are the function of the number of observations

Shapiro-Wilk Goodness-of-Fit Test Goodness-of-fit tests [GOF] compare the distribution of observed values to known, theoretical distributions. The Shapiro-Wilk GOF test [SW GOF], appropriate for sample sizes less than or equal to 50, has been applied to observations on the 23-24 parameters quantified in background surface and subsurface soils. The test score from the SW GOF corresponds to a probability of the occurrence of that score, relative to the number of observations. Probabilities less than 0.05 are considered evidence that the observed values deviate substantively from the tested theoretical distribution. In this TM, SW GOF tests for normality were performed using both untransformed and log transformed values. If both normal and lognormal results exceeded 0.05, the distribution corresponding to the larger SW GOF probability was assumed. If neither result exceeded 0.05, upper tolerance intervals were estimated using nonparametric methods. If only one of the results exceeded 0.05, that distribution was assumed and percentile calculations applied accordingly.

3.0 AVAILABLE DATA

The original data file of metals quantifications from ABL background locations consisted of 835 records. Examination of the file resulted in some preliminary data management procedures to document internal consistency and acceptability of reported results and consolidation of QA/QC samples into single estimates. Available data and data management procedures and results are summarized, as follows:

- Data were quantified in units of mg/Kg. Data qualifiers included 12 unique codes, listed in *Q.xls*. The original qualifiers were coded into three categories: detected,

undetected and rejected [D, U and R]. A multiplier was applied to each reported concentration, dependent upon the qualifier. Detects were multiplied by 1; undetected concentrations by .5 and rejected values by 0 [and then removed from the file]. As indicated in the table, 12 values were eliminated from the original file, resulting in a data base of 823 records. These records are listed in *RAW.xls*.

- Background soils were collected from surface depths [0 – 1ft bgs] and subsurface depths [2ft, 2-4ft, 4ft and 4-6ft bgs] from 19 and 13 different locations on the ABL facility, respectively. Specific sample locations and the corresponding SiteIdentifier for the two matrices are listed in *S.xls*, along with the count of observations in the original datafile.

- As indicated in *S.xls*, four surface samples were duplicated: HCS-BR-2/-2DUP, 10006B-3-T/-TDUP, 22A-1-T/-TDUP and 23-2-T/-TDUP. *DUPES.xls* lists the 90 paired duplicate results for each set and parameter. The table lists the two values for the pair as well as the mean and RPD. The table has been sorted by RPD [decreasing]. The mean value was substituted into the database so that duplicate results were represented by a single concentration in order to eliminate artificial waiting of that location due to QA/QC sampling. *RPD.xls* summarizes individual RPDs by parameter, listing the minimum, maximum and mean RPD. In a 'fair' world, RPDs would cover approximately the same range of positive and negative values and average 0. While some parameters exhibit comparatively high average RPDs, the sample size is limited. Additionally, none of the minimum or maximum values are so extreme as to indicate a problem. Replacement of duplicate measures with a single result resulted in a database for analysis of 734 records [*ANLYZE.xls*].

- Parameters quantified from the soil samples included 23 metals from subsurface soils: AG, AL, AS, BA, BE, CA, CD, CO, CR, CU, FE, HG, K, MG, MN, NA, NI, PB, SB, SE, TL, V and ZN. Surface soils were quantified for the same parameters plus CN for a total of 24 parameters. Comparison of surface and subsurface results was performed using boxplots, corroborated with t-tests. *BOX.doc* displays the 23 pairs of surface | subsurface boxplots for the 23 parameters quantified in both surface and subsurface samples. The plots have been transformed to a log scale to more clearly exhibit the distributions of observations. *MATRIX.xls* tabulates results from t-tests using untransformed and log transformed concentrations. Assuming a level of 0.05 as indicative of statistically significant differences between the two populations, the two tests yield the same conclusion with three exceptions: AG, CA and HG. In these cases, results are similar but, individually, would have lead to different conclusions. For purposes of these comparisons, the log Normal results were considered preferable. *MATRIX.xls* indicates that the majority of surface and subsurface comparisons [15 of 23 or, 65 percent] are significantly different, supporting the calculation of independent surface and subsurface UTLs.

- A preliminary examination of the Site5 data was performed in order to evaluate the potential for major differences in surface soil metals estimates including and excluding the two samples from Site5. *SITE5.xls* lists each parameter * sample identifier result, where each result was compared to all results for the same parameter. The relative rank is standardized to the count of all records for that parameter. A relative rank of 1.00 indicates that the Site5 result is the maximum result for that parameter in all surface samples. A relative rank of 0.05 indicates that the Site5 result was the minimum of the

19 surface soil results reported. Relative ranks ranged between 0.05 and 1.00, averaging 0.65 with a median value of 0.68; suggesting that for at least some parameters, inclusion of the Site5 results could be substantive.

- *SUM1.xls* summarizes results from surface and subsurface results by parameter. The table includes: matrix, parameter name, the count of detected observations and total observations, FD, the minimum and maximum of reported non-detects and detects and the mean, standard deviation and coefficient of variation for the observations [where, nondetects have been treated at half the reported detection limit]. Two parameters were not detected in subsurface samples: HG and NA. FDs for the remaining parameters range between 15 and 100 percent. CN and NA were not detected in any surface samples. FDs for the remaining 22 parameters range between 5 and 100 percent.
- Where FDs are 0, calculation of background UTLs is not meaningful. Rather, such a calculated value would be a statement about analytical sensitivity rather than the true distribution of parameter concentrations in background soils. In such cases, a more conservative estimate is recommended—the mean reported nondetect. A detected exceedance of the mean U concentration would be an indication that the on-site concentrations exceed what would be expected in true background locations.

4.0 PRELIMINARY EVALUATIONS

This section summarizes results from the evaluations of potential outliers and parameter distribution testing.

Potential Outliers. *LSUM1.xls* summarizes results from the Dixon test, applied to the full set of observations from surface and subsurface metals. Based upon the number of observations, only the maximum SE concentration in surface soils could be considered an outlier. The FD of SE in surface soils is 11 percent. Consequently, all but 2 of the values have been halved prior to log transformation. In subsurface samples, the maximum values of HG and AG [with FDs less than or equal to 15 percent] exhibit elevated levels. *MAX.xls* lists the location for each parameter maximum for surface and subsurface samples included in the analysis.

Distribution Testing. *dSS.doc* and *dSB.doc* consist of 24 and 23 parameter-specific sets of graphical displays, evaluating the goodness of fit of normal and lognormal distributions to available surface and subsurface data, respectively. Each pair consists of normal and lognormal test results. Each of the 94 figures includes 4 panels, described as follows:

- The upper left figure is a frequency distribution of the observations, plotting relative frequency across concentration. The frequency distribution is useful in identifying relative abundance of observations over the range of concentrations within the subset.
- The lower left plot is a quantile – quantile plot of a theoretical distribution [normal or lognormal] on the ordinate plotted against the quantiles of the observed values on the abscissa. Adherence to the theoretical distribution is evidenced by the points lying on the diagonal; that is, the quantiles of theoretical and observed values coincide.

- The upper right panel is a display of the cumulative density function of the observations [solid line] against the theoretical distribution being tested. The more closely the observations follow the theoretical distribution, the closer are the lines.
- The lower right panel documents results of the Shapiro-Francia goodness-of-fit test, indicating the distribution being tested, the probability value of the test statistic [given the degrees of freedom of the observations]. By convention, values exceeding a cutpoint [typically, 0.05 or 0.10] indicate that the value of the W-statistic is common enough to accept the null hypothesis of the observations following the theoretical distribution tested

Results from the goodness-of-fit testing for the surface and subsurface metals parameters [with and without Site5 data] are given in *UTLS.SB.xls*, *UTLs.SS.xls* and *UTLs.SSnotSITE5.xls*

5.0 BACKGROUND SOIL CONCENTRATIONS

UTLs.xls includes three worksheets for surface soils [all site], surface soils [Site 5 results excluded] and subsurface soils for the 23 - 24 parameters for which background estimates have been generated. Format of the three worksheets is consistent with columns in the table to document: N, or, sample size [following outlier removal]; FD; the probability values from the SW GOF for normal [~Normal] and lognormal [~LogN]; and the distribution assumed for percentile calculations [NonP = nonparametric and Log=LogNormal]. The final column lists the UTL or UCL, as indicated in the preceding column [where UCLs represent the average non-detect for parameters with FDs equaling zero]. In the case of the parametric [~N or ~LogN] estimates, the UTLs are calculated values and represent the calculated 95percent upper confidence limit on the 95th UTL. In the case of nonparametric estimates, the confidence is also 95 percent but the coverage is limited by the number of observations. If sample sizes were on the order of 60 observations, the maximum value would represent approximately 95 percent confidence on the 95th. However, where sample sizes are on the order of 13 – 19, coverage is limited [to 79 and 85 percent, respectively].

ABL BACKGROUND SOIL METALS

DATA QUALIFIERS: CONCENTRATION ADJUSTMENT

Q.xls

Q	ORIGINAL QUALIFIER	N	CONCENTRATION MULTIPLIER
U	B	113	0.5
U	BJ	1	0.5
D	Clear	469	1
D	J	75	1
D	JD	2	1
D	JS	11	1
D	N	2	1
R	R	12	0
D	RS	1	1
U	U	136	0.5
U	UJ	11	0.5
U	UJB	2	0.5

ABL BACKGROUND SOIL METALS CONCENTRATIONS:
SURFACE [SS] & SUBSURFACE [SB] SAMPLE IDENTIFIERS
S.xls

SAMPLEID	MATRIX	SITEID	N
10006A-1-D	SB	Aoc 10006	23
10006A-2-D	SB	Aoc 10006	23
10006A-3-D	SB	Aoc 10006	23
10006B-1-D	SB	Aoc 10006	23
10006B-2-D	SB	Aoc 10006	23
10006B-3-D	SB	Aoc 10006	23
26-1-D	SB	Swmu 26	23
26-2-D	SB	Swmu 26	23
37D-1-D	SB	Swmu 37D	23
37T-1-D	SB	Swmu 37T	23
HCS-PWA-29	SB	Site 10	23
HCS-S2-5	SB	Site 2	23
HCS-S2-6	SB	Site 2	23
HCS-BR-1	SS	Background	24
HCS-BR-2	SS	Background	24
HCS-BR-2DUP*	SS	Background	24
HCS-BR-3	SS	Background	24
HCS-BR-4	SS	Background	24
HCS-S5-1	SS	Site 5	24
HCS-S5-2	SS	Site 5	24
10006A-1-T	SS	Aoc 10006	23
10006A-2-T	SS	Aoc 10006	23
10006A-3-T	SS	Aoc 10006	23
10006B-3-T	SS	Aoc 10006	23
10006B-3-T/DUP*	SS	Aoc 10006	23
22A-1-T	SS	Swmu 22	23
22A-1-T/DUP*	SS	Swmu 22	23
22A-2-T	SS	Swmu 22	23
22C-1-T	SS	Swmu 22C	23
22C-2-T	SS	Swmu 22C	23
23-1-T	SS	Swmu 23	23
23-2-T	SS	Swmu 23	23
23-2-T/DUP*	SS	Swmu 23	23
23-4-T	SS	Swmu 23	23
HCS-PWA-29S	SS	Site 10	23
SITE3-1-T	SS	Site 3	23

* Duplicate Sample results have been averaged to single value. [See text.]

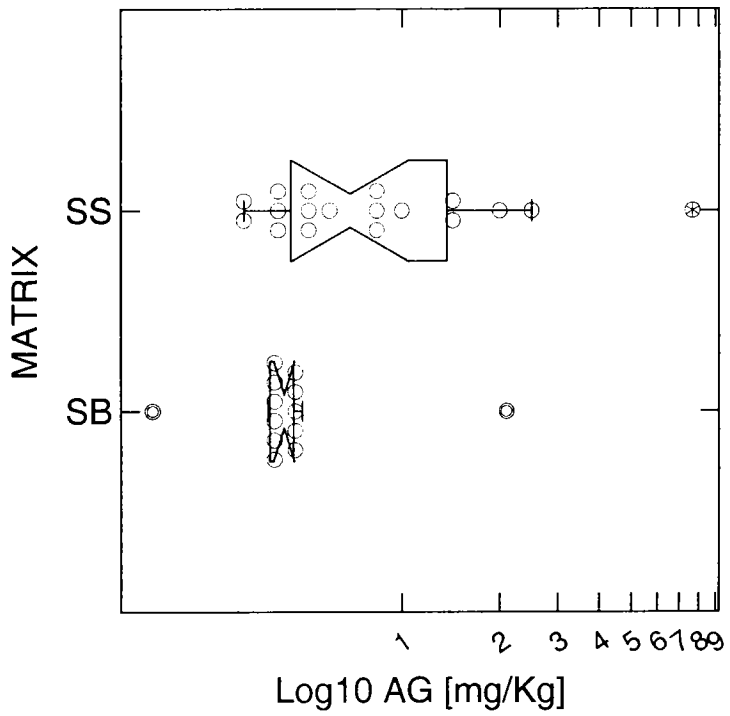
ABL BACKGROUND SOIL METALS ESTIMATION:
DUPLICATE SAMPLE RESULTS
DUPES.xls

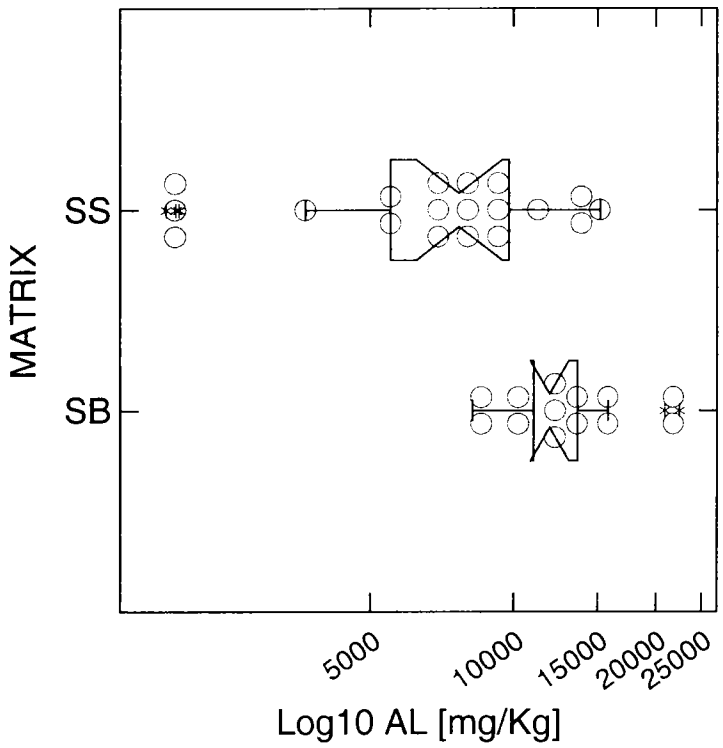
MATRIX	P	SID	VAL1	Q1	VAL2	Q2	MEANVAL	Q	RPD
SS	CA	HCS-BR-2	32300.0	D	1040.0	D	16670.0	D	187.5
SS	MG	HCS-BR-2	4760.0	D	209.5	U	2484.8	D	183.1
SS	K	HCS-BR-2	1490.0	D	185.0	U	837.5	D	155.8
SS	TL	22A-1-T	2.3	D	0.5	U	1.4	D	133.3
SS	BA	HCS-BR-2	138.0	D	45.2	D	91.6	D	101.3
SS	SB	HCS-BR-2	17.5	D			17.5	D	100.0
SS	K	22A-1-T	1340.0	D	469.0	U	904.5	D	96.3
SS	AG	22A-1-T	2.0	D	0.8	U	1.4	D	90.9
SS	PB	HCS-BR-2	41.6	D	16.9	D	29.2	D	84.4
SS	CO	22A-1-T	11.2	D	5.1	U	8.1	D	75.7
SS	AL	HCS-BR-2	7270.0	D	3320.0	D	5295.0	D	74.6
SS	BE	22A-1-T	1.0	D	0.5	U	0.7	D	74.0
SS	V	HCS-BR-2	25.5	D	12.9	D	19.2	D	65.6
SS	TL	10006B-3-T	0.8	U	0.5	U	0.6	U	55.0
SS	NA	22A-1-T	29.2	U	18.9	U	24.0	U	43.1
SS	CR	HCS-BR-2	11.7	D	7.6	D	9.6	D	42.5
SS	AL	22A-1-T	8850.0	D	6200.0	D	7525.0	D	35.2
SS	MN	10006B-3-T	374.0	D	275.0	D	324.5	D	30.5
SS	CU	HCS-BR-2	20.1	D	15.1	D	17.6	D	28.4
SS	CR	22A-1-T	14.5	D	11.0	D	12.8	D	27.5
SS	SE	22A-1-T	0.4	U	0.3	U	0.4	U	27.0
SS	NA	10006B-3-T	40.2	U	30.8	U	35.5	U	26.5
SS	CD	HCS-BR-2	0.4	U	0.3	U	0.3	U	23.3
SS	V	22A-1-T	20.7	D	16.4	D	18.6	D	23.2
SS	CD	10006B-3-T	0.3	U	0.3	U	0.3	U	22.6
SS	SE	10006B-3-T	0.3	U	0.3	U	0.3	U	22.6
SS	TL	HCS-BR-2	0.5	U	0.4	U	0.4	U	22.0
SS	MG	22A-1-T	1090.0	D	875.0	D	982.5	D	21.9
SS	ZN	22A-1-T	66.7	D	53.7	D	60.2	D	21.6
SS	NI	22A-1-T	20.6	D	16.7	D	18.7	D	20.9
SS	K	10006B-3-T	1810.0	D	1520.0	D	1665.0	D	17.4
SS	PB	22A-1-T	30.7	D	25.9	D	28.3	D	17.0
SS	ZN	10006B-3-T	42.7	D	36.6	D	39.6	D	15.4
SS	AL	10006B-3-T	15100.0	D	13000.0	D	14050.0	D	14.9
SS	FE	22A-1-T	24400.0	D	21600.0	D	23000.0	D	12.2
SS	AS	23-2-T	12.2	D	10.8	D	11.5	D	12.2
SS	AS	22A-1-T	7.1	D	6.3	D	6.7	D	11.9
SS	CU	22A-1-T	18.8	D	16.8	D	17.8	D	11.2
SS	CU	10006B-3-T	32.3	D	28.9	D	30.6	D	11.1
SS	BA	22A-1-T	115.0	D	104.0	D	109.5	D	10.0
SS	V	10006B-3-T	20.8	D	18.9	D	19.8	D	9.6
SS	AS	10006B-3-T	9.3	D	8.5	D	8.9	D	9.0
SS	BE	10006B-3-T	1.2	D	1.1	D	1.2	D	8.7
SS	FE	23-2-T	26800.0	D	24700.0	D	25750.0	D	8.2
SS	CN	HCS-BR-2	0.6	U	0.6	U	0.6	U	8.0
SS	BA	10006B-3-T	66.7	D	61.7	D	64.2	D	7.8
SS	MN	22A-1-T	705.0	D	658.0	D	681.5	D	6.9
SS	CA	10006B-3-T	4860.0	D	4560.0	D	4710.0	D	6.4
SS	AS	HCS-BR-2	6.5	D	6.1	D	6.3	D	6.3

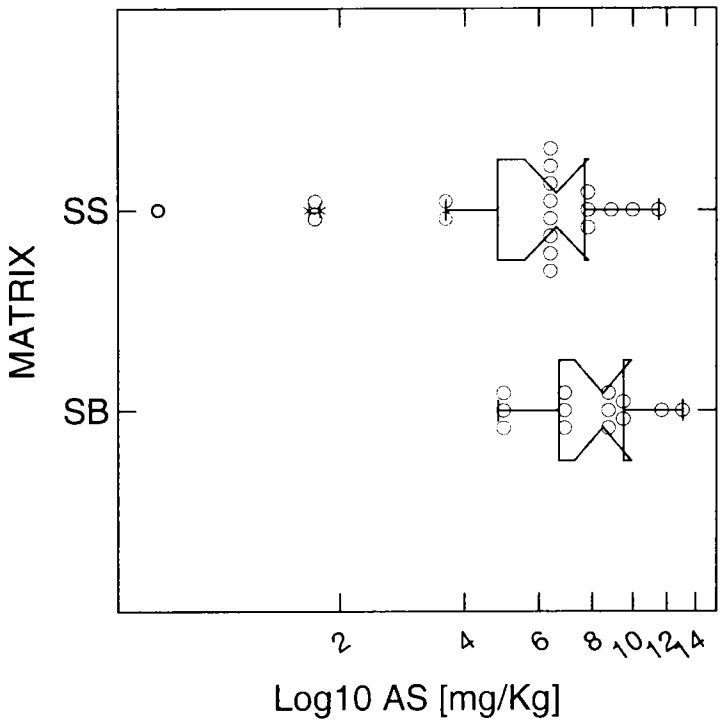
SS	CO	10006B-3-T	13.4 D	12.6 D	13.0 D	6.2
SS	V	23-2-T	20.8 D	19.6 D	20.2 D	5.9
SS	CU	23-2-T	19.3 D	18.2 D	18.8 D	5.9
SS	FE	10006B-3-T	35400.0 D	33500.0 D	34450.0 D	5.5
SS	PB	23-2-T	17.4 D	16.5 D	16.9 D	5.3
SS	BA	23-2-T	78.7 D	75.1 D	76.9 D	4.7
SS	MG	10006B-3-T	2660.0 D	2550.0 D	2605.0 D	4.2
SS	CA	22A-1-T	2410.0 D	2330.0 D	2370.0 D	3.4
SS	CO	23-2-T	22.3 D	21.6 D	21.9 D	3.2
SS	PB	10006B-3-T	13.2 D	12.8 D	13.0 D	3.1
SS	HG	22A-1-T	0.1 U	0.1 U	0.1 U	0.0
SS	BE	23-2-T	0.4 U	0.4 U	0.4 U	-1.2
SS	MN	23-2-T	541.0 D	550.0 D	545.5 D	-1.6
SS	CD	23-2-T	0.3 U	0.3 U	0.3 U	-3.5
SS	SE	23-2-T	0.3 U	0.3 U	0.3 U	-3.5
SS	TL	23-2-T	0.3 U	0.3 U	0.3 U	-3.5
SS	CR	23-2-T	14.0 D	14.5 D	14.3 D	-3.5
SS	AL	23-2-T	11000.0 D	11500.0 D	11250.0 D	-4.4
SS	NI	23-2-T	15.1 D	15.9 D	15.5 D	-5.2
SS	MN	HCS-BR-2	586.0 D	628.0 D	607.0 D	-6.9
SS	CD	22A-1-T	0.3 U	0.3 U	0.3 U	-9.8
SS	ZN	23-2-T	44.0 D	48.7 D	46.4 D	-10.1
SS	K	23-2-T	957.0 D	1060.0 D	1008.5 D	-10.2
SS	AG	23-2-T	0.5 U	0.6 U	0.5 U	-11.5
SS	FE	HCS-BR-2	18900.0 D	21500.0 D	20200.0 D	-12.9
SS	NA	23-2-T	31.0 U	36.8 U	33.9 U	-16.8
SS	HG	10006B-3-T	0.0 U	0.0 U	0.0 U	-18.2
SS	HG	HCS-BR-2	0.2 D	0.2 D	0.2 D	-23.5
SS	HG	23-2-T	0.0 U	0.1 U	0.0 U	-35.3
SS	CR	10006B-3-T	13.9 D	19.9 D	16.9 D	-35.5
SS	NI	10006B-3-T	25.0 D	36.9 D	31.0 D	-38.4
SS	SE	HCS-BR-2	0.5 U	0.9 D	0.7 D	-57.8
SS	ZN	HCS-BR-2	75.1 D	138.0 D	106.5 D	-59.0
SS	AG	HCS-BR-2	0.6 U	1.2 D	0.9 D	-66.7
SS	NA	HCS-BR-2	39.2 U	79.0 U	59.1 U	-67.5
SS	NI	HCS-BR-2	16.3 D	38.9 D	27.6 D	-81.9
SS	MG	23-2-T	2160.0 D	5170.0 D	3665.0 D	-82.1
SS	CA	23-2-T	23500.0 D	56900.0 D	40200.0 D	-83.1
SS	AG	10006B-3-T	0.9 U	2.2 D	1.6 D	-83.9
SS	BE	HCS-BR-2	0.3 U	1.0 D	0.6 D	-100.8
SS	CO	HCS-BR-2	4.6 U	28.6 D	16.6 D	-145.1

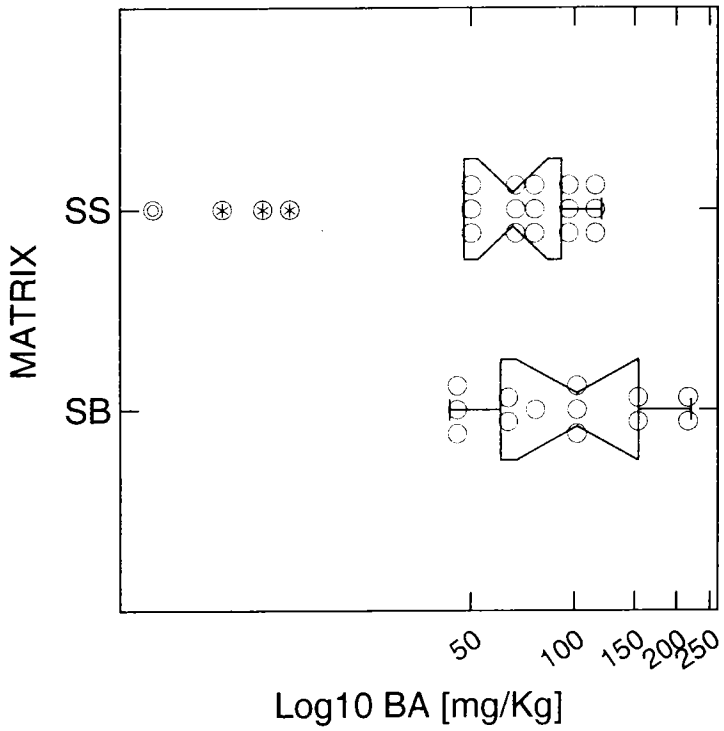
ABL BACKGROUND SOIL METAL CONCENTRATION ESTIMATION:
DUPLICATE RELATIVE PERCENT DIFFERENCEs
RPDs.xls

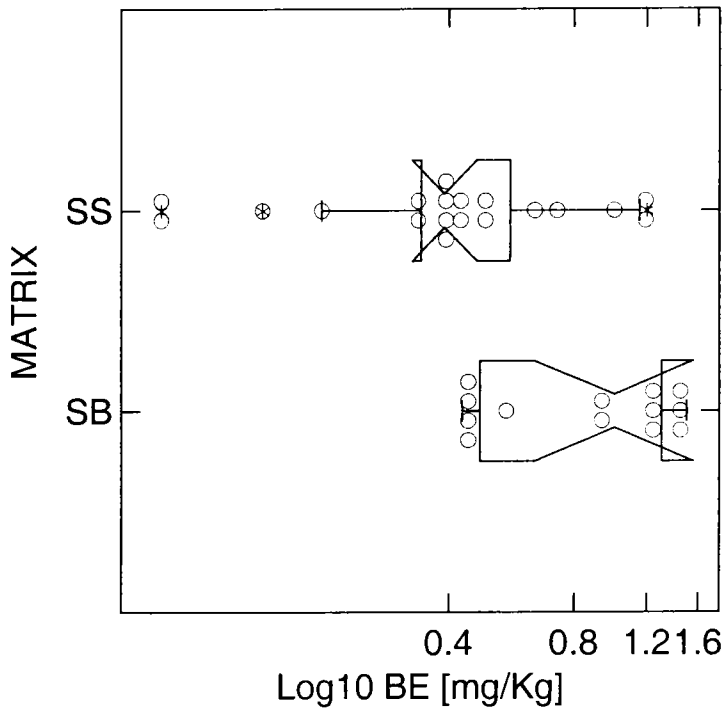
			RELATIVE PERCENT DIFFERENCE		
MATRIX	**P**	**N**	**MIN**	**MAX**	**MEAN**
SS	AG	4	-84	91	-18
SS	AL	4	-4	75	30
SS	AS	4	6	12	10
SS	BA	4	5	101	31
SS	BE	4	-101	74	-5
SS	CA	4	-83	188	29
SS	CD	4	-10	23	8
SS	CN	1	8	8	8
SS	CO	4	-145	76	-15
SS	CR	4	-36	42	8
SS	CU	4	6	28	14
SS	FE	4	-13	12	3
SS	HG	4	-35	0	-19
SS	K	4	-10	156	65
SS	MG	4	-82	183	32
SS	MN	4	-7	31	7
SS	NA	4	-67	43	-4
SS	NI	4	-82	21	-26
SS	PB	4	3	84	27
SS	SB	1	100	100	100
SS	SE	4	-58	27	-3
SS	TL	4	-4	133	52
SS	V	4	6	66	26
SS	ZN	4	-59	22	-8

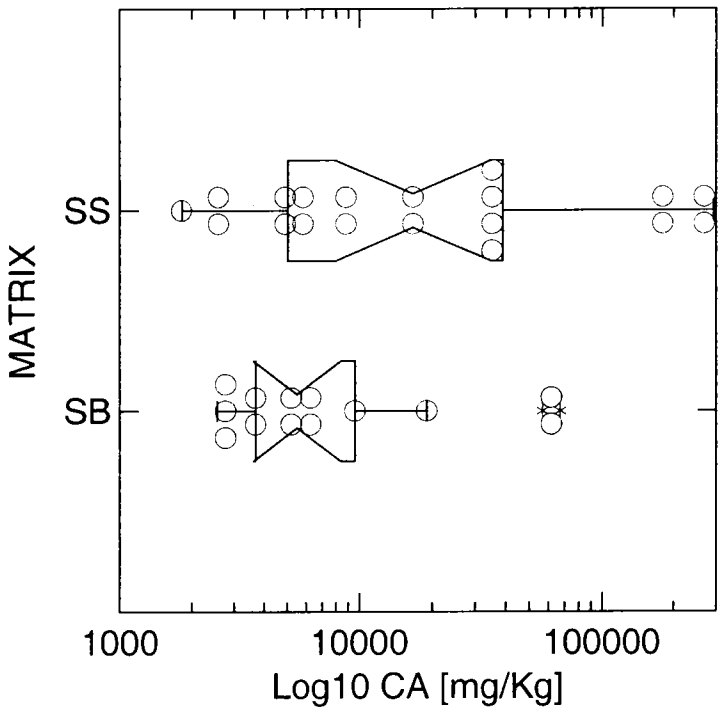

MATRIX
SS
SB
1
2
3
4
5
6
7
8
9
Log10 AG [mg/Kg]

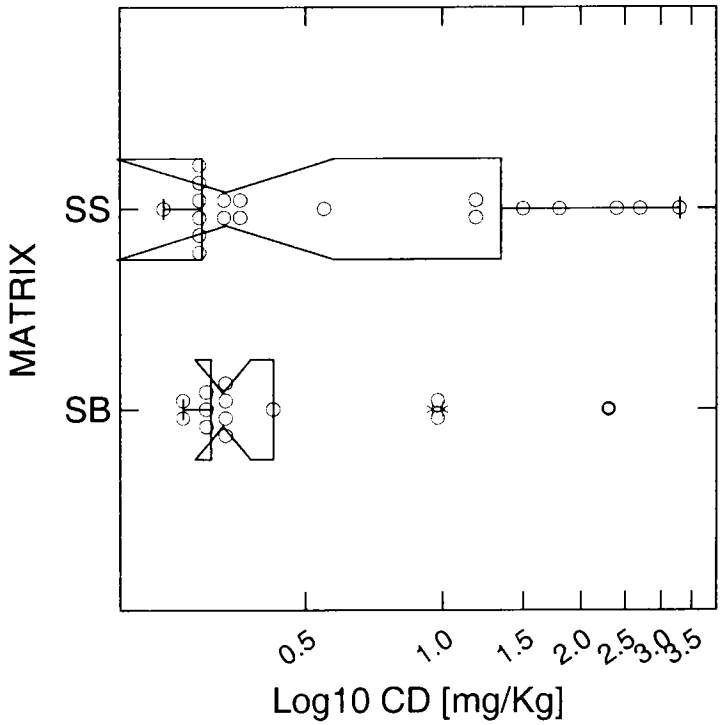

MATRIX
SS
SB
5000
10000
15000
20000
25000
Log10 AL [mg/Kg]

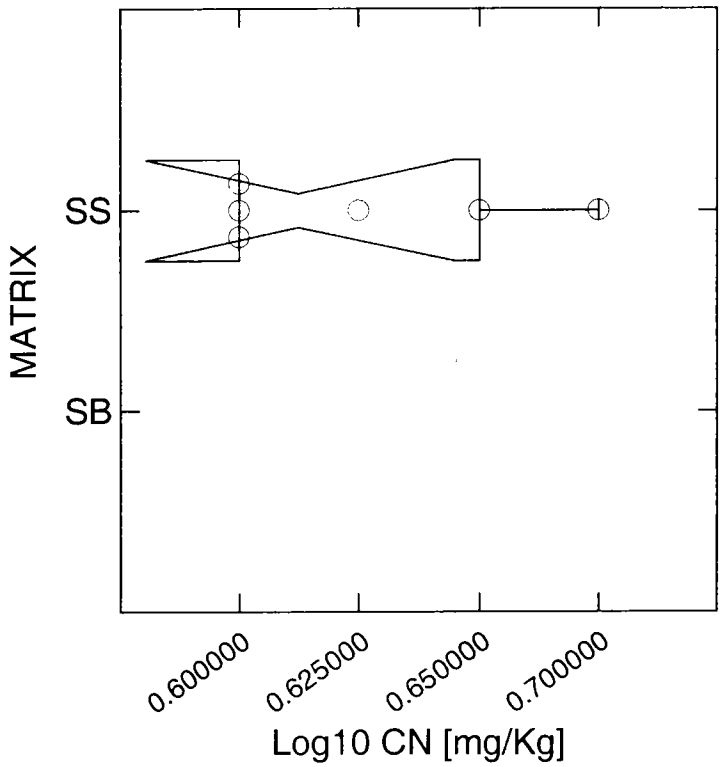

MATRIX
SS
SB
2
4
6
8
10
12
14
Log10 AS [mg/Kg]

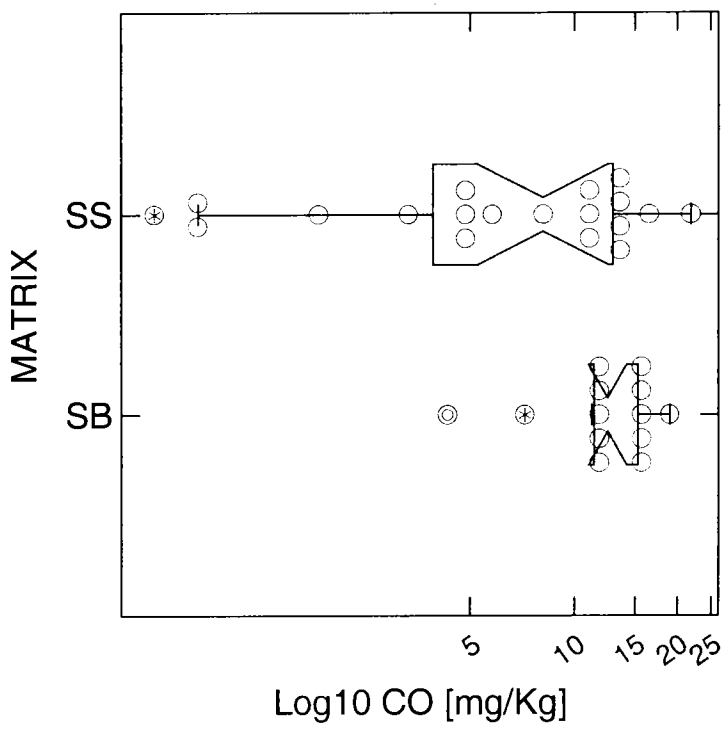

MATRIX
SS
SB
50
100
150
200
250
Log10 BA [mg/Kg]

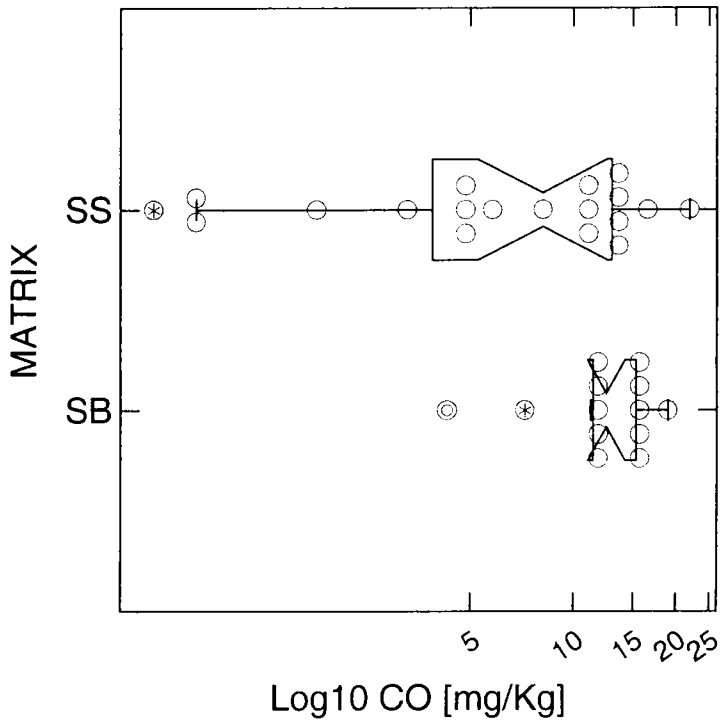

MATRIX
SS
SB
0.4
0.8
1.2
1.6
Log10 BE [mg/Kg]

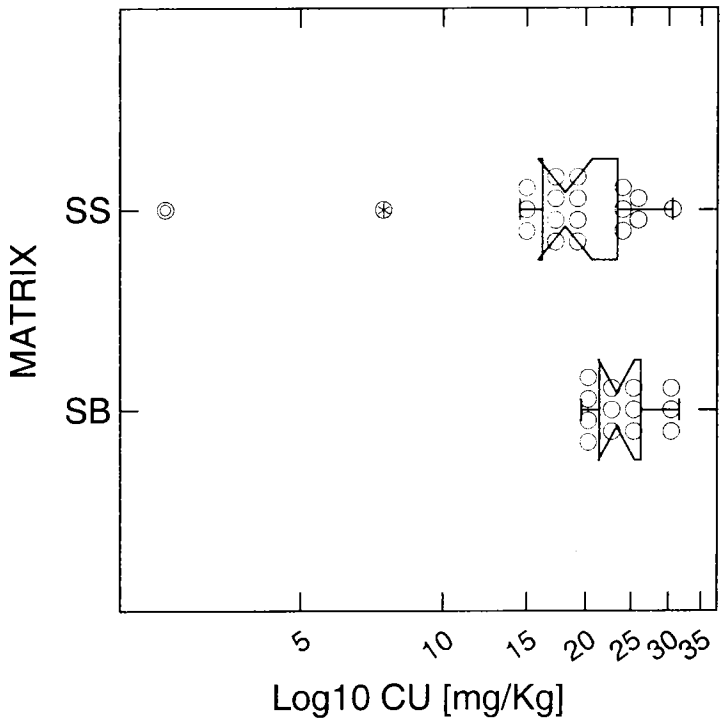

MATRIX
SS
SB
1000
10000
100000
Log10 CA [mg/Kg]

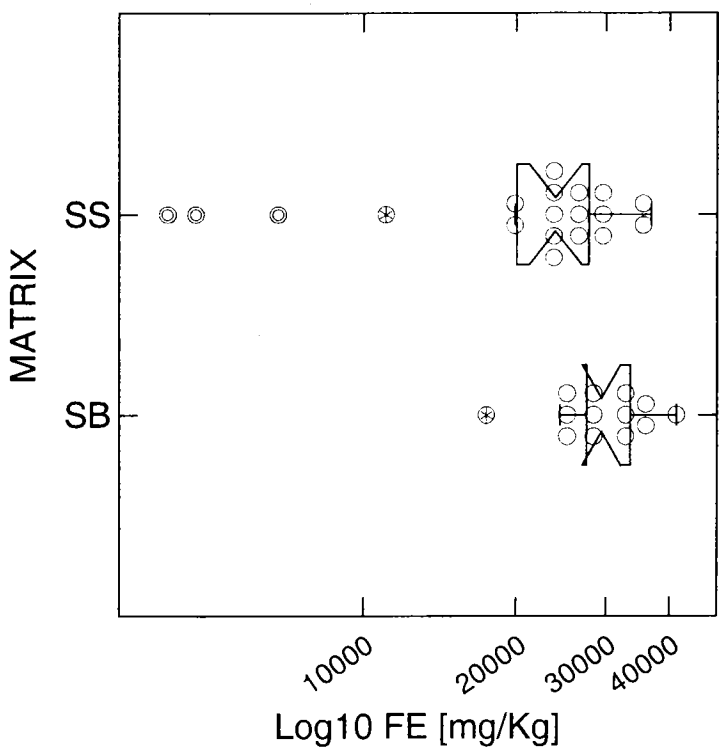

MATRIX
SS
SB
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Log10 CD [mg/Kg]

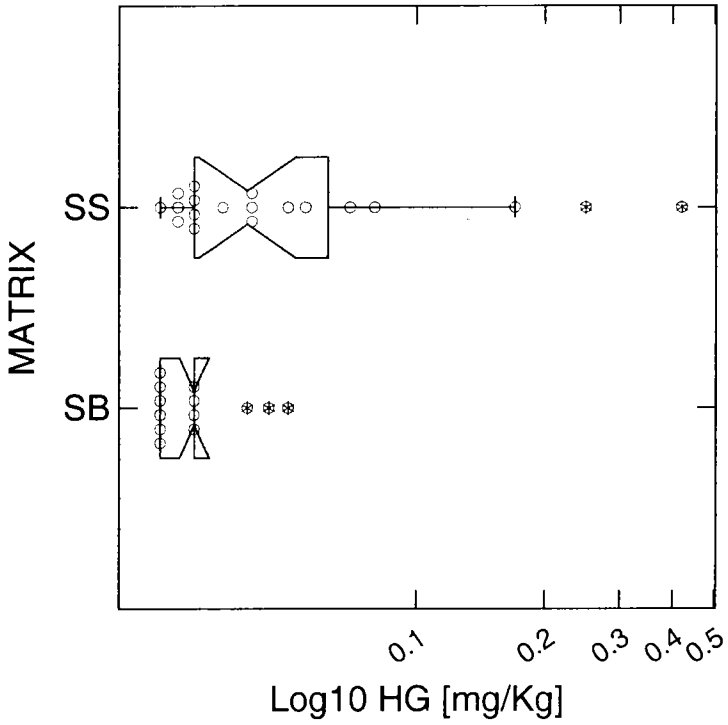

MATRIX
SS
SB
0.600000
0.625000
0.650000
0.700000
Log10 CN [mg/Kg]

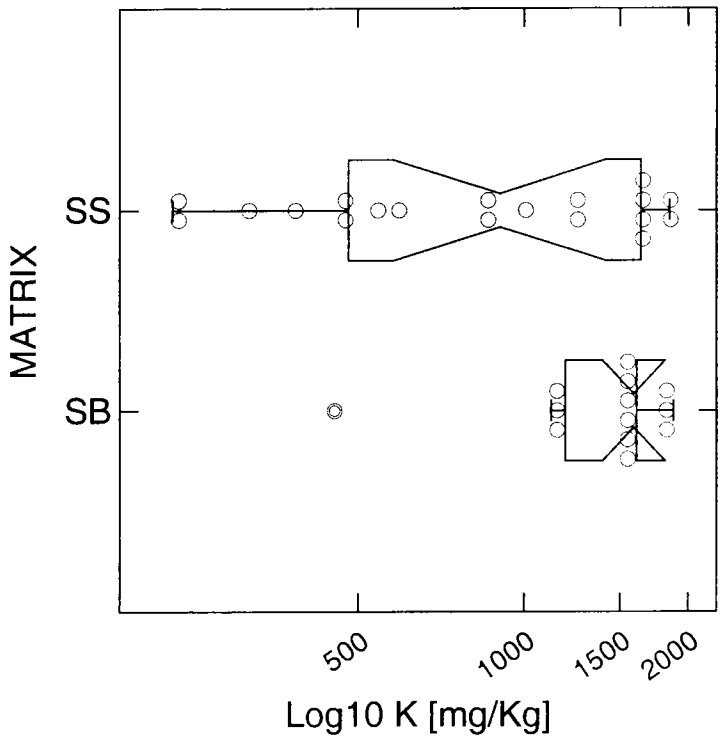

MATRIX
SS
SB
5
10
15
20
25
Log10 CO [mg/Kg]

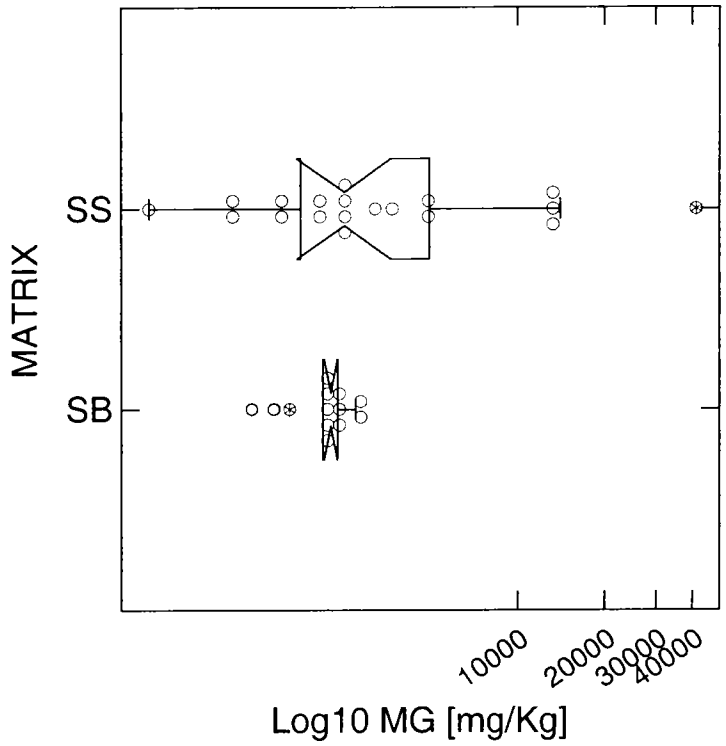

MATRIX
SS
SB
5
10
15
20
25
Log10 CO [mg/Kg]

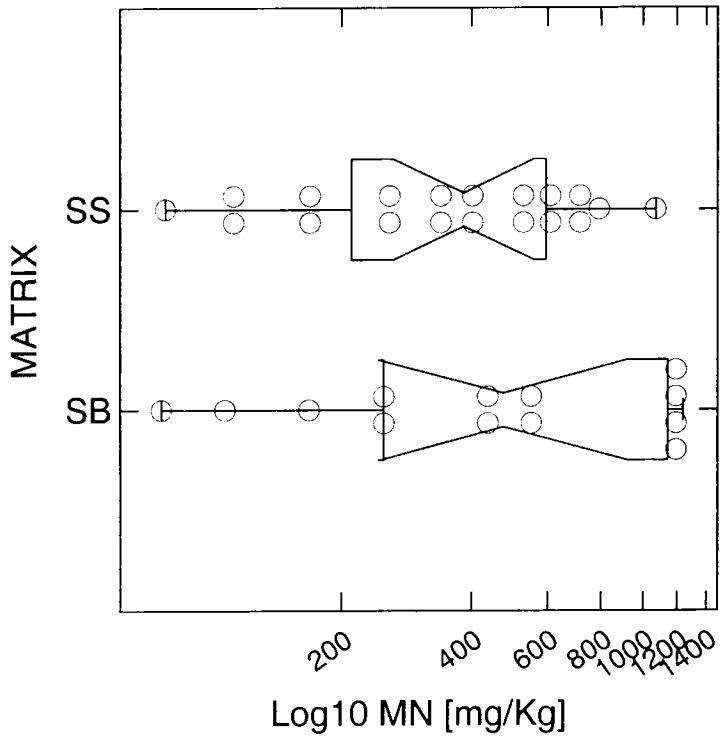

MATRIX
SS
SB
5
10
15
20
25
30
35
Log10 CU [mg/Kg]

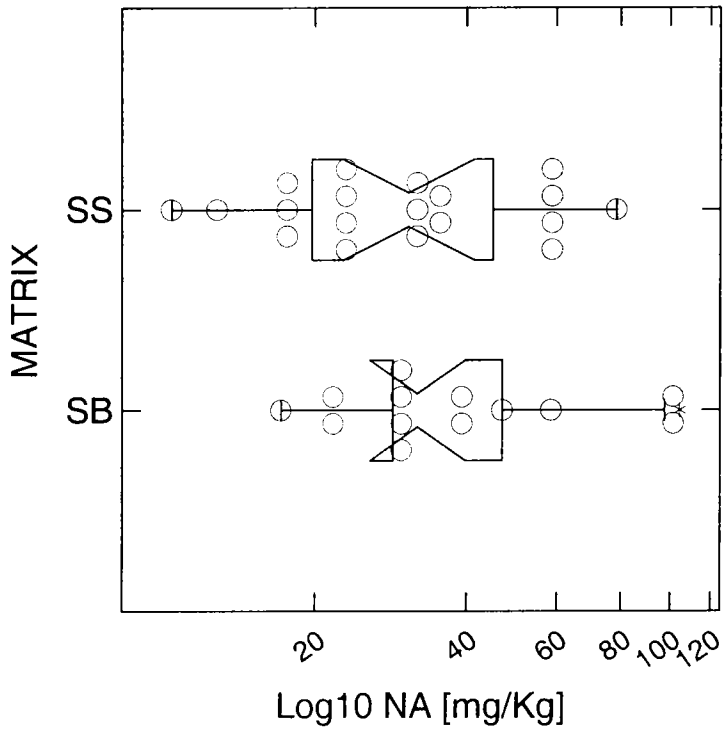

MATRIX
SS
SB
10000
20000
30000
40000
Log10 FE [mg/Kg]

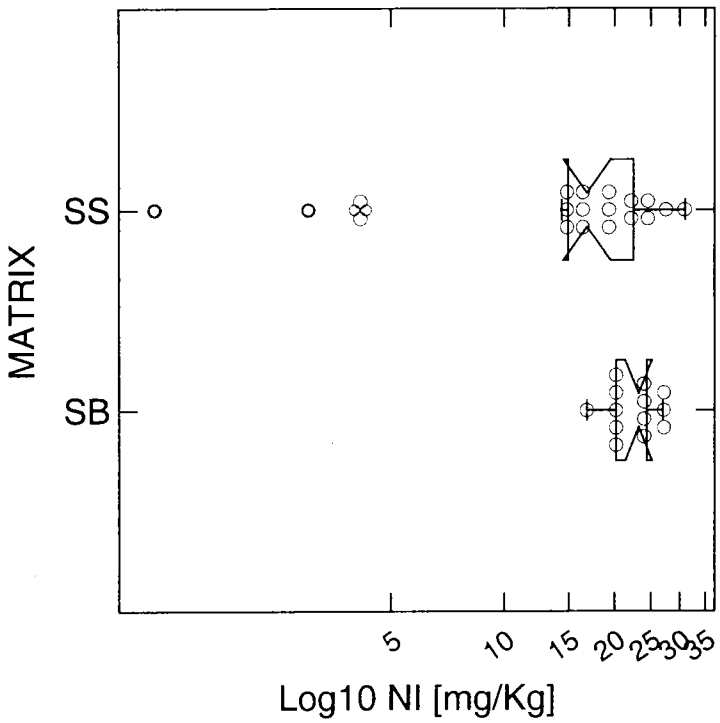

MATRIX
SS
SB
0.1
0.2
0.3
0.4
0.5
Log10 HG [mg/Kg]

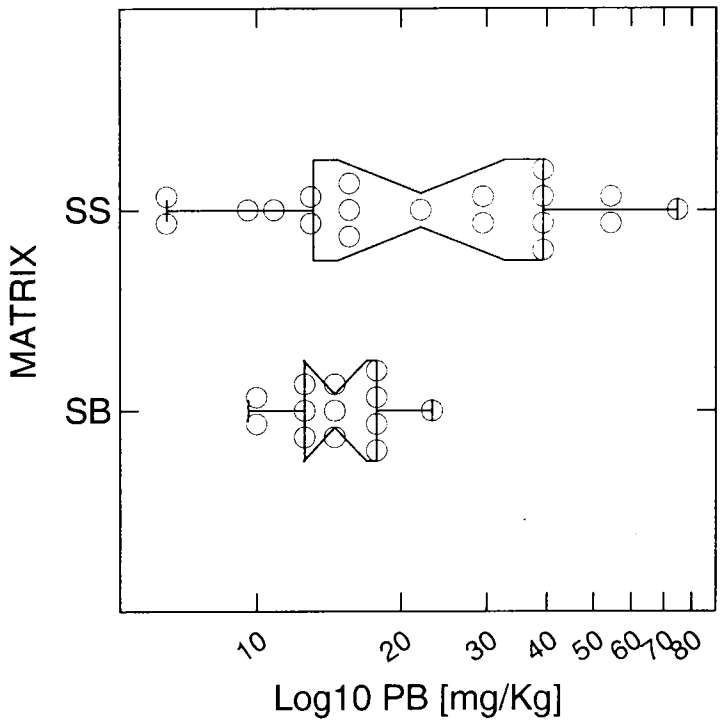

MATRIX
SS
SB
500
1000
1500
2000
Log10 K [mg/Kg]

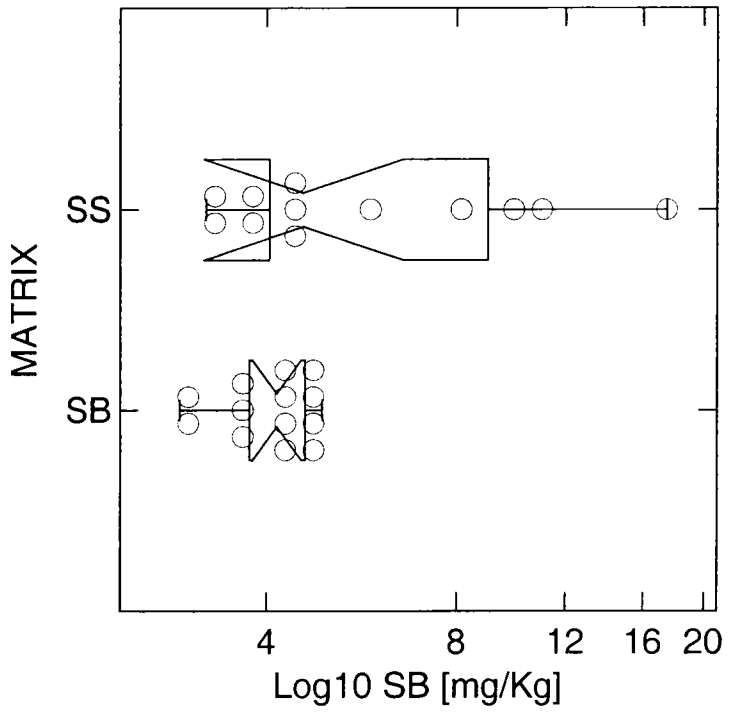

MATRIX
SS
SB
10000
20000
30000
40000
Log10 MG [mg/Kg]

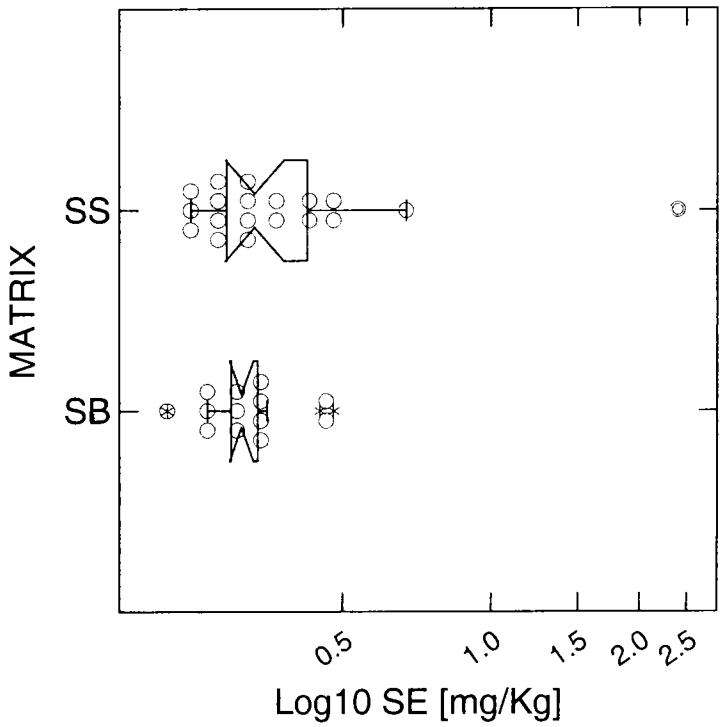

MATRIX
SS
SB
200
400
600
800
1000
1200
1400
Log10 MN [mg/Kg]

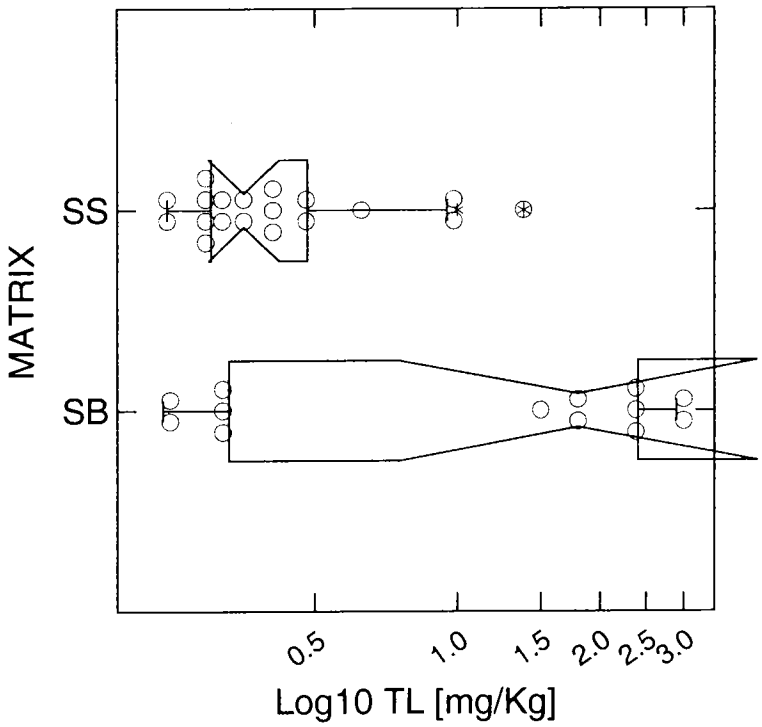

MATRIX
SS
SB
20
40
60
80
100
120
Log10 NA [mg/Kg]

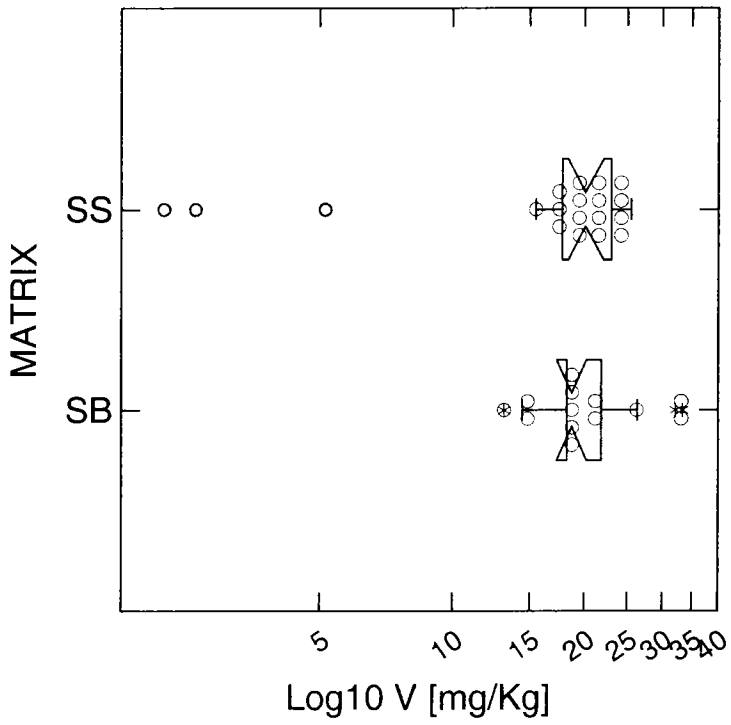

MATRIX
SS
SB
5
10
15
20
25
30
35
Log10 NI [mg/Kg]

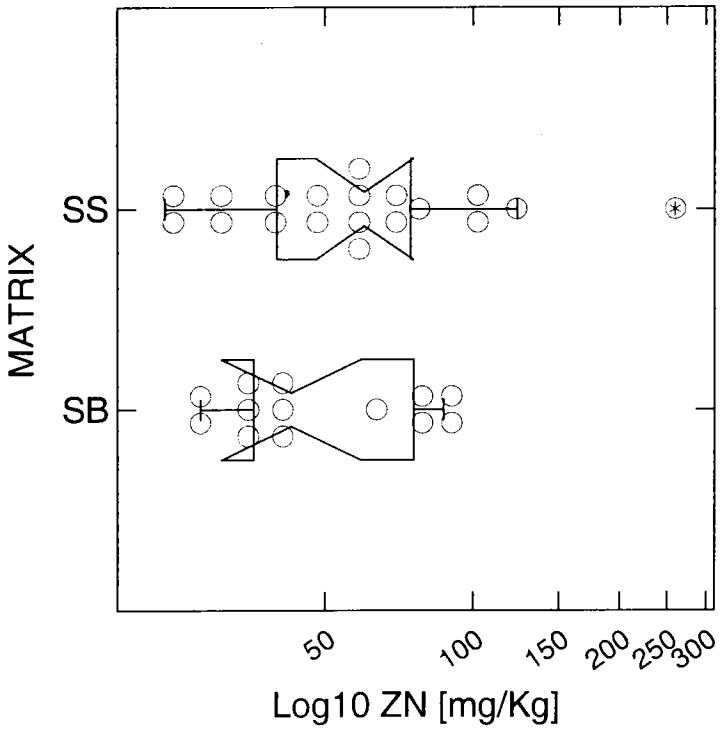

MATRIX
SS
SB
10
20
30
40
50
60
70
80
Log10 PB [mg/Kg]


MATRIX
SS
SB
4
8
12
16
20
Log10 SB [mg/Kg]


MATRIX
SS
SB
0.5
1.0
1.5
2.0
2.5
Log10 SE [mg/Kg]


MATRIX
SS
SB
0.5
1.0
1.5
2.0
2.5
3.0
Log10 TL [mg/Kg]


MATRIX
SS
SB
5
10
15
20
25
30
35
40
Log10 V [mg/Kg]


MATRIX
SS
SB
50
100
150
200
250
300
Log10 ZN [mg/Kg]

ABL SOIL BACKGROUND METALS EVALUATION:
SURFACE *vs* SUBSURFACE COMPARISONS
MATRIX.xls

P	~N	~LogN	RELATIONSHIP
AG	0.11	0.02	SB < SS
AL	0.002	0.001	SB > SS
AS	0.05	0.04	SB > SS
BA	0.03	0.02	SB > SS
BE	0.003	0.001	SB > SS
CA	0.05	0.07	NS
CD	0.19	0.26	NS
CN	NA	NA	NA
CO	0.02	0.01	SB > SS
CR	0.02	0.02	SB > SS
CU	0.003	0.01	SB > SS
FE	0.006	0.01	SB > SS
HG	0.06	0.01	SB < SS
K	0.01	0.009	SB > SS
MG	0.08	0.09	NS
MN	0.27	0.55	NS
NA	0.31	0.24	NS
NI	0.02	0.02	SB > SS
PB	0.01	0.04	SB < SS
SB	0.05	0.04	SB < SS
SE	0.24	0.20	NS
TL	0.005	0.01	SB > SS
V	0.28	0.17	NS
ZN	0.21	0.31	NS

ABL BACKGROUND SOIL METALS

SITE 5: RELATIVE RANK

SITE5.xls

RELATIVE RANK	SID	PB	SITE	RANK	
1.00	HCS-S5-1	CA	Site 5	19	
1.00	HCS-S5-2	CN	Site 5	6	
1.00	HCS-S5-1	MG	Site 5	19	
1.00	HCS-S5-2	NA	Site 5	19	
1.00	HCS-S5-2	SB	Site 5	12	
0.92	HCS-S5-1	SB	Site 5	11	
0.89	HCS-S5-2	CA	Site 5	17	
0.89	HCS-S5-2	CU	Site 5	17	
0.89	HCS-S5-2	MG	Site 5	17	
0.89	HCS-S5-1	SE	Site 5	17	
0.89	HCS-S5-2	AG	Site 5	16	
0.84	HCS-S5-2	CR	Site 5	16	
0.84	HCS-S5-1	CU	Site 5	16	
0.84	HCS-S5-1	NA	Site 5	16	
0.83	HCS-S5-1	CN	Site 5	5	
0.79	HCS-S5-2	BE	Site 5	15	
0.79	HCS-S5-2	K	Site 5	15	
0.79	HCS-S5-2	TL	Site 5	15	
0.79	HCS-S5-2	V	Site 5	15	
0.74	HCS-S5-2	AL	Site 5	14	
0.74	HCS-S5-2	BA	Site 5	14	
0.74	HCS-S5-1	CO	Site 5	14	
0.74	HCS-S5-1	K	Site 5	14	
0.74	HCS-S5-2	PB	Site 5	14	
0.74	HCS-S5-2	ZN	Site 5	14	x
0.68	HCS-S5-1	BA	Site 5	13	
0.68	HCS-S5-1	NI	Site 5	13	
0.68	HCS-S5-1	PB	Site 5	13	
0.63	HCS-S5-1	AL	Site 5	12	
0.58	HCS-S5-1	BE	Site 5	11	
0.58	HCS-S5-2	FE	Site 5	11	
0.58	HCS-S5-1	MN	Site 5	11	
0.58	HCS-S5-1	TL	Site 5	11	
0.53	HCS-S5-2	MN	Site 5	10	
0.47	HCS-S5-2	CO	Site 5	9	
0.47	HCS-S5-1	ZN	Site 5	9	
0.42	HCS-S5-1	FE	Site 5	8	
0.42	HCS-S5-2	NI	Site 5	8	
0.42	HCS-S5-2	SE	Site 5	8	
0.37	HCS-S5-2	AS	Site 5	7	
0.33	HCS-S5-1	AG	Site 5	6	
0.26	HCS-S5-1	AS	Site 5	5	
0.26	HCS-S5-2	CD	Site 5	5	
0.26	HCS-S5-1	HG	Site 5	5	
0.26	HCS-S5-1	V	Site 5	5	
0.21	HCS-S5-1	CD	Site 5	4	
0.21	HCS-S5-2	HG	Site 5	4	
0.05	HCS-S5-1	CR	Site 5	1	
48					
0.05					
1.00					
0.65					

ABL BACKGROUND SOIL METALS
SITE 5: RELATIVE RANK

RELATIVE RANK	SID	PB	SITE	RANK
0.3333333	HCS-S5-1	AG	Site 5	6
0.8888889	HCS-S5-2	AG	Site 5	16
0.6315789	HCS-S5-1	AL	Site 5	12
0.7368421	HCS-S5-2	AL	Site 5	14
0.2631579	HCS-S5-1	AS	Site 5	5
0.3684211	HCS-S5-2	AS	Site 5	7
0.6842105	HCS-S5-1	BA	Site 5	13
0.7368421	HCS-S5-2	BA	Site 5	14
0.5789474	HCS-S5-1	BE	Site 5	11
0.7894737	HCS-S5-2	BE	Site 5	15
0.8947368	HCS-S5-2	CA	Site 5	17
1	HCS-S5-1	CA	Site 5	19
0.2105263	HCS-S5-1	CD	Site 5	4
0.2631579	HCS-S5-2	CD	Site 5	5
0.8333333	HCS-S5-1	CN	Site 5	5
1	HCS-S5-2	CN	Site 5	6
0.4736842	HCS-S5-2	CO	Site 5	9
0.7368421	HCS-S5-1	CO	Site 5	14
0.0526316	HCS-S5-1	CR	Site 5	1
0.8421053	HCS-S5-2	CR	Site 5	16
0.8421053	HCS-S5-1	CU	Site 5	16
0.8947368	HCS-S5-2	CU	Site 5	17
0.4210526	HCS-S5-1	FE	Site 5	8
0.5789474	HCS-S5-2	FE	Site 5	11
0.2105263	HCS-S5-2	HG	Site 5	4
0.2631579	HCS-S5-1	HG	Site 5	5
0.7368421	HCS-S5-1	K	Site 5	14
0.7894737	HCS-S5-2	K	Site 5	15
0.8947368	HCS-S5-2	MG	Site 5	17
1	HCS-S5-1	MG	Site 5	19
0.5263158	HCS-S5-2	MN	Site 5	10
0.5789474	HCS-S5-1	MN	Site 5	11
0.8421053	HCS-S5-1	NA	Site 5	16
1	HCS-S5-2	NA	Site 5	19
0.4210526	HCS-S5-2	NI	Site 5	8
0.6842105	HCS-S5-1	NI	Site 5	13
0.6842105	HCS-S5-1	PB	Site 5	13
0.7368421	HCS-S5-2	PB	Site 5	14
0.9166667	HCS-S5-1	SB	Site 5	11
1	HCS-S5-2	SB	Site 5	12
0.4210526	HCS-S5-2	SE	Site 5	8
0.8947368	HCS-S5-1	SE	Site 5	17
0.5789474	HCS-S5-1	TL	Site 5	11
0.7894737	HCS-S5-2	TL	Site 5	15
0.2631579	HCS-S5-1	V	Site 5	5
0.7894737	HCS-S5-2	V	Site 5	15
0.4736842	HCS-S5-1	ZN	Site 5	9
0.7368421	HCS-S5-2	ZN	Site 5	14
48				
0.0526316				
1				
0.6518336				

	Sid	Dup	Matrix	P	Conc	Q	Units	Top	
1	22C-1-T	0	SS	AG	7.6999998	D	MG/KG		0
2	10006A-1-T	0	SS	AG	2.5	D	MG/KG		0
3	HCS-BR-3	0	SS	AG	2	D	MG/KG		0
4	10006B-3-T	Y	SS	AG	1.55	D	MG/KG		0
5	22A-1-T	Y	SS	AG	1.375	D	MG/KG		0
6	HCS-S5-1	0	SS	AG	1	D	MG/KG		0
7	HCS-BR-2	Y	SS	AG	0.9	D	MG/KG		0
8	22A-2-T	0	SS	AG	0.85	U	MG/KG		0
9	22C-2-T	0	SS	AG	0.8	U	MG/KG		0
10	HCS-BR-4	0	SS	AG	0.6	U	MG/KG		0
11	SITE3-1-T	0	SS	AG	0.55	U	MG/KG		0
12	23-2-T	Y	SS	AG	0.52	U	MG/KG		0
13	HCS-BR-1	0	SS	AG	0.495	U	MG/KG		0
14	10006A-3-T	0	SS	AG	0.455	U	MG/KG		0
15	10006A-2-T	0	SS	AG	0.41	U	MG/KG		0
16	HCS-S5-2	0	SS	AG	0.4	U	MG/KG		0
17	23-1-T	0	SS	AG	0.33	U	MG/KG		0
18	23-4-T	0	SS	AG	0.33	U	MG/KG		0
1	10006A-3-T	0	SS	AL	15200	D	MG/KG		0
2	10006B-3-T	Y	SS	AL	14050	D	MG/KG		0
3	10006A-2-T	0	SS	AL	13300	D	MG/KG		0
4	23-2-T	Y	SS	AL	11250	D	MG/KG		0
5	SITE3-1-T	0	SS	AL	10100	D	MG/KG		0
6	HCS-BR-3	0	SS	AL	9500	D	MG/KG		0
7	HCS-PWA-29S	0	SS	AL	9040	D	MG/KG		0
8	HCS-BR-1	0	SS	AL	8920	D	MG/KG		0
9	HCS-BR-4	0	SS	AL	8110	D	MG/KG		0
10	22A-2-T	0	SS	AL	7710	D	MG/KG		0
11	22A-1-T	Y	SS	AL	7525	D	MG/KG		0
12	HCS-S5-1	0	SS	AL	7230	D	MG/KG		0
13	22C-1-T	0	SS	AL	6680	D	MG/KG		0
14	HCS-S5-2	0	SS	AL	5770	D	MG/KG		0
15	HCS-BR-2	Y	SS	AL	5295	D	MG/KG		0
16	10006A-1-T	0	SS	AL	3640	D	MG/KG		0
17	22C-2-T	0	SS	AL	1970	D	MG/KG		0
18	23-1-T	0	SS	AL	1940	D	MG/KG		0
19	23-4-T	0	SS	AL	1850	D	MG/KG		0
1	23-2-T	Y	SS	AS	11.5	D	MG/KG		0
2	10006A-3-T	0	SS	AS	10	D	MG/KG		0
3	10006B-3-T	Y	SS	AS	8.9000001	D	MG/KG		0
4	HCS-BR-1	0	SS	AS	8.1999998	D	MG/KG		0
5	HCS-S5-1	0	SS	AS	7.8000002	D	MG/KG		0
6	SITE3-1-T	0	SS	AS	7.5999999	D	MG/KG		0
7	HCS-S5-2	0	SS	AS	6.8000002	D	MG/KG		0
8	22A-1-T	Y	SS	AS	6.7	D	MG/KG		0
9	22A-2-T	0	SS	AS	6.5999999	D	MG/KG		0
10	22C-1-T	0	SS	AS	6.5999999	D	MG/KG		0
11	HCS-PWA-29S	0	SS	AS	6.5	D	MG/KG		0
12	HCS-BR-2	Y	SS	AS	6.3	D	MG/KG		0
13	HCS-BR-3	0	SS	AS	6.1999998	D	MG/KG		0
14	HCS-BR-4	0	SS	AS	6.1999998	D	MG/KG		0
15	10006A-2-T	0	SS	AS	3.7	D	MG/KG		0
16	10006A-1-T	0	SS	AS	3.5999999	D	MG/KG		0
17	23-4-T	0	SS	AS	1.8	D	MG/KG		0
18	23-1-T	0	SS	AS	1.7	D	MG/KG		0
19	22C-2-T	0	SS	AS	0.75	U	MG/KG		0

1	HCS-PWA-29S	0	SS	BA	120	D	MG/KG	0
2	HCS-BR-4	0	SS	BA	110	D	MG/KG	0
3	22A-1-T	Y	SS	BA	109.5	D	MG/KG	0
4	HCS-BR-3	0	SS	BA	102	D	MG/KG	0
5	22A-2-T	0	SS	BA	91.900002	D	MG/KG	0
6	HCS-BR-2	Y	SS	BA	91.6	D	MG/KG	0
7	SITE3-1-T	0	SS	BA	78.400002	D	MG/KG	0
8	23-2-T	Y	SS	BA	76.899998	D	MG/KG	0
9	10006A-3-T	0	SS	BA	69.900002	D	MG/KG	0
10	10006A-2-T	0	SS	BA	66.199997	D	MG/KG	0
11	10006B-3-T	Y	SS	BA	64.199999	D	MG/KG	0
12	22C-1-T	0	SS	BA	64.099998	D	MG/KG	0
13	HCS-S5-1	0	SS	BA	54.200001	D	MG/KG	0
14	HCS-S5-2	0	SS	BA	47.900002	D	MG/KG	0
15	HCS-BR-1	0	SS	BA	47.599998	D	MG/KG	0
16	10006A-1-T	0	SS	BA	14.75	U	MG/KG	0
17	22C-2-T	0	SS	BA	12.3	U	MG/KG	0
18	23-4-T	0	SS	BA	9.3500004	U	MG/KG	0
19	23-1-T	0	SS	BA	5.8499999	U	MG/KG	0
1	HCS-PWA-29S	0	SS	BE	1.2	D	MG/KG	0
2	10006B-3-T	Y	SS	BE	1.15	D	MG/KG	0
3	10006A-3-T	0	SS	BE	1	D	MG/KG	0
4	22A-1-T	Y	SS	BE	0.73	D	MG/KG	0
5	HCS-BR-2	Y	SS	BE	0.645	D	MG/KG	0
6	22A-2-T	0	SS	BE	0.49	U	MG/KG	0
7	23-2-T	Y	SS	BE	0.4275	U	MG/KG	0
8	SITE3-1-T	0	SS	BE	0.4	U	MG/KG	0
9	22C-1-T	0	SS	BE	0.395	U	MG/KG	0
10	HCS-BR-3	0	SS	BE	0.39	U	MG/KG	0
11	HCS-S5-1	0	SS	BE	0.39	U	MG/KG	0
12	10006A-2-T	0	SS	BE	0.385	U	MG/KG	0
13	HCS-BR-1	0	SS	BE	0.38	U	MG/KG	0
14	HCS-BR-4	0	SS	BE	0.36	U	MG/KG	0
15	HCS-S5-2	0	SS	BE	0.325	U	MG/KG	0
16	22C-2-T	0	SS	BE	0.195	U	MG/KG	0
17	10006A-1-T	0	SS	BE	0.14	U	MG/KG	0
18	23-1-T	0	SS	BE	0.08	U	MG/KG	0
19	23-4-T	0	SS	BE	0.08	U	MG/KG	0
1	23-1-T	0	SS	CA	292000	D	MG/KG	0
2	23-4-T	0	SS	CA	273000	D	MG/KG	0
3	22C-2-T	0	SS	CA	246000	D	MG/KG	0
4	10006A-1-T	0	SS	CA	180000	D	MG/KG	0
5	23-2-T	Y	SS	CA	40200	D	MG/KG	0
6	HCS-BR-1	0	SS	CA	37600	D	MG/KG	0
7	22C-1-T	0	SS	CA	34800	D	MG/KG	0
8	10006A-2-T	0	SS	CA	32400	D	MG/KG	0
9	SITE3-1-T	0	SS	CA	17500	D	MG/KG	0
10	HCS-BR-2	Y	SS	CA	16670	D	MG/KG	0
11	10006A-3-T	0	SS	CA	10000	D	MG/KG	0
12	22A-2-T	0	SS	CA	8100	D	MG/KG	0
13	HCS-BR-3	0	SS	CA	5830	D	MG/KG	0
14	HCS-PWA-29S	0	SS	CA	5380	D	MG/KG	0
15	10006B-3-T	Y	SS	CA	4710	D	MG/KG	0
16	HCS-BR-4	0	SS	CA	4520	D	MG/KG	0
17	HCS-S5-2	0	SS	CA	2930	D	MG/KG	0
18	22A-1-T	Y	SS	CA	2370	D	MG/KG	0
19	HCS-S5-1	0	SS	CA	1810	D	MG/KG	0

1	10006A-1-T	0	SS	CD	3.3	D	MG/KG	0
2	22C-1-T	0	SS	CD	2.7	D	MG/KG	0
3	23-1-T	0	SS	CD	2.4000001	D	MG/KG	0
4	HCS-S5-1	0	SS	CD	1.8	D	MG/KG	0
5	HCS-S5-2	0	SS	CD	1.5	D	MG/KG	0
6	HCS-BR-1	0	SS	CD	1.2	D	MG/KG	0
7	HCS-PWA-29S	0	SS	CD	1.15	U	MG/KG	0
8	HCS-BR-3	0	SS	CD	0.55	U	MG/KG	0
9	HCS-BR-4	0	SS	CD	0.36	U	MG/KG	0
10	22A-2-T	0	SS	CD	0.335	U	MG/KG	0
11	SITE3-1-T	0	SS	CD	0.33	U	MG/KG	0
12	HCS-BR-2	Y	SS	CD	0.3225	U	MG/KG	0
13	10006A-2-T	0	SS	CD	0.31	U	MG/KG	0
14	22A-1-T	Y	SS	CD	0.305	U	MG/KG	0
15	10006A-3-T	0	SS	CD	0.29	U	MG/KG	0
16	22C-2-T	0	SS	CD	0.29	U	MG/KG	0
17	10006B-3-T	Y	SS	CD	0.2875	U	MG/KG	0
18	23-2-T	Y	SS	CD	0.285	U	MG/KG	0
19	23-4-T	0	SS	CD	0.245	U	MG/KG	0
1	HCS-BR-3	0	SS	CN	0.7	U	MG/KG	0
2	HCS-BR-4	0	SS	CN	0.65	U	MG/KG	0
3	HCS-BR-2	Y	SS	CN	0.625	U	MG/KG	0
4	HCS-BR-1	0	SS	CN	0.6	U	MG/KG	0
5	HCS-S5-1	0	SS	CN	0.6	U	MG/KG	0
6	HCS-S5-2	0	SS	CN	0.6	U	MG/KG	0
1	23-2-T	Y	SS	CO	21.95	D	MG/KG	0
2	HCS-BR-2	Y	SS	CO	16.575	D	MG/KG	0
3	10006A-3-T	0	SS	CO	14.5	D	MG/KG	0
4	SITE3-1-T	0	SS	CO	13.5	D	MG/KG	0
5	10006B-3-T	Y	SS	CO	13	D	MG/KG	0
6	HCS-PWA-29S	0	SS	CO	12.9	D	MG/KG	0
7	22A-2-T	0	SS	CO	11.4	D	MG/KG	0
8	HCS-BR-1	0	SS	CO	10.6	D	MG/KG	0
9	HCS-S5-2	0	SS	CO	10.5	D	MG/KG	0
10	22A-1-T	Y	SS	CO	8.125	D	MG/KG	0
11	HCS-BR-4	0	SS	CO	5.8000002	U	MG/KG	0
13	HCS-BR-3	0	SS	CO	5.3000002	U	MG/KG	0
12	22C-1-T	0	SS	CO	5.3000002	U	MG/KG	0
14	HCS-S5-1	0	SS	CO	4.5999999	U	MG/KG	0
15	10006A-2-T	0	SS	CO	3.3	U	MG/KG	0
16	10006A-1-T	0	SS	CO	1.8	U	MG/KG	0
17	22C-2-T	0	SS	CO	0.8	U	MG/KG	0
18	23-4-T	0	SS	CO	0.8	U	MG/KG	0
19	23-1-T	0	SS	CO	0.6	U	MG/KG	0
1	HCS-S5-1	0	SS	CR	20.5	D	MG/KG	0
2	22C-1-T	0	SS	CR	19.299999	D	MG/KG	0
3	10006A-3-T	0	SS	CR	17.700001	D	MG/KG	0
4	10006A-2-T	0	SS	CR	17.299999	D	MG/KG	0
5	10006B-3-T	Y	SS	CR	16.9	D	MG/KG	0
6	23-2-T	Y	SS	CR	14.25	D	MG/KG	0
7	HCS-BR-3	0	SS	CR	14.2	D	MG/KG	0
8	SITE3-1-T	0	SS	CR	14.1	D	MG/KG	0
9	HCS-PWA-29S	0	SS	CR	13.4	D	MG/KG	0
10	HCS-BR-4	0	SS	CR	12.9	D	MG/KG	0
11	22A-1-T	Y	SS	CR	12.75	D	MG/KG	0
12	HCS-BR-1	0	SS	CR	11.9	D	MG/KG	0
13	22A-2-T	0	SS	CR	11.7	D	MG/KG	0

14	10006A-1-T	0	SS	CR	10	D	MG/KG	0
15	HCS-BR-2	Y	SS	CR	9.6499999	D	MG/KG	0
16	HCS-S5-2	0	SS	CR	9.6000004	D	MG/KG	0
17	22C-2-T	0	SS	CR	7	D	MG/KG	0
18	23-1-T	0	SS	CR	3.2	D	MG/KG	0
19	23-4-T	0	SS	CR	2.8	D	MG/KG	0
1	10006B-3-T	Y	SS	CU	30.599999	D	MG/KG	0
2	22A-2-T	0	SS	CU	25.9	D	MG/KG	0
3	22C-1-T	0	SS	CU	25.6	D	MG/KG	0
4	HCS-BR-3	0	SS	CU	24.4	D	MG/KG	0
5	10006A-3-T	0	SS	CU	23.5	D	MG/KG	0
6	SITE3-1-T	0	SS	CU	23.200001	D	MG/KG	0
7	10006A-2-T	0	SS	CU	19.299999	D	MG/KG	0
8	23-2-T	Y	SS	CU	18.75	D	MG/KG	0
9	HCS-BR-4	0	SS	CU	18.6	D	MG/KG	0
10	HCS-PWA-29S	0	SS	CU	18.1	D	MG/KG	0
11	10006A-1-T	0	SS	CU	18	D	MG/KG	0
12	22A-1-T	Y	SS	CU	17.799999	D	MG/KG	0
13	HCS-BR-2	Y	SS	CU	17.6	D	MG/KG	0
14	23-4-T	0	SS	CU	16.700001	D	MG/KG	0
15	HCS-BR-1	0	SS	CU	15.7	D	MG/KG	0
16	HCS-S5-1	0	SS	CU	15	D	MG/KG	0
17	HCS-S5-2	0	SS	CU	14.5	D	MG/KG	0
18	23-1-T	0	SS	CU	7.5	D	MG/KG	0
19	22C-2-T	0	SS	CU	2.5999999	U	MG/KG	0
1	10006A-3-T	0	SS	FE	36800	D	MG/KG	0
2	10006B-3-T	Y	SS	FE	34450	D	MG/KG	0
3	10006A-2-T	0	SS	FE	29500	D	MG/KG	0
4	SITE3-1-T	0	SS	FE	28700	D	MG/KG	0
5	22C-1-T	0	SS	FE	28300	D	MG/KG	0
6	HCS-PWA-29S	0	SS	FE	27200	D	MG/KG	0
7	23-2-T	Y	SS	FE	25750	D	MG/KG	0
8	HCS-S5-1	0	SS	FE	25700	D	MG/KG	0
9	22A-2-T	0	SS	FE	24600	D	MG/KG	0
10	HCS-BR-3	0	SS	FE	23900	D	MG/KG	0
11	HCS-S5-2	0	SS	FE	23300	D	MG/KG	0
13	HCS-BR-4	0	SS	FE	23000	D	MG/KG	0
12	22A-1-T	Y	SS	FE	23000	D	MG/KG	0
14	HCS-BR-2	Y	SS	FE	20200	D	MG/KG	0
15	HCS-BR-1	0	SS	FE	19900	D	MG/KG	0
16	10006A-1-T	0	SS	FE	11100	D	MG/KG	0
17	22C-2-T	0	SS	FE	6820	D	MG/KG	0
18	23-4-T	0	SS	FE	4720	D	MG/KG	0
19	23-1-T	0	SS	FE	4160	D	MG/KG	0
1	22C-1-T	0	SS	HG	0.42	D	MG/KG	0
2	10006A-1-T	0	SS	HG	0.25	D	MG/KG	0
3	HCS-BR-2	Y	SS	HG	0.17	D	MG/KG	0
4	HCS-S5-2	0	SS	HG	0.08	D	MG/KG	0
5	HCS-S5-1	0	SS	HG	0.07	D	MG/KG	0
6	22A-1-T	Y	SS	HG	0.055	U	MG/KG	0
7	HCS-BR-4	0	SS	HG	0.05	U	MG/KG	0
8	23-2-T	Y	SS	HG	0.0425	U	MG/KG	0
9	HCS-BR-1	0	SS	HG	0.04	U	MG/KG	0
10	HCS-BR-3	0	SS	HG	0.04	U	MG/KG	0
11	23-4-T	0	SS	HG	0.035	U	MG/KG	0
12	10006A-2-T	0	SS	HG	0.03	U	MG/KG	0
13	10006A-3-T	0	SS	HG	0.03	U	MG/KG	0

17	HCS-PWA-29S	0	SS	HG	0.03	U	MG/KG	0
14	22A-2-T	0	SS	HG	0.03	U	MG/KG	0
15	22C-2-T	0	SS	HG	0.03	U	MG/KG	0
16	23-1-T	0	SS	HG	0.03	U	MG/KG	0
18	10006B-3-T	Y	SS	HG	0.0275	U	MG/KG	0
19	SITE3-1-T	0	SS	HG	0.025	U	MG/KG	0
1	HCS-BR-1	0	SS	K	1850	D	MG/KG	0
2	HCS-BR-4	0	SS	K	1810	D	MG/KG	0
3	HCS-BR-3	0	SS	K	1700	D	MG/KG	0
4	10006A-3-T	0	SS	K	1670	D	MG/KG	0
5	10006B-3-T	Y	SS	K	1665	D	MG/KG	0
6	SITE3-1-T	0	SS	K	1610	D	MG/KG	0
7	10006A-2-T	0	SS	K	1270	D	MG/KG	0
8	22A-2-T	0	SS	K	1220	D	MG/KG	0
9	23-2-T	Y	SS	K	1008.5	D	MG/KG	0
10	22A-1-T	Y	SS	K	904.5	D	MG/KG	0
11	HCS-BR-2	Y	SS	K	837.5	D	MG/KG	0
12	22C-1-T	0	SS	K	595	U	MG/KG	0
13	HCS-PWA-29S	0	SS	K	545	U	MG/KG	0
14	HCS-S5-1	0	SS	K	500	U	MG/KG	0
15	HCS-S5-2	0	SS	K	462.5	U	MG/KG	0
16	10006A-1-T	0	SS	K	385	U	MG/KG	0
17	22C-2-T	0	SS	K	317	U	MG/KG	0
18	23-1-T	0	SS	K	246.5	U	MG/KG	0
19	23-4-T	0	SS	K	229.5	U	MG/KG	0
1	10006A-1-T	0	SS	MG	41300	D	MG/KG	0
2	23-4-T	0	SS	MG	14100	D	MG/KG	0
3	22C-2-T	0	SS	MG	13000	D	MG/KG	0
4	23-1-T	0	SS	MG	12800	D	MG/KG	0
5	HCS-BR-1	0	SS	MG	5180	D	MG/KG	0
6	22C-1-T	0	SS	MG	4700	D	MG/KG	0
7	23-2-T	Y	SS	MG	3665	D	MG/KG	0
8	SITE3-1-T	0	SS	MG	3200	D	MG/KG	0
9	10006B-3-T	Y	SS	MG	2605	D	MG/KG	0
10	HCS-BR-2	Y	SS	MG	2484.75	D	MG/KG	0
11	HCS-BR-3	0	SS	MG	2460	D	MG/KG	0
12	10006A-3-T	0	SS	MG	2400	D	MG/KG	0
13	10006A-2-T	0	SS	MG	2100	D	MG/KG	0
14	HCS-BR-4	0	SS	MG	1970	D	MG/KG	0
15	HCS-PWA-29S	0	SS	MG	1560	D	MG/KG	0
16	22A-2-T	0	SS	MG	1450	D	MG/KG	0
17	HCS-S5-2	0	SS	MG	1110	D	MG/KG	0
18	22A-1-T	Y	SS	MG	982.5	D	MG/KG	0
19	HCS-S5-1	0	SS	MG	525	U	MG/KG	0
1	HCS-PWA-29S	0	SS	MN	1070	D	MG/KG	0
2	HCS-BR-4	0	SS	MN	792	D	MG/KG	0
3	SITE3-1-T	0	SS	MN	726	D	MG/KG	0
4	22A-1-T	Y	SS	MN	681.5	D	MG/KG	0
5	HCS-BR-2	Y	SS	MN	607	D	MG/KG	0
6	22A-2-T	0	SS	MN	582	D	MG/KG	0
7	23-2-T	Y	SS	MN	545.5	D	MG/KG	0
8	HCS-BR-3	0	SS	MN	504	D	MG/KG	0
9	22C-1-T	0	SS	MN	421	D	MG/KG	0
10	HCS-S5-2	0	SS	MN	384	D	MG/KG	0
11	HCS-S5-1	0	SS	MN	373	D	MG/KG	0
12	10006B-3-T	Y	SS	MN	324.5	D	MG/KG	0
13	HCS-BR-1	0	SS	MN	257	D	MG/KG	0

14	10006A-3-T	0	SS	MN	247	D	MG/KG	0
15	10006A-1-T	0	SS	MN	180	D	MG/KG	0
16	22C-2-T	0	SS	MN	161	D	MG/KG	0
17	10006A-2-T	0	SS	MN	114	D	MG/KG	0
18	23-4-T	0	SS	MN	107	D	MG/KG	0
19	23-1-T	0	SS	MN	77.900002	D	MG/KG	0
1	10006A-1-T	0	SS	NA	78.5	U	MG/KG	0
2	22C-2-T	0	SS	NA	61.5	U	MG/KG	0
3	HCS-BR-2	Y	SS	NA	59.075001	U	MG/KG	0
4	23-1-T	0	SS	NA	59	U	MG/KG	0
5	23-4-T	0	SS	NA	56.5	U	MG/KG	0
6	22C-1-T	0	SS	NA	35.799999	U	MG/KG	0
7	10006B-3-T	Y	SS	NA	35.450001	U	MG/KG	0
8	HCS-BR-1	0	SS	NA	33.950001	U	MG/KG	0
9	23-2-T	Y	SS	NA	33.9	U	MG/KG	0
10	SITE3-1-T	0	SS	NA	30.700001	U	MG/KG	0
11	10006A-3-T	0	SS	NA	24.6	U	MG/KG	0
12	22A-1-T	Y	SS	NA	24.025001	U	MG/KG	0
13	HCS-BR-3	0	SS	NA	22.950001	U	MG/KG	0
14	10006A-2-T	0	SS	NA	22.15	U	MG/KG	0
15	22A-2-T	0	SS	NA	17.5	U	MG/KG	0
16	HCS-S5-1	0	SS	NA	17.1	U	MG/KG	0
17	HCS-BR-4	0	SS	NA	16.9	U	MG/KG	0
18	HCS-PWA-29S	0	SS	NA	12.8	U	MG/KG	0
19	HCS-S5-2	0	SS	NA	10.45	U	MG/KG	0
1	10006B-3-T	Y	SS	NI	30.950001	D	MG/KG	0
2	HCS-BR-2	Y	SS	NI	27.6	D	MG/KG	0
3	HCS-BR-1	0	SS	NI	24.6	D	MG/KG	0
4	SITE3-1-T	0	SS	NI	23.799999	D	MG/KG	0
5	HCS-BR-4	0	SS	NI	23.6	D	MG/KG	0
6	10006A-3-T	0	SS	NI	21.4	D	MG/KG	0
7	22C-1-T	0	SS	NI	21.4	D	MG/KG	0
8	HCS-S5-2	0	SS	NI	20.299999	D	MG/KG	0
9	22A-1-T	Y	SS	NI	18.650001	D	MG/KG	0
11	HCS-BR-3	0	SS	NI	16.799999	D	MG/KG	0
10	22A-2-T	0	SS	NI	16.799999	D	MG/KG	0
12	HCS-PWA-29S	0	SS	NI	16.4	D	MG/KG	0
13	HCS-S5-1	0	SS	NI	15.9	D	MG/KG	0
14	23-2-T	Y	SS	NI	15.5	D	MG/KG	0
15	10006A-2-T	0	SS	NI	14.3	D	MG/KG	0
16	23-4-T	0	SS	NI	4.3000002	D	MG/KG	0
17	23-1-T	0	SS	NI	4	D	MG/KG	0
18	10006A-1-T	0	SS	NI	3	U	MG/KG	0
19	22C-2-T	0	SS	NI	1.15	U	MG/KG	0
1	22C-1-T	0	SS	PB	74.900002	D	MG/KG	0
2	10006A-1-T	0	SS	PB	57.700001	D	MG/KG	0
3	22A-2-T	0	SS	PB	52.200001	D	MG/KG	0
4	SITE3-1-T	0	SS	PB	41.5	D	MG/KG	0
5	HCS-BR-4	0	SS	PB	39.799999	D	MG/KG	0
6	HCS-BR-1	0	SS	PB	38.799999	D	MG/KG	0
7	HCS-BR-3	0	SS	PB	37.700001	D	MG/KG	0
8	HCS-BR-2	Y	SS	PB	29.249999	D	MG/KG	0
9	22A-1-T	Y	SS	PB	28.3	D	MG/KG	0
10	HCS-PWA-29S	0	SS	PB	22	D	MG/KG	0
11	23-2-T	Y	SS	PB	16.95	D	MG/KG	0
12	10006A-3-T	0	SS	PB	15.1	D	MG/KG	0
13	HCS-S5-1	0	SS	PB	15	D	MG/KG	0

14	HCS-S5-2	0	SS	PB	13.3	D	MG/KG	0
15	10006B-3-T	Y	SS	PB	13	D	MG/KG	0
16	10006A-2-T	0	SS	PB	10.9	D	MG/KG	0
17	23-4-T	0	SS	PB	9.6000004	D	MG/KG	0
18	23-1-T	0	SS	PB	6.5999999	D	MG/KG	0
19	22C-2-T	0	SS	PB	6.5	D	MG/KG	0
1	HCS-BR-2	N	SS	SB	17.5	D	MG/KG	0
2	23-1-T	0	SS	SB	11	D	MG/KG	0
3	HCS-BR-1	0	SS	SB	9.8999996	D	MG/KG	0
4	22C-2-T	0	SS	SB	8.1499996	U	MG/KG	0
5	22C-1-T	0	SS	SB	5.8499999	U	MG/KG	0
6	SITE3-1-T	0	SS	SB	4.5999999	U	MG/KG	0
7	10006A-3-T	0	SS	SB	4.5500002	U	MG/KG	0
8	10006A-1-T	0	SS	SB	4.4000001	U	MG/KG	0
9	10006A-2-T	0	SS	SB	4.3000002	U	MG/KG	0
10	HCS-PWA-29S	0	SS	SB	3.8	U	MG/KG	0
11	HCS-S5-1	0	SS	SB	3.45	U	MG/KG	0
12	HCS-S5-2	0	SS	SB	3.2	U	MG/KG	0
1	HCS-BR-1	0	SS	SE	2.4000001	D	MG/KG	0
2	HCS-BR-2	Y	SS	SE	0.675	D	MG/KG	0
3	HCS-BR-3	0	SS	SE	0.485	U	MG/KG	0
4	HCS-BR-4	0	SS	SE	0.48	U	MG/KG	0
5	HCS-PWA-29S	0	SS	SE	0.43	U	MG/KG	0
6	22C-1-T	0	SS	SE	0.415	U	MG/KG	0
7	22A-1-T	Y	SS	SE	0.37	U	MG/KG	0
8	HCS-S5-2	0	SS	SE	0.355	U	MG/KG	0
9	22A-2-T	0	SS	SE	0.335	U	MG/KG	0
10	SITE3-1-T	0	SS	SE	0.33	U	MG/KG	0
11	10006A-1-T	0	SS	SE	0.315	U	MG/KG	0
12	10006A-2-T	0	SS	SE	0.31	U	MG/KG	0
13	10006A-3-T	0	SS	SE	0.29	U	MG/KG	0
14	22C-2-T	0	SS	SE	0.29	U	MG/KG	0
15	10006B-3-T	Y	SS	SE	0.2875	U	MG/KG	0
16	23-2-T	Y	SS	SE	0.285	U	MG/KG	0
17	HCS-S5-1	0	SS	SE	0.27	U	MG/KG	0
18	23-1-T	0	SS	SE	0.245	U	MG/KG	0
19	23-4-T	0	SS	SE	0.245	U	MG/KG	0
1	22A-1-T	Y	SS	TL	1.38	D	MG/KG	0
2	SITE3-1-T	0	SS	TL	1	U	MG/KG	0
3	22A-2-T	0	SS	TL	0.95	U	MG/KG	0
4	10006B-3-T	Y	SS	TL	0.6275	U	MG/KG	0
5	HCS-BR-3	0	SS	TL	0.485	U	MG/KG	0
6	HCS-BR-4	0	SS	TL	0.48	U	MG/KG	0
7	HCS-BR-2	Y	SS	TL	0.4325	U	MG/KG	0
8	22C-1-T	0	SS	TL	0.415	U	MG/KG	0
9	HCS-BR-1	0	SS	TL	0.395	U	MG/KG	0
10	HCS-PWA-29S	0	SS	TL	0.355	U	MG/KG	0
11	HCS-S5-1	0	SS	TL	0.32	U	MG/KG	0
12	10006A-1-T	0	SS	TL	0.315	U	MG/KG	0
13	10006A-2-T	0	SS	TL	0.31	U	MG/KG	0
14	10006A-3-T	0	SS	TL	0.305	U	MG/KG	0
15	HCS-S5-2	0	SS	TL	0.3	U	MG/KG	0
16	22C-2-T	0	SS	TL	0.29	U	MG/KG	0
17	23-2-T	Y	SS	TL	0.285	U	MG/KG	0
18	23-1-T	0	SS	TL	0.245	U	MG/KG	0
19	23-4-T	0	SS	TL	0.245	U	MG/KG	0
1	HCS-BR-4	0	SS	V	25.5	D	MG/KG	0

2	HCS-BR-3	0	SS	V	25.200001	D	MG/KG	0
3	HCS-BR-1	0	SS	V	24.299999	D	MG/KG	0
4	HCS-PWA-29S	0	SS	V	23.9	D	MG/KG	0
5	HCS-S5-1	0	SS	V	23.5	D	MG/KG	0
6	10006A-1-T	0	SS	V	22.4	D	MG/KG	0
7	22A-2-T	0	SS	V	21.1	D	MG/KG	0
8	10006A-3-T	0	SS	V	20.9	D	MG/KG	0
9	23-2-T	Y	SS	V	20.2	D	MG/KG	0
10	10006A-2-T	0	SS	V	20.1	D	MG/KG	0
11	10006B-3-T	Y	SS	V	19.849999	D	MG/KG	0
12	HCS-BR-2	Y	SS	V	19.2	D	MG/KG	0
13	22C-1-T	0	SS	V	18.9	D	MG/KG	0
14	22A-1-T	Y	SS	V	18.55	D	MG/KG	0
15	HCS-S5-2	0	SS	V	17	D	MG/KG	0
16	SITE3-1-T	0	SS	V	15.5	D	MG/KG	0
17	22C-2-T	0	SS	V	5.1500001	U	MG/KG	0
18	23-4-T	0	SS	V	2.5999999	U	MG/KG	0
19	23-1-T	0	SS	V	2.2	U	MG/KG	0
1	10006A-1-T	0	SS	ZN	260	D	MG/KG	0
2	22C-1-T	0	SS	ZN	123	D	MG/KG	0
3	HCS-BR-2	Y	SS	ZN	106.55	D	MG/KG	0
4	HCS-BR-1	0	SS	ZN	98.199997	D	MG/KG	0
5	HCS-BR-4	0	SS	ZN	77.800003	D	MG/KG	0
6	HCS-BR-3	0	SS	ZN	71.599998	D	MG/KG	0
7	22A-2-T	0	SS	ZN	67	D	MG/KG	0
8	HCS-PWA-29S	0	SS	ZN	62.200001	D	MG/KG	0
9	HCS-S5-1	0	SS	ZN	62.099998	D	MG/KG	0
10	22A-1-T	Y	SS	ZN	60.199999	D	MG/KG	0
11	23-4-T	0	SS	ZN	56.400002	D	MG/KG	0
12	SITE3-1-T	0	SS	ZN	49.900002	D	MG/KG	0
13	23-2-T	Y	SS	ZN	46.35	D	MG/KG	0
14	HCS-S5-2	0	SS	ZN	40.099998	D	MG/KG	0
15	10006B-3-T	Y	SS	ZN	39.65	D	MG/KG	0
16	10006A-3-T	0	SS	ZN	31.5	D	MG/KG	0
17	10006A-2-T	0	SS	ZN	30.799999	D	MG/KG	0
18	23-1-T	0	SS	ZN	24.6	D	MG/KG	0
19	22C-2-T	0	SS	ZN	23.6	D	MG/KG	0

Bot	Lnconc	SITEID
1	2.0412203	Swmu 22C
1	0.9162907	Aoc 10006
1	0.6931472	Background
1	0.4382549	Aoc 10006
1	0.3184537	Swmu 22
1	0	Site 5
1	-0.10536	Background
1	-0.162519	Swmu 22
1	-0.223144	Swmu 22C
1	-0.510826	Background
1	-0.597837	Site 3
1	-0.653926	Swmu 23
1	-0.703198	Background
1	-0.787458	Aoc 10006
1	-0.891598	Aoc 10006
1	-0.916291	Site 5
1	-1.108663	Swmu 23
1	-1.108663	Swmu 23
1	9.6290507	Aoc 10006
1	9.5503777	Aoc 10006
1	9.4955193	Aoc 10006
1	9.3281234	Swmu 23
1	9.2202907	Site 3
1	9.1590471	Background
1	9.1094145	Site 10
1	9.0960512	Background
1	9.0008531	Background
1	8.9502735	Swmu 22
1	8.9259861	Swmu 22
1	8.8859943	Site 5
1	8.8068733	Swmu 22C
1	8.6604274	Site 5
1	8.5745183	Background
1	8.199739	Aoc 10006
1	7.5857888	Swmu 22C
1	7.5704433	Swmu 23
1	7.5229409	Swmu 23
1	2.442347	Swmu 23
1	2.3025851	Aoc 10006
1	2.1860513	Aoc 10006
1	2.1041341	Background
1	2.0541238	Site 5
1	2.0281482	Site 3
1	1.9169226	Site 5
1	1.9021075	Swmu 22
1	1.8870696	Swmu 22
1	1.8870696	Swmu 22C
1	1.8718022	Site 10
1	1.8405496	Background
1	1.8245493	Background
1	1.8245493	Background
1	1.3083328	Aoc 10006
1	1.2809338	Aoc 10006
1	0.5877866	Swmu 23
1	0.5306283	Swmu 23
1	-0.287682	Swmu 22C

1	4.7874917	Site 10
1	4.7004804	Background
1	4.6959245	Swmu 22
1	4.6249728	Background
1	4.520701	Swmu 22
1	4.5174313	Background
1	4.3618239	Site 3
1	4.3425058	Swmu 23
1	4.2470657	Aoc 10006
1	4.1926804	Aoc 10006
1	4.1620032	Aoc 10006
1	4.1604443	Swmu 22C
1	3.9926809	Site 5
1	3.8691155	Site 5
1	3.8628327	Background
1	2.6912431	Aoc 10006
1	2.5095993	Swmu 22C
1	2.2353764	Swmu 23
1	1.7664416	Swmu 23
1	0.1823216	Site 10
1	0.139762	Aoc 10006
1	0	Aoc 10006
1	-0.314711	Swmu 22
1	-0.438505	Background
1	-0.71335	Swmu 22
1	-0.849801	Swmu 23
1	-0.916291	Site 3
1	-0.928869	Swmu 22C
1	-0.941609	Background
1	-0.941609	Site 5
1	-0.954512	Aoc 10006
1	-0.967584	Background
1	-1.021651	Background
1	-1.12393	Site 5
1	-1.634756	Swmu 22C
1	-1.966113	Aoc 10006
1	-2.525729	Swmu 23
1	-2.525729	Swmu 23
1	12.584509	Swmu 23
1	12.517227	Swmu 23
1	12.413087	Swmu 22C
1	12.100712	Aoc 10006
1	10.601622	Swmu 23
1	10.534759	Background
1	10.457373	Swmu 22C
1	10.385914	Aoc 10006
1	9.7699562	Site 3
1	9.721366	Background
1	9.2103404	Aoc 10006
1	8.9996193	Swmu 22
1	8.6707723	Background
1	8.5904437	Site 10
1	8.4574432	Aoc 10006
1	8.4162673	Background
1	7.9827577	Site 5
1	7.7706452	Swmu 22
1	7.5010821	Site 5

1 1.1939225 Aoc 10006
1 0.9932518 Swmu 22C
1 0.8754688 Swmu 23
1 0.5877866 Site 5
1 0.4054651 Site 5
1 0.1823216 Background
1 0.1397619 Site 10
1 -0.597837 Background
1 -1.021651 Background
1 -1.093625 Swmu 22
1 -1.108663 Site 3
1 -1.131652 Background
1 -1.171183 Aoc 10006
1 -1.187444 Swmu 22
1 -1.237874 Aoc 10006
1 -1.237874 Swmu 22C
1 -1.246532 Aoc 10006
1 -1.255266 Swmu 23
1 -1.406497 Swmu 23
1 -0.356675 Background
1 -0.430783 Background
1 -0.470004 Background
1 -0.510826 Background
1 -0.510826 Site 5
1 -0.510826 Site 5
1 3.0887671 Swmu 23
1 2.8078956 Background
1 2.6741486 Aoc 10006
1 2.6026897 Site 3
1 2.5649494 Aoc 10006
1 2.5572273 Site 10
1 2.4336133 Swmu 22
1 2.360854 Background
1 2.3513753 Site 5
1 2.0949457 Swmu 22
1 1.757858 Background
1 1.6677069 Background
1 1.6677069 Swmu 22C
1 1.5260563 Site 5
1 1.1939225 Aoc 10006
1 0.5877866 Aoc 10006
1 -0.223144 Swmu 22C
1 -0.223144 Swmu 23
1 -0.510826 Swmu 23
1 3.0204249 Site 5
1 2.9601051 Swmu 22C
1 2.8735647 Aoc 10006
1 2.8507065 Aoc 10006
1 2.8273136 Aoc 10006
1 2.6567569 Swmu 23
1 2.653242 Background
1 2.6461748 Site 3
1 2.5952547 Site 10
1 2.5572273 Background
1 2.5455313 Swmu 22
1 2.4765384 Background
1 2.4595888 Swmu 22

1	2.3025851	Aoc 10006
1	2.2669579	Background
1	2.2617631	Site 5
1	1.9459101	Swmu 22C
1	1.1631508	Swmu 23
1	1.0296194	Swmu 23
1	3.421	Aoc 10006
1	3.254243	Swmu 22
1	3.2425924	Swmu 22C
1	3.1945831	Background
1	3.1570004	Aoc 10006
1	3.1441523	Site 3
1	2.9601051	Aoc 10006
1	2.9311938	Swmu 23
1	2.9231616	Background
1	2.895912	Site 10
1	2.8903718	Aoc 10006
1	2.8791984	Swmu 22
1	2.8678989	Background
1	2.8154088	Swmu 23
1	2.7536607	Background
1	2.7080502	Site 5
1	2.6741486	Site 5
1	2.014903	Swmu 23
1	0.9555114	Swmu 22C
1	10.513253	Aoc 10006
1	10.447264	Aoc 10006
1	10.292146	Aoc 10006
1	10.264652	Site 3
1	10.250617	Swmu 22C
1	10.210972	Site 10
1	10.15619	Swmu 23
1	10.154246	Site 5
1	10.110502	Swmu 22
1	10.081634	Background
1	10.056209	Site 5
1	10.043249	Background
1	10.043249	Swmu 22
1	9.9134379	Background
1	9.898475	Background
1	9.3147004	Aoc 10006
1	8.8276148	Swmu 22C
1	8.4595641	Swmu 23
1	8.3332704	Swmu 23
1	-0.867501	Swmu 22C
1	-1.386294	Aoc 10006
1	-1.771957	Background
1	-2.525729	Site 5
1	-2.65926	Site 5
1	-2.900422	Swmu 22
1	-2.995732	Background
1	-3.158251	Swmu 23
1	-3.218876	Background
1	-3.218876	Background
1	-3.352407	Swmu 23
1	-3.506558	Aoc 10006
1	-3.506558	Aoc 10006

1	-3.506558	Site 10
1	-3.506558	Swmu 22
1	-3.506558	Swmu 22C
1	-3.506558	Swmu 23
1	-3.593569	Aoc 10006
1	-3.688879	Site 3
1	7.5229409	Background
1	7.5010821	Background
1	7.4383835	Background
1	7.4205789	Aoc 10006
1	7.4175804	Aoc 10006
1	7.3839895	Site 3
1	7.1467722	Aoc 10006
1	7.1066061	Swmu 22
1	6.9162194	Swmu 23
1	6.8073823	Swmu 22
1	6.7304213	Background
1	6.3885614	Swmu 22C
1	6.3007858	Site 10
1	6.2146081	Site 5
1	6.1366466	Site 5
1	5.9532433	Aoc 10006
1	5.7589018	Swmu 22C
1	5.507362	Swmu 23
1	5.435903	Swmu 23
1	10.628618	Aoc 10006
1	9.5539301	Swmu 23
1	9.4727046	Swmu 22C
1	9.4572004	Swmu 23
1	8.5525603	Background
1	8.4553178	Swmu 22C
1	8.2065836	Swmu 23
1	8.0709061	Site 3
1	7.865188	Aoc 10006
1	7.8179273	Background
1	7.8079166	Background
1	7.783224	Aoc 10006
1	7.6496926	Aoc 10006
1	7.5857888	Background
1	7.3524411	Site 10
1	7.2793188	Swmu 22
1	7.0121153	Site 5
1	6.8901003	Swmu 22
1	6.2633983	Site 5
1	6.9754139	Site 10
1	6.6745614	Background
1	6.58755	Site 3
1	6.5242963	Swmu 22
1	6.4085288	Background
1	6.3664704	Swmu 22
1	6.3017028	Swmu 23
1	6.2225763	Background
1	6.0426328	Swmu 22C
1	5.9506426	Site 5
1	5.9215784	Site 5
1	5.7822855	Aoc 10006
1	5.5490761	Background

1	5.5093883	Aoc	10006
1	5.1929569	Aoc	10006
1	5.0814044	Swmu	22C
1	4.7361984	Aoc	10006
1	4.6728288	Swmu	23
1	4.355426	Swmu	23
1	4.3630986	Aoc	10006
1	4.1190372	Swmu	22C
1	4.0788078	Background	
1	4.0775374	Swmu	23
1	4.0342406	Swmu	23
1	3.5779479	Swmu	22C
1	3.5681233	Aoc	10006
1	3.5248889	Background	
1	3.523415	Swmu	23
1	3.4242627	Site	3
1	3.2027465	Aoc	10006
1	3.179095	Swmu	22
1	3.133318	Background	
1	3.0978375	Aoc	10006
1	2.8622009	Swmu	22
1	2.8390785	Site	5
1	2.8273136	Background	
1	2.5494452	Site	10
1	2.346602	Site	5
1	3.432373	Aoc	10006
1	3.3178158	Background	
1	3.2027465	Background	
1	3.1696855	Site	3
1	3.1612467	Background	
1	3.0633909	Aoc	10006
1	3.0633909	Swmu	22C
1	3.0106208	Site	5
1	2.9258462	Swmu	22
1	2.8213788	Background	
1	2.8213788	Swmu	22
1	2.7972813	Site	10
1	2.7663191	Site	5
1	2.74084	Swmu	23
1	2.6602596	Aoc	10006
1	1.4586151	Swmu	23
1	1.3862944	Swmu	23
1	1.0986123	Aoc	10006
1	0.1397619	Swmu	22C
1	4.3161539	Swmu	22C
1	4.0552572	Aoc	10006
1	3.9550825	Swmu	22
1	3.7256934	Site	3
1	3.6838669	Background	
1	3.6584202	Background	
1	3.6296601	Background	
1	3.3758795	Background	
1	3.3428618	Swmu	22
1	3.0910425	Site	10
1	2.8302678	Swmu	23
1	2.7146948	Aoc	10006
1	2.7080502	Site	5

1	2.587764	Site 5
1	2.5649494	Aoc 10006
1	2.3887628	Aoc 10006
1	2.2617631	Swmu 23
1	1.8870696	Swmu 23
1	1.8718022	Swmu 22C
1	2.8622009	Background
1	2.3978953	Swmu 23
1	2.2925347	Background
1	2.0980179	Swmu 22C
1	1.7664416	Swmu 22C
1	1.5260563	Site 3
1	1.5151273	Aoc 10006
1	1.4816046	Aoc 10006
1	1.4586151	Aoc 10006
1	1.3350011	Site 10
1	1.2383742	Site 5
1	1.1631508	Site 5
1	0.8754688	Background
1	-0.393043	Background
1	-0.723606	Background
1	-0.733969	Background
1	-0.84397	Site 10
1	-0.879477	Swmu 22C
1	-0.994252	Swmu 22
1	-1.035638	Site 5
1	-1.093625	Swmu 22
1	-1.108663	Site 3
1	-1.155183	Aoc 10006
1	-1.171183	Aoc 10006
1	-1.237874	Aoc 10006
1	-1.237874	Swmu 22C
1	-1.246532	Aoc 10006
1	-1.255266	Swmu 23
1	-1.309333	Site 5
1	-1.406497	Swmu 23
1	-1.406497	Swmu 23
1	0.3220835	Swmu 22
1	0	Site 3
1	-0.051293	Swmu 22
1	-0.466012	Aoc 10006
1	-0.723606	Background
1	-0.733969	Background
1	-0.838173	Background
1	-0.879477	Swmu 22C
1	-0.928869	Background
1	-1.035638	Site 10
1	-1.139434	Site 5
1	-1.155183	Aoc 10006
1	-1.171183	Aoc 10006
1	-1.187443	Aoc 10006
1	-1.203973	Site 5
1	-1.237874	Swmu 22C
1	-1.255266	Swmu 23
1	-1.406497	Swmu 23
1	-1.406497	Swmu 23
1	3.2386785	Background

1	3.226844	Background
1	3.1904763	Background
1	3.1738784	Site 10
1	3.1570004	Site 5
1	3.1090609	Aoc 10006
1	3.0492731	Swmu 22
1	3.0397491	Aoc 10006
1	3.0056826	Swmu 23
1	3.0007198	Aoc 10006
1	2.988204	Aoc 10006
1	2.9549103	Background
1	2.9391619	Swmu 22C
1	2.9204698	Swmu 22
1	2.8332133	Site 5
1	2.74084	Site 3
1	1.6389967	Swmu 22C
1	0.9555114	Swmu 23
1	0.7884574	Swmu 23
1	5.5606816	Aoc 10006
1	4.8121844	Swmu 22C
1	4.6686144	Background
1	4.5870062	Background
1	4.3541415	Background
1	4.2710951	Background
1	4.2046926	Swmu 22
1	4.130355	Site 10
1	4.128746	Site 5
1	4.0976723	Swmu 22
1	4.0324692	Swmu 23
1	3.910021	Site 3
1	3.8362213	Swmu 23
1	3.6913763	Site 5
1	3.6800909	Aoc 10006
1	3.4499875	Aoc 10006
1	3.4275147	Aoc 10006
1	3.2027465	Swmu 23
1	3.1612467	Swmu 22C

ABL BACKGROUND SOIL METALS CONCENTRATION
SUMMARY BY MATRIX * PARAMETER
SUM1.xls

					NON-DETECTS		DETECTS				
MATRIX	P	D	N	FD	MIN	MAX	MIN	MAX	MEAN	SD	CV
SB	AL	13	13	1.00			8220.00	22500.00	13127.69	4306.76	0.33
SB	AS	13	13	1.00			4.80	13.10	8.15	2.54	0.31
SB	BA	13	13	1.00			43.30	220.00	107.67	59.46	0.55
SB	CA	13	13	1.00			2540.00	67000.00	14646.92	21498.01	1.47
SB	CR	13	13	1.00			12.30	24.00	16.37	3.85	0.23
SB	CU	13	13	1.00			19.60	31.60	24.60	4.02	0.16
SB	FE	13	13	1.00			17500.00	41300.00	30215.38	5989.97	0.20
SB	MG	13	13	1.00			1190.00	2730.00	2108.46	436.52	0.21
SB	MN	13	13	1.00			76.20	1240.00	585.40	445.72	0.76
SB	NI	13	13	1.00			16.80	27.00	22.31	2.95	0.13
SB	PB	13	13	1.00			9.60	23.20	15.21	3.83	0.25
SB	V	13	13	1.00			13.10	33.40	20.86	6.26	0.30
SB	ZN	13	13	1.00			27.90	87.00	52.46	22.34	0.43
SB	CO	12	13	0.92	4.30	4.30	7.20	19.00	12.70	4.38	0.34
SB	K	12	13	0.92	454.00	454.00	1120.00	1880.00	1429.77	434.70	0.30
SB	BE	8	13	0.62	0.43	0.55	0.90	1.50	0.85	0.53	0.63
SB	TL	8	13	0.62	0.24	0.33	1.50	2.90	1.45	1.14	0.79
SB	CD	3	13	0.23	0.27	0.43	0.95	2.30	0.45	0.63	1.40
SB	AG	2	13	0.15	0.17	0.50	0.48	2.10	0.37	0.53	1.42
SB	SB	2	13	0.15	3.55	4.90	2.90	3.00	2.26	0.37	0.16
SB	SE	2	13	0.15	0.22	0.35	0.45	0.48	0.20	0.12	0.60
SB	HG		13		0.03	0.05			0.02	0.00	0.27
SB	NA		13		17.10	104.50			21.83	13.88	0.64
SS	AL	19	19	1.00			1850.00	15200.00	7846.32	3944.74	0.50
SS	CA	19	19	1.00			1810.00	292000.00	63990.53	100297.17	1.57
SS	CR	19	19	1.00			2.80	20.50	12.59	4.85	0.39
SS	FE	19	19	1.00			4160.00	36800.00	22163.16	9300.46	0.42
SS	MN	19	19	1.00			77.90	1070.00	429.18	269.54	0.63
SS	PB	19	19	1.00			6.50	74.90	27.85	19.27	0.69
SS	ZN	19	19	1.00			23.60	260.00	70.08	53.50	0.76
SS	AS	18	19	0.95	0.75	0.75	1.70	11.50	6.16	2.85	0.46
SS	CU	18	19	0.95	2.60	2.60	7.50	30.60	18.53	6.63	0.36
SS	MG	18	19	0.95	525.00	525.00	982.50	41300.00	6175.25	9502.22	1.54
SS	NI	17	19	0.89	1.15	3.00	4.00	30.95	16.76	8.68	0.52
SS	V	16	19	0.84	2.20	5.15	15.50	25.50	17.95	7.73	0.43
SS	BA	15	19	0.79	5.85	14.75	47.60	120.00	63.97	37.38	0.58
SS	K	11	19	0.58	229.50	595.00	837.50	1850.00	904.51	675.12	0.75
SS	CO	10	19	0.53	0.60	5.80	8.13	21.95	7.75	6.64	0.86
SS	AG	7	18	0.39	0.33	0.85	0.90	7.70	1.11	1.79	1.62
SS	CD	6	19	0.32	0.25	1.15	1.20	3.30	0.81	1.03	1.27
SS	BE	5	19	0.26	0.08	0.49	0.65	1.20	0.37	0.38	1.04
SS	HG	5	19	0.26	0.03	0.05	0.07	0.42	0.07	0.11	1.63
SS	SB	3	12	0.25	3.20	8.15	9.90	17.50	4.96	5.08	1.02
SS	SE	2	19	0.11	0.25	0.49	0.67	2.40	0.31	0.52	1.66
SS	TL	1	19	0.05	0.25	1.00	1.38	1.38	0.28	0.29	1.04
SS	CN		6		0.60	0.70			0.31	0.02	0.06
SS	NA		19		10.45	78.50			17.18	9.73	0.57

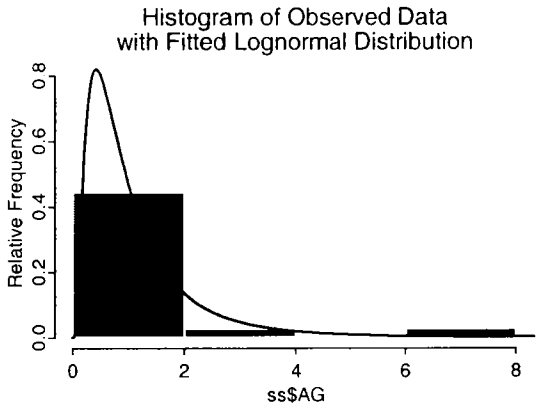
DIXON OUTLIER TEST RESULTS
BY MATRIX BY PARAMETER
LSUM1.xls

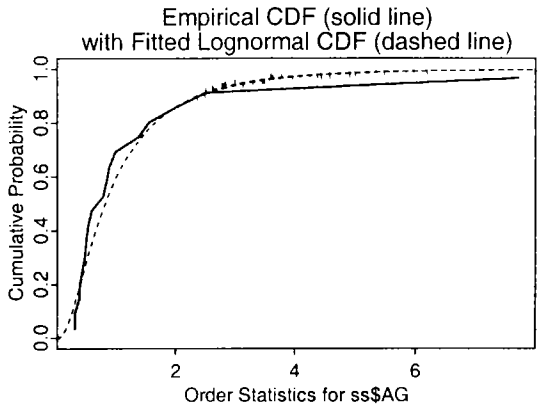
Matrix	P	D	N	FD	MAXD	MEAN	SD	Z
SS	SE	2	19	0.11	0.88	-0.47	0.34	3.92
SS	TL	1	19	0.05	0.32	-0.43	0.27	2.77
SS	ZN	19	19	1.00	5.56	4.06	0.59	2.53
SS	HG	5	19	0.26	-0.87	-1.73	0.38	2.27
SS	CD	6	19	0.32	1.19	-0.13	0.64	2.07
SS	MG	18	19	0.95	10.63	7.92	1.52	1.78
SS	BE	5	19	0.26	0.18	-0.50	0.39	1.75
SS	PB	19	19	1.00	4.32	3.09	0.73	1.68
SS	CA	19	19	1.00	12.58	9.83	1.66	1.67
SS	MN	19	19	1.00	6.98	5.83	0.75	1.53
SS	CO	10	19	0.53	3.09	1.54	1.16	1.34
SS	AL	19	19	1.00	9.63	8.80	0.65	1.27
SS	AS	18	19	0.95	2.44	1.67	0.67	1.16
SS	CR	19	19	1.00	3.02	2.43	0.54	1.10
SS	FE	19	19	1.00	10.51	9.86	0.64	1.01
SS	CU	18	19	0.95	3.42	2.80	0.64	0.97
SS	K	11	19	0.58	7.52	5.43	2.16	0.97
SS	NI	17	19	0.89	3.43	2.55	0.96	0.93
SS	BA	15	19	0.79	4.79	3.67	1.36	0.82
SS	V	16	19	0.84	3.24	2.65	0.94	0.63
SS	NA		19			1.69	0.29	-5.93
SS	AG	7	18	0.39	2.04	0.03	0.66	3.06
SB	HG		13			-1.75	0.12	14.42
SB	AG	2	13	0.15	0.74	-0.39	0.37	3.05
SB	CD	3	13	0.23	0.83	-0.37	0.42	2.89
SB	SB	2	13	0.15	1.10	0.78	0.14	2.24
SB	CA	13	13	1.00	11.11	8.90	1.09	2.02
SB	AL	13	13	1.00	10.02	9.44	0.30	1.94
SB	CR	13	13	1.00	3.18	2.77	0.22	1.85
SB	V	13	13	1.00	3.51	3.00	0.28	1.81
SB	PB	13	13	1.00	3.14	2.69	0.25	1.80
SB	CU	13	13	1.00	3.45	3.19	0.16	1.66
SB	AS	13	13	1.00	2.57	2.05	0.32	1.64
SB	BA	13	13	1.00	5.39	4.54	0.55	1.55
SB	FE	13	13	1.00	10.63	10.30	0.21	1.55
SB	NI	13	13	1.00	3.30	3.10	0.13	1.48
SB	ZN	13	13	1.00	4.47	3.88	0.42	1.40
SB	BE	8	13	0.62	0.41	-0.02	0.33	1.32
SB	MG	13	13	1.00	7.91	7.63	0.24	1.18
SB	MN	13	13	1.00	7.12	6.03	0.94	1.16
SB	TL	8	13	0.62	1.06	0.25	0.74	1.10
SB	CO	12	13	0.92	2.94	2.44	0.57	0.89
SB	K	12	13	0.92	7.54	6.99	1.19	0.46
SB	SE	2	13	0.15	-0.73	-0.63	0.09	-1.21
SB	NA		13			1.81	0.27	-6.62
SS	SB	3	12	0.25	2.86	1.20	0.82	2.04
SS	CN		6			-0.23	0.03	7.50

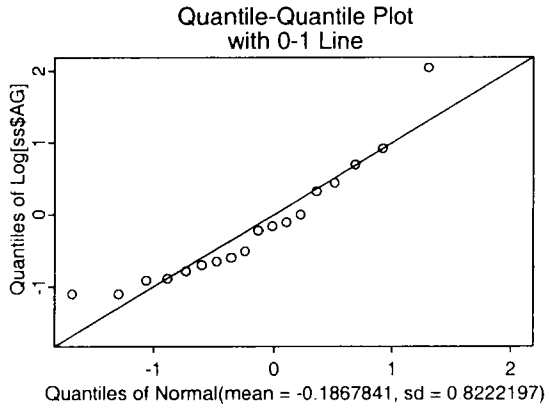
ABL BACKGROUND SOIL METALS CONCENTRATION ESTIMATES
MAXIMUM DETECTED CONCENTRATION:
BY MATRIX BY PARAMETER
MAX.xls

Matrix	P	CONC	Sid	Dup
SB	TL	2.9000001	10006A-1-D	0
SB	AL	22500	10006A-2-D	0
SB	V	33.400002	10006A-2-D	0
SB	BE	1.5	10006A-3-D	0
SB	MG	2730	10006A-3-D	0
SB	SB	4.9000001	10006A-3-D	0
SB	CA	67000	10006B-1-D	0
SB	K	1880	26-1-D	0
SB	MN	1240	26-1-D	0
SB	CR	24	37T-1-D	0
SB	TL	2.9000001	37T-1-D	0
SB	AG	2.0999999	HCS-PWA-29	0
SB	AS	13.1	HCS-PWA-29	0
SB	CD	2.3	HCS-PWA-29	0
SB	FE	41300	HCS-PWA-29	0
SB	HG	0.05	HCS-PWA-29	0
SB	ZN	87	HCS-PWA-29	0
SB	BA	220	HCS-S2-5	0
SB	SE	0.48	HCS-S2-5	0
SB	CO	19	HCS-S2-6	0
SB	CU	31.6	HCS-S2-6	0
SB	NA	104.5	HCS-S2-6	0
SB	NI	27	HCS-S2-6	0
SB	PB	23.200001	HCS-S2-6	0
SS	CD	3.3	10006A-1-T	0
SS	MG	41300	10006A-1-T	0
SS	NA	78.5	10006A-1-T	0
SS	ZN	260	10006A-1-T	0
SS	AL	15200	10006A-3-T	0
SS	FE	36800	10006A-3-T	0
SS	CU	30.599999	10006B-3-T	Y
SS	NI	30.950001	10006B-3-T	Y
SS	TL	1.38	22A-1-T	Y
SS	AG	7.6999998	22C-1-T	0
SS	HG	0.42	22C-1-T	0
SS	PB	74.900002	22C-1-T	0
SS	CA	292000	23-1-T	0
SS	AS	11.5	23-2-T	Y
SS	CO	21.95	23-2-T	Y
SS	K	1850	HCS-BR-1	0
SS	SE	2.4000001	HCS-BR-1	0
SS	SB	17.5	HCS-BR-2	N
SS	CN	0.7	HCS-BR-3	0
SS	V	25.5	HCS-BR-4	0
SS	BA	120	HCS-PWA-29S	0
SS	BE	1.2	HCS-PWA-29S	0
SS	MN	1070	HCS-PWA-29S	0
SS	CR	20.5	HCS-S5-1	0

Results of Shapiro-Wilk GOF Test for ss$AG



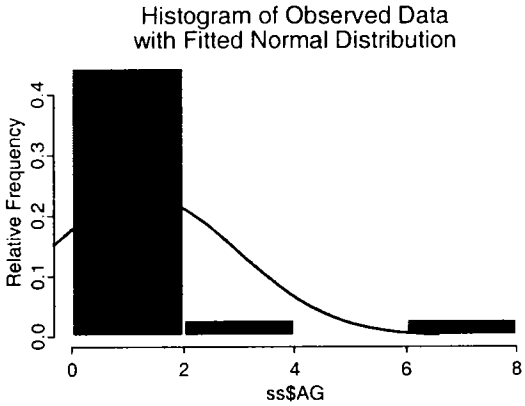


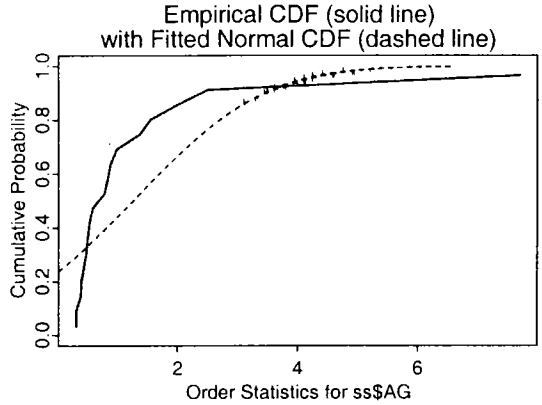


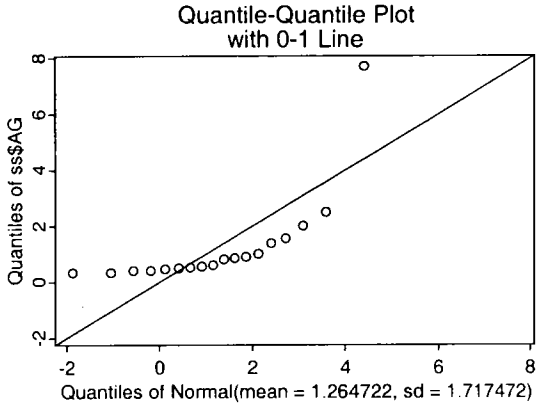
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.1867841 sdlog = 0.8222197
Data:	ss$AG
Sample Size:	18
Test Statistic:	W = 0.8966215
Test Statistic Parmeter:	n = 18
P-value:	0.05019251

Results of Shapiro-Wilk GOF Test for ss$AG



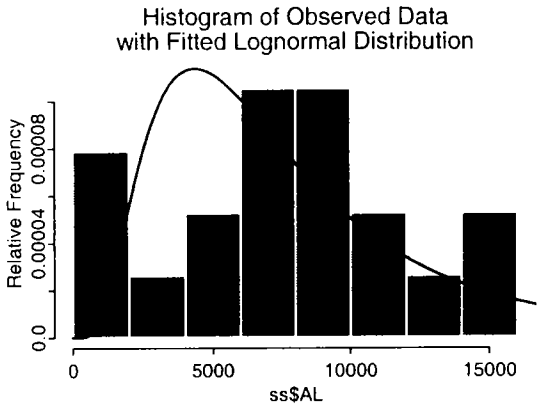


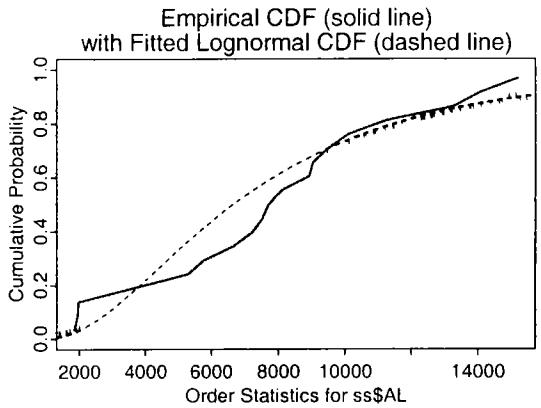


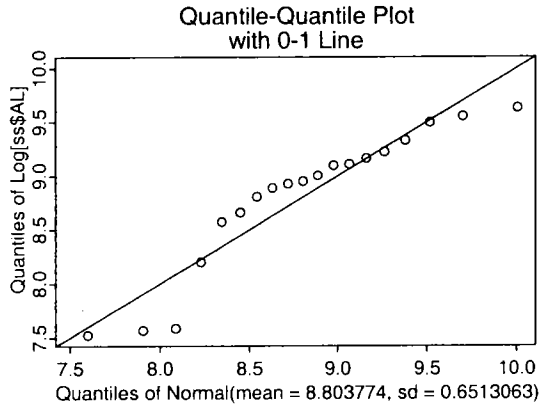
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 1.264722 sd = 1.717472
Data:	ss$AG
Sample Size:	18
Test Statistic:	W = 0.5395858
Test Statistic Parmeter:	n = 18
P-value:	1.803362e-6

Results of Shapiro-Wilk GOF Test for ss$AL



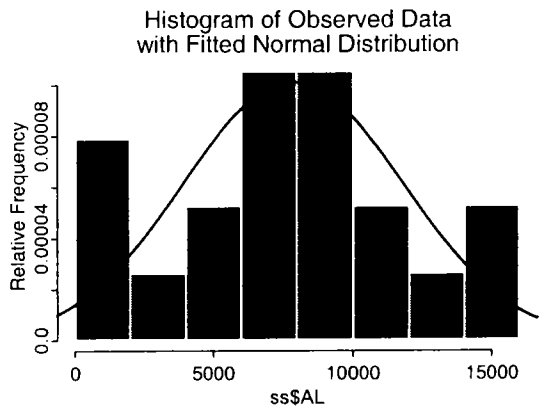


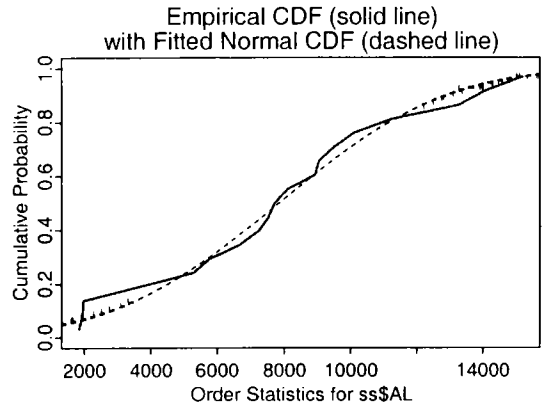


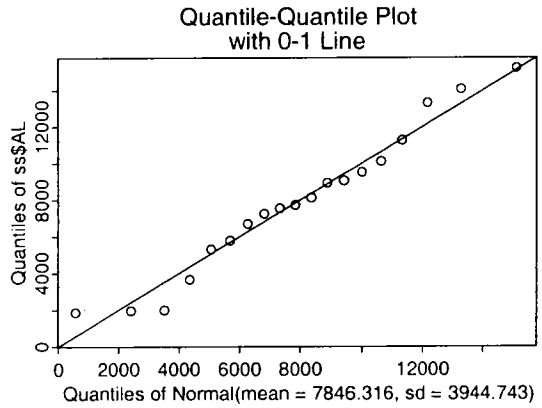
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 8.803774 sdlog = 0.6513063
Data:	ss$AL
Sample Size:	19
Test Statistic:	W = 0.8756764
Test Statistic Parmeter:	n = 19
P-value:	0.01806835

Results of Shapiro-Wilk GOF Test for ss$AL



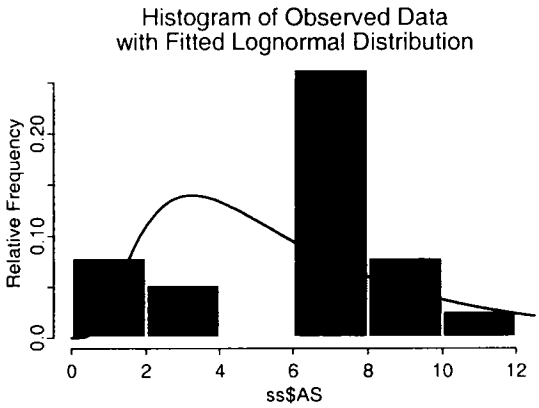


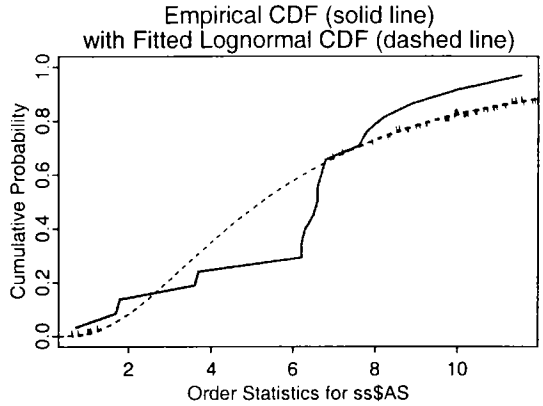


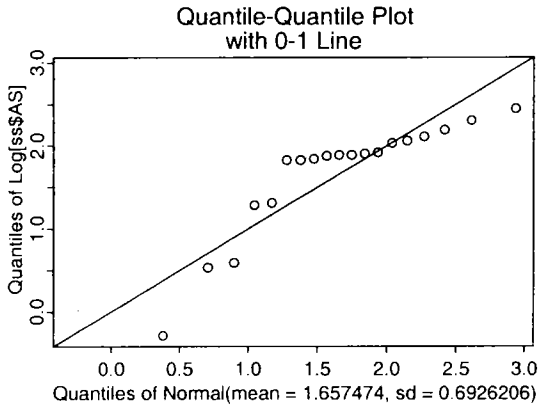
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 7846.316 sd = 3944.743
Data:	ss$AL
Sample Size:	19
Test Statistic:	W = 0.9604512
Test Statistic Parmeter:	n = 19
P-value:	0.5813029

Results of Shapiro-Wilk GOF Test for ss$AS



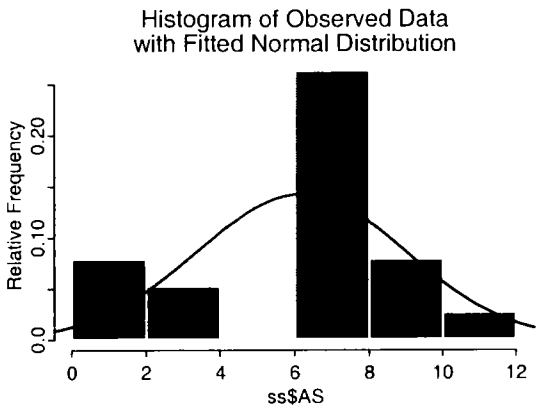


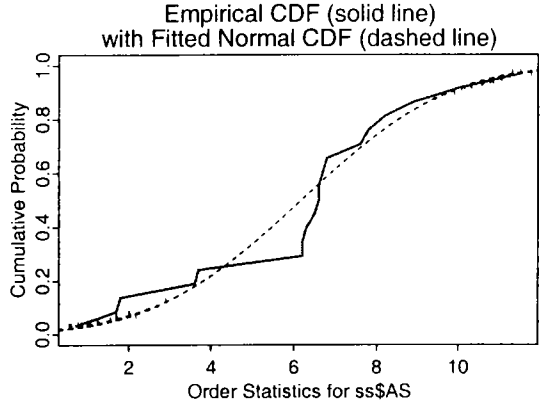


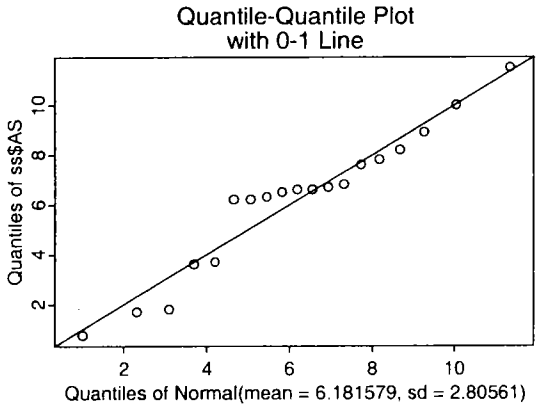
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 1.657474 sdlog = 0.6926206
Data:	ss$AS
Sample Size:	19
Test Statistic:	W = 0.7974012
Test Statistic Parmeter:	n = 19
P-value:	0.001047968

Results of Shapiro-Wilk GOF Test for ss$AS



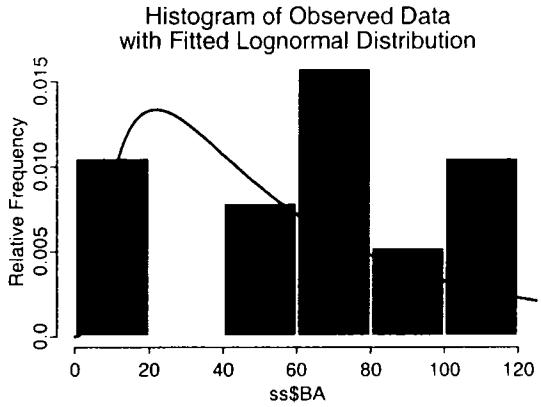


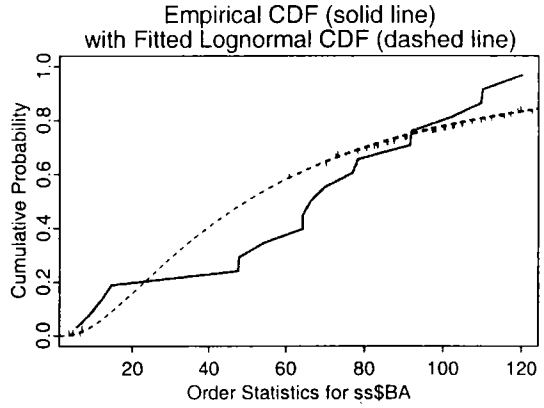


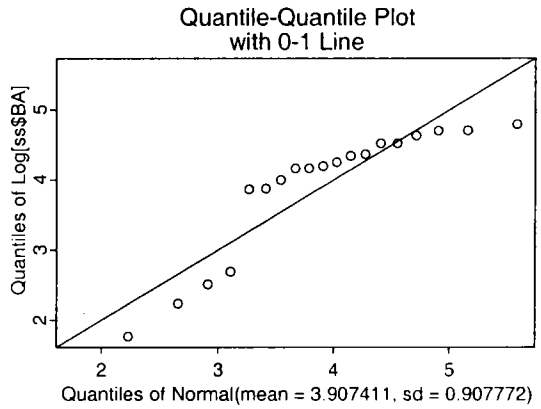
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 6.181579 sd = 2.80561
Data:	ss$AS
Sample Size:	19
Test Statistic:	W = 0.9410238
Test Statistic Parmeter:	n = 19
P-value:	0.2751112

Results of Shapiro-Wilk GOF Test for ss$BA



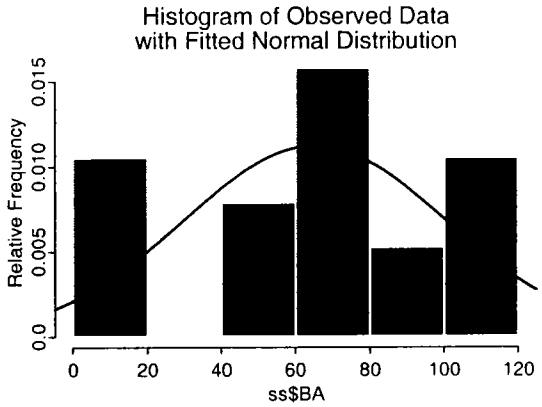


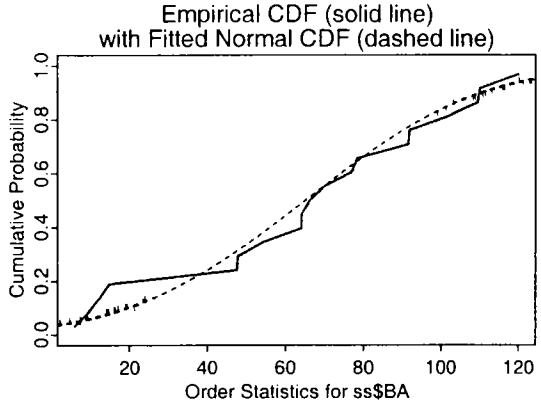


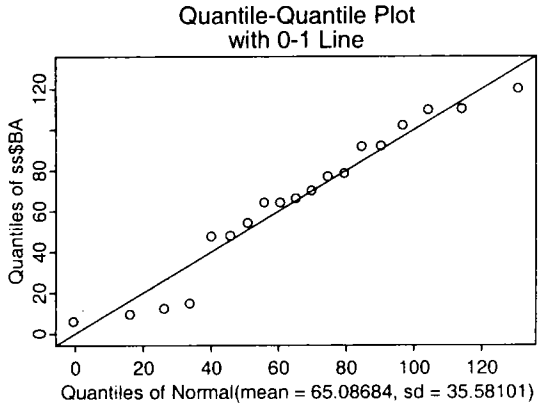
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 3.907411 sdlog = 0.907772
Data:	ss$BA
Sample Size:	19
Test Statistic:	W = 0.8000955
Test Statistic Parmeter:	n = 19
P-value:	0.001146498

Results of Shapiro-Wilk GOF Test for ss$BA



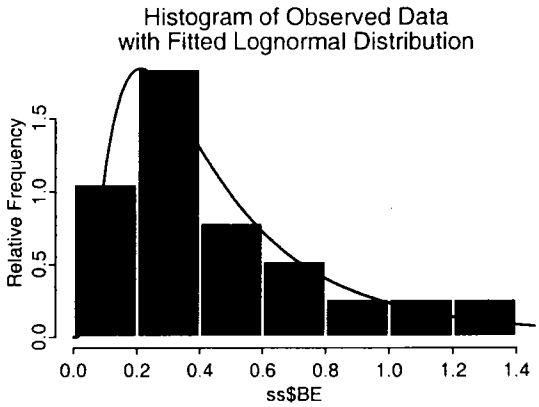


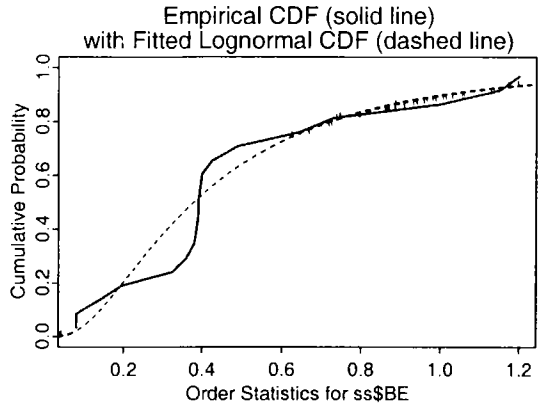


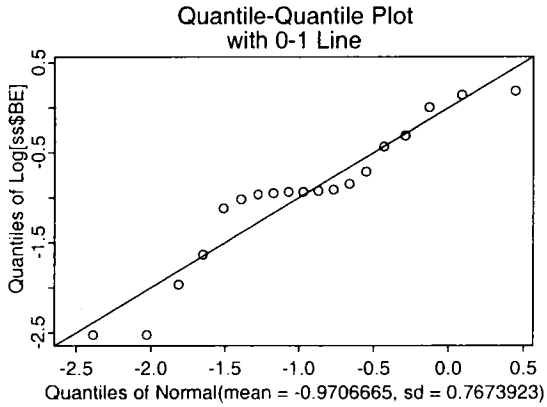
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 65.08684 sd = 35.58101
Data:	ss$BA
Sample Size:	19
Test Statistic:	W = 0.9394424
Test Statistic Parmeter:	n = 19
P-value:	0.2576594

Results of Shapiro-Wilk GOF Test for ss$BE



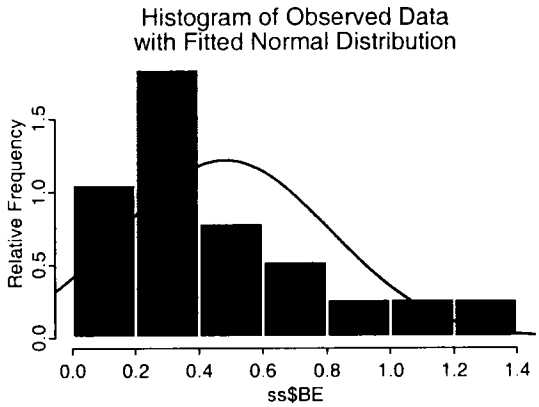


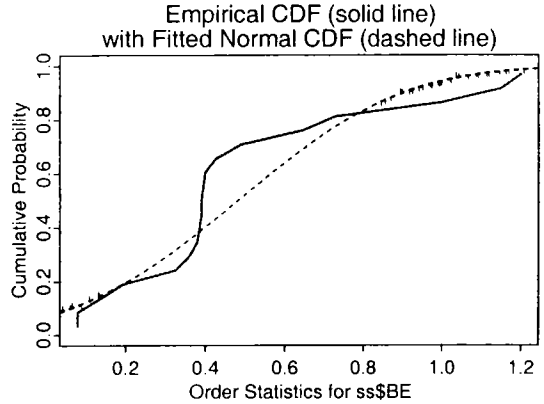


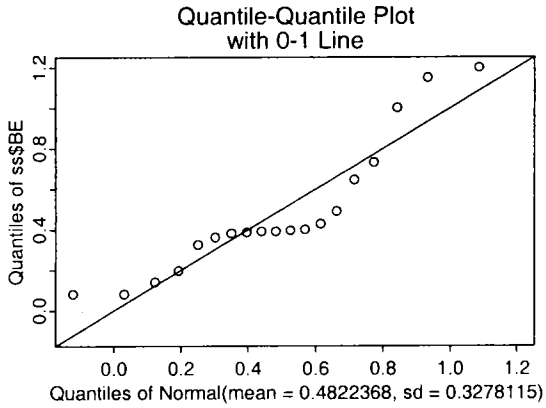
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.9706665 sdlog = 0.7673923
Data:	ss$BE
Sample Size:	19
Test Statistic:	W = 0.9078351
Test Statistic Parmeter:	n = 19
P-value:	0.06756416

Results of Shapiro-Wilk GOF Test for ss$BE



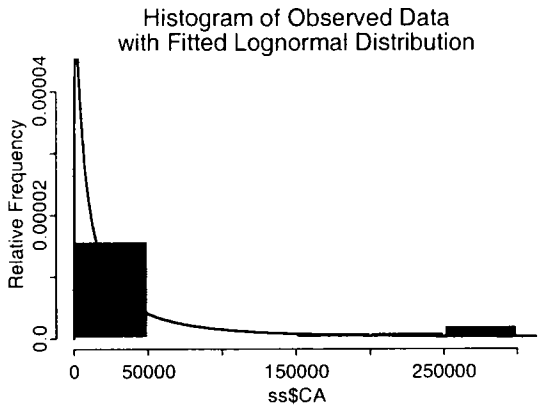


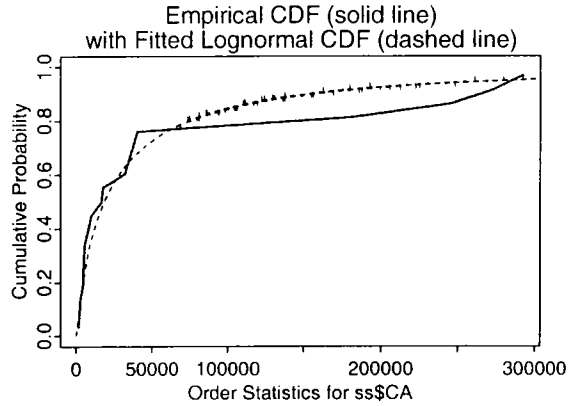


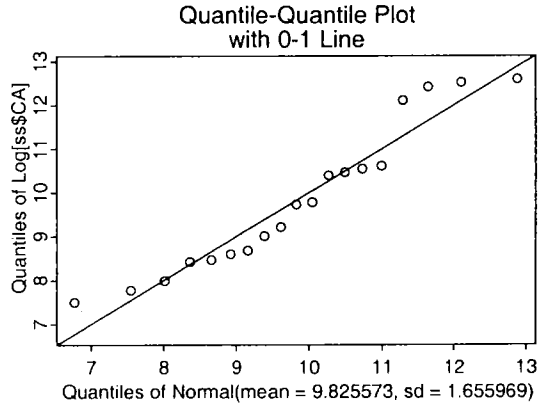
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.4822368 sd = 0.3278115
Data:	ss$BE
Sample Size:	19
Test Statistic:	W = 0.858283
Test Statistic Parmeter:	n = 19
P-value:	0.009176759

Results of Shapiro-Wilk GOF Test for ss$CA



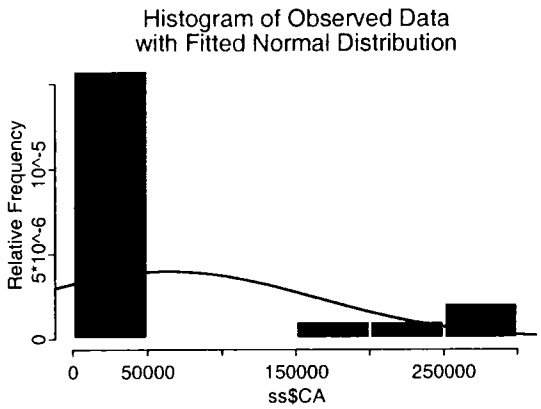


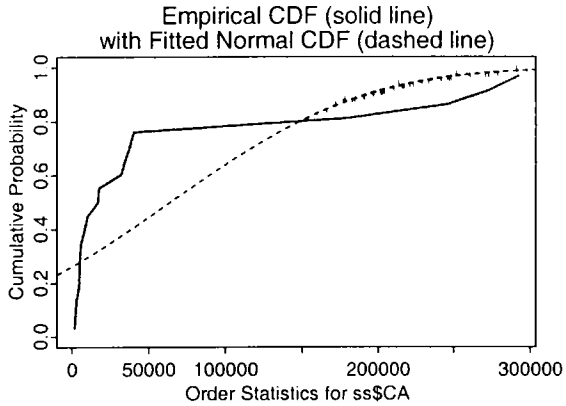


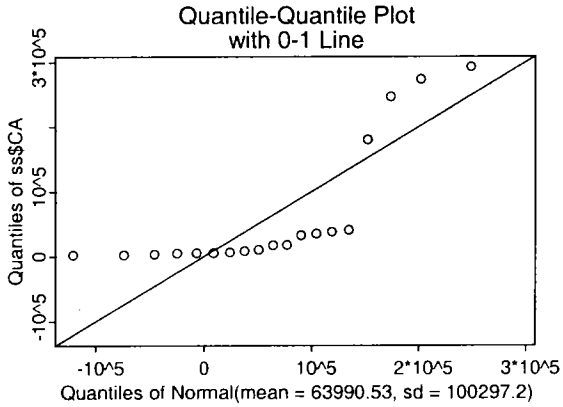
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 9.825573 sdlog = 1.655969
Data:	ss$CA
Sample Size:	19
Test Statistic:	W = 0.9201867
Test Statistic Parmeter:	n = 19
P-value:	0.1140715

Results of Shapiro-Wilk GOF Test for ss$CA



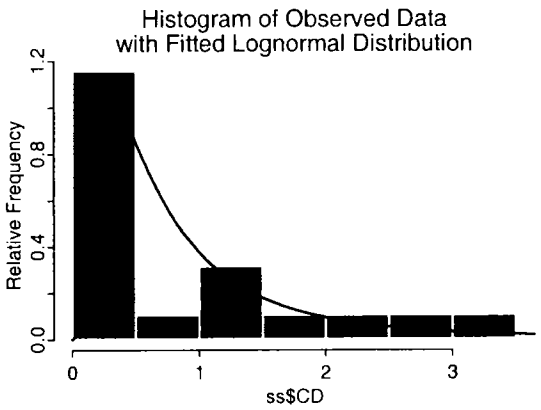


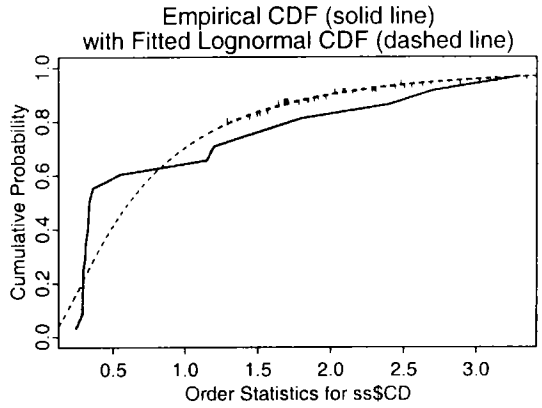


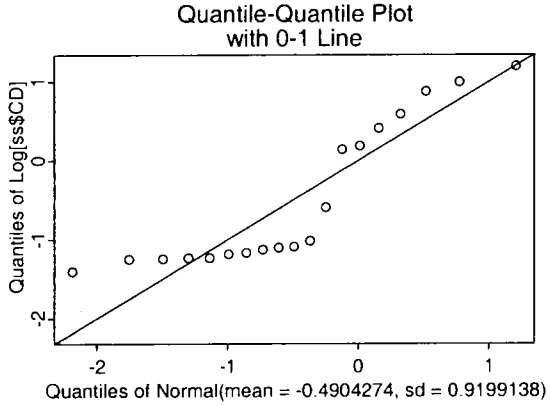
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 6.399053e4 sd = 1.002972e5
Data:	ss$CA
Sample Size:	19
Test Statistic:	W = 0.6366474
Test Statistic Parmeter:	n = 19
P-value:	1.070589e-5

Results of Shapiro-Wilk GOF Test for ss$CD



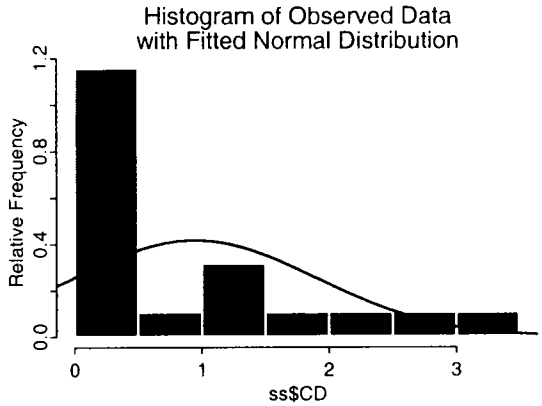


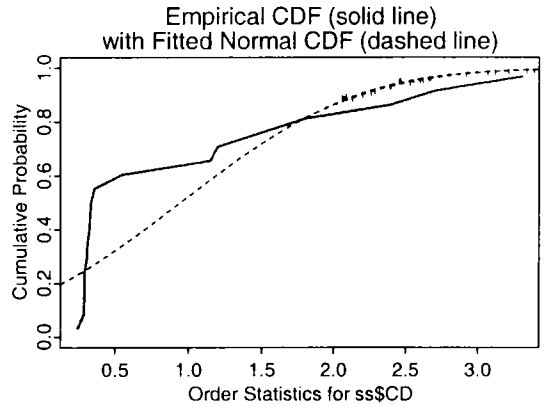


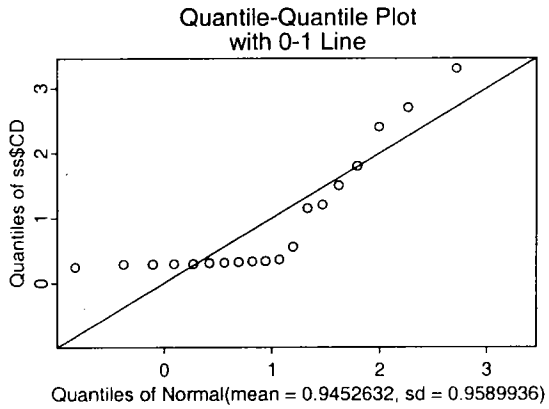
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.4904274 sdlog = 0.9199138
Data:	ss$CD
Sample Size:	19
Test Statistic:	W = 0.803757
Test Statistic Parmeter:	n = 19
P-value:	0.001296523

Results of Shapiro-Wilk GOF Test for ss$CD



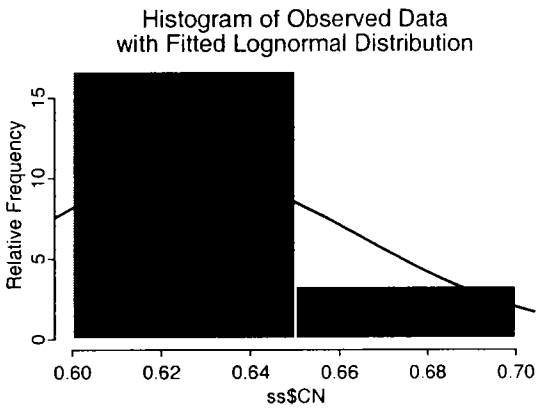


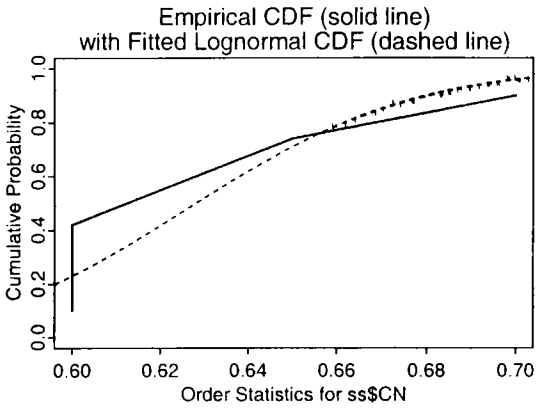


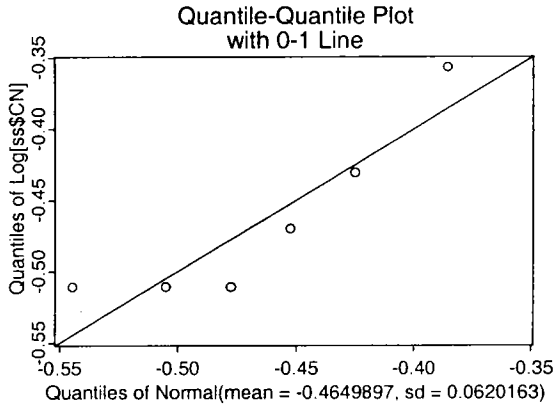
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.9452632 sd = 0.9589936
Data:	ss$CD
Sample Size:	19
Test Statistic:	W = 0.7427593
Test Statistic Parmeter:	n = 19
P-value:	1.883253e-4

Results of Shapiro-Wilk GOF Test for ss$CN



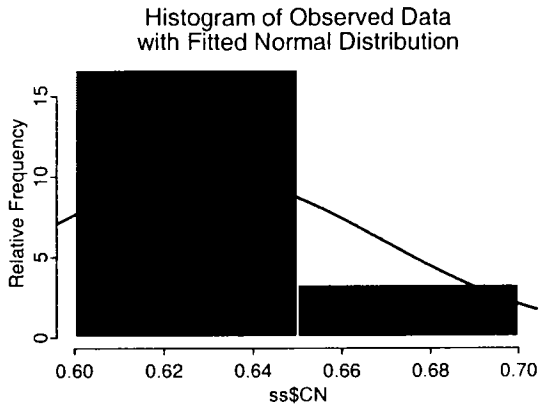


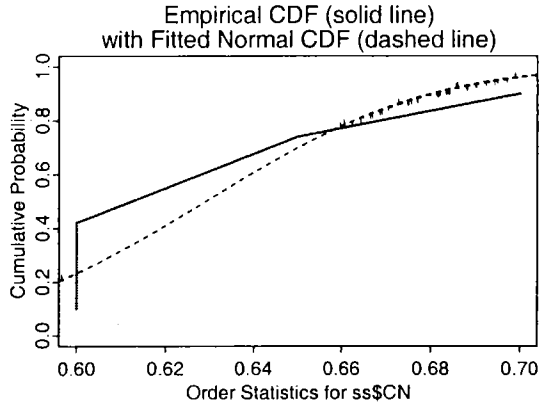


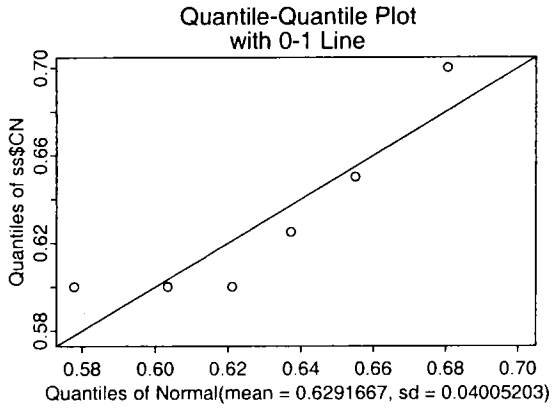
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.4649897 sdlog = 0.0620163
Data:	ss$CN
Sample Size:	6
Test Statistic:	W = 0.8149184
Test Statistic Parmeter:	n = 6
P-value:	0.07971224

Results of Shapiro-Wilk GOF Test for ss$CN



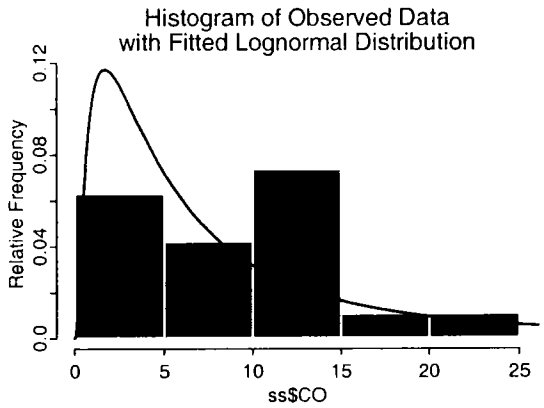


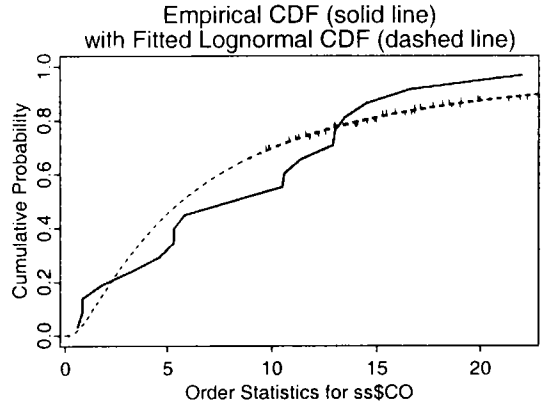


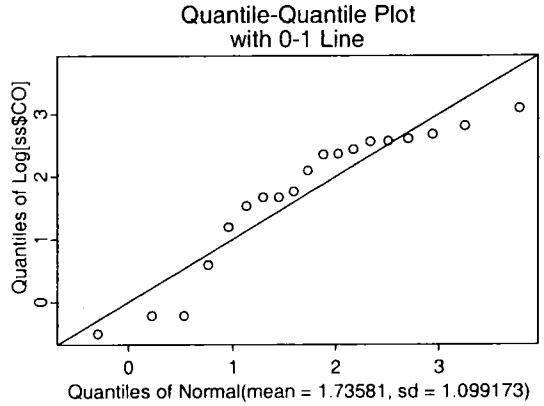
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.6291667 sd = 0.04005203
Data:	ss$CN
Sample Size:	6
Test Statistic:	W = 0.8086843
Test Statistic Parmeter:	n = 6
P-value:	0.07025607

Results of Shapiro-Wilk GOF Test for ss$CO



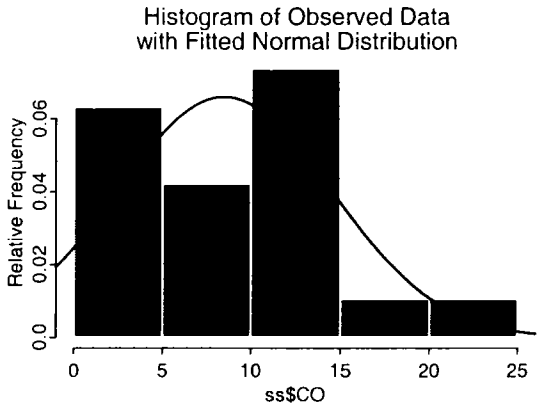


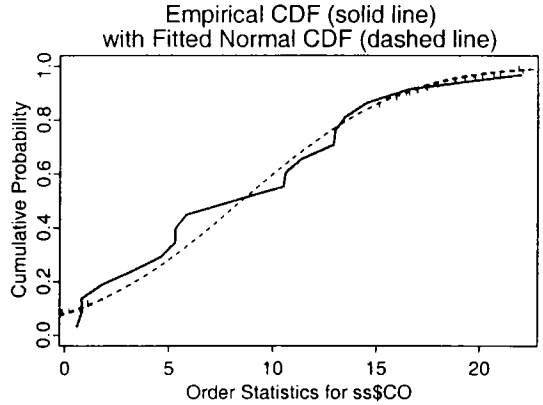


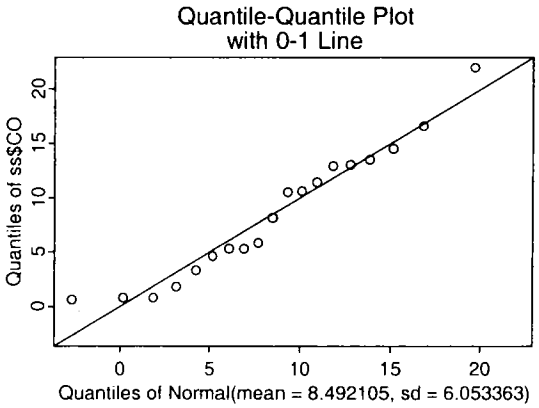
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 1.73581 sdlog = 1.099173
Data:	ss$CO
Sample Size:	19
Test Statistic:	W = 0.8720511
Test Statistic Parmeter:	n = 19
P-value:	0.01565458

Results of Shapiro-Wilk GOF Test for ss$CO



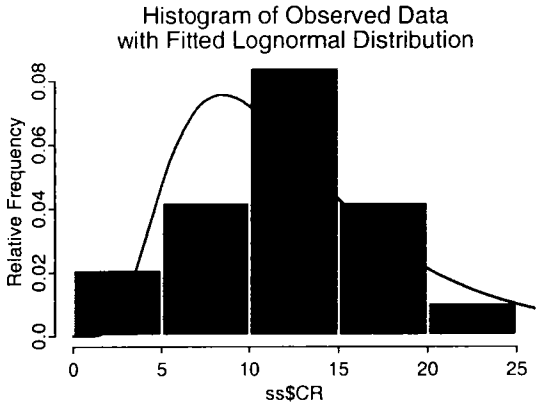


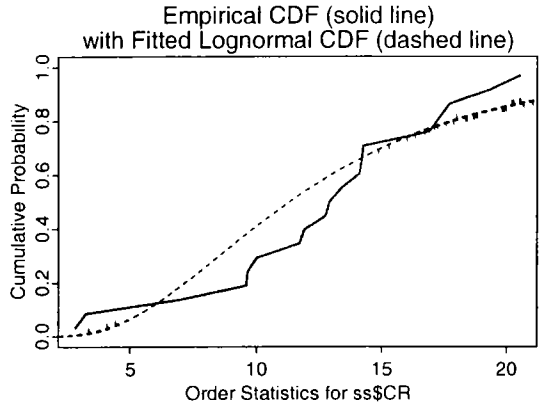


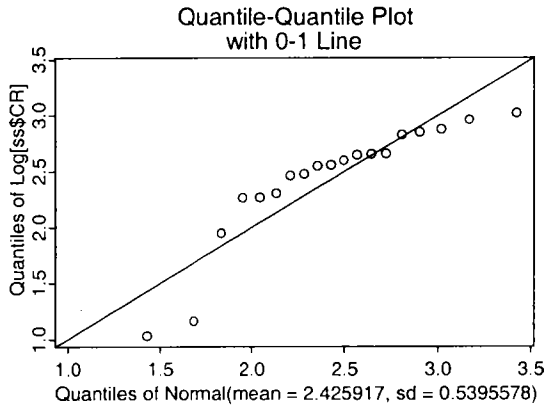
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 8.492105 sd = 6.053363
Data:	ss$CO
Sample Size:	19
Test Statistic:	W = 0.94523
Test Statistic Parmeter:	n = 19
P-value:	0.3267859

Results of Shapiro-Wilk GOF Test for ss$CR



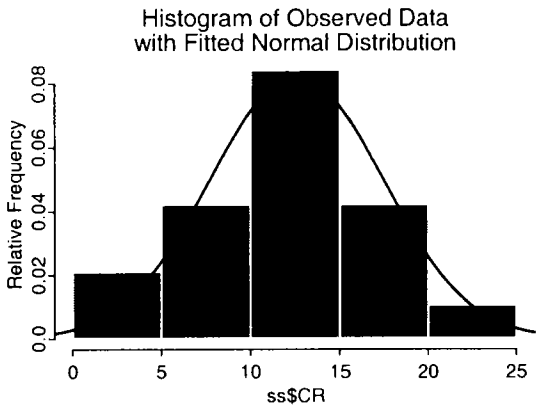


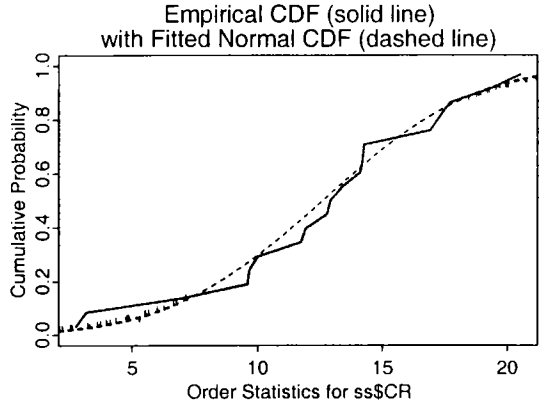


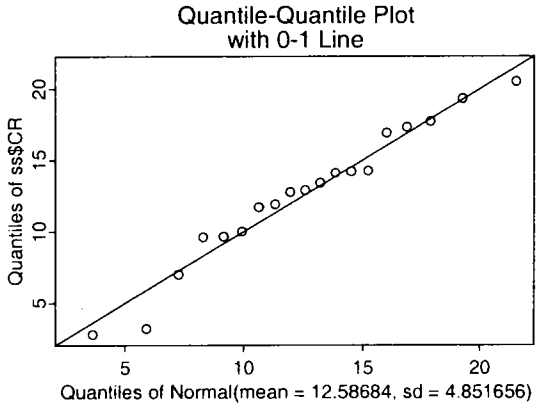
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.425917 sdlog = 0.5395578
Data:	ss$CR
Sample Size:	19
Test Statistic:	W = 0.8115938
Test Statistic Parmeter:	n = 19
P-value:	0.001692588

Results of Shapiro-Wilk GOF Test for ss$CR



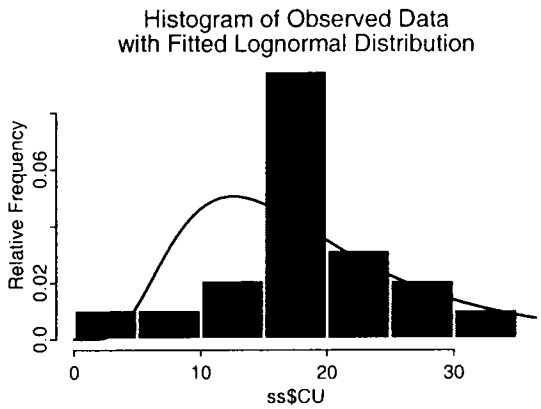


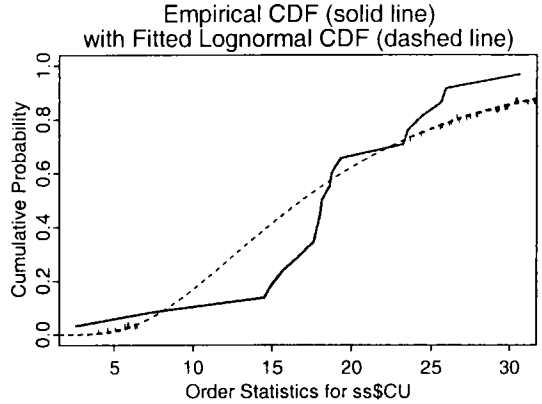


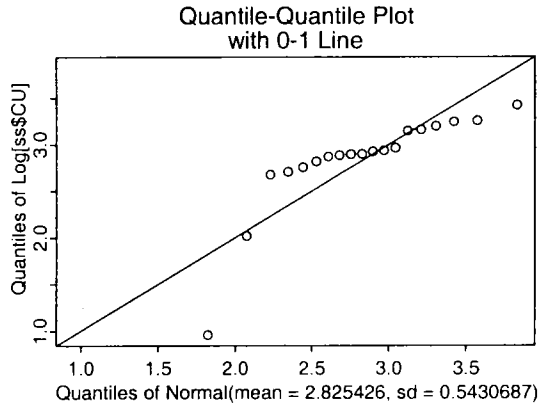
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 12.58684 sd = 4.851656
Data:	ss$CR
Sample Size:	19
Test Statistic:	W = 0.9582404
Test Statistic Parmeter:	n = 19
P-value:	0.5382276

Results of Shapiro-Wilk GOF Test for ss$CU



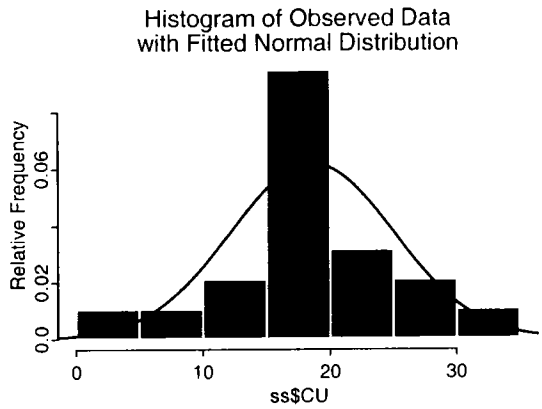


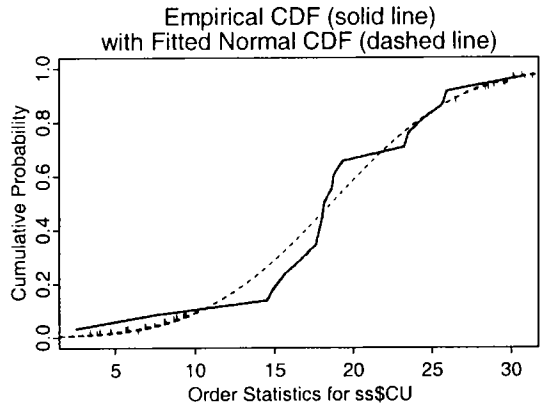


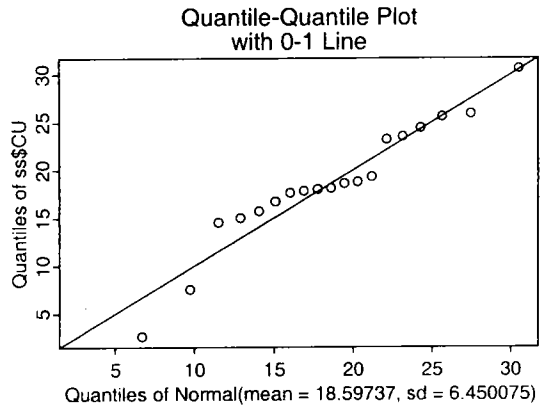
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.825426 sdlog = 0.5430687
Data:	ss$CU
Sample Size:	19
Test Statistic:	W = 0.7173612
Test Statistic Parmeter:	n = 19
P-value:	9.01772e-5

Results of Shapiro-Wilk GOF Test for ss$CU



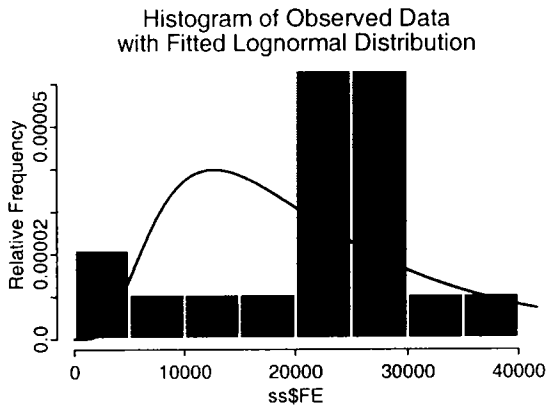


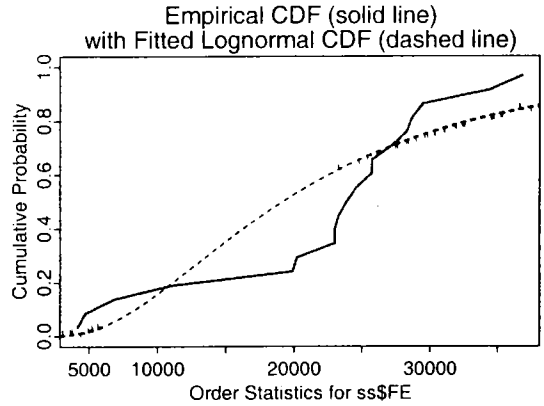


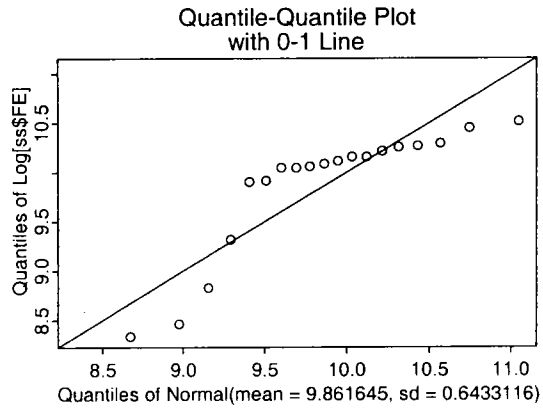
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 18.59737 sd = 6.450075
Data:	ss$CU
Sample Size:	19
Test Statistic:	W = 0.9391261
Test Statistic Parmeter:	n = 19
P-value:	0.2542927

Results of Shapiro-Wilk GOF Test for ss$FE



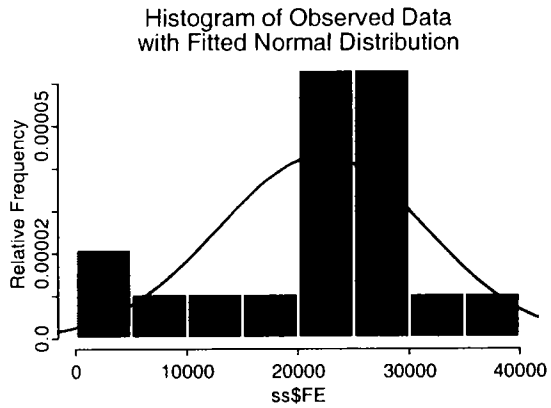


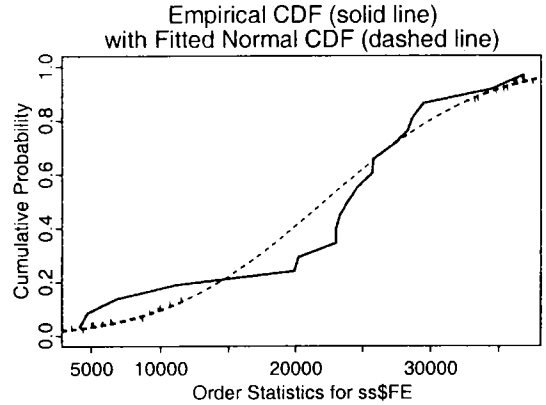


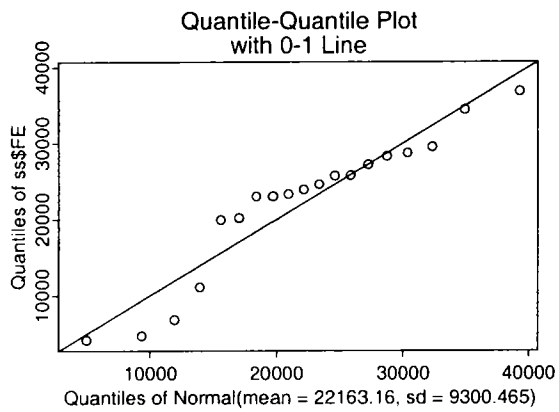
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 9.861645 sdlog = 0.6433116
Data:	ss$FE
Sample Size:	19
Test Statistic:	W = 0.7566741
Test Statistic Parmeter:	n = 19
P-value:	2.86351e-4

Results of Shapiro-Wilk GOF Test for ss$FE



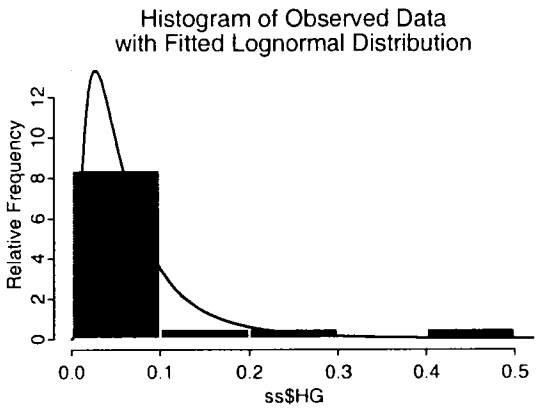


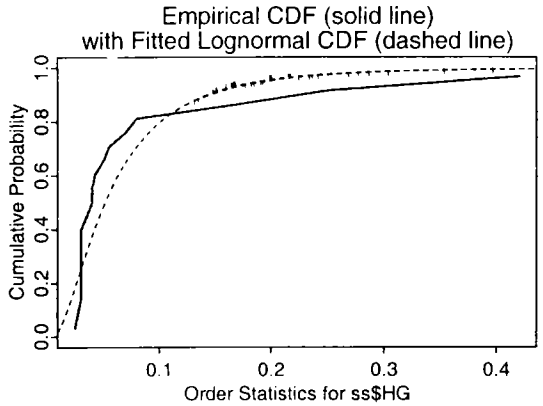


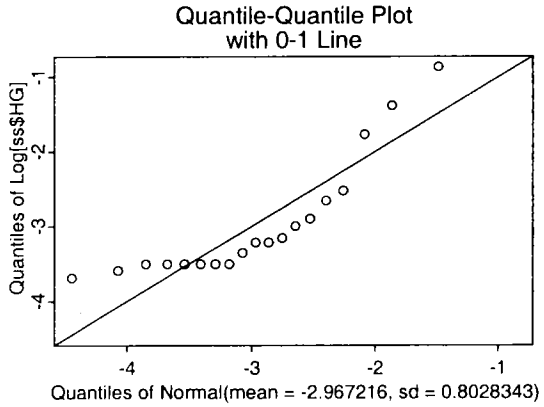
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 2.216316e4 sd = 9300.465
Data:	ss$FE
Sample Size:	19
Test Statistic:	W = 0.9006561
Test Statistic Parmeter:	n = 19
P-value:	0.05000082

Results of Shapiro-Wilk GOF Test for ss$HG



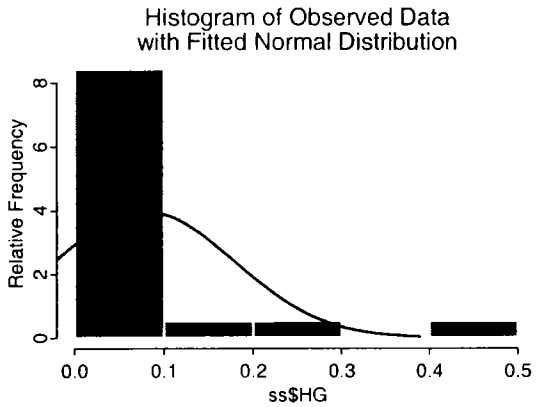


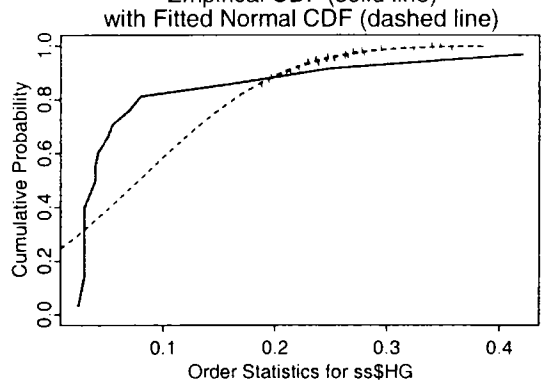


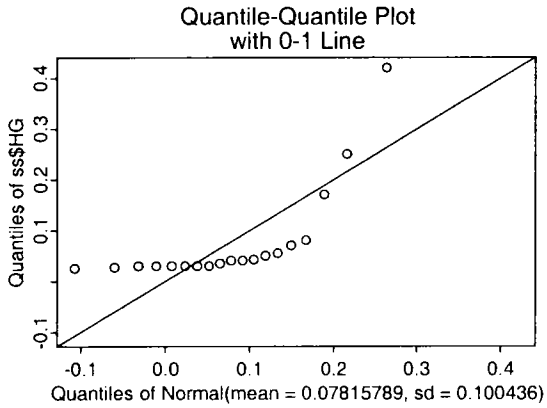
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -2.967216 sdlog = 0.8028343
Data:	ss$HG
Sample Size:	19
Test Statistic:	W = 0.7779043
Test Statistic Parmeter:	n = 19
P-value:	5.554002e-4

Results of Shapiro-Wilk GOF Test for ss$HG



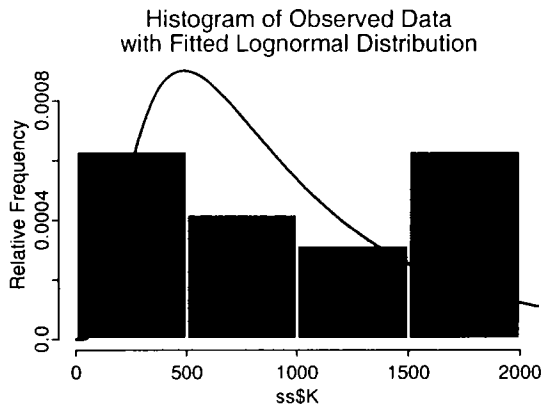


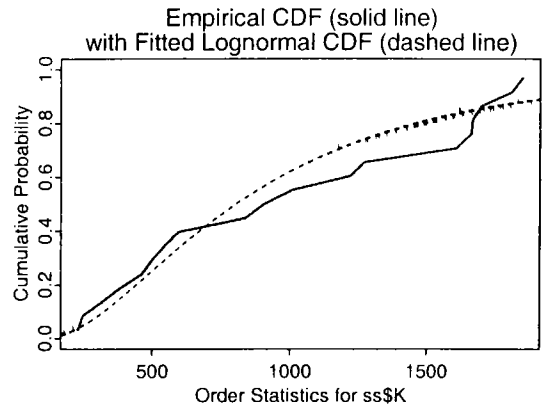


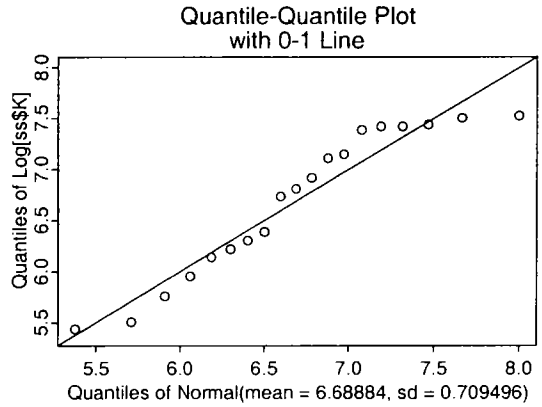
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.07815789 sd = 0.100436
Data:	ss$HG
Sample Size:	19
Test Statistic:	W = 0.5648681
Test Statistic Parmeter:	n = 19
P-value:	1.996494e-6

Results of Shapiro-Wilk GOF Test for ss$K



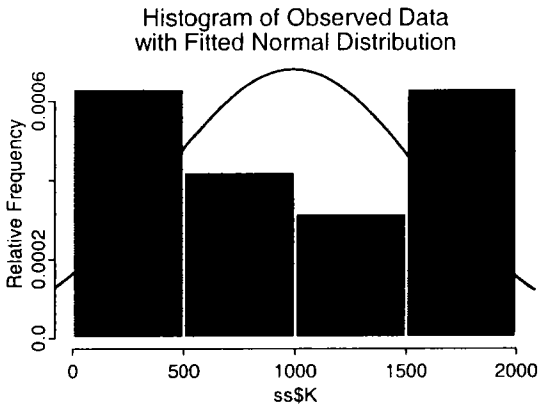


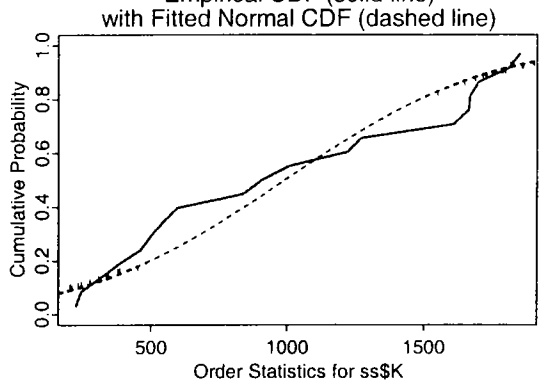


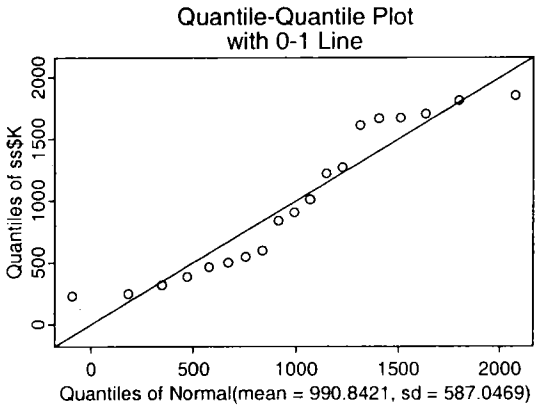
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 6.68884 sdlog = 0.709496
Data:	ss$K
Sample Size:	19
Test Statistic:	W = 0.9079003
Test Statistic Parmeter:	n = 19
P-value:	0.06775025

Results of Shapiro-Wilk GOF Test for ss$K



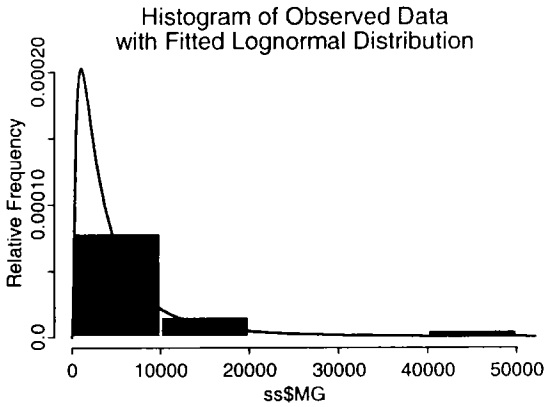


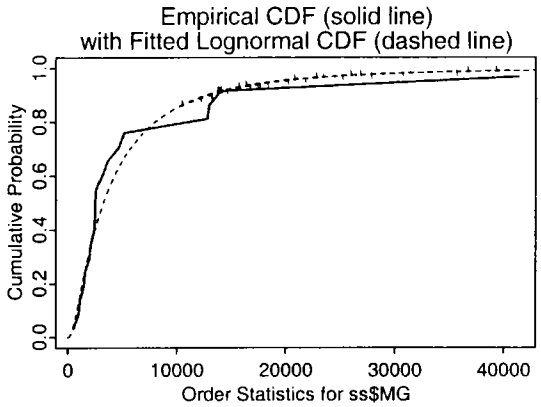


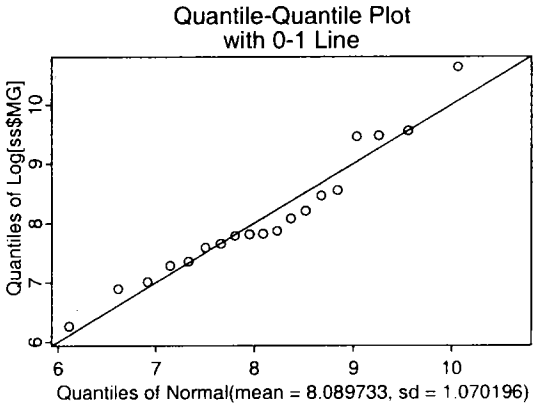
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 990.8421 sd = 587.0469
Data:	ss$K
Sample Size:	19
Test Statistic:	W = 0.8931424
Test Statistic Parmeter:	n = 19
P-value:	0.03662292

Results of Shapiro-Wilk GOF Test for ss$MG



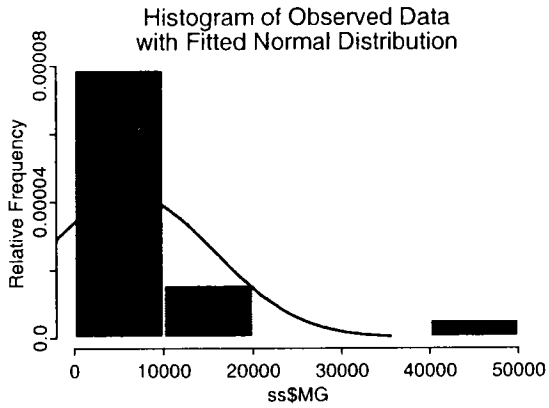


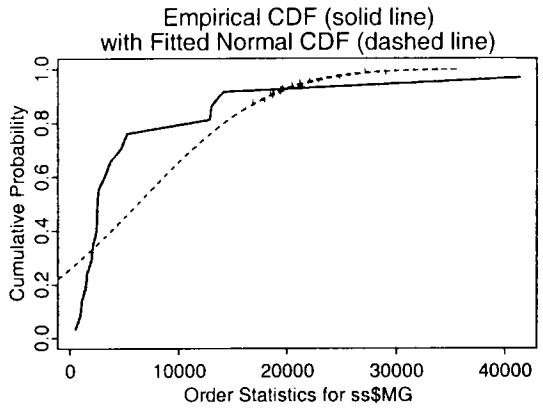


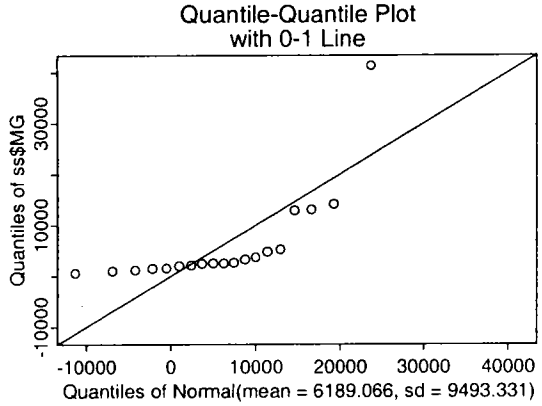
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 8.089733 sdlog = 1.070196
Data:	ss$MG
Sample Size:	19
Test Statistic:	W = 0.9462574
Test Statistic Parmeter:	n = 19
P-value:	0.3406223

Results of Shapiro-Wilk GOF Test for ss$MG



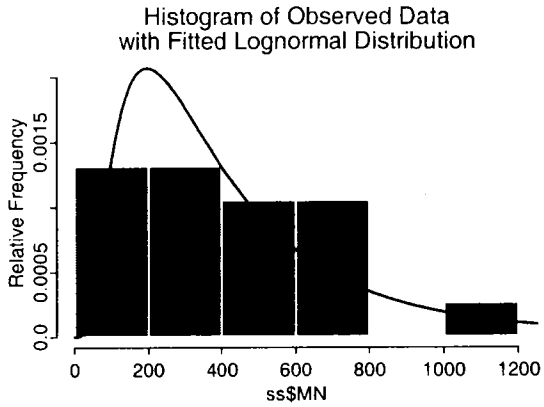


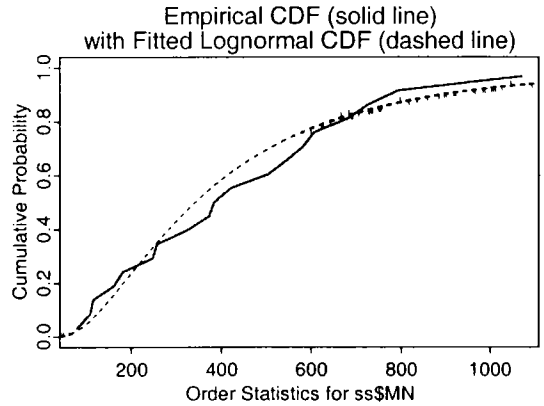


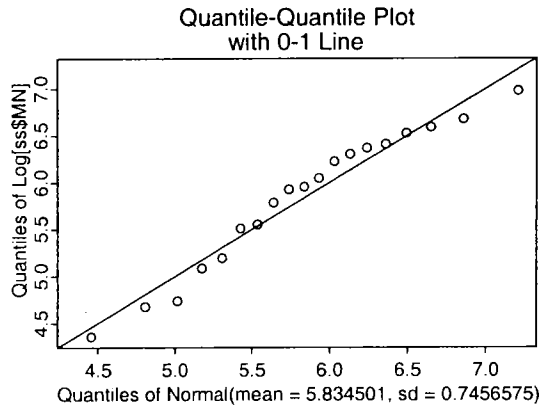
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 6189.066 sd = 9493.331
Data:	ss$MG
Sample Size:	19
Test Statistic:	W = 0.5682027
Test Statistic Parmeter:	n = 19
P-value:	2.150355e-6

Results of Shapiro-Wilk GOF Test for ss$MN



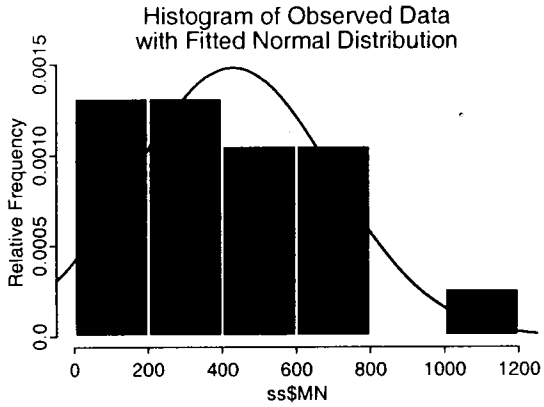


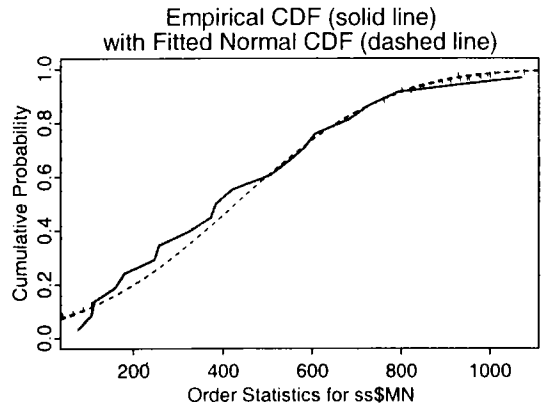


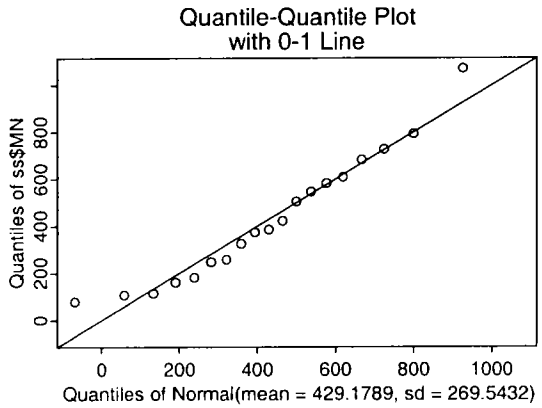
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 5.834501 sdlog = 0.7456575
Data:	ss$MN
Sample Size:	19
Test Statistic:	W = 0.9524519
Test Statistic Parmeter:	n = 19
P-value:	0.4345593

Results of Shapiro-Wilk GOF Test for ss$MN



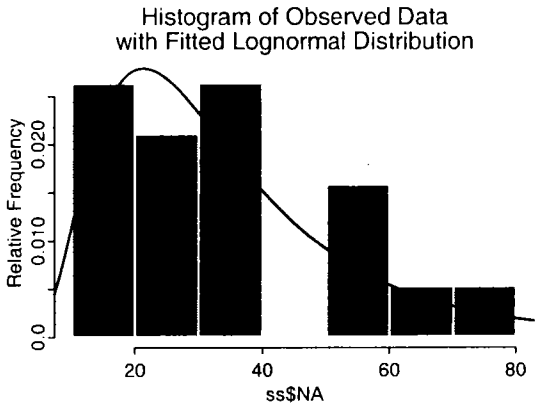


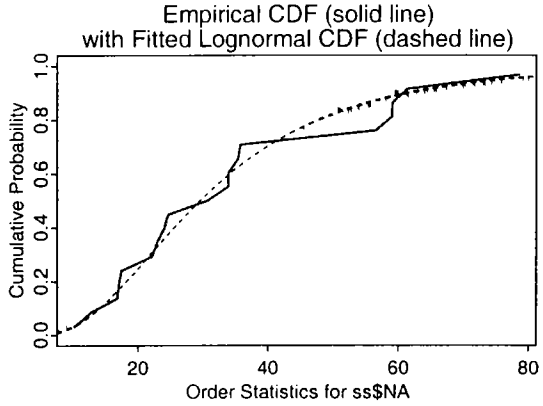


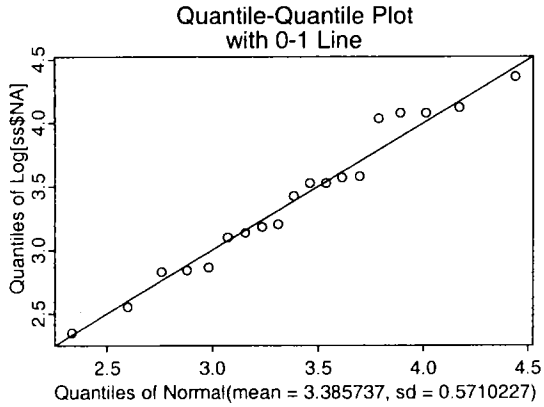
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 429.1789 sd = 269.5432
Data:	ss$MN
Sample Size:	19
Test Statistic:	W = 0.949772
Test Statistic Parmeter:	n = 19
P-value:	0.3916902

Results of Shapiro-Wilk GOF Test for ss$NA



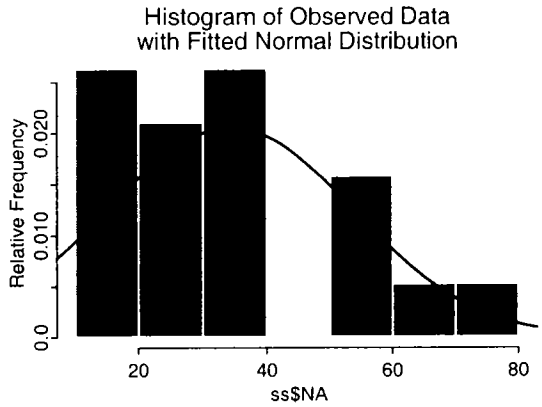


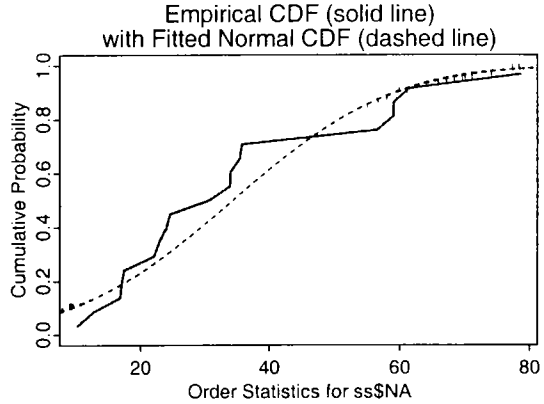


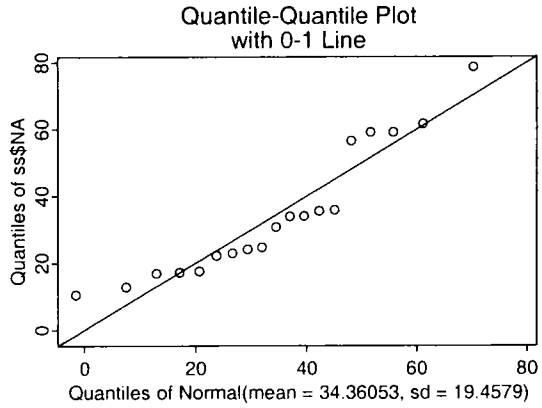
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 3.385737 sdlog = 0.5710227
Data:	ss$NA
Sample Size:	19
Test Statistic:	W = 0.9630115
Test Statistic Parmeter:	n = 19
P-value:	0.6329455

Results of Shapiro-Wilk GOF Test for ss$NA



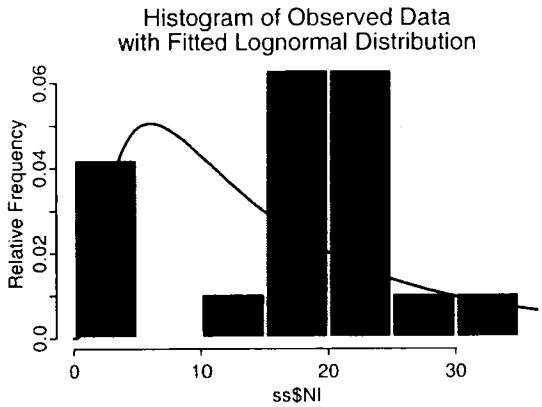


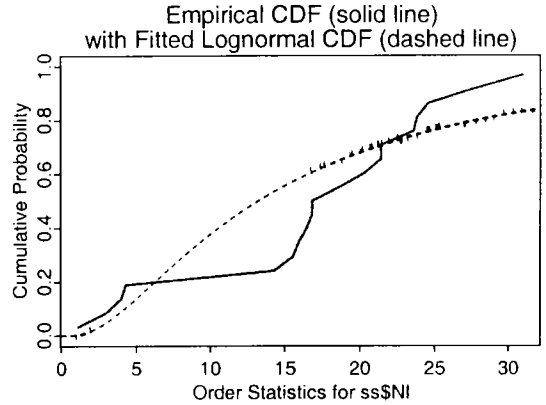


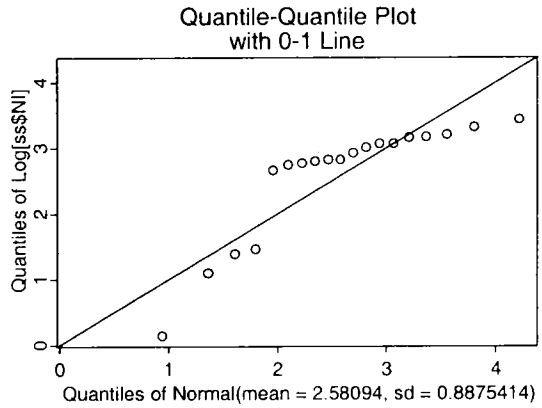
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 34.36053 sd = 19.4579
Data:	ss$NA
Sample Size:	19
Test Statistic:	W = 0.8947783
Test Statistic Parmeter:	n = 19
P-value:	0.03917787

Results of Shapiro-Wilk GOF Test for ss$NI



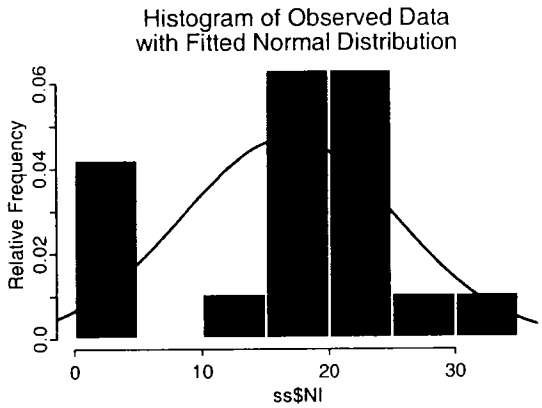


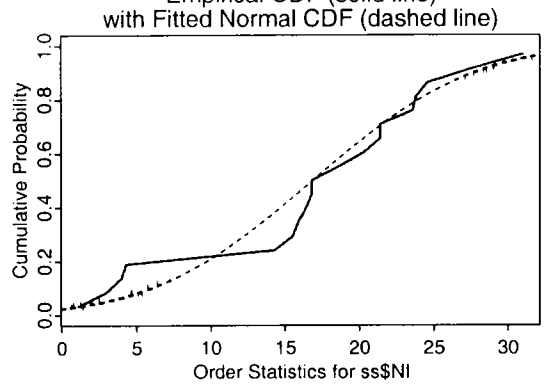


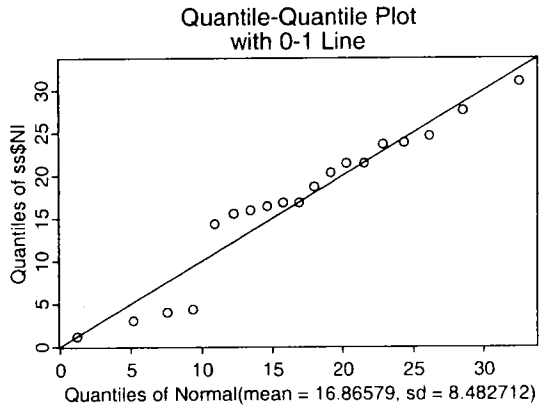
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.58094 sdlog = 0.8875414
Data:	ss$NI
Sample Size:	19
Test Statistic:	W = 0.7605259
Test Statistic Parmeter:	n = 19
P-value:	3.222362e-4

Results of Shapiro-Wilk GOF Test for ss$NI



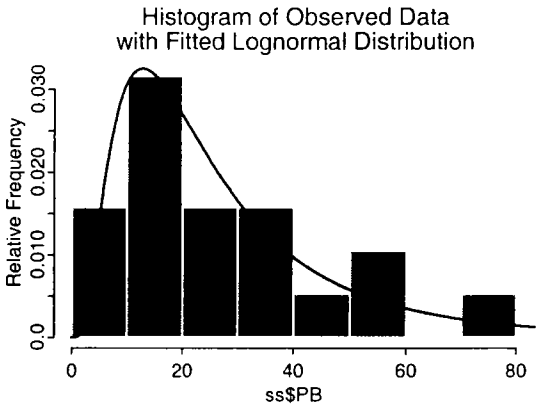


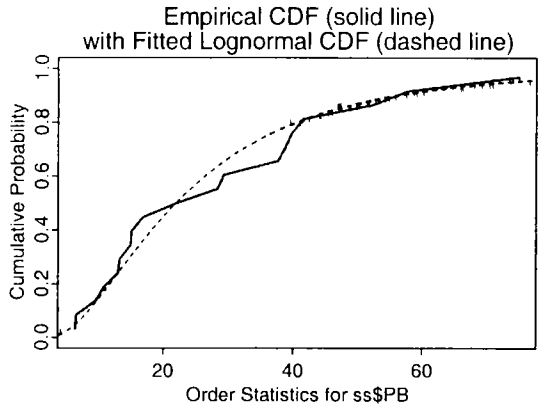


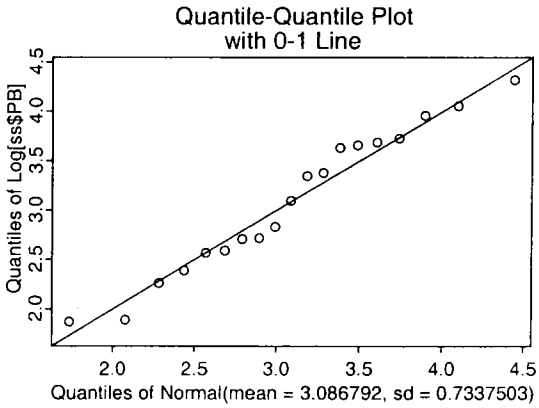
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 16.86579 sd = 8.482712
Data:	ss$NI
Sample Size:	19
Test Statistic:	W = 0.9268544
Test Statistic Parmeter:	n = 19
P-value:	0.1515224

Results of Shapiro-Wilk GOF Test for ss$PB



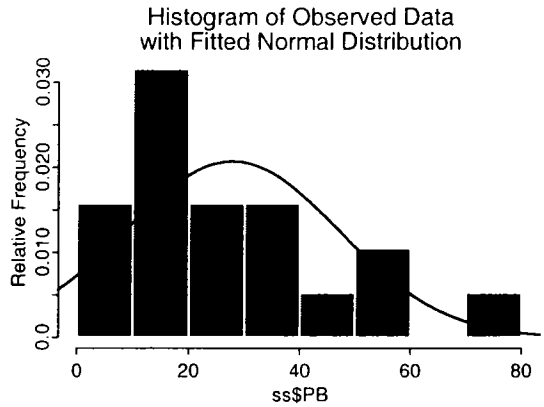


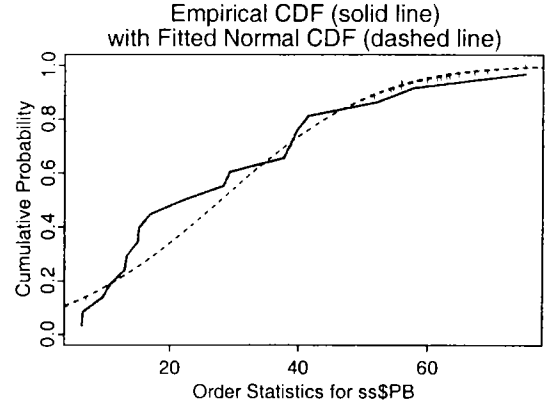


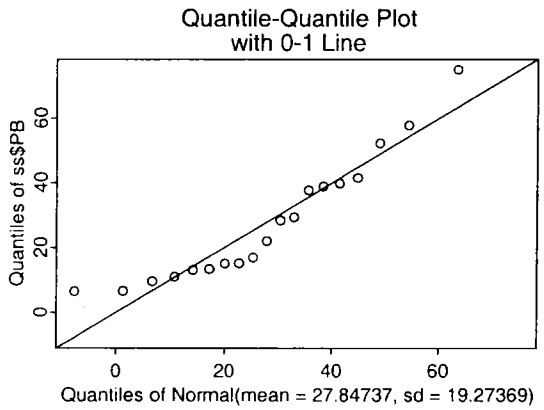
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 3.086792 sdlog = 0.7337503
Data:	ss$PB
Sample Size:	19
Test Statistic:	W = 0.9579485
Test Statistic Parmeter:	n = 19
P-value:	0.5326676

Results of Shapiro-Wilk GOF Test for ss$PB



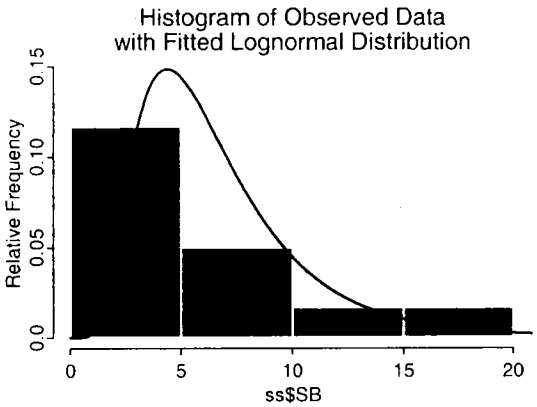


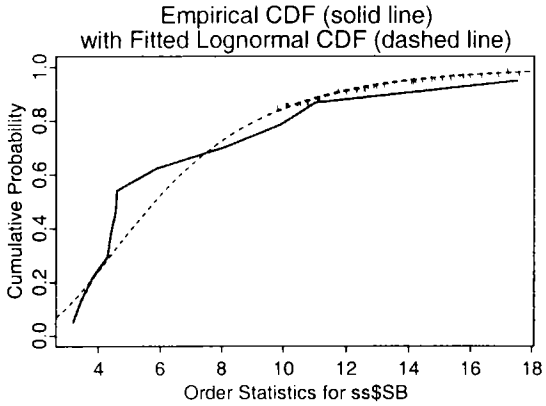


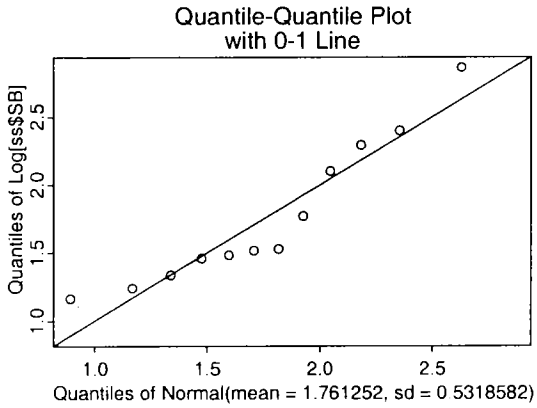
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 27.84737 sd = 19.27369
Data:	ss$PB
Sample Size:	19
Test Statistic:	W = 0.9002356
Test Statistic Parmeter:	n = 19
P-value:	0.04913184

Results of Shapiro-Wilk GOF Test for ss$SB



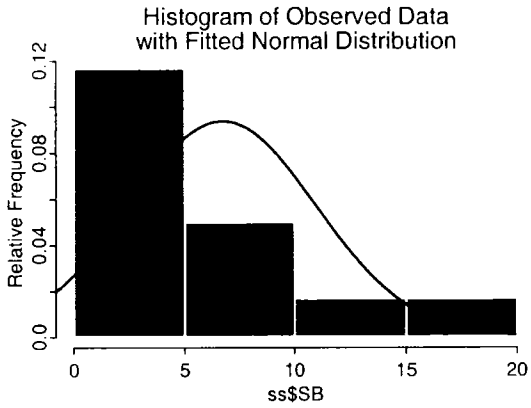


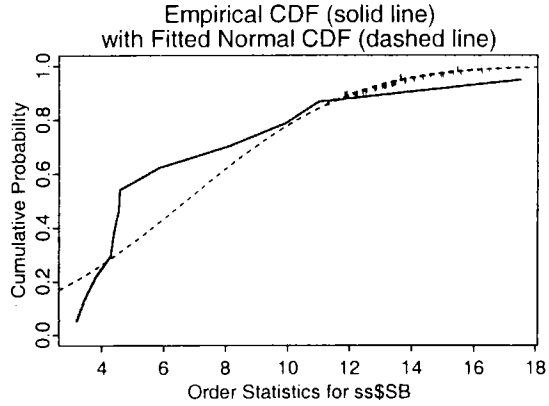


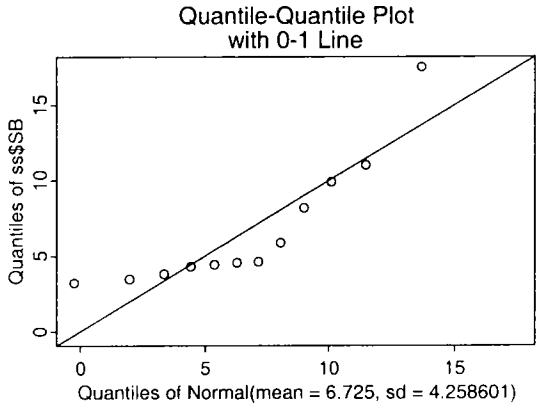
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 1.761252 sdlog = 0.5318582
Data:	ss$SB
Sample Size:	12
Test Statistic:	W = 0.8949207
Test Statistic Parmeter:	n = 12
P-value:	0.1363898

Results of Shapiro-Wilk GOF Test for ss$SB



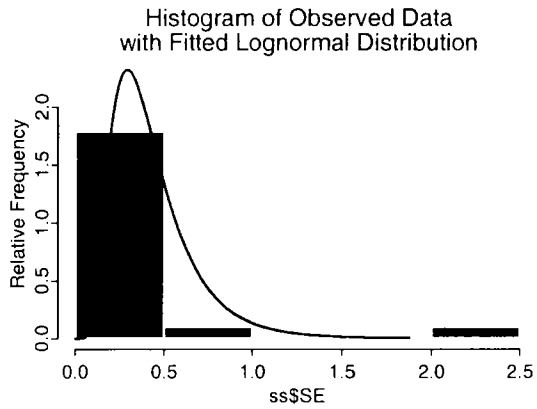


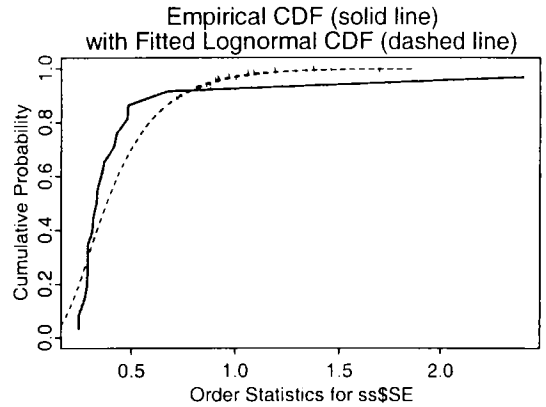


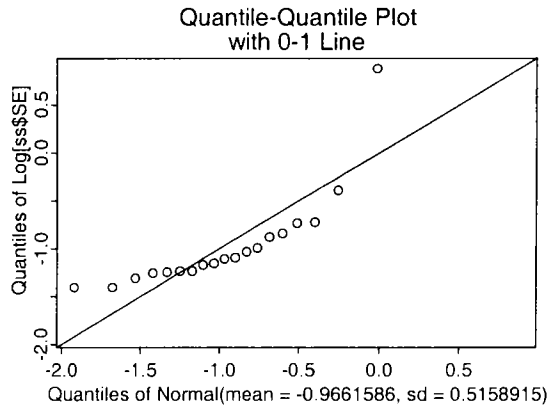
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 6.725 sd = 4.258601
Data:	ss$SB
Sample Size:	12
Test Statistic:	W = 0.7854521
Test Statistic Parmeter:	n = 12
P-value:	0.006431891

Results of Shapiro-Wilk GOF Test for ss$SE



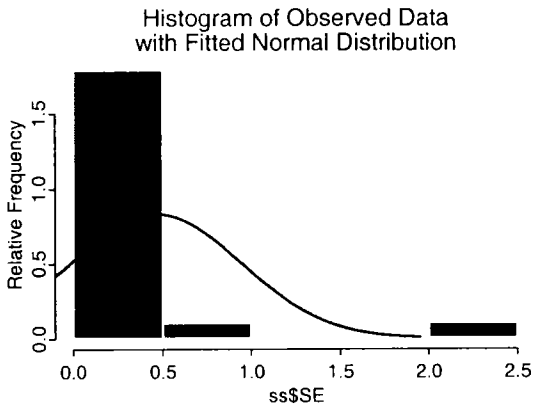


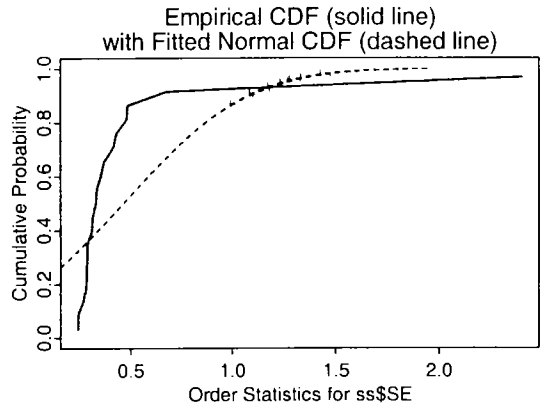


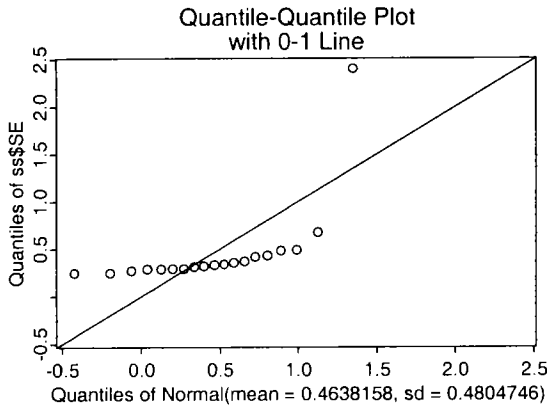
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.9661586 sdlog = 0.5158915
Data:	ss$SE
Sample Size:	19
Test Statistic:	W = 0.6960712
Test Statistic Parmeter:	n = 19
P-value:	4.993014e-5

Results of Shapiro-Wilk GOF Test for ss$SE



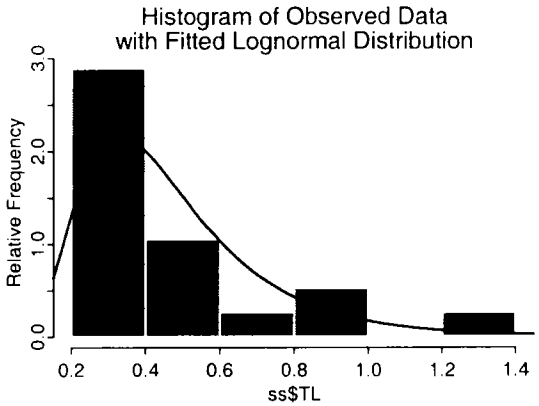


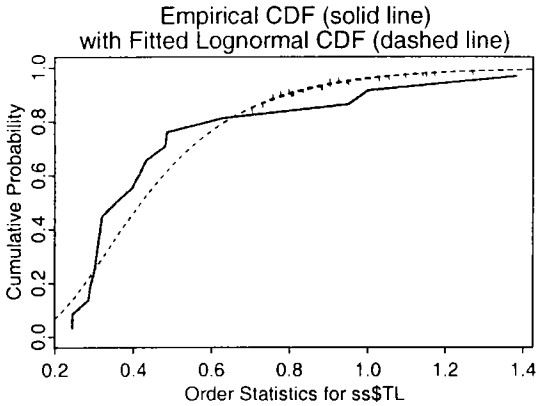


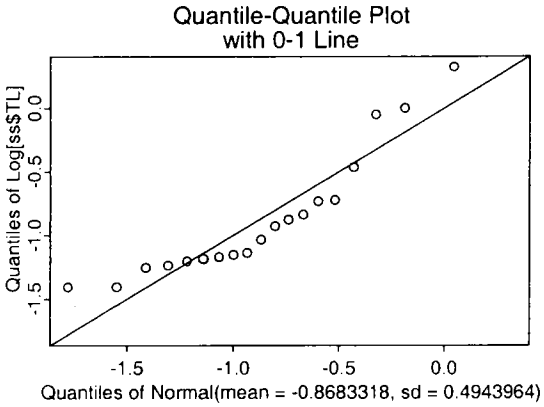
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.4638158 sd = 0.4804746
Data:	ss$SE
Sample Size:	19
Test Statistic:	W = 0.4193333
Test Statistic Parmeter:	n = 19
P-value:	1.044163e-7

Results of Shapiro-Wilk GOF Test for ss$TL



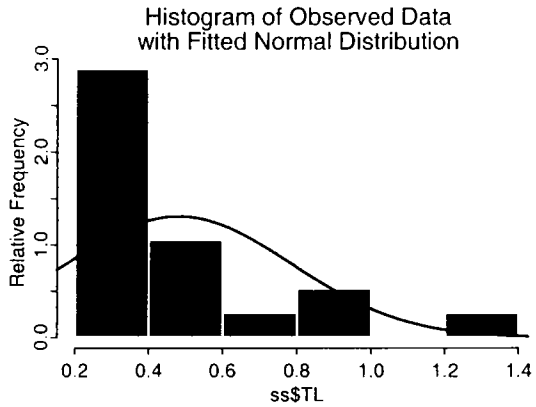


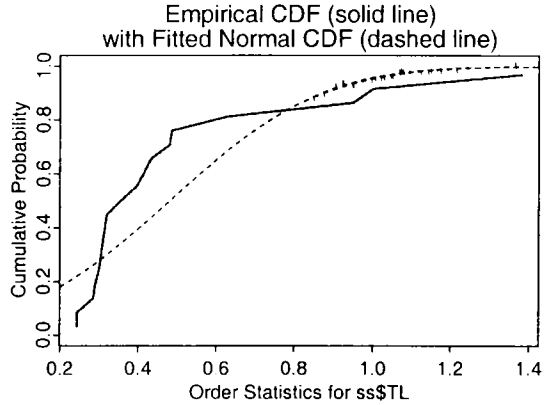


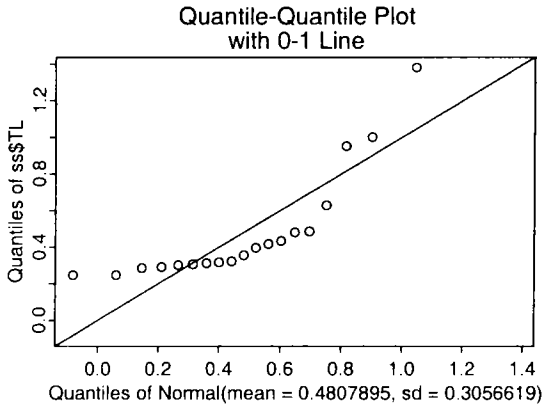
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.8683318 sdlog = 0.4943964
Data:	ss$TL
Sample Size:	19
Test Statistic:	W = 0.858313
Test Statistic Parmeter:	n = 19
P-value:	0.009187267

Results of Shapiro-Wilk GOF Test for ss$TL



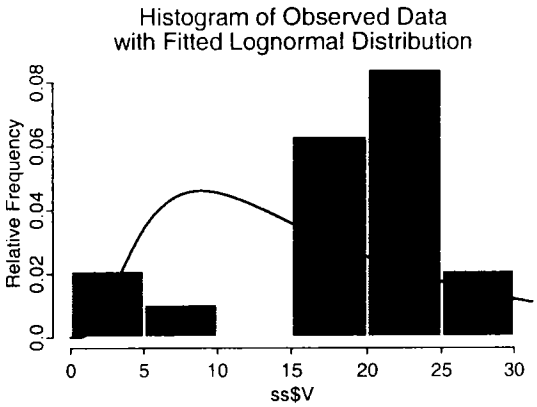


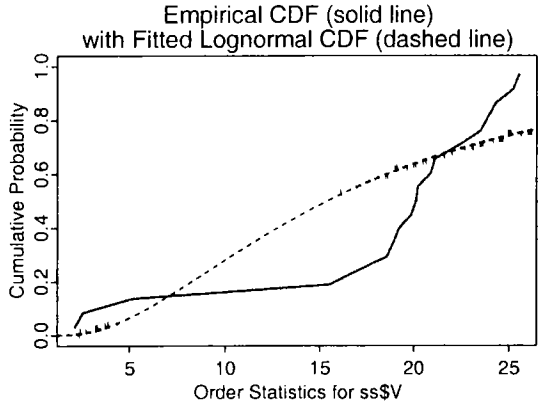


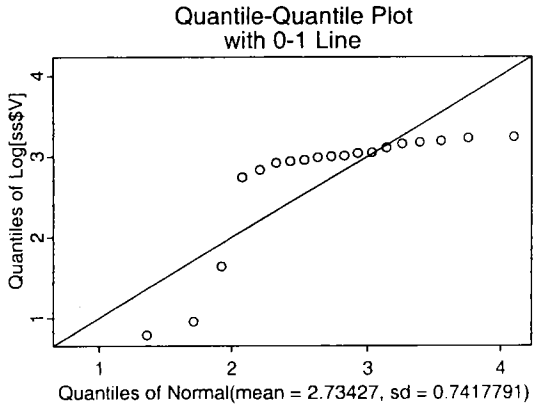
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.4807895 sd = 0.3056619
Data:	ss$TL
Sample Size:	19
Test Statistic:	W = 0.7214253
Test Statistic Parmeter:	n = 19
P-value:	1.012156e-4

Results of Shapiro-Wilk GOF Test for ss$V



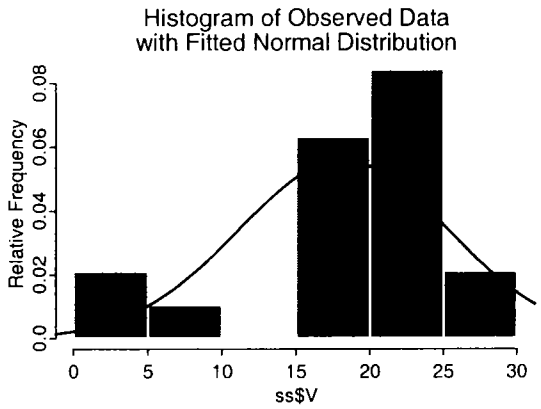


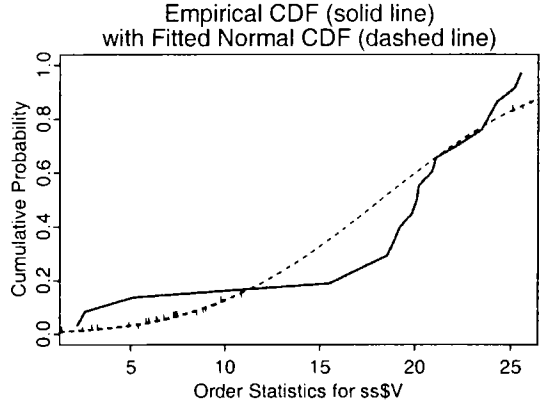


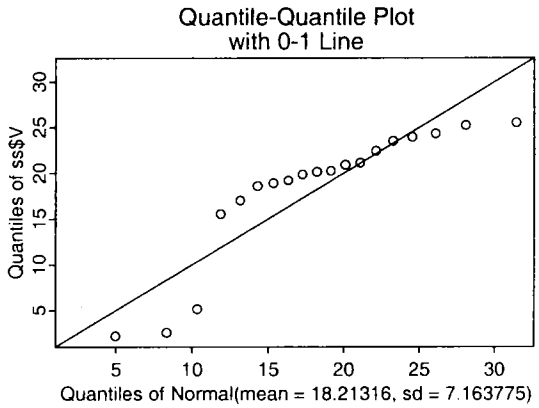
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.73427 sdlog = 0.7417791
Data:	ss$V
Sample Size:	19
Test Statistic:	W = 0.6255861
Test Statistic Parmeter:	n = 19
P-value:	8.167456e-6

Results of Shapiro-Wilk GOF Test for ss$V



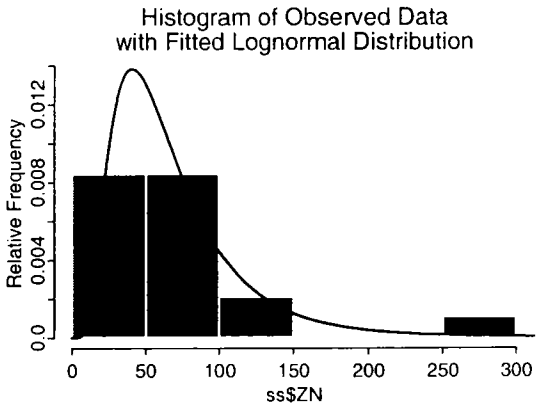


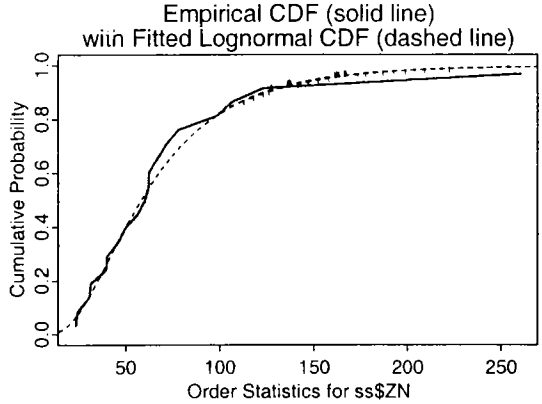


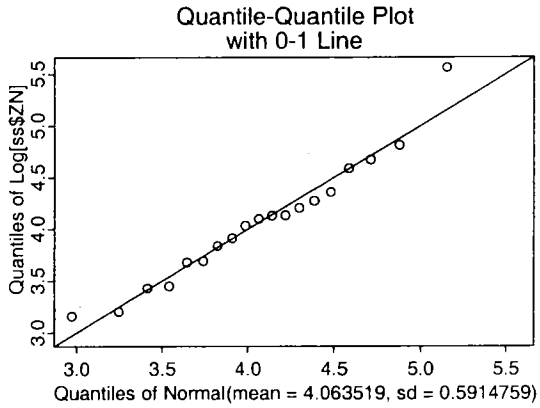
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 18.21316 sd = 7.163775
Data:	ss$V
Sample Size:	19
Test Statistic:	W = 0.7891702
Test Statistic Parmeter:	n = 19
P-value:	7.989698e-4

Results of Shapiro-Wilk GOF Test for ss$ZN



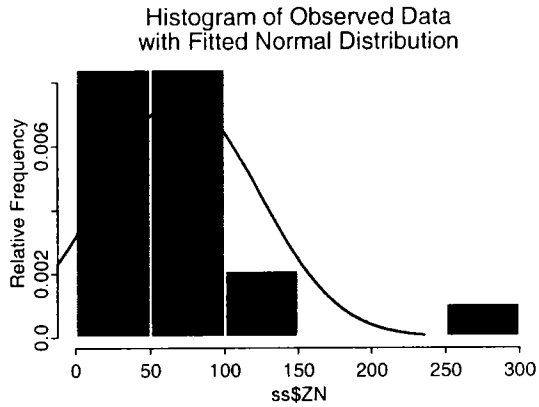


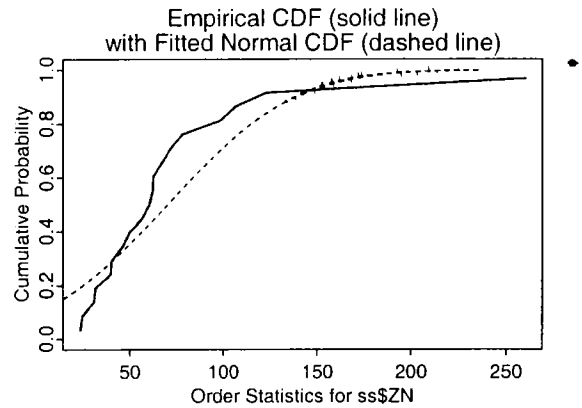


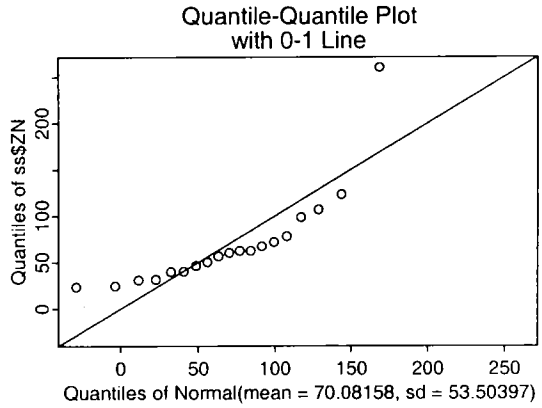
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 4.063519 sdlog = 0.5914759
Data:	ss$ZN
Sample Size:	19
Test Statistic:	W = 0.9614086
Test Statistic Parmeter:	n = 19
P-value:	0.6004266

Results of Shapiro-Wilk GOF Test for ss$ZN



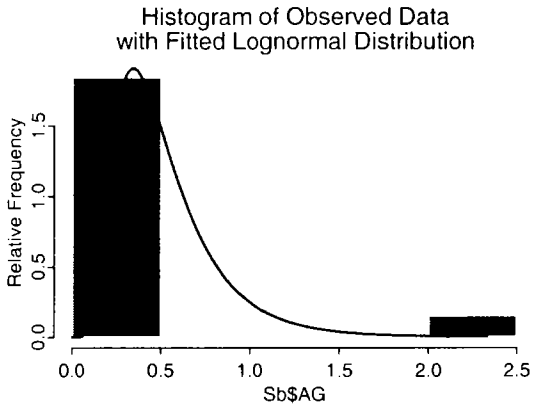


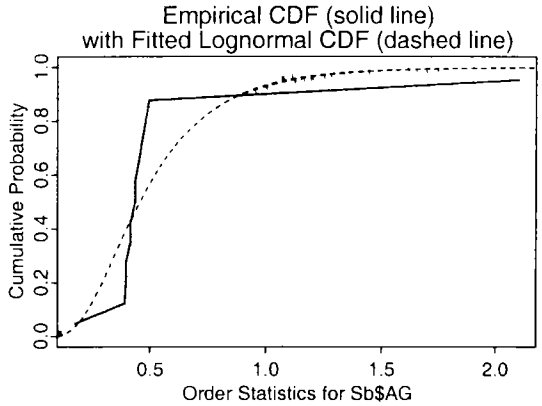


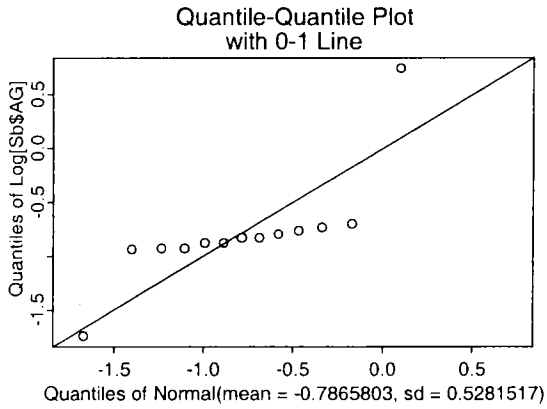
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 70.08158 sd = 53.50397
Data:	ss$ZN
Sample Size:	19
Test Statistic:	W = 0.713019
Test Statistic Parmeter:	n = 19
P-value:	7.978597e-5

Results of Shapiro-Wilk GOF Test for Sb$AG



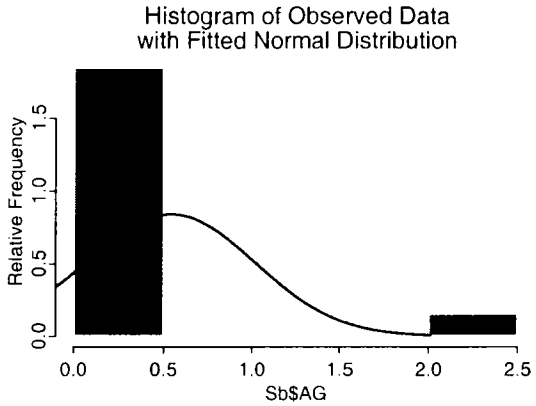


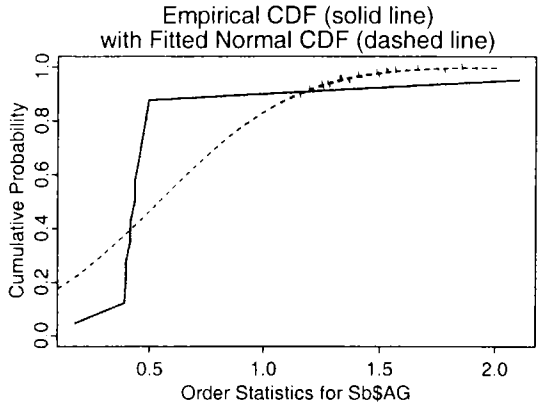


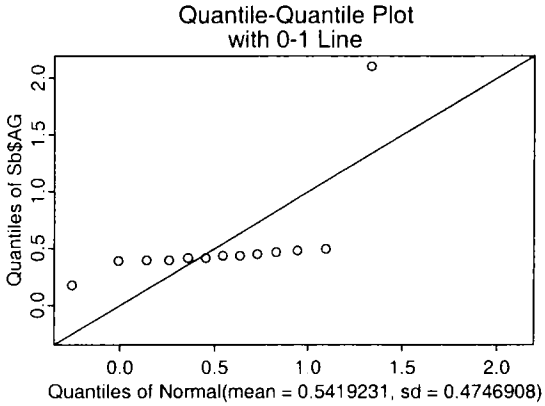
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.7865803 sdlog = 0.5281517
Data:	Sb$AG
Sample Size:	13
Test Statistic:	W = 0.6695481
Test Statistic Parmeter:	n = 13
P-value:	2.79785e-4

Results of Shapiro-Wilk GOF Test for Sb$AG



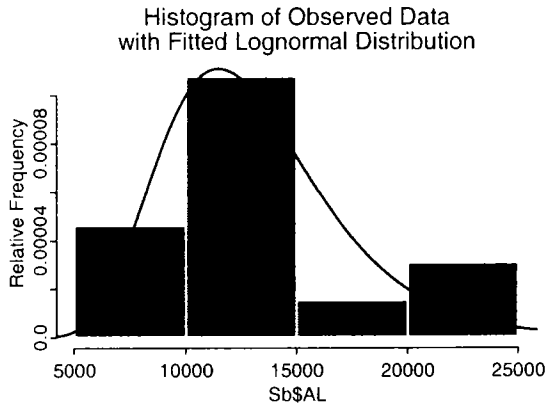


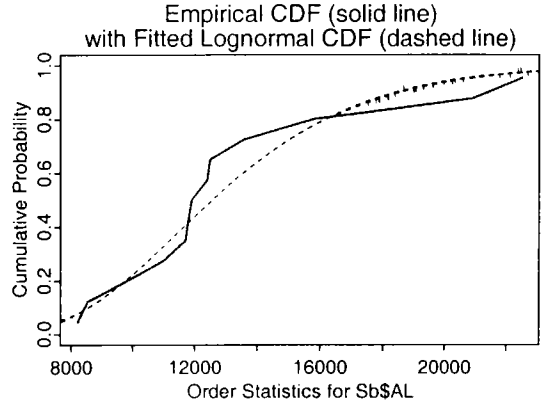


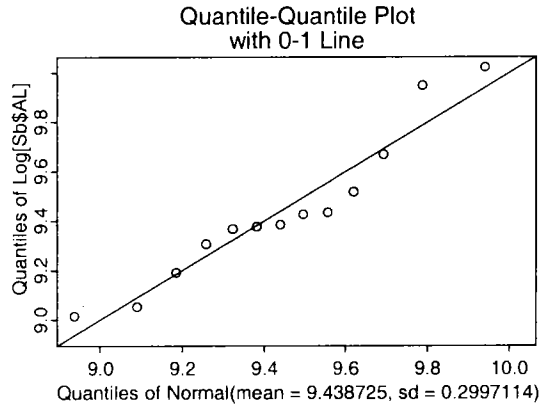
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.5419231 sd = 0.4746908
Data:	Sb$AG
Sample Size:	13
Test Statistic:	W = 0.4505354
Test Statistic Parmeter:	n = 13
P-value:	4.362024e-6

Results of Shapiro-Wilk GOF Test for Sb$AL



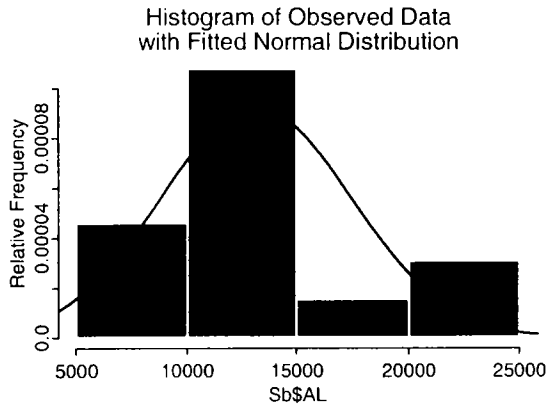


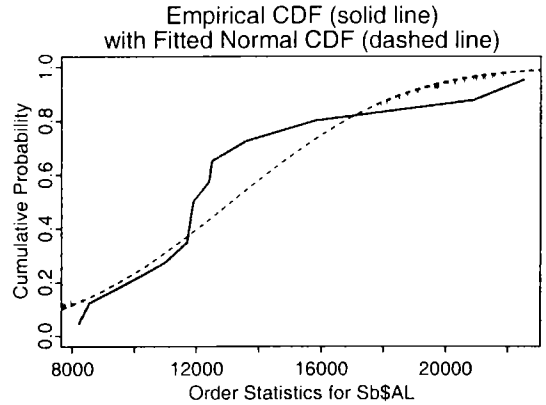


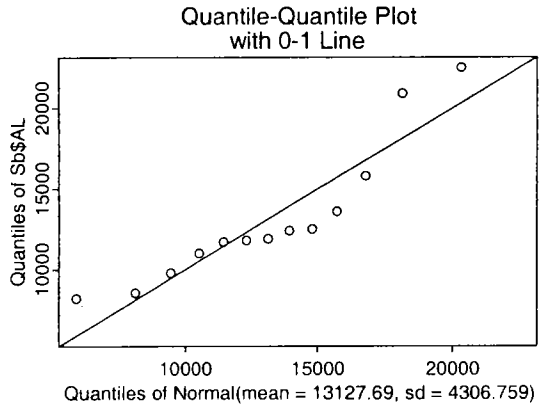
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 9.438725 sdlog = 0.2997114
Data:	Sb$AL
Sample Size:	13
Test Statistic:	W = 0.9239959
Test Statistic Parmeter:	n = 13
P-value:	0.2838548

Results of Shapiro-Wilk GOF Test for Sb$AL



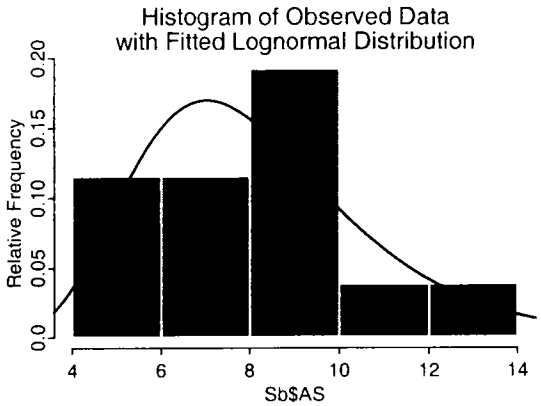


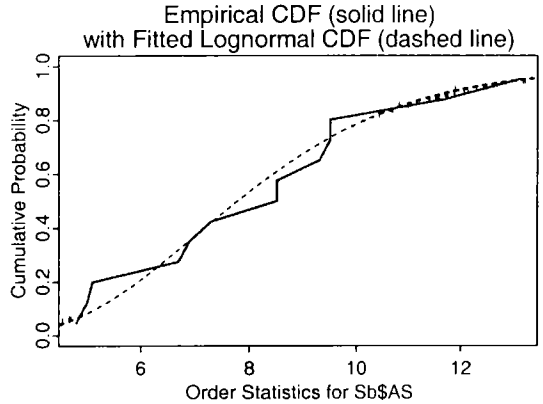


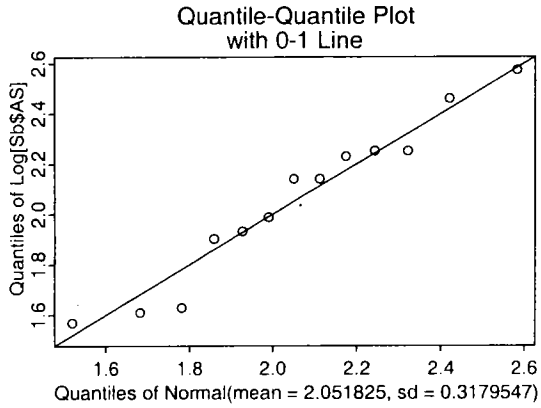
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 1.312769e4 sd = 4306.759
Data:	Sb$AL
Sample Size:	13
Test Statistic:	W = 0.8512549
Test Statistic Parmeter:	n = 13
P-value:	0.02959502

Results of Shapiro-Wilk GOF Test for Sb$AS



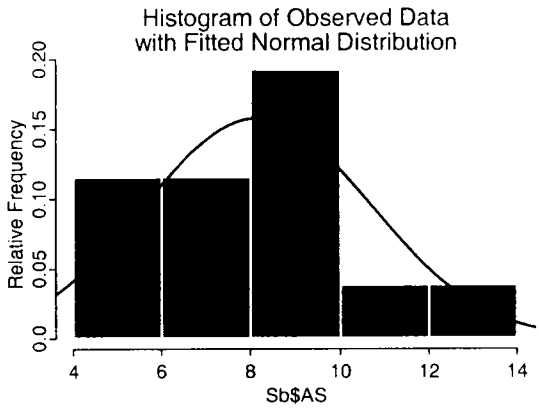


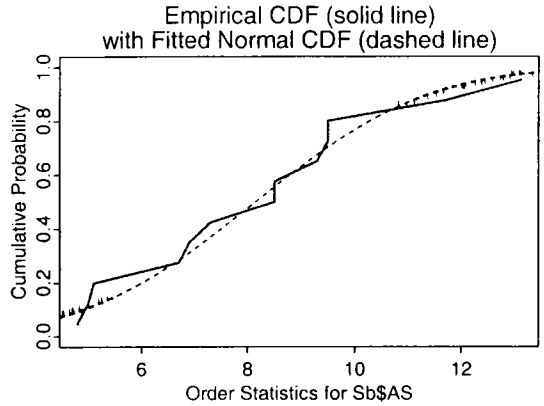


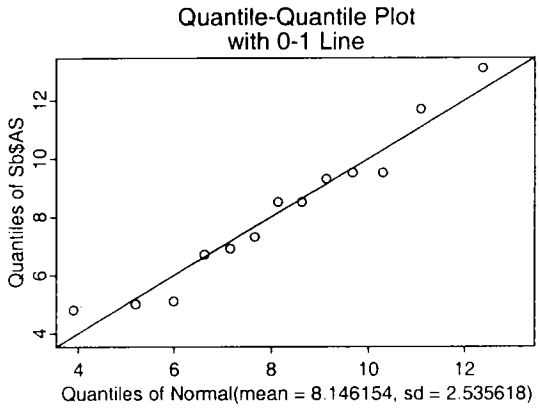
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.051825 sdlog = 0.3179547
Data:	Sb$AS
Sample Size:	13
Test Statistic:	W = 0.9460102
Test Statistic Parmeter:	n = 13
P-value:	0.5392442

Results of Shapiro-Wilk GOF Test for Sb$AS



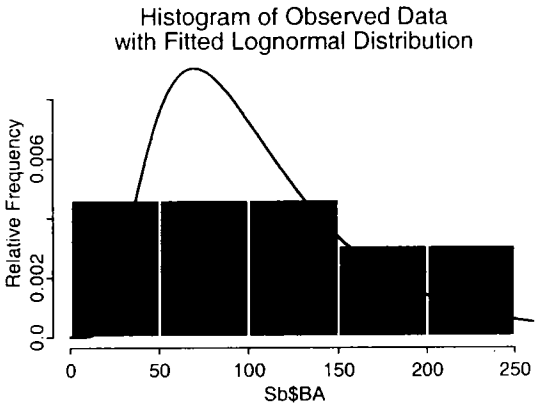


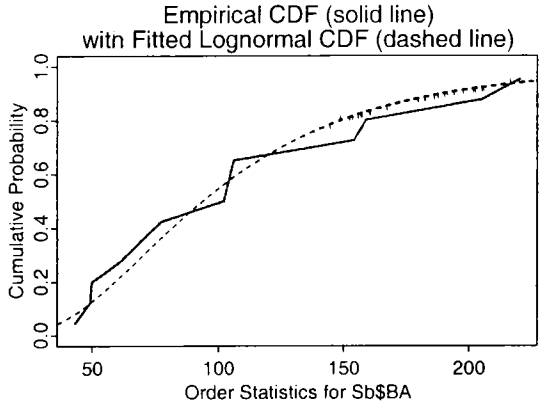


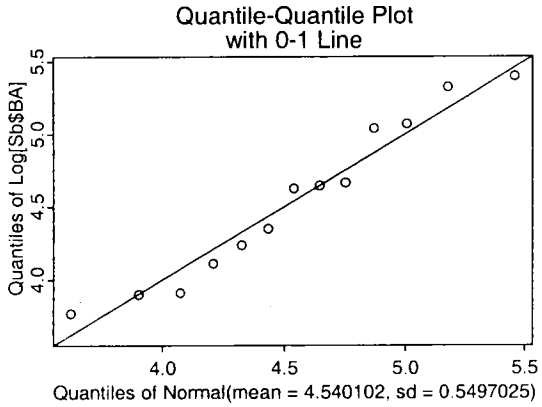
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 8.146154 sd = 2.535618
Data:	Sb$AS
Sample Size:	13
Test Statistic:	W = 0.9458256
Test Statistic Parmeter:	n = 13
P-value:	0.5365876

Results of Shapiro-Wilk GOF Test for Sb$BA



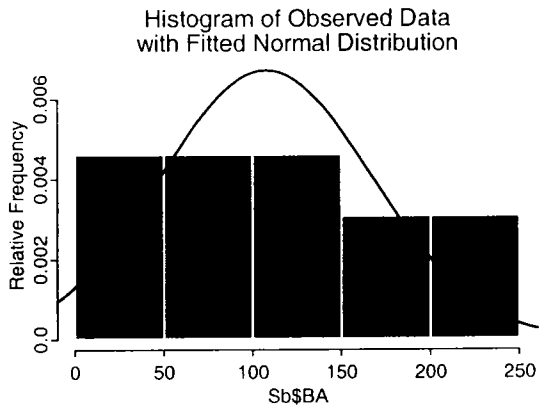


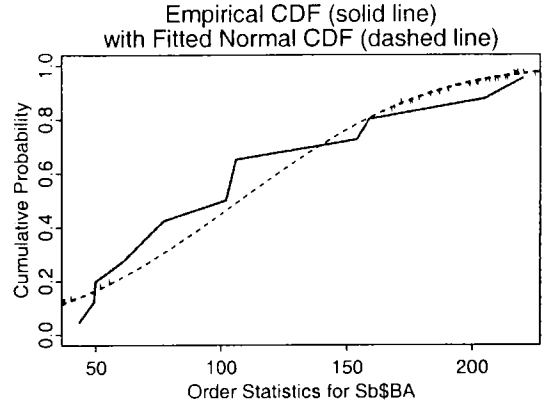


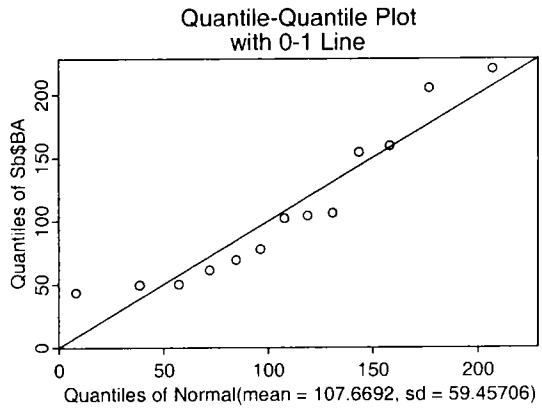
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 4.540102 sdlog = 0.5497025
Data:	Sb$BA
Sample Size:	13
Test Statistic:	W = 0.940834
Test Statistic Parmeter:	n = 13
P-value:	0.4677919

Results of Shapiro-Wilk GOF Test for Sb$BA



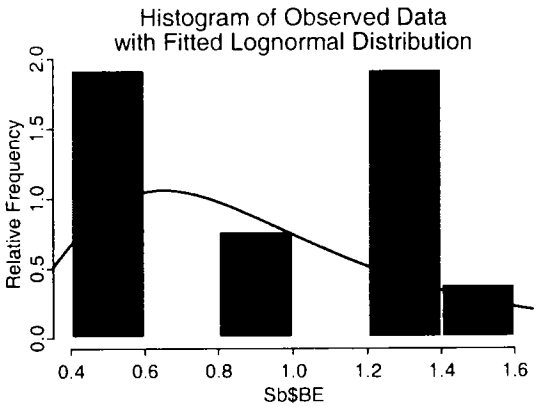


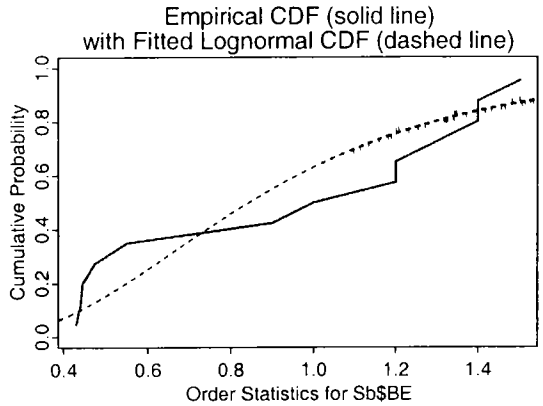


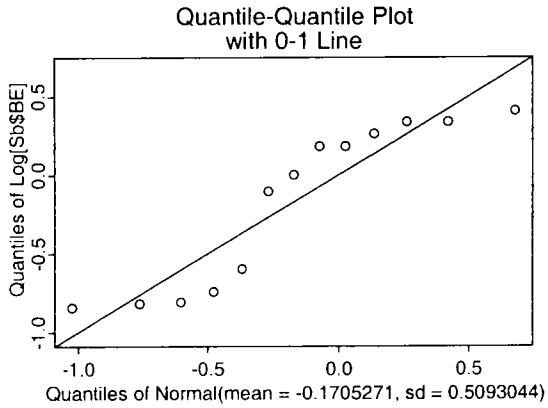
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 107.6692 sd = 59.45706
Data:	Sb$BA
Sample Size:	13
Test Statistic:	W = 0.8890862
Test Statistic Parmeter:	n = 13
P-value:	0.09478442

Results of Shapiro-Wilk GOF Test for Sb$BE



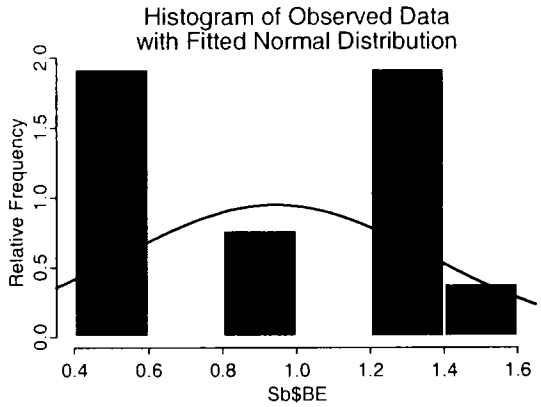


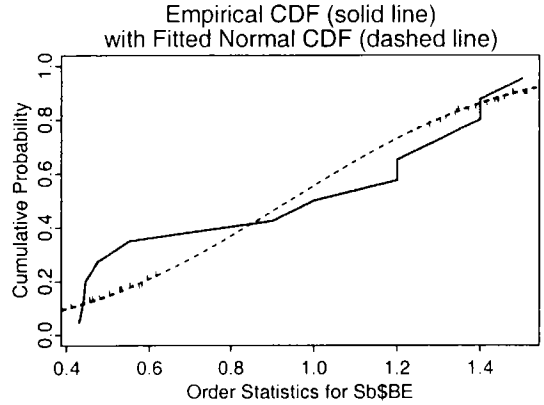


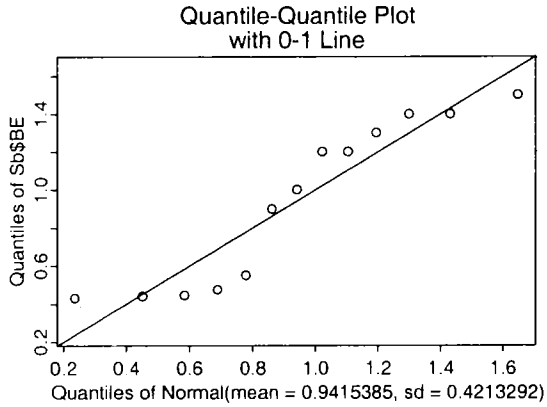
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.1705271 sdlog = 0.5093044
Data:	Sb$BE
Sample Size:	13
Test Statistic:	W = 0.8274694
Test Statistic Parmeter:	n = 13
P-value:	0.01472631

Results of Shapiro-Wilk GOF Test for Sb$BE



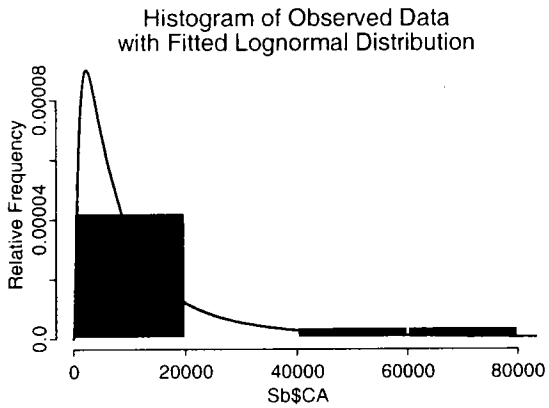


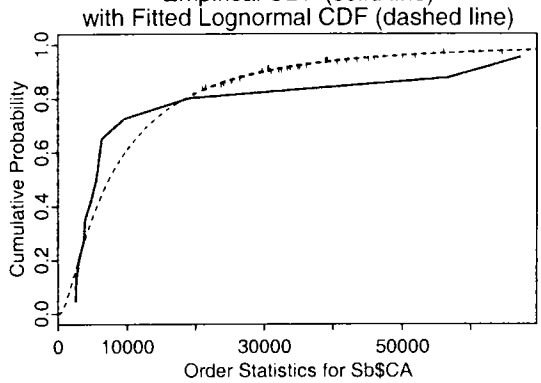


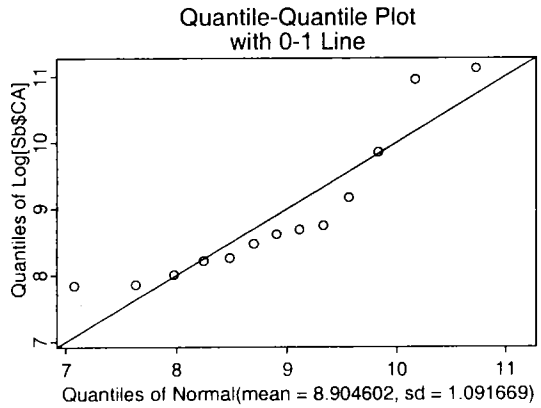
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.9415385 sd = 0.4213292
Data:	Sb$BE
Sample Size:	13
Test Statistic:	W = 0.8582775
Test Statistic Parmeter:	n = 13
P-value:	0.03656361

Results of Shapiro-Wilk GOF Test for Sb$CA



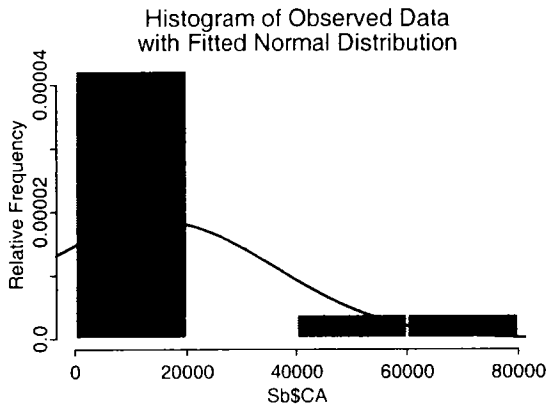


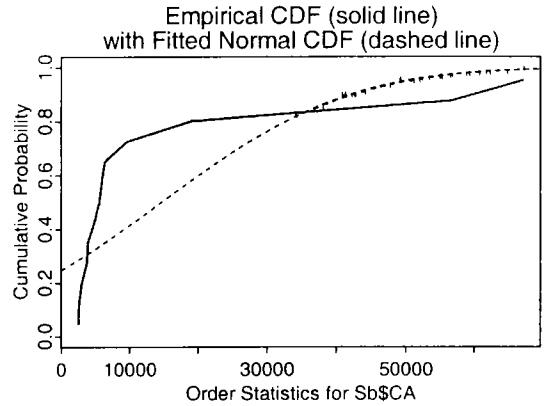


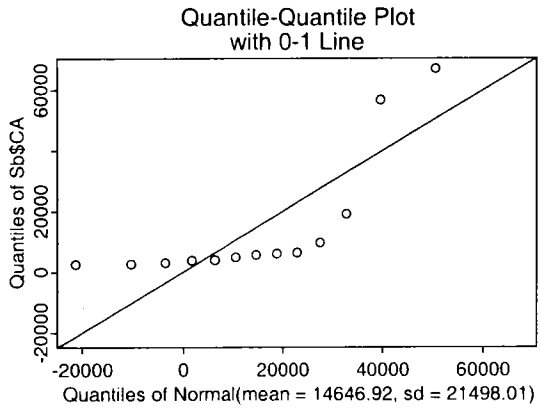
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 8.904602 sdlog = 1.091669
Data:	Sb$CA
Sample Size:	13
Test Statistic:	W = 0.8343158
Test Statistic Parmeter:	n = 13
P-value:	0.0179502

Results of Shapiro-Wilk GOF Test for Sb$CA



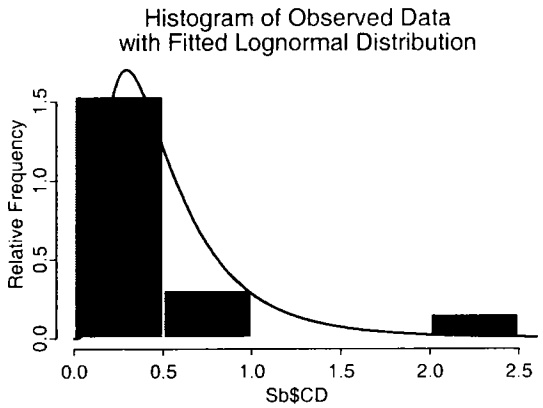


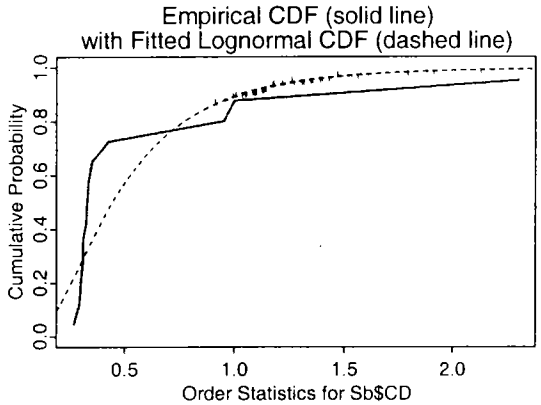


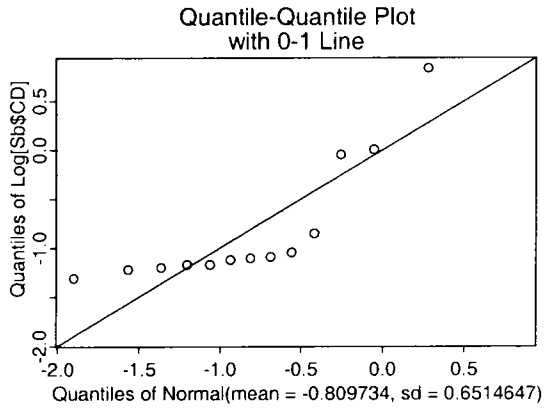
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 1.464692e4 sd = 2.149801e4
Data:	Sb$CA
Sample Size:	13
Test Statistic:	W = 0.5999953
Test Statistic Parmeter:	n = 13
P-value:	6.546967e-5

Results of Shapiro-Wilk GOF Test for Sb$CD



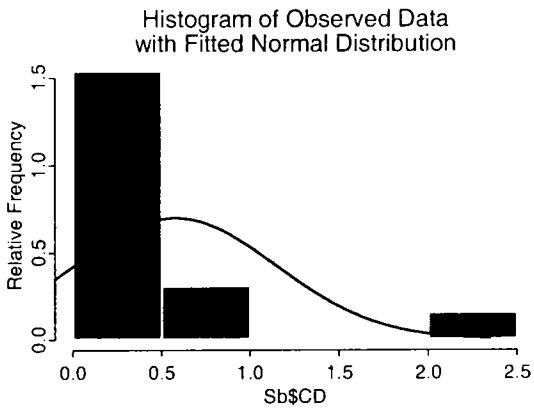


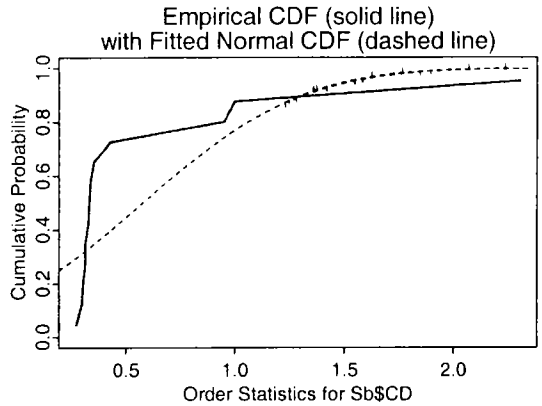


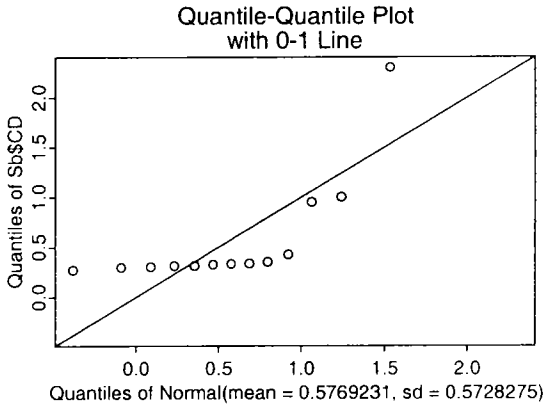
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -0.809734 sdlog = 0.6514647
Data:	Sb$CD
Sample Size:	13
Test Statistic:	W = 0.7090734
Test Statistic Parmeter:	n = 13
P-value:	6.849111e-4

Results of Shapiro-Wilk GOF Test for Sb$CD



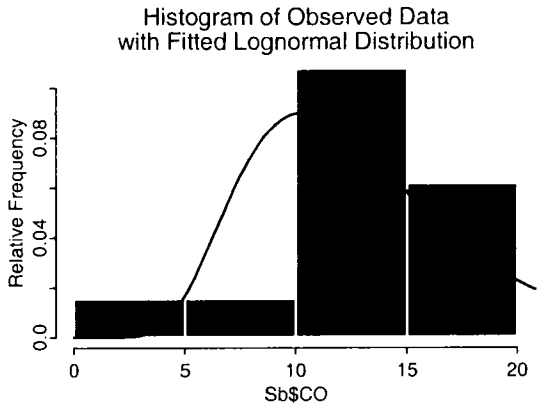


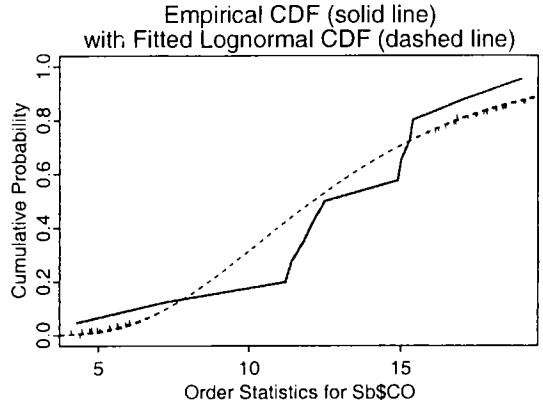


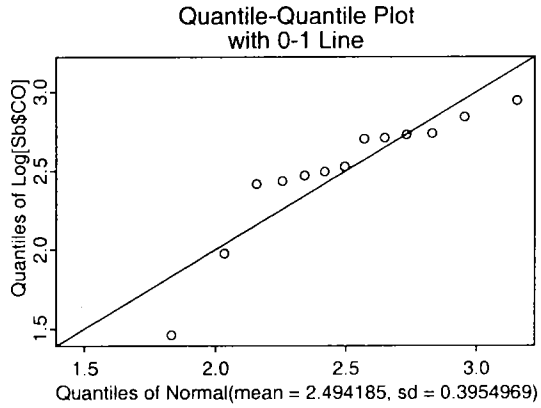
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.5769231 sd = 0.5728275
Data:	Sb$CD
Sample Size:	13
Test Statistic:	W = 0.5738471
Test Statistic Parmeter:	n = 13
P-value:	3.92832e-5

Results of Shapiro-Wilk GOF Test for Sb$CO



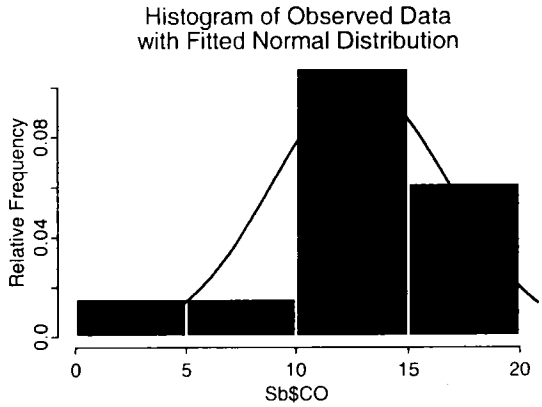


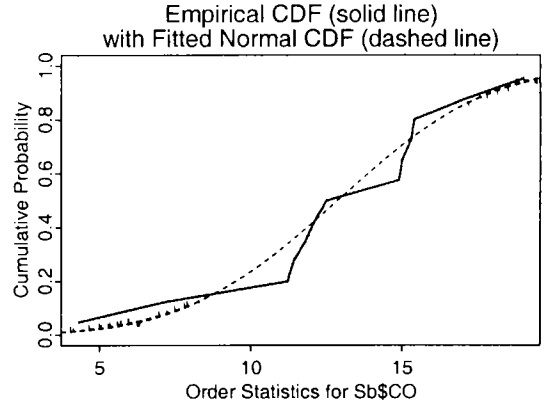


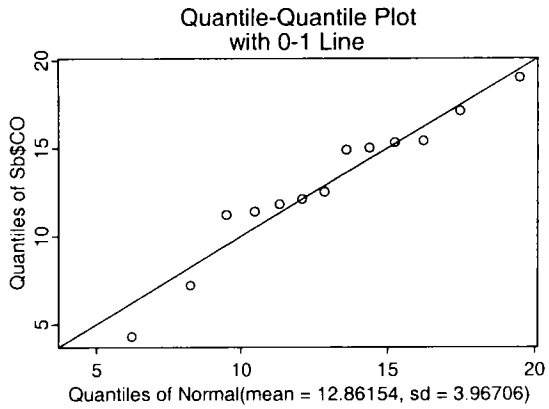
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.494185 sdlog = 0.3954969
Data:	Sb$CO
Sample Size:	13
Test Statistic:	W = 0.8298491
Test Statistic Parmeter:	n = 13
P-value:	0.01577099

Results of Shapiro-Wilk GOF Test for Sb$CO



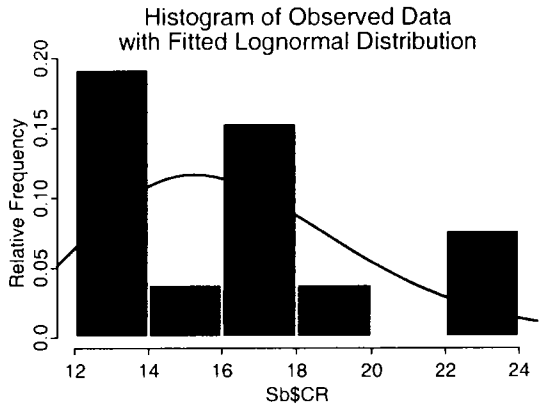


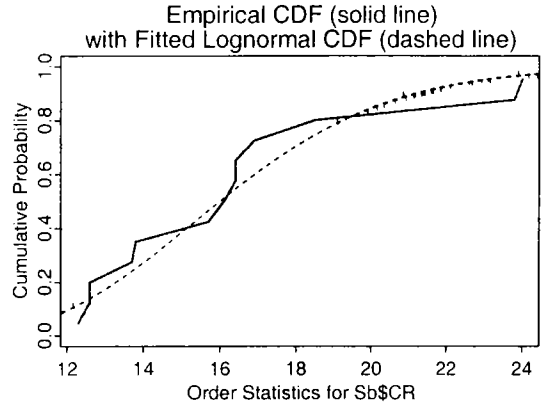


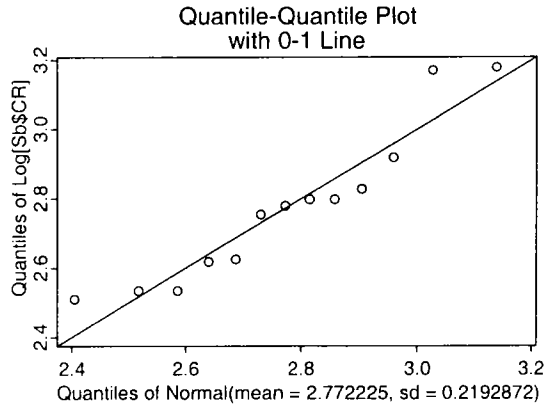
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 12.86154 sd = 3.96706
Data:	Sb$CO
Sample Size:	13
Test Statistic:	W = 0.9433571
Test Statistic Parmeter:	n = 13
P-value:	0.5018159

Results of Shapiro-Wilk GOF Test for Sb$CR



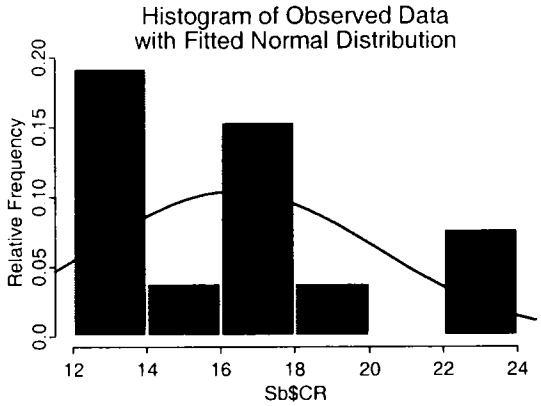


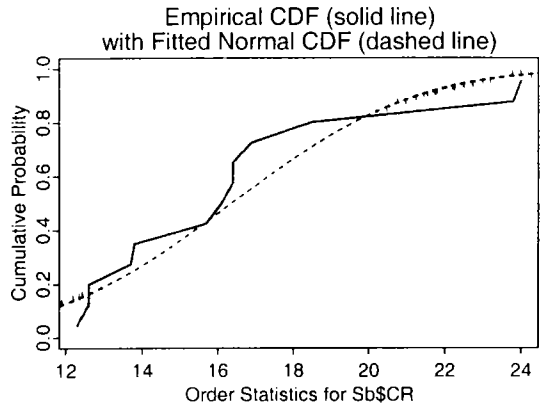


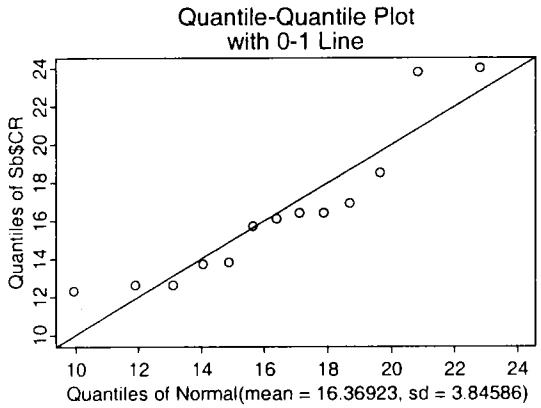
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.772225 sdlog = 0.2192872
Data:	Sb$CR
Sample Size:	13
Test Statistic:	W = 0.8965273
Test Statistic Parmeter:	n = 13
P-value:	0.1198346

Results of Shapiro-Wilk GOF Test for Sb$CR



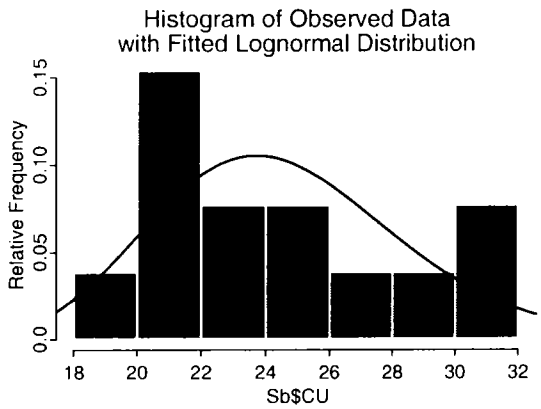


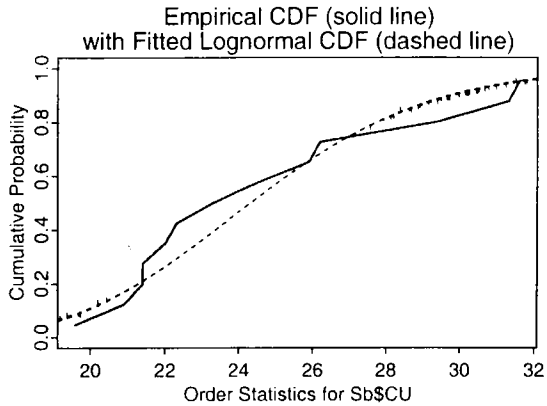


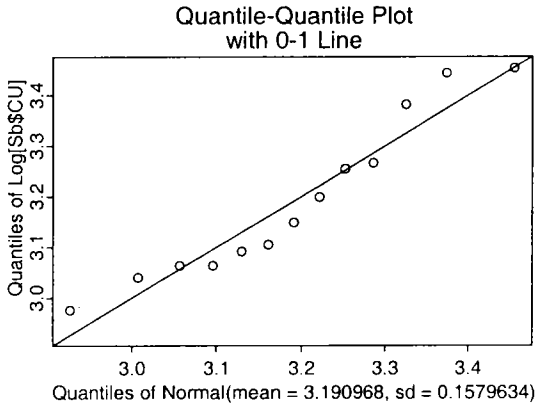
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 16.36923 sd = 3.84586
Data:	Sb$CR
Sample Size:	13
Test Statistic:	W = 0.8498299
Test Statistic Parmeter:	n = 13
P-value:	0.02836034

Results of Shapiro-Wilk GOF Test for Sb$CU



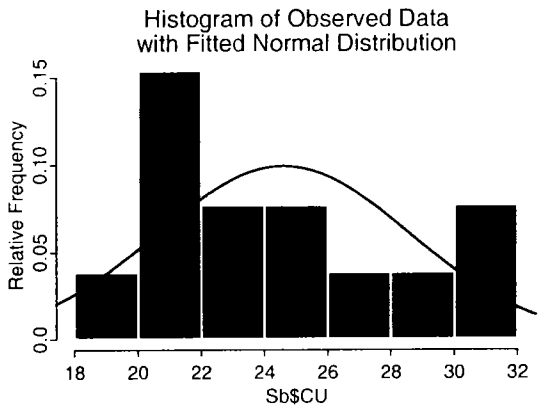


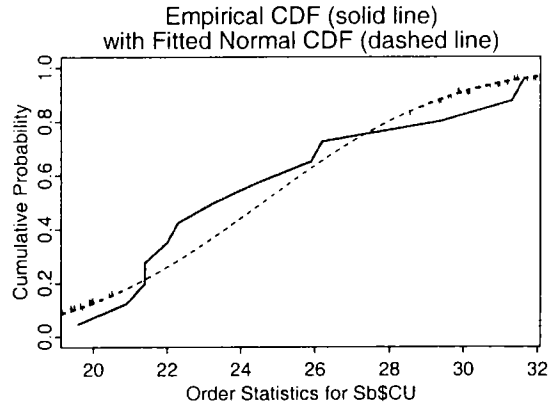


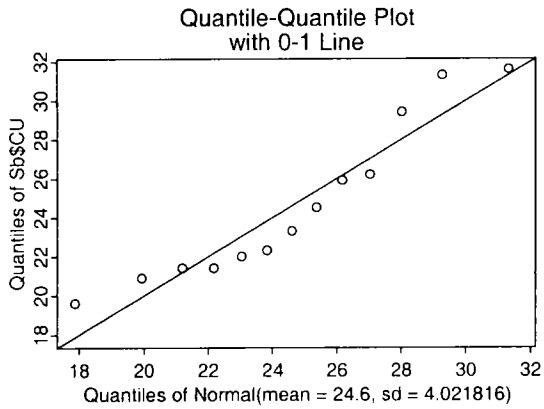
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 3.190968 sdlog = 0.1579634
Data:	Sb$CU
Sample Size:	13
Test Statistic:	W = 0.9185256
Test Statistic Parmeter:	n = 13
P-value:	0.2396034

Results of Shapiro-Wilk GOF Test for Sb$CU



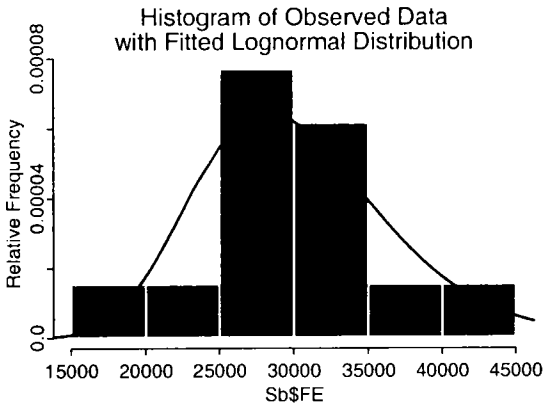


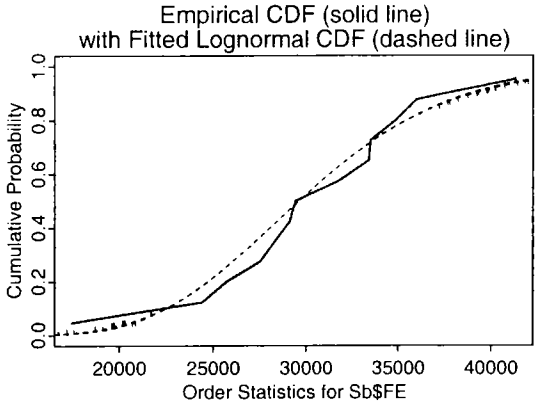


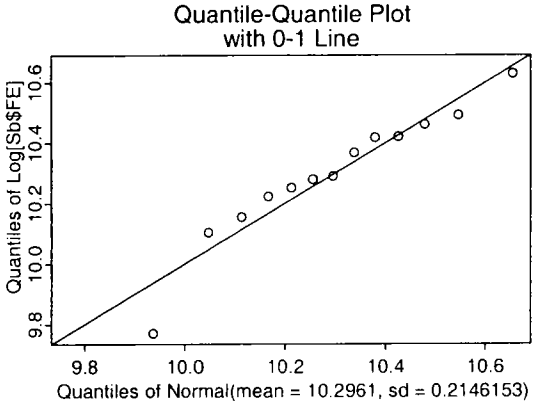
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 24.6 sd = 4.021816
Data:	Sb$CU
Sample Size:	13
Test Statistic:	W = 0.8956413
Test Statistic Parmeter:	n = 13
P-value:	0.1165296

Results of Shapiro-Wilk GOF Test for Sb$FE



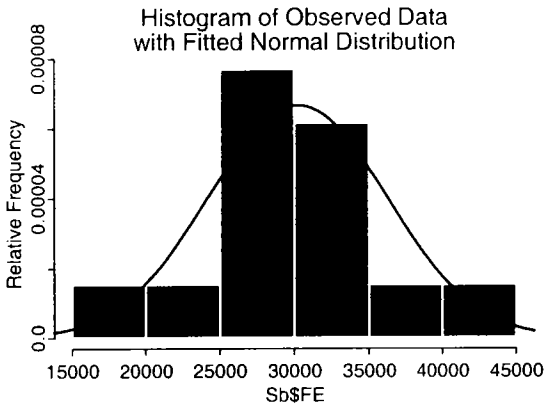


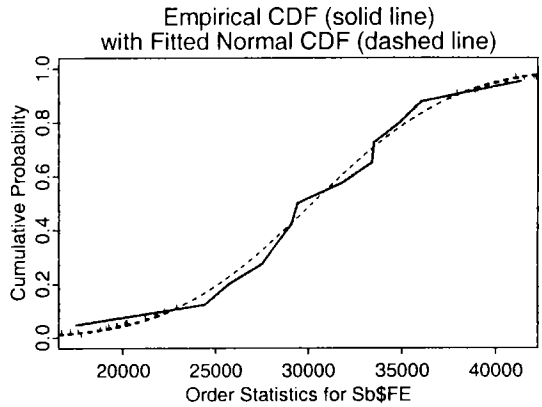


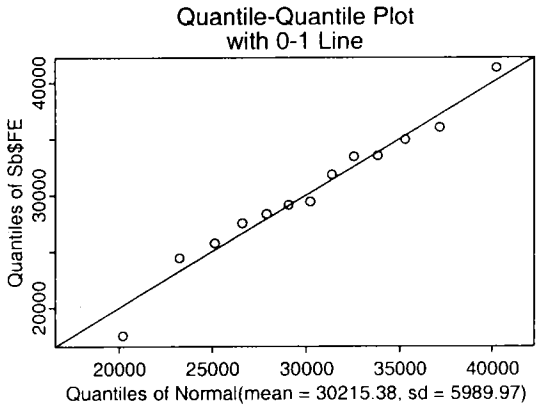
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 10.2961 sdlog = 0.2146153
Data:	Sb$FE
Sample Size:	13
Test Statistic:	W = 0.9378209
Test Statistic Parmeter:	n = 13
P-value:	0.4293113

Results of Shapiro-Wilk GOF Test for Sb$FE



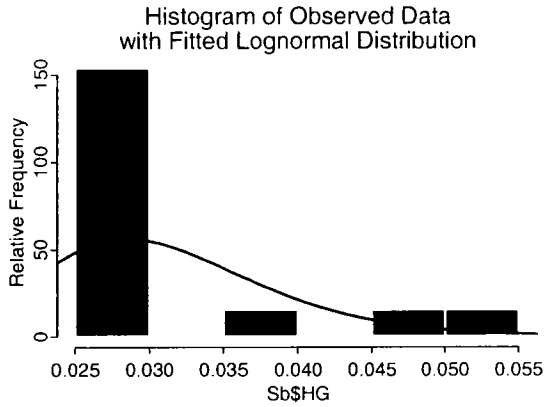


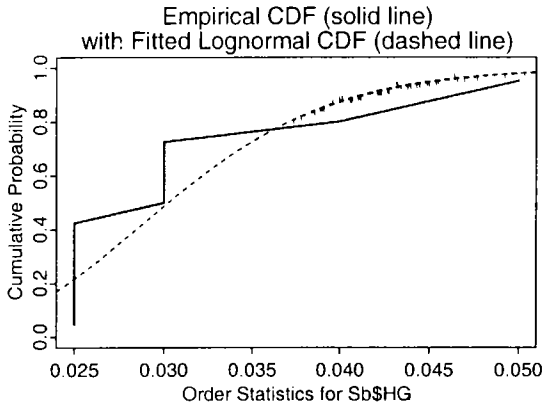


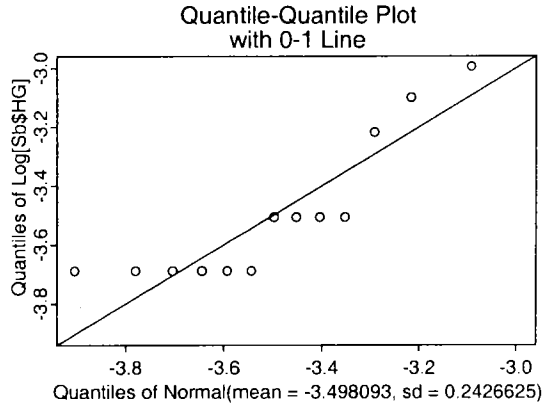
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 3.021538e4 sd = 5989.97
Data:	Sb$FE
Sample Size:	13
Test Statistic:	W = 0.9818906
Test Statistic Parmeter:	n = 13
P-value:	0.9874041

Results of Shapiro-Wilk GOF Test for Sb$HG



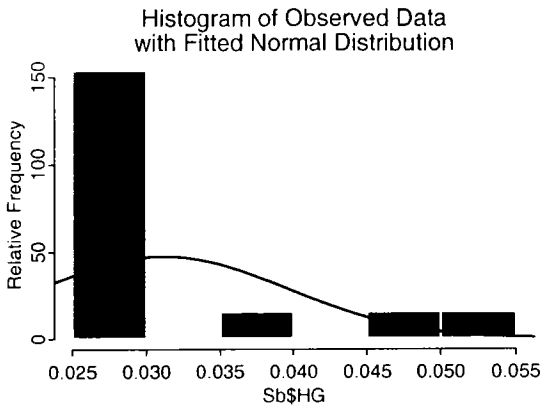


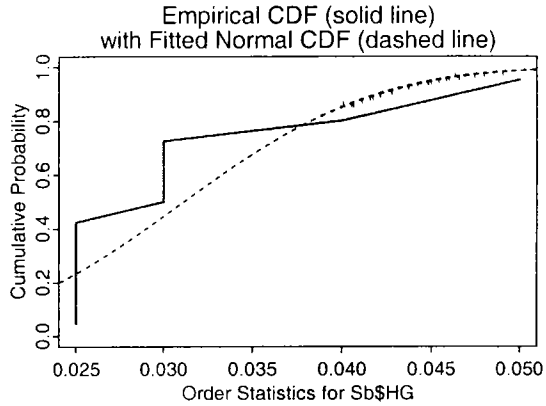


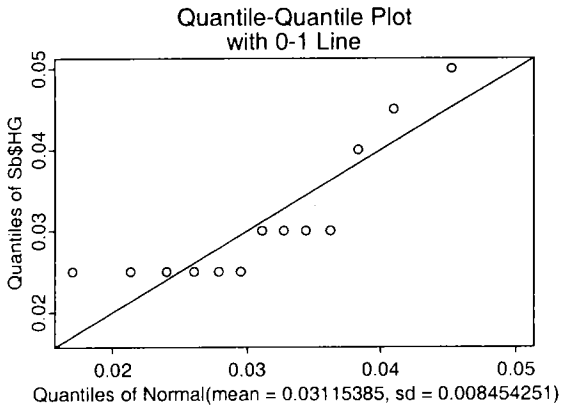
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -3.498093 sdlog = 0.2426625
Data:	Sb$HG
Sample Size:	13
Test Statistic:	W = 0.777411
Test Statistic Parmeter:	n = 13
P-value:	0.003720551

Results of Shapiro-Wilk GOF Test for Sb$HG



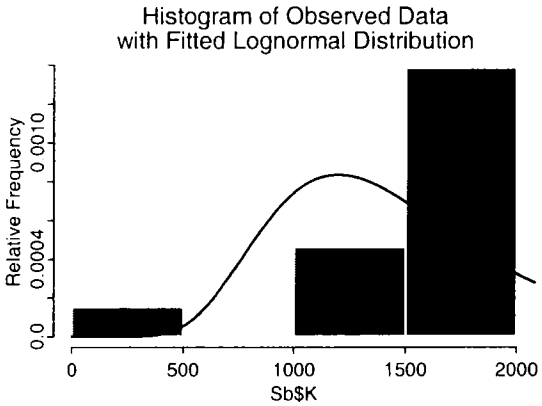


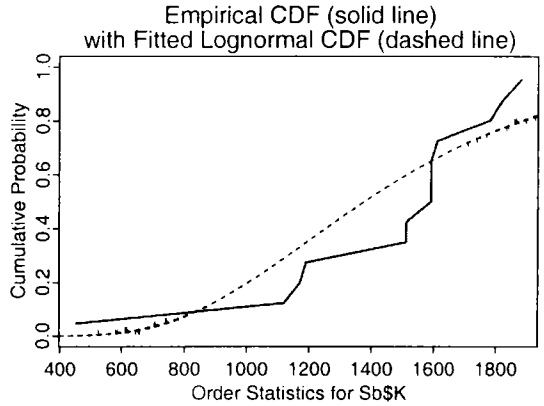


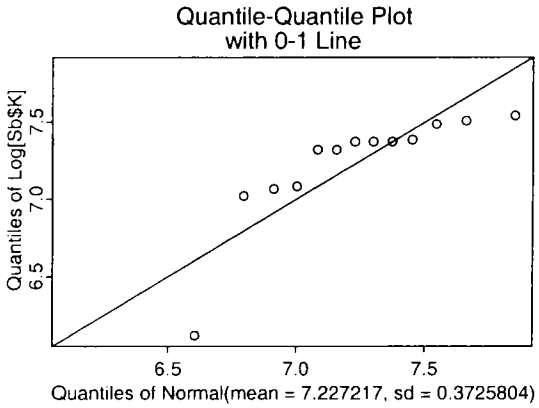
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.03115385 sd = 0.008454251
Data:	Sb$HG
Sample Size:	13
Test Statistic:	W = 0.7481896
Test Statistic Parmeter:	n = 13
P-value:	0.001761029

Results of Shapiro-Wilk GOF Test for Sb$K



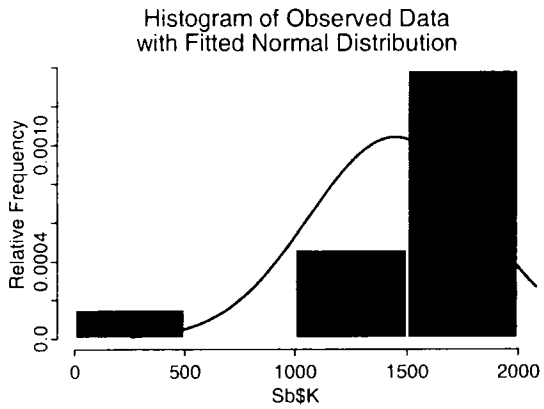


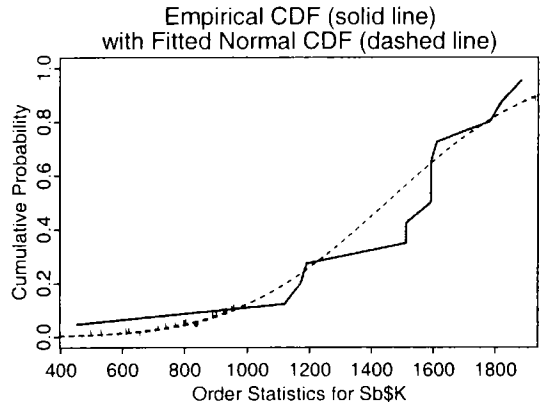


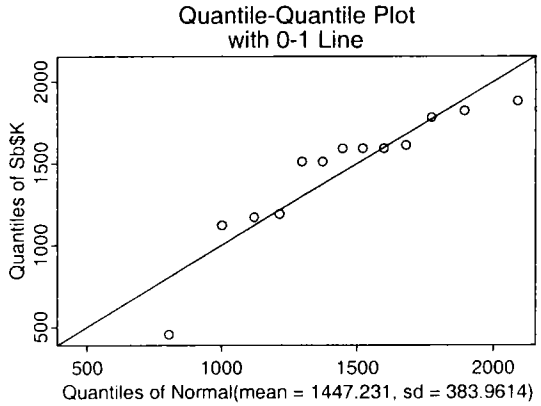
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 7.227217 sdlog = 0.3725804
Data:	Sb$K
Sample Size:	13
Test Statistic:	W = 0.705517
Test Statistic Parmeter:	n = 13
P-value:	6.304408e-4

Results of Shapiro-Wilk GOF Test for Sb$K



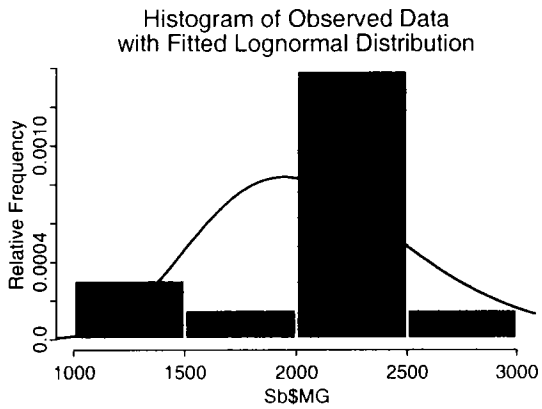


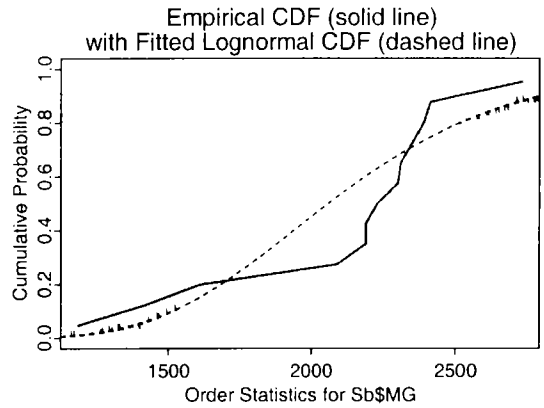


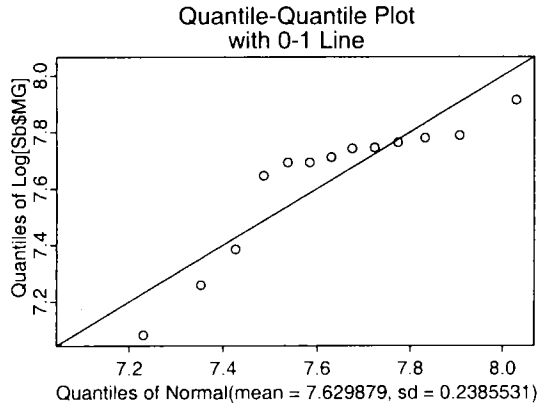
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 1447.231 sd = 383.9614
Data:	Sb$K
Sample Size:	13
Test Statistic:	W = 0.8535134
Test Statistic Parmeter:	n = 13
P-value:	0.03166935

Results of Shapiro-Wilk GOF Test for Sb$MG



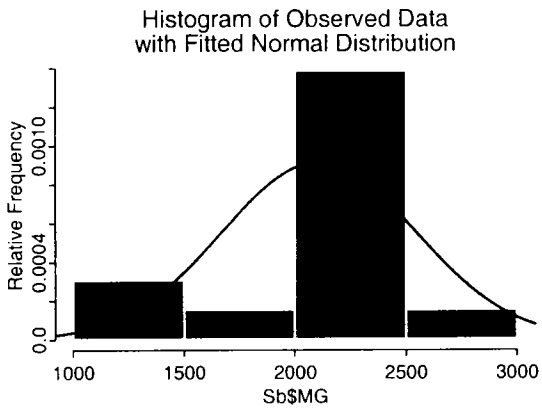


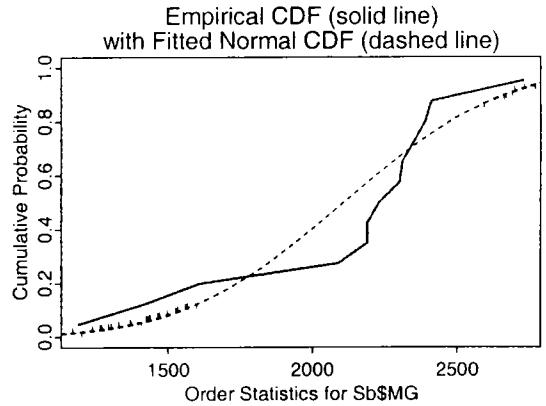


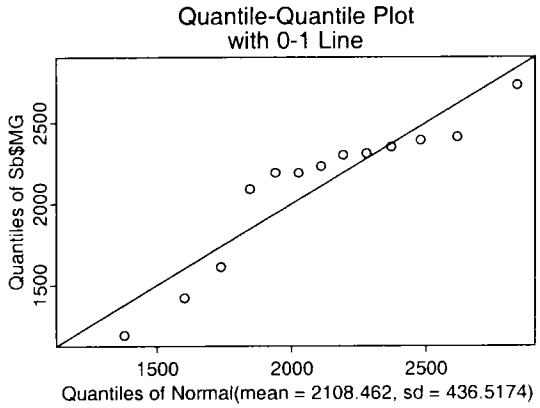
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 7.629879 sdlog = 0.2385531
Data:	Sb$MG
Sample Size:	13
Test Statistic:	W = 0.81145
Test Statistic Parmeter:	n = 13
P-value:	0.009353724

Results of Shapiro-Wilk GOF Test for Sb$MG



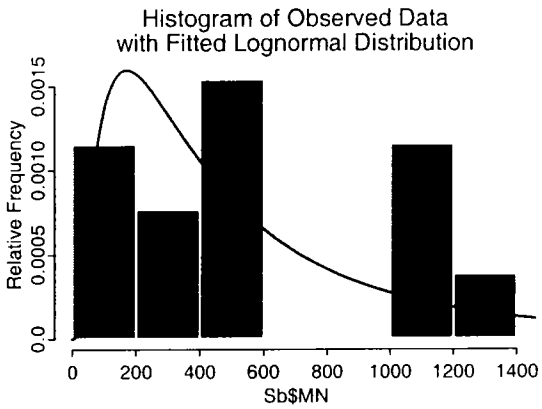


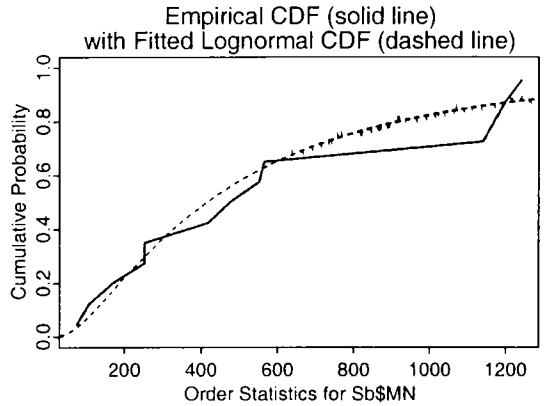


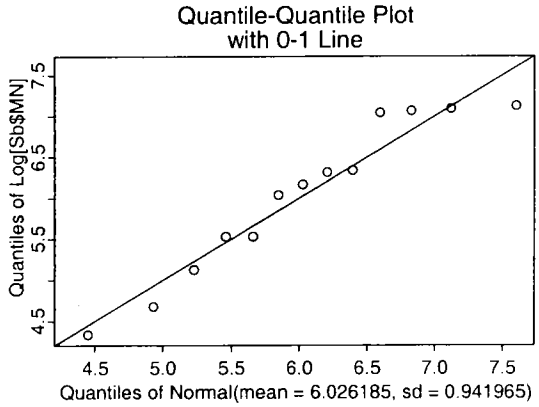
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 2108.462 sd = 436.5174
Data:	Sb$MG
Sample Size:	13
Test Statistic:	W = 0.8641419
Test Statistic Parmeter:	n = 13
P-value:	0.04370235

Results of Shapiro-Wilk GOF Test for Sb$MN



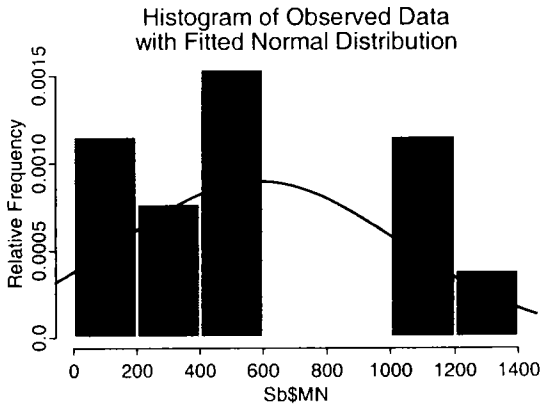


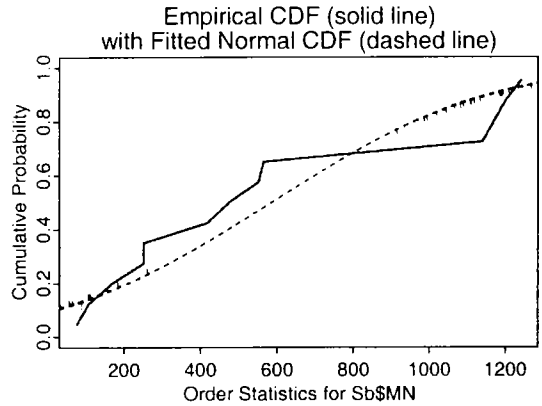


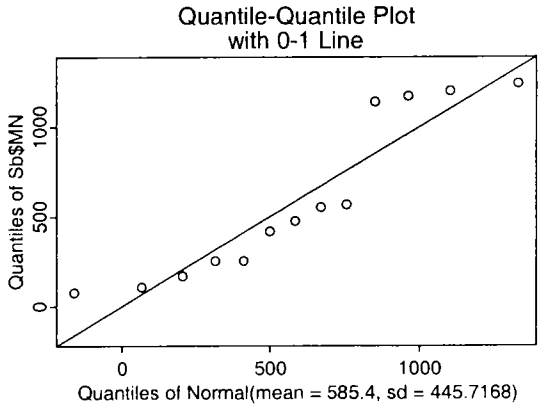
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 6.026185 sdlog = 0.941965
Data:	Sb$MN
Sample Size:	13
Test Statistic:	W = 0.9198473
Test Statistic Parmeter:	n = 13
P-value:	0.2496664

Results of Shapiro-Wilk GOF Test for Sb$MN



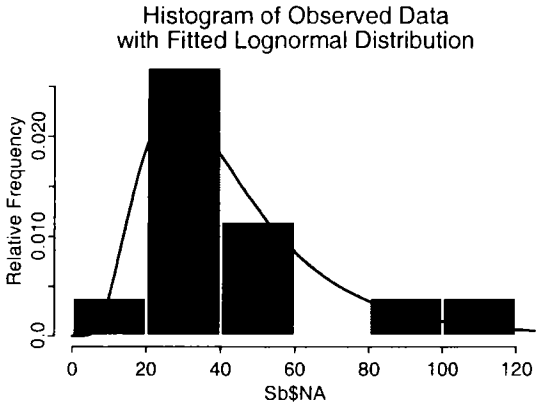


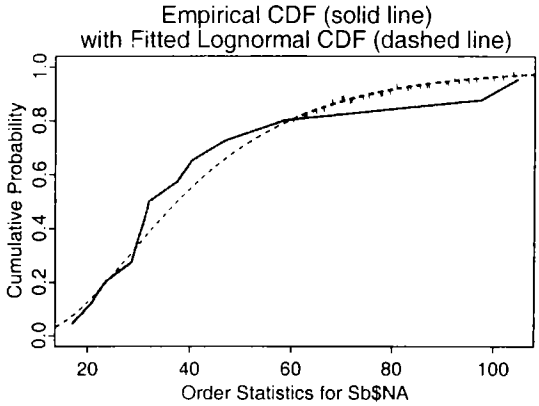


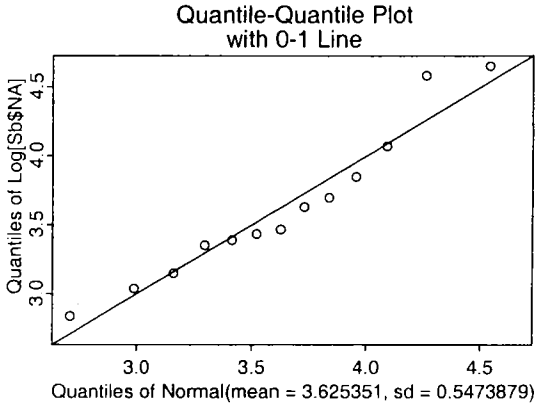
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 585.4 sd = 445.7168
Data:	Sb$MN
Sample Size:	13
Test Statistic:	W = 0.848992
Test Statistic Parmeter:	n = 13
P-value:	0.02765979

Results of Shapiro-Wilk GOF Test for Sb$NA



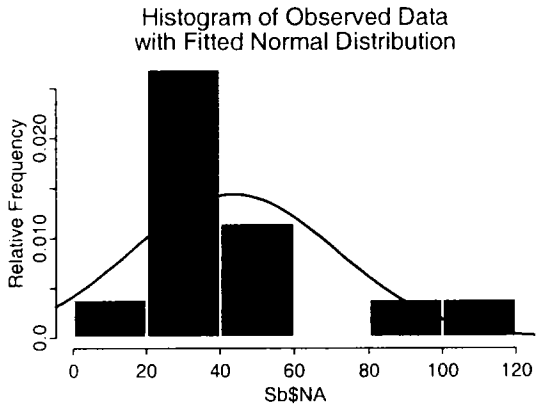


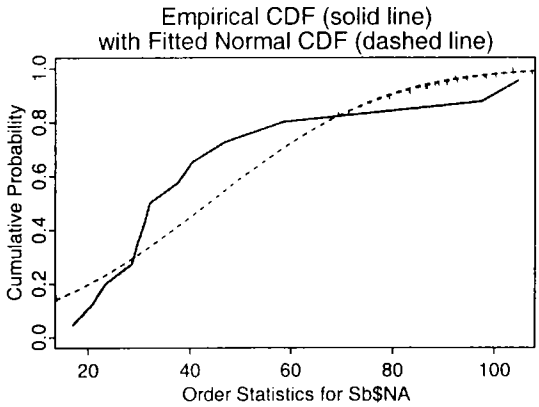


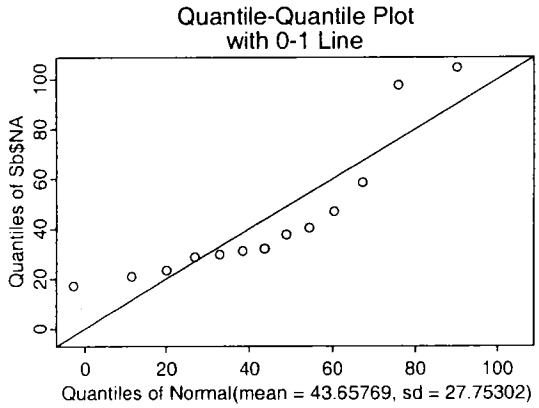
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 3.625351 sdlog = 0.5473879
Data:	Sb$NA
Sample Size:	13
Test Statistic:	W = 0.9345924
Test Statistic Parmeter:	n = 13
P-value:	0.3907794

Results of Shapiro-Wilk GOF Test for Sb$NA



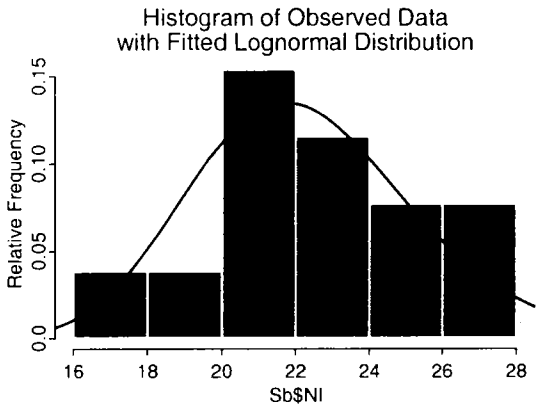


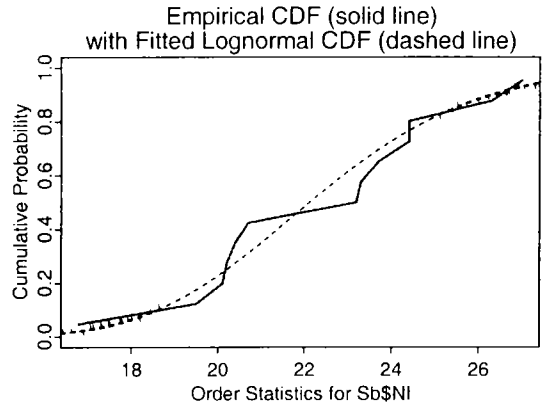


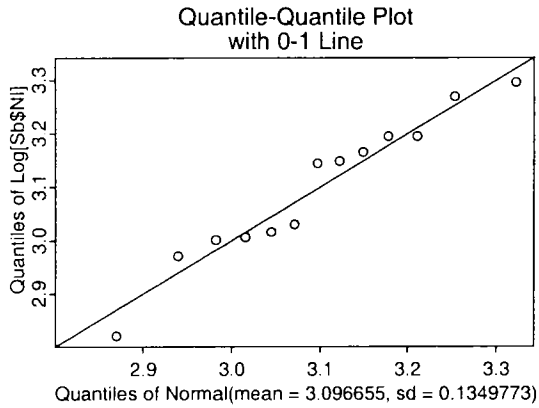
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 43.65769 sd = 27.75302
Data:	Sb$NA
Sample Size:	13
Test Statistic:	W = 0.7893992
Test Statistic Parmeter:	n = 13
P-value:	0.00511471

Results of Shapiro-Wilk GOF Test for Sb$NI



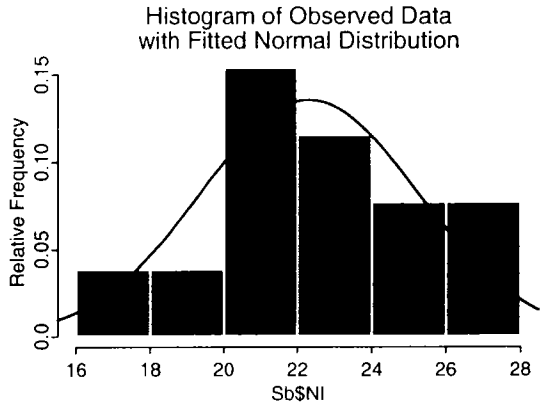


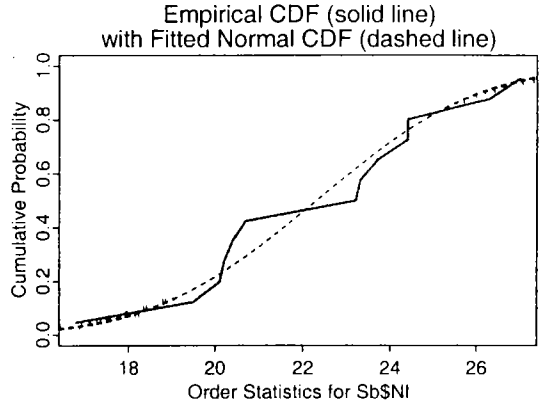


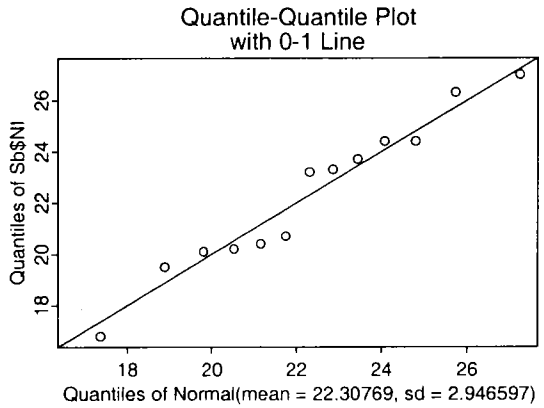
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 3.096655 sdlog = 0.1349773
Data:	Sb$NI
Sample Size:	13
Test Statistic:	W = 0.9496416
Test Statistic Parmeter:	n = 13
P-value:	0.5928684

Results of Shapiro-Wilk GOF Test for Sb$NI



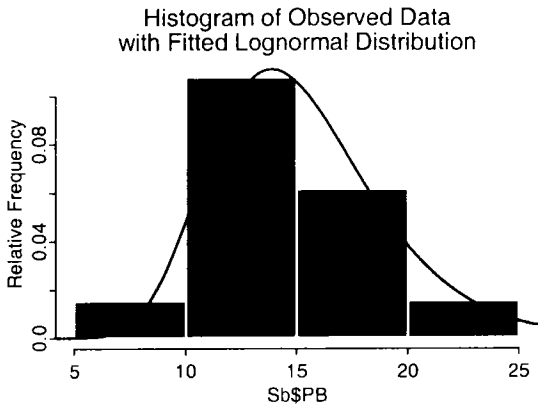


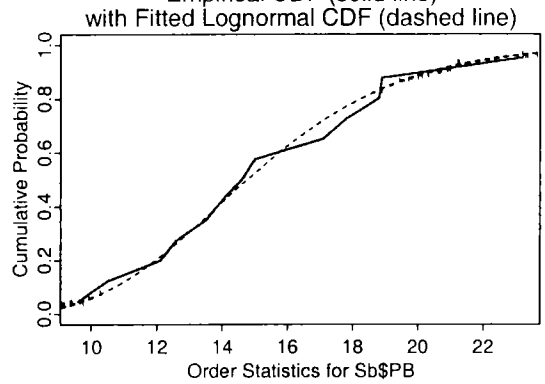


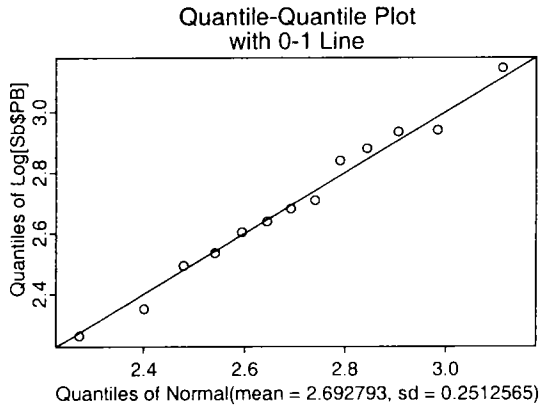
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 22.30769 sd = 2.946597
Data:	Sb$NI
Sample Size:	13
Test Statistic:	W = 0.9569516
Test Statistic Parmeter:	n = 13
P-value:	0.7061516

Results of Shapiro-Wilk GOF Test for Sb$PB



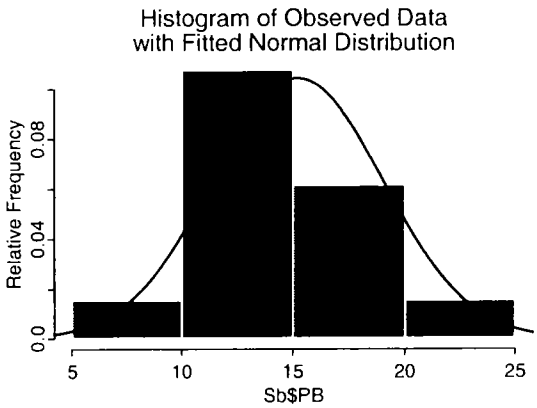


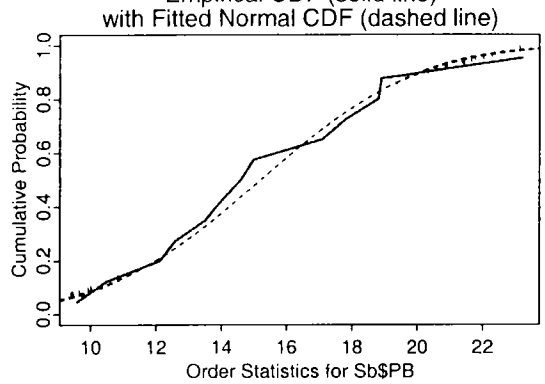


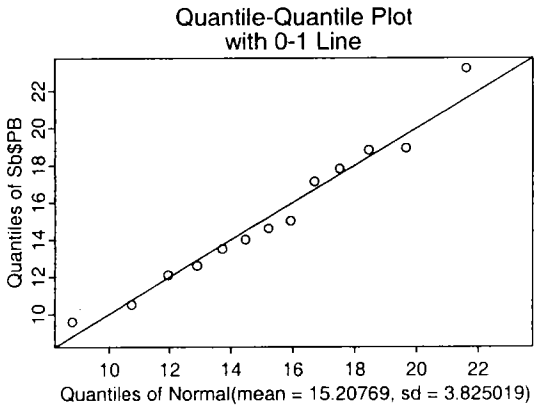
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.692793 sdlog = 0.2512565
Data:	Sb$PB
Sample Size:	13
Test Statistic:	W = 0.9838179
Test Statistic Parmeter:	n = 13
P-value:	0.9930316

Results of Shapiro-Wilk GOF Test for Sb$PB



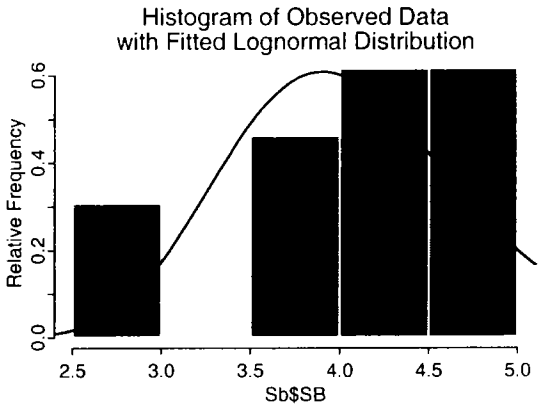


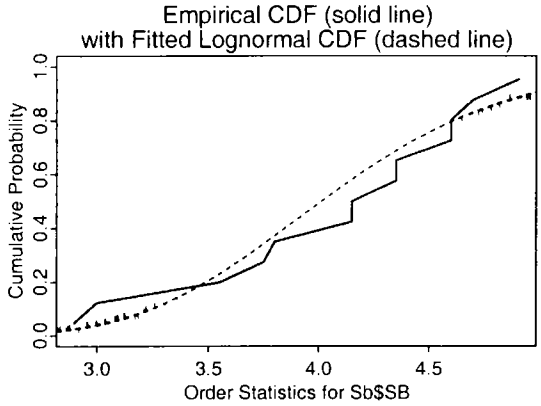


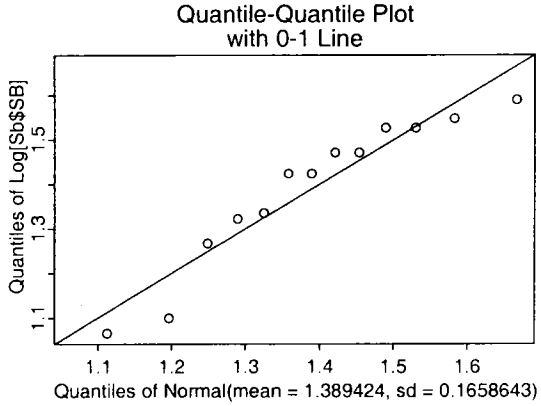
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 15.20769 sd = 3.825019
Data:	Sb$PB
Sample Size:	13
Test Statistic:	W = 0.9678574
Test Statistic Parmeter:	n = 13
P-value:	0.8674637

Results of Shapiro-Wilk GOF Test for Sb$SB



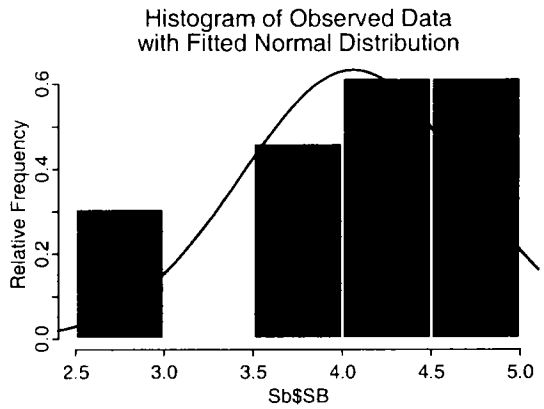


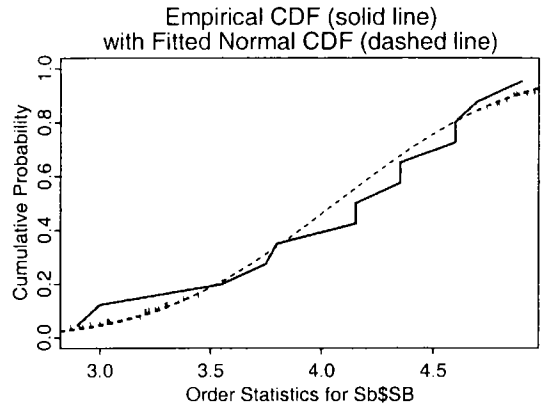


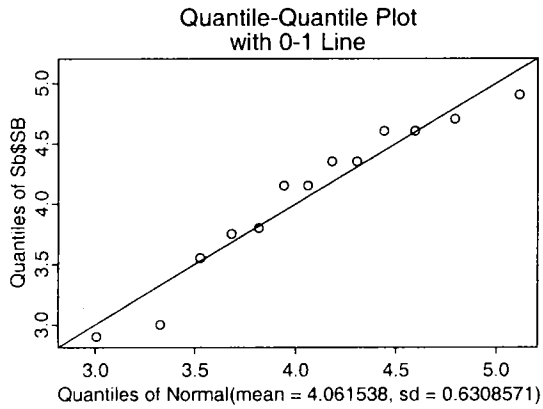
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 1.389424 sdlog = 0.1658643
Data:	Sb$SB
Sample Size:	13
Test Statistic:	W = 0.8998136
Test Statistic Parmeter:	n = 13
P-value:	0.1329431

Results of Shapiro-Wilk GOF Test for Sb$SB



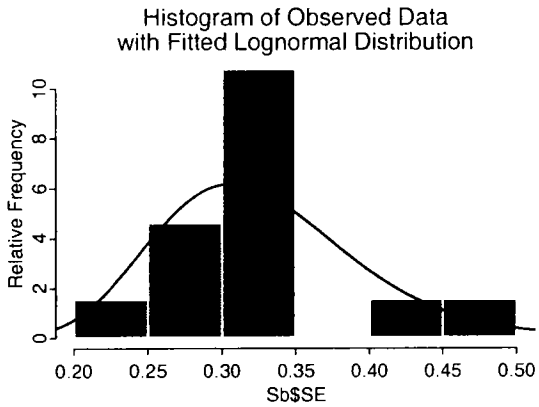


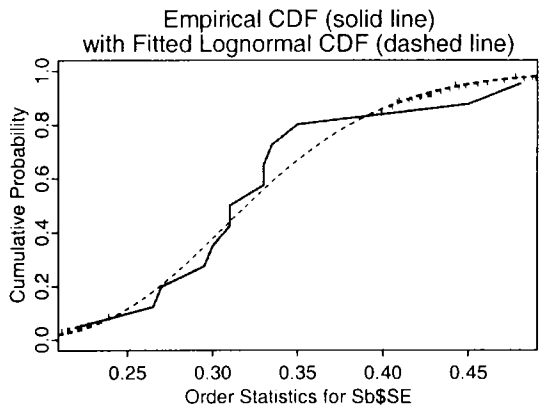


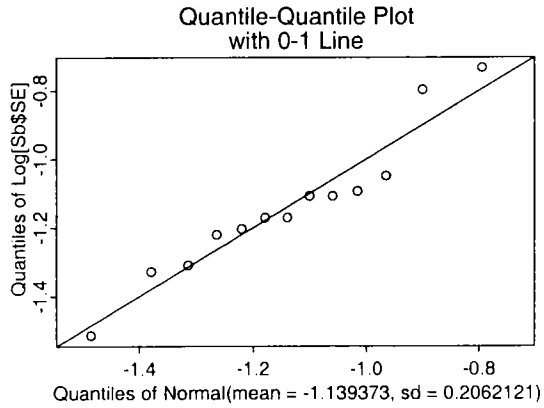
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 4.061538 sd = 0.6308571
Data:	Sb$SB
Sample Size:	13
Test Statistic:	W = 0.9290432
Test Statistic Parmeter:	n = 13
P-value:	0.331123

Results of Shapiro-Wilk GOF Test for Sb$SE



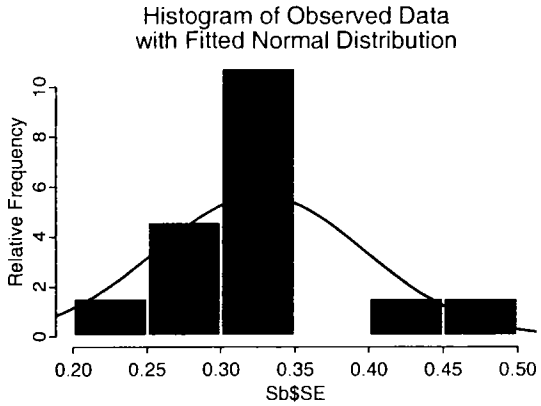


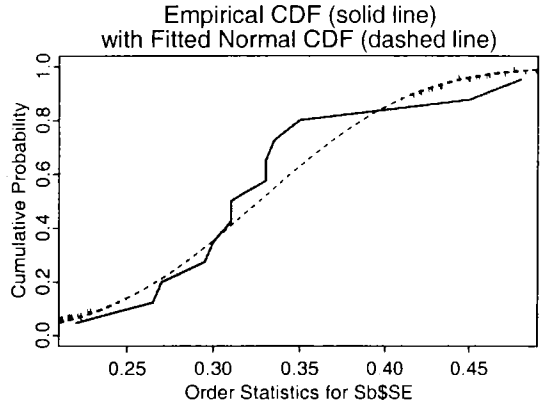


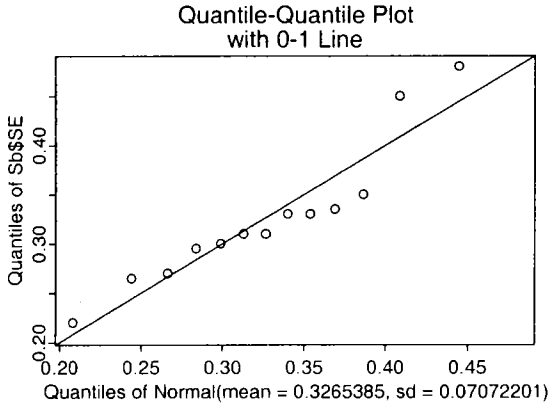
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = -1.139373 sdlog = 0.2062121
Data:	Sb$SE
Sample Size:	13
Test Statistic:	W = 0.9383632
Test Statistic Parmeter:	n = 13
P-value:	0.43606

Results of Shapiro-Wilk GOF Test for Sb$SE



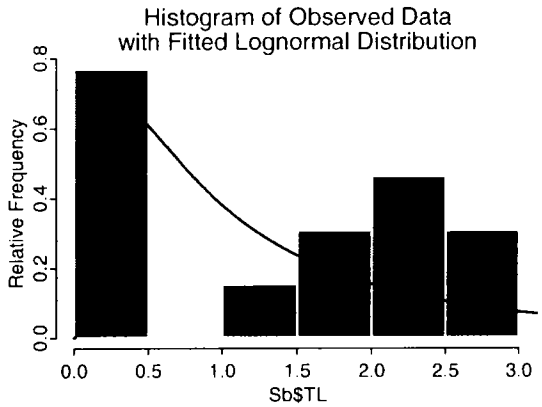


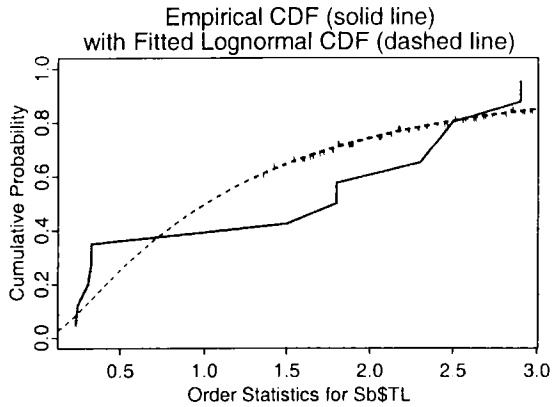


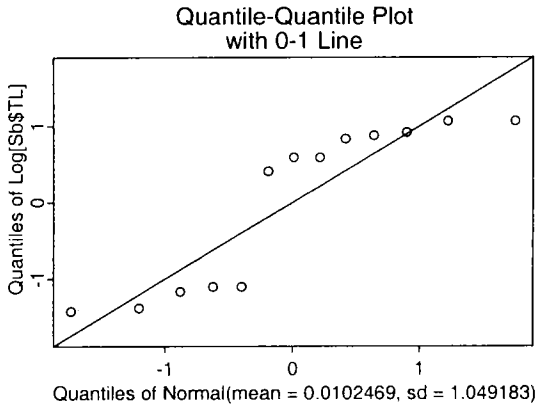
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 0.3265385 sd = 0.07072201
Data:	Sb$SE
Sample Size:	13
Test Statistic:	W = 0.8907591
Test Statistic Parmeter:	n = 13
P-value:	0.09990668

Results of Shapiro-Wilk GOF Test for Sb$TL



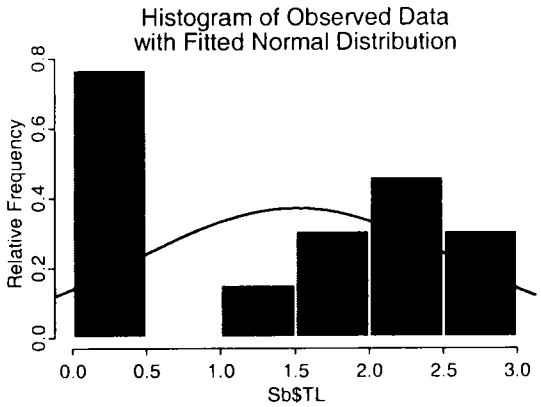


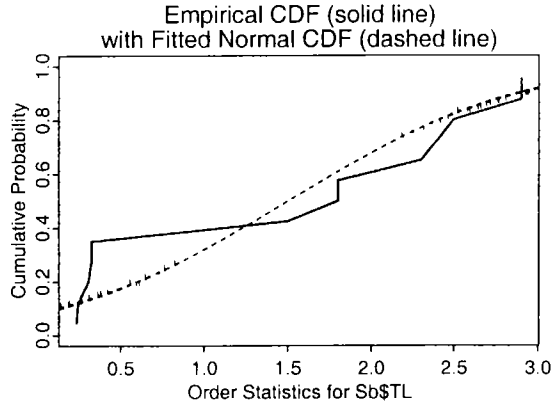


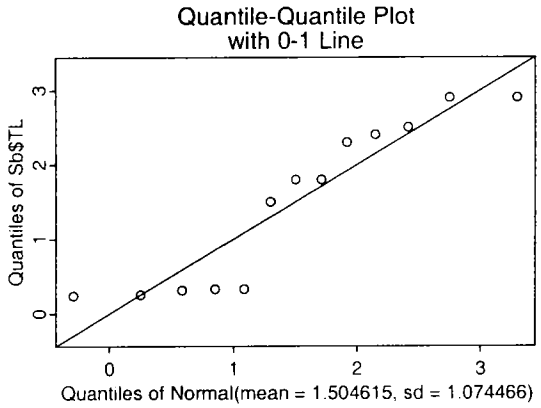
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 0.0102469 sdlog = 1.049183
Data:	Sb$TL
Sample Size:	13
Test Statistic:	W = 0.7836147
Test Statistic Parmeter:	n = 13
P-value:	0.004382888

Results of Shapiro-Wilk GOF Test for Sb$TL



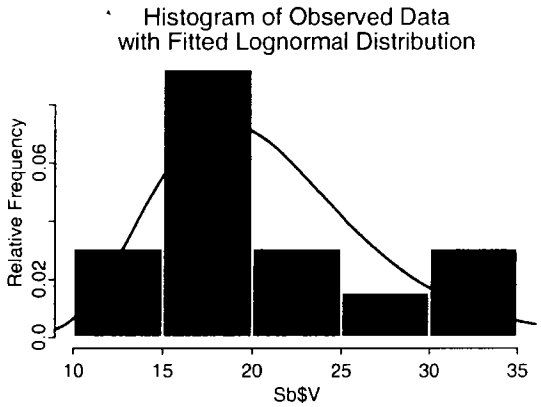


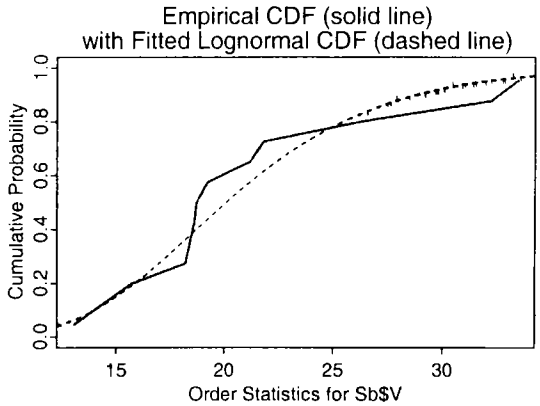


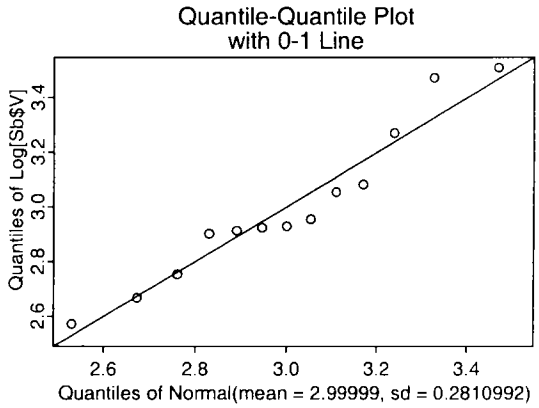
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 1.504615 sd = 1.074466
Data:	Sb$TL
Sample Size:	13
Test Statistic:	W = 0.8454723
Test Statistic Parmeter:	n = 13
P-value:	0.02491079

Results of Shapiro-Wilk GOF Test for Sb$V



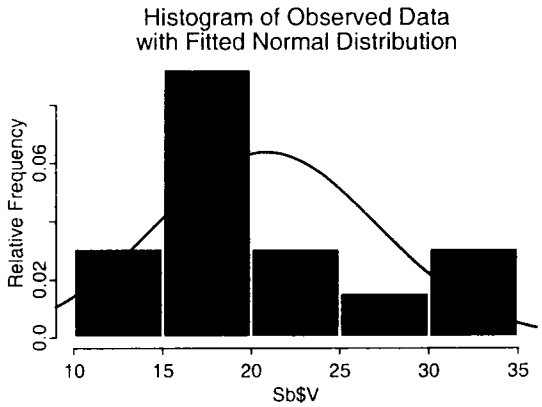


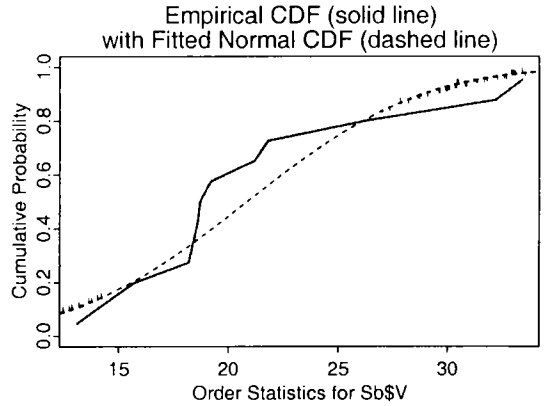


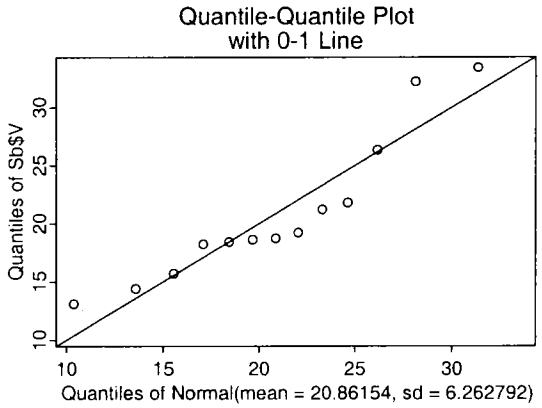
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 2.99999 sdlog = 0.2810992
Data:	Sb$V
Sample Size:	13
Test Statistic:	W = 0.9343657
Test Statistic Parmeter:	n = 13
P-value:	0.38818

Results of Shapiro-Wilk GOF Test for Sb$V





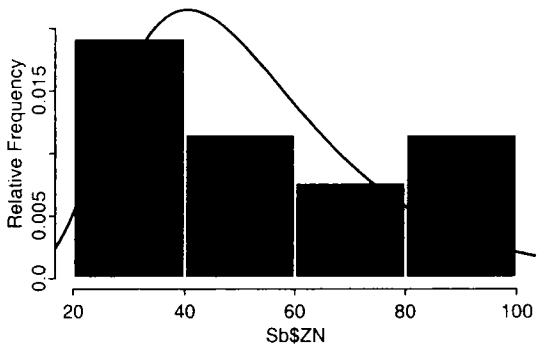


Results of Shapiro-Wilk GOF

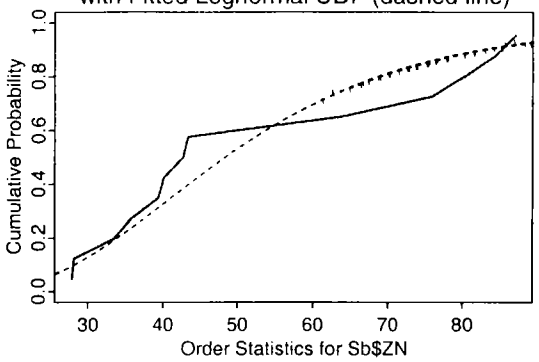
Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 20.86154 sd = 6.262792
Data:	Sb$V
Sample Size:	13
Test Statistic:	W = 0.8753839
Test Statistic Parmeter:	n = 13
P-value:	0.06177454

Results of Shapiro-Wilk GOF Test for Sb$ZN

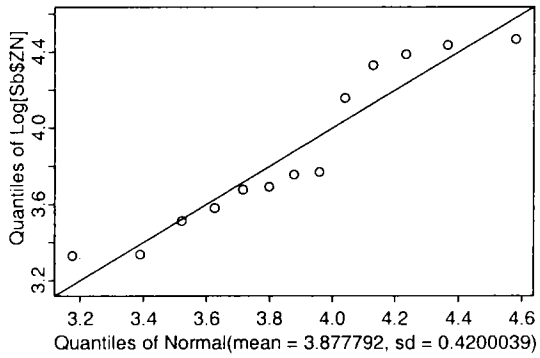
Histogram of Observed Data
with Fitted Lognormal Distribution



Empirical CDF (solid line)
with Fitted Lognormal CDF (dashed line)



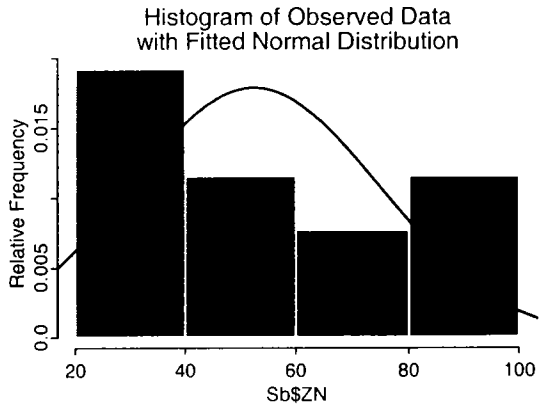
Quantile-Quantile Plot
with 0-1 Line

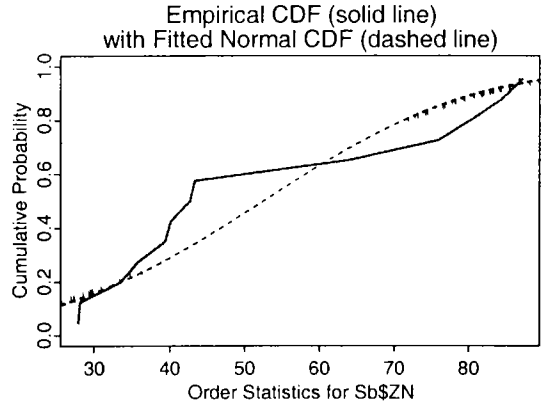


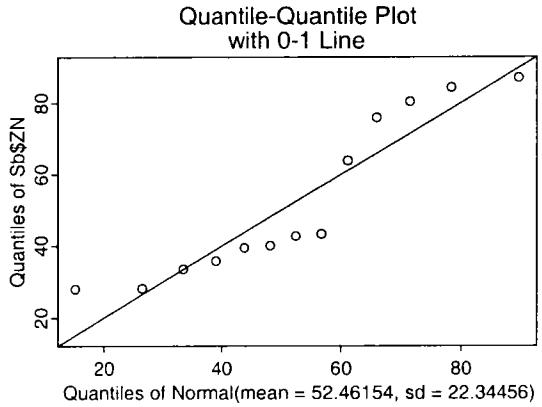
Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 3.877792 sdlog = 0.4200039
Data:	Sb$ZN
Sample Size:	13
Test Statistic:	W = 0.888
Test Statistic Parmeter:	n = 13
P-value:	0.09160316

Results of Shapiro-Wilk GOF Test for Sb$ZN







Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Normal
Estimated Parameters:	mean = 52.46154 sd = 22.34456
Data:	Sb$ZN
Sample Size:	13
Test Statistic:	W = 0.8495579
Test Statistic Parmeter:	n = 13
P-value:	0.02813088

ABL BACKGROUND SOIL METALS:
DISTRIBUTION GOF/UTL ESTIMATION
UTLs.SS.xls

				SHAPIRO-WILK				
MATRIX	P	N	FD	~N	~LOGN	DIST	ESTIMATOR	UPPER BOUND
SS	AL	19	1.00	0.58	0.02	N	UTL	17405
SS	CA	19	1.00	E-5	0.11	LOGN	UTL	1022792
SS	CR	19	1.00	0.54	0.002	N	UTL	24.3
SS	FE	19	1.00	0.05	E-4	N	UTL	44700
SS	MN	19	1.00	0.39	0.43	LOGN	UTL	2082
SS	PB	19	1.00	0.05	0.53	LOGN	UTL	130
SS	ZN	19	1.00	E-5	0.60	LOGN	UTL	244
SS	AS	19	0.95	0.28	0.001	N	UTL	13
SS	CU	19	0.95	0.25	E-5	N	UTL	34.2
SS	MG	19	0.95	E-6	0.34	LOGN	UTL	43602
SS	NI	19	0.89	0.15	E-4	N	UTL	37
SS	V	19	0.84	E-4	E-6	NPAR	UTL	25.5 [85%]
SS	BA	19	0.79	0.26	0.001	N	UTL	151
SS	K	19	0.58	0.04	0.07	LOGN	UTL	4482
SS	CO	19	0.53	0.33	0.02	N	UTL	23.2
SS	AG	18	0.39	E-6	0.05	LOGN	UTL	6.2
SS	CD	19	0.32	E-4	0.001	NPAR	UTL	3.3 [85%]
SS	BE	19	0.26	0.009	0.07	LOGN	UTL	2.4
SS	HG	19	0.26	E-6	E-4	NPAR	UTL	.42 [85%]
SS	SB	12	0.25	0.006	0.14	LOGN	UTL	25
SS	SE	19	0.11	E-7	E-5	NPAR	UTL	2.4 [85%]
SS	TL	19	0.05	E-4	0.009	NPAR	UTL	1.4 [85%]
SS	CN	6	0.00	NA	NA	NA	UCL	1.3
SS	NA	19	0.00	NA	NA	NA	UCL	69

ABL BACKGROUND SOIL METALS:

DISTRIBUTION GOF/UTL ESTIMATION

UTLs.SSnotSITE5.xls

				SHAPIRO-WILK				
MATRIX	P	N	FD	~N	~LOGN	DIST	ESTIMATOR	UPPERBOUND
SS	AL	17	1.00	0.50	0.02	NA	UTL	18312
SS	CA	17	1.00	E-5	0.12	LOGN	UTL	1177778
SS	CR	17	1.00	0.26	0.001	N	UTL	23.9
SS	FE	17	1.00	0.11	0.001	N	UTL	46295
SS	MG	17	1.00	E-6	0.09	LOGN	UTL	45132
SS	MN	17	1.00	0.31	0.33	N	UTL	1144
SS	PB	17	1.00	0.17	0.44	N	UTL	79
SS	ZN	17	1.00	E-4	0.72	LOGN	UTL	277
SS	AS	17	0.94	0.44	0.004	NA	UTL	13.4
SS	CU	17	0.94	0.12	E-5	N	UTL	35.6
SS	NI	17	0.88	0.19	0.001	N	UTL	39
SS	V	17	0.82	0.001	E-5	NPAR	UTL	25.5 [84%]
SS	K	17	0.65	0.07	0.03	N	UTL	2524
SS	CO	17	0.53	0.31	0.02	N	UTL	24.3
SS	AG	16	0.38	E-6	0.08	LOGN	UTL	7.4
SS	SB	10	0.30	0.02	0.13	LOGN	UTL	29
SS	BE	17	0.29	0.03	0.1	LOGN	UTL	2.9
SS	CD	17	0.24	E-5	E-4	NPAR	UTL	3.3 [84%]
SS	HG	17	0.18	E-6	E-4	NPAR	UTL	.42 [84%]
SS	SE	17	0.12	E-7	E-4	NPAR	UTL	2.4 [84%]
SS	TL	17	0.06	E-4	0.04	NPAR	UCL	1.4 [84%]
SS	BA	17	0.03	0.12	0.001	NA	UTL	160
SS	CN	4	0.00	NA	NA	NA	UCL	1.4
SS	NA	17	0.00	NA	NA	NA	UCL	74

ABL BACKGROUND SOIL METALS:
DISTRIBUTION GOF/UTL ESTIMATION
UTLs.SB.xls

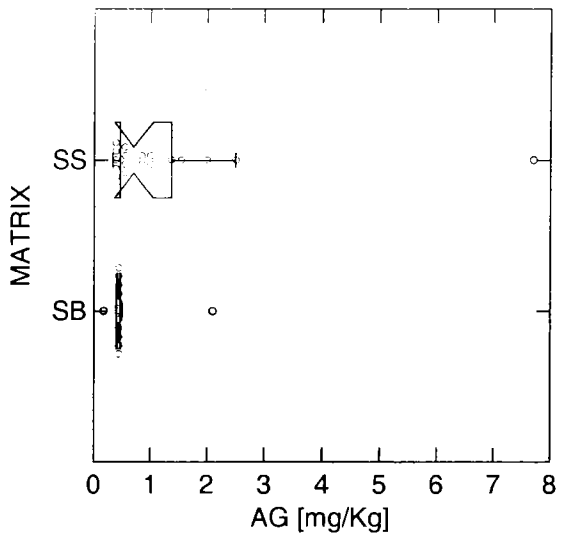
MATRIX	P	N	FD	SHAPIRO-WILK ~N	~LOGN	DIST	ESTIMATOR	UPPER BOUND
SB	AL	13	1.00	0.03	0.28	LOGN	UTL	27976
SB	AS	13	1.00	0.54	0.54	N	UTL	15
SB	BA	13	1.00	0.09	0.47	LOGN	UTL	407
SB	CA	13	1.00	E-5	0.02	NPAR	UTL	67000 [79%]
SB	CR	13	1.00	0.03	0.12	LOGN	UTL	29
SB	CU	13	1.00	0.12	0.24	LOGN	UTL	37
SB	FE	13	1.00	0.99	0.43	N	UTL	46212.00
SB	MG	13	1.00	0.04	0.01	NPAR	UTL	2730 [79%]
SB	MN	13	1.00	0.03	0.25	LOGN	UTL	5124
SB	NI	13	1.00	0.71	0.59	N	UCL	30
SB	PB	13	1.00	0.87	0.99	LOGN	UTL	29
SB	V	13	1.00	0.06	0.39	LOGN	UTL	43
SB	ZN	13	1.00	0.03	0.09	LOGN	UTL	149
SB	CO	13	0.92	0.50	0.02	N	UTL	24
SB	K	13	0.92	0.03	E-4	NPAR	UTL	1880 [79%]
SB	BE	13	0.62	0.04	0.01	NPAR	UTL	1.5 [79%]
SB	TL	13	0.62	0.02	0.00	NPAR	UTL	2.9 [79%]
SB	CD	13	0.23	E-5	E-4	NPAR	UTL	2.3 [79%]
SB	AG	13	0.15	E-6	E-4	NPAR	UTL	2.1 [79%]
SB	SB	13	0.15	0.33	0.13	N	UTL	5.7
SB	SE	13	0.15	0.10	0.44	LOGN	UTL	.56
SB	HG	13	0.00	NA	NA	NA	UCL	0.06
SB	NA	13	0.00	NA	NA	NA	UCL	87

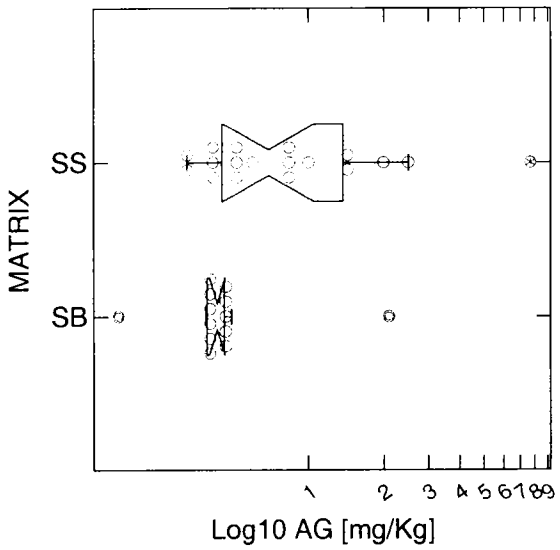
IMPORT successfully completed.

32 cases and 50 variables processed and saved.

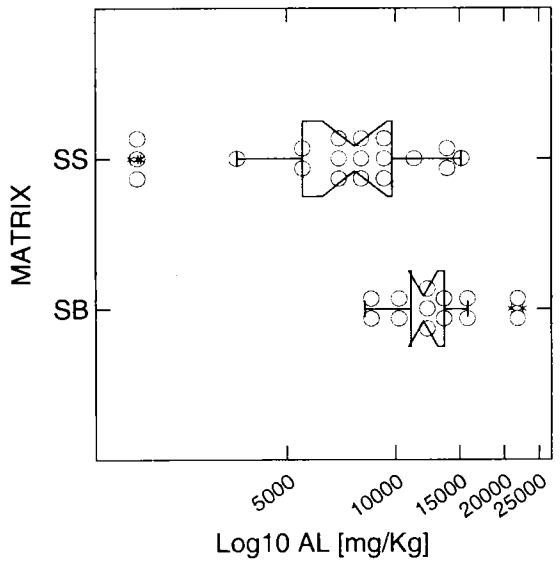
SYSTAT Rectangular file C:\Documents\PROJ\ABL\ana.SYD,
created Tue Mar 07, 2000 at 09:07:14, contains variables:

SID$	MATRIX$	AG	Q1$	AL	Q2$
AS	Q3$	BA	Q4$	BE	Q5$
CA	Q6$	CD	Q7$	CN$	Q8$
CO	Q9$	CR	Q10$	CU	Q11$
FE	Q12$	HG	Q13$	K	Q14$
MG	Q15$	MN	Q16$	NA	Q17$
NI	Q18$	PB	Q19$	SB	Q20$
SE	Q21$	TL	Q22$	V	Q23$
ZN	Q24$				





GSAVE successfully completed.



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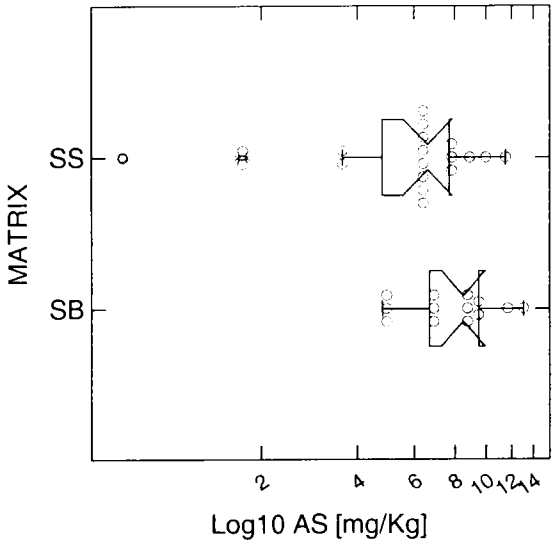

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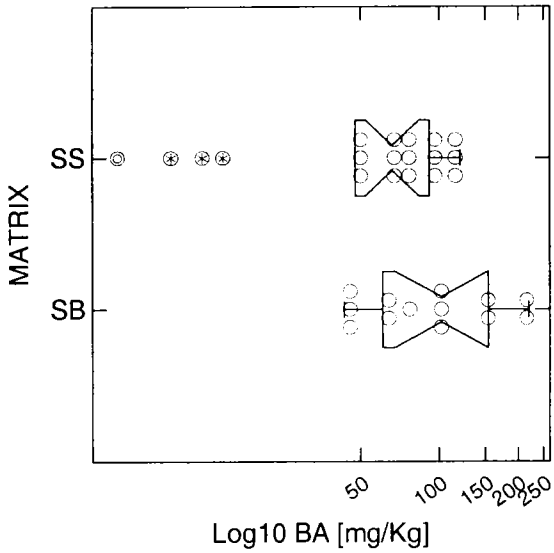

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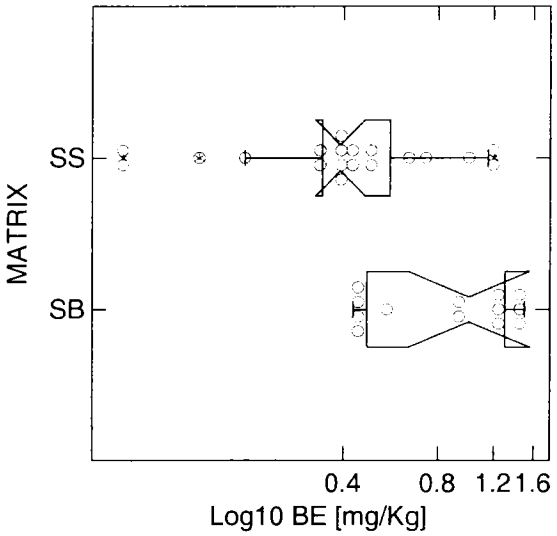

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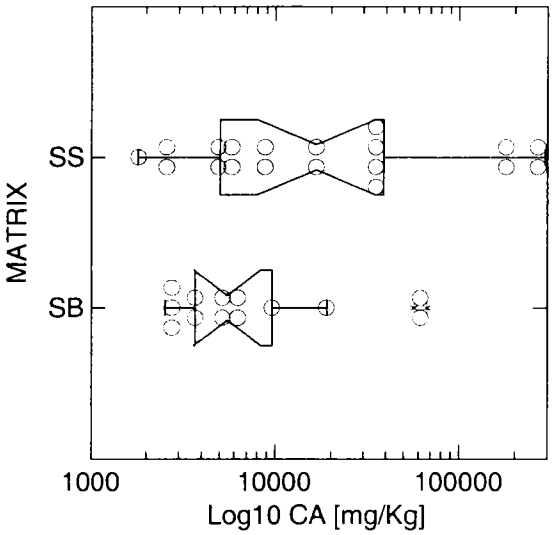

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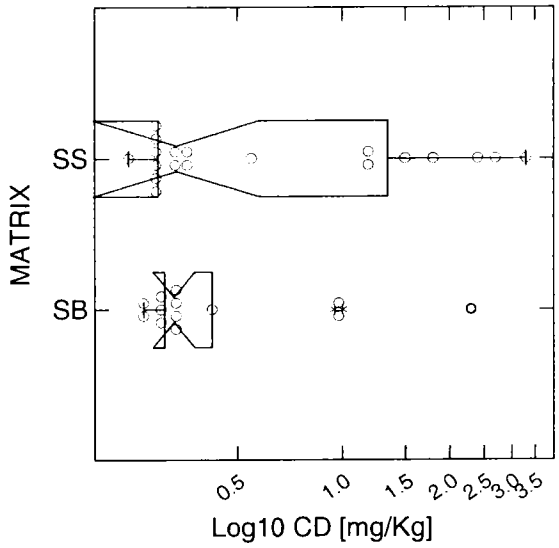

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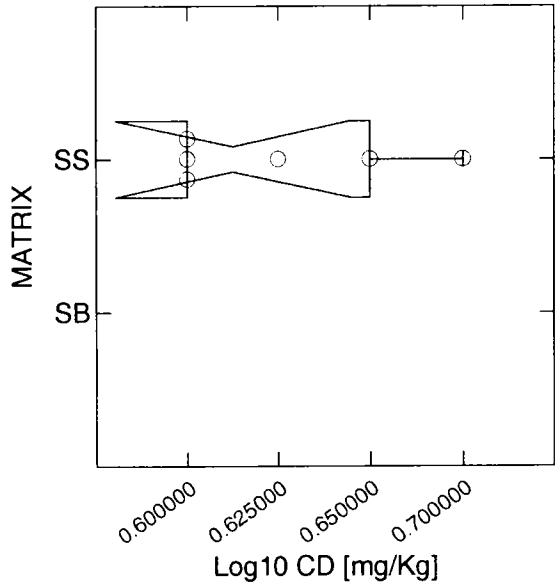

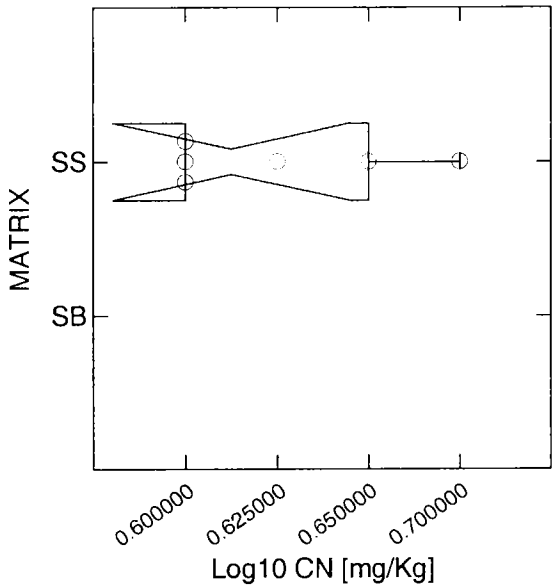

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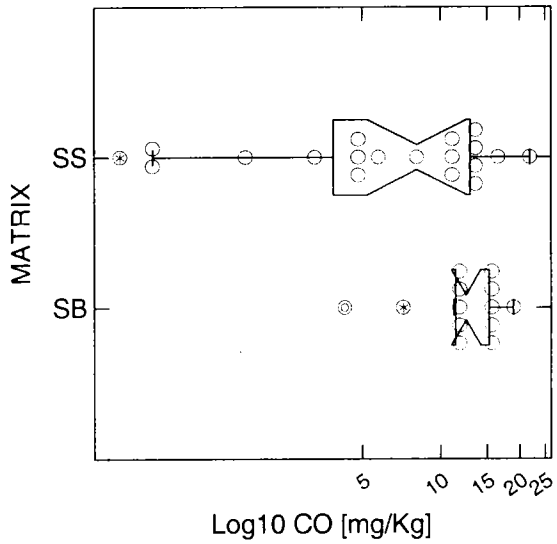

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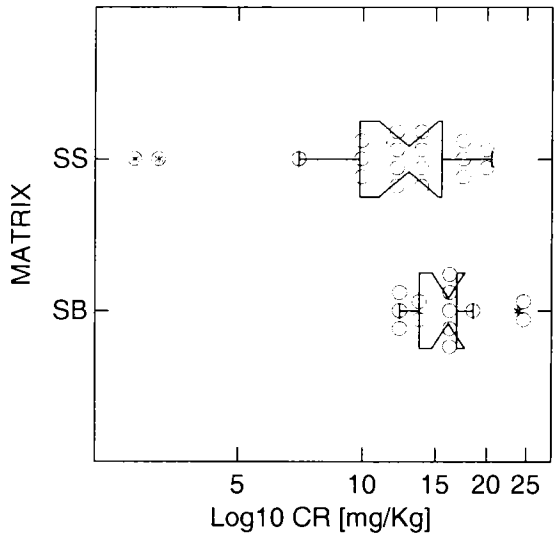

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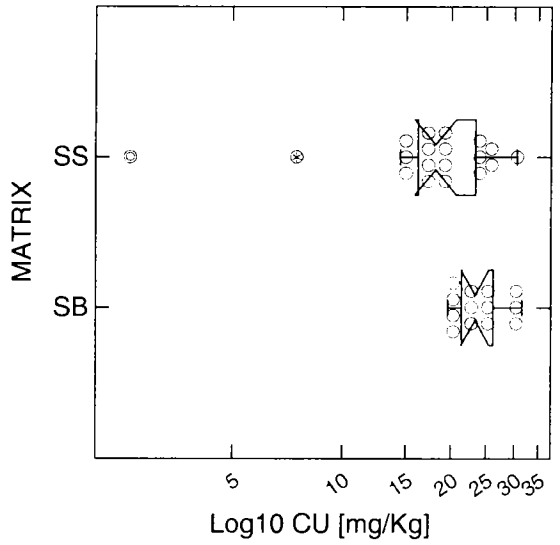

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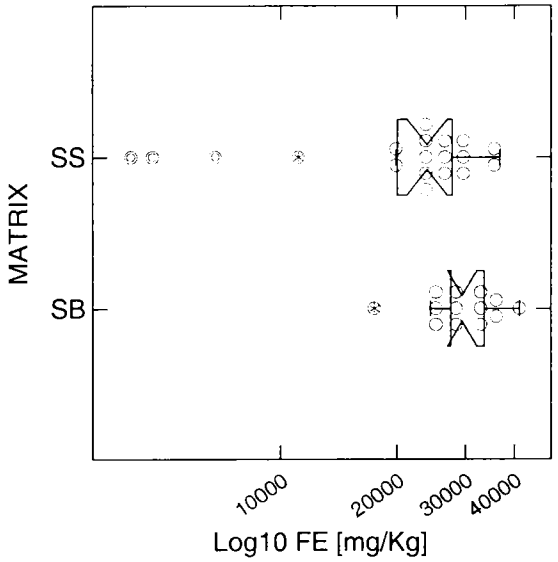

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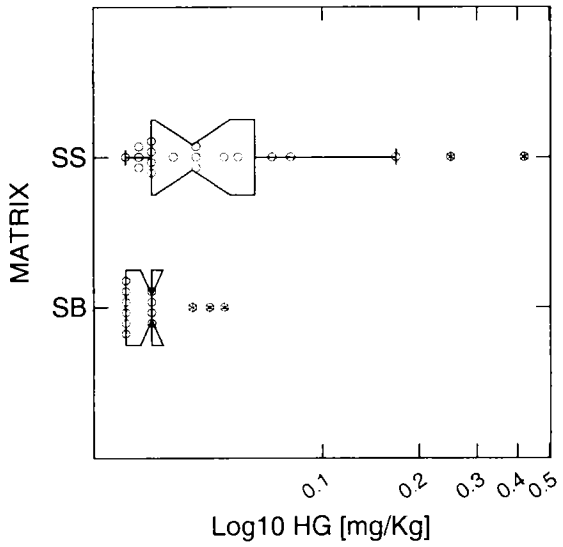

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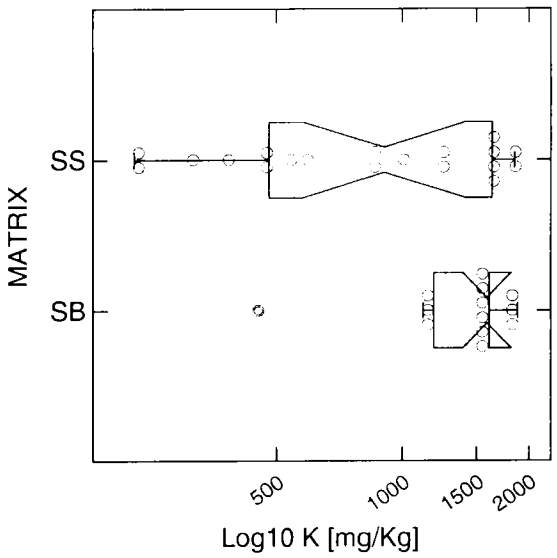

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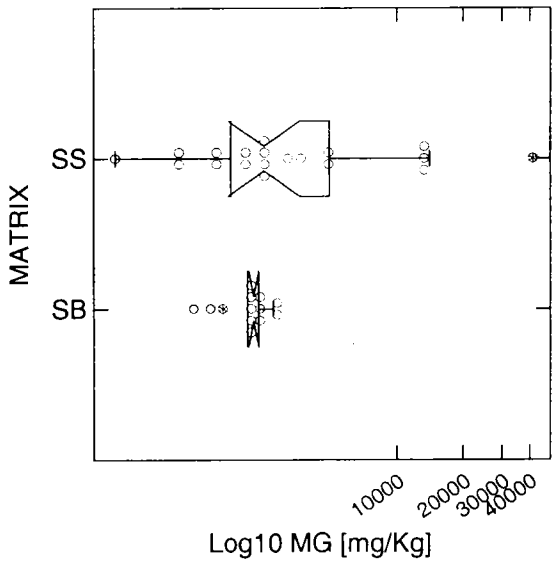

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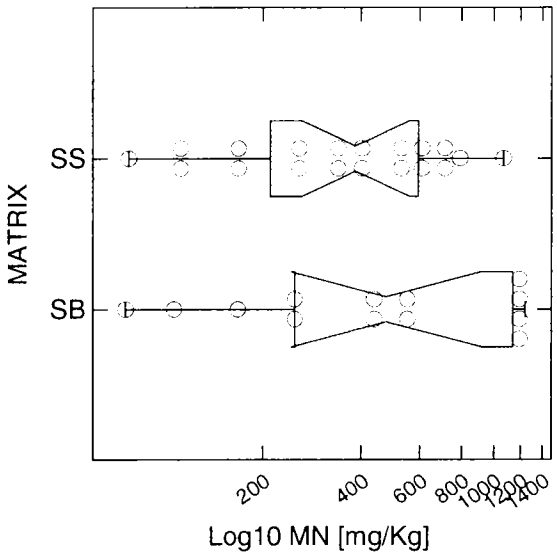

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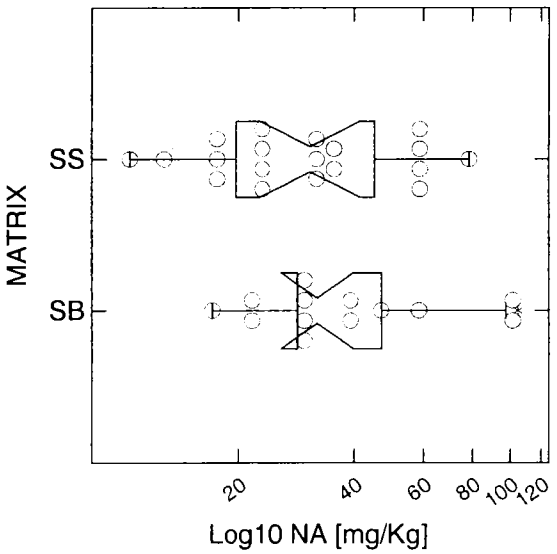

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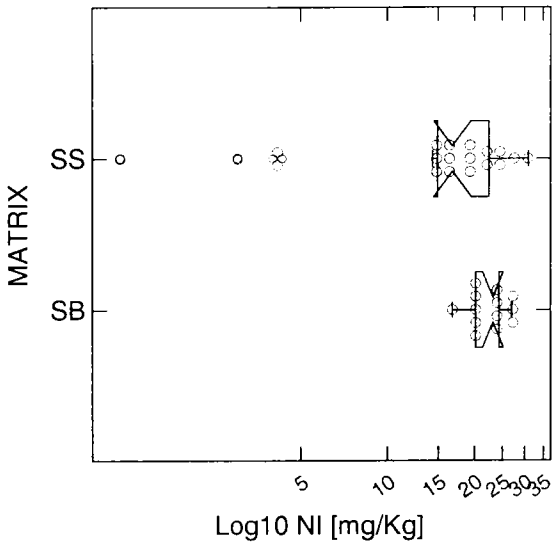

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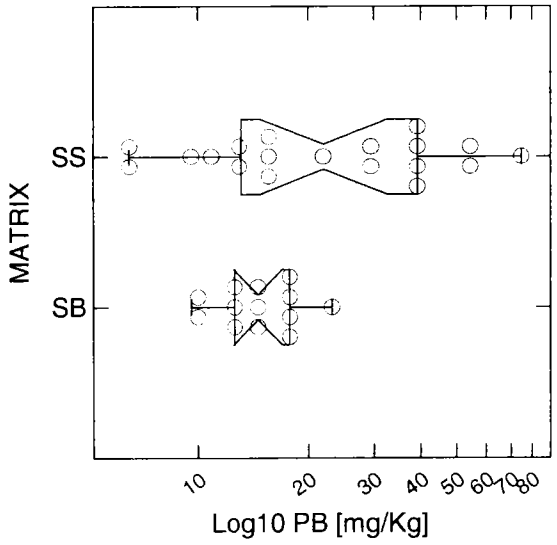

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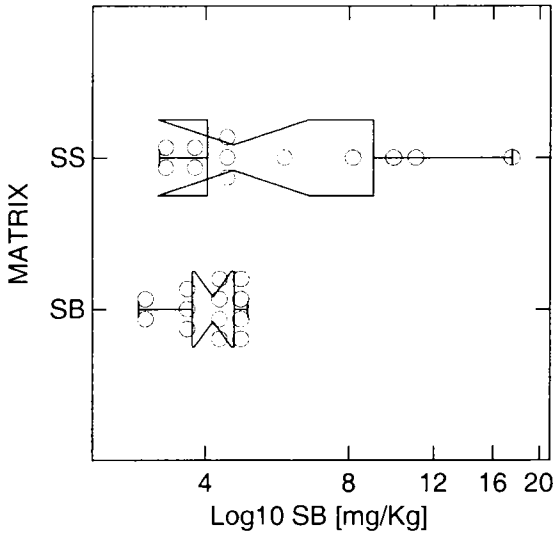

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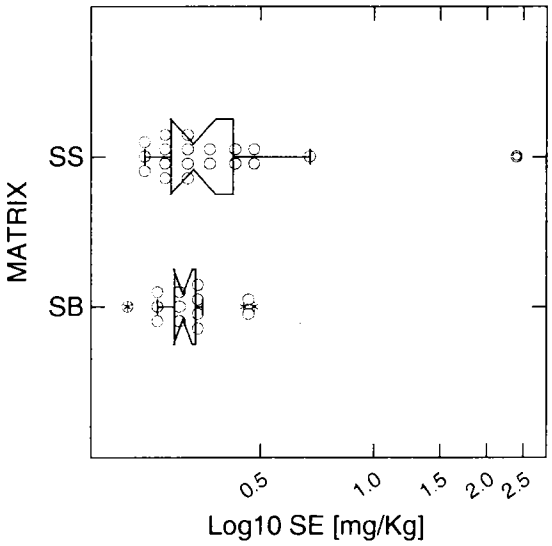

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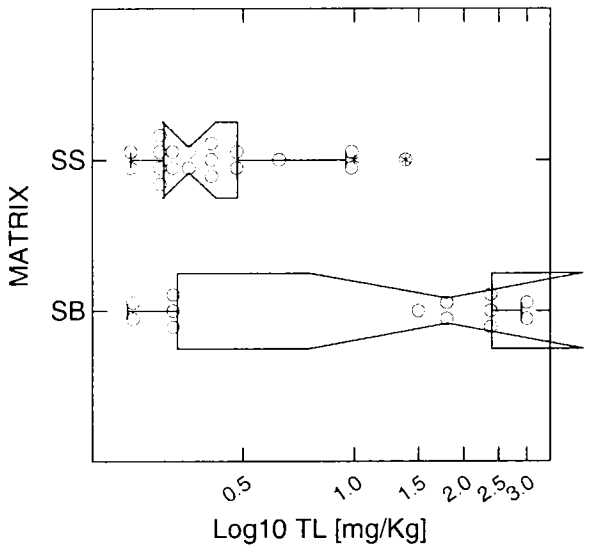

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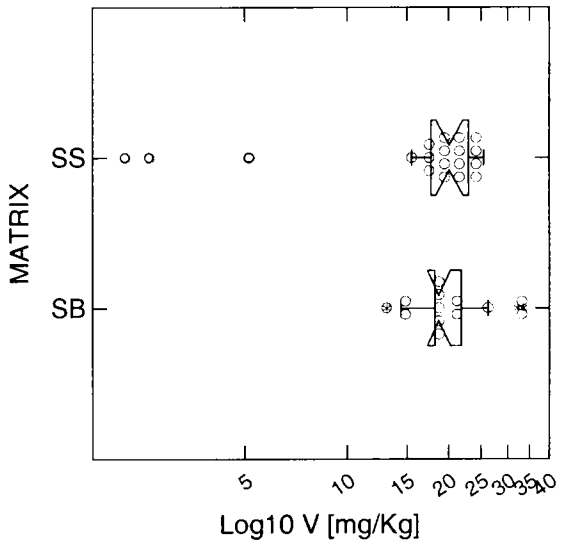

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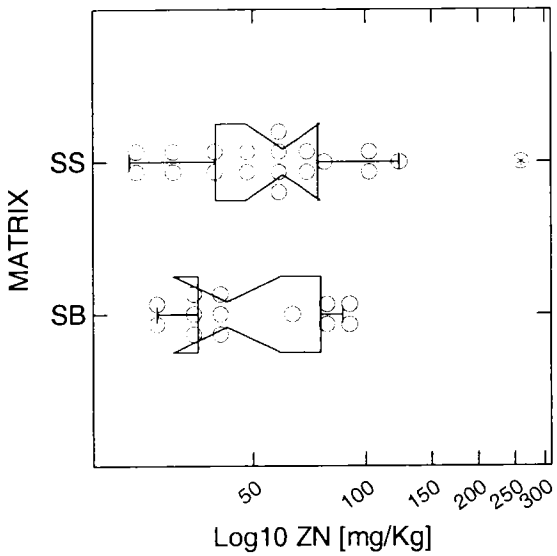

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Two-sample t test on AG grouped by MATRIX$

Group	N	Mean	SD
SB	13	0.542	0.475
SS	18	1.265	1.717

Separate Variance t = -1.698 df = 20.5 Prob = 0.105
Dunn-Sidak Adjusted Prob = 0.921
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.723 95.00% CI = -1.609 to 0.164

Pooled Variance t = -1.471 df = 29 Prob = 0.152
Dunn-Sidak Adjusted Prob = 0.977
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.723 95.00% CI = -1.728 to 0.282

Two-sample t test on AL grouped by MATRIX$

Group	N	Mean	SD
SB	13	13127.692	4306.759
SS	19	7846.316	3944.743

Separate Variance t = 3.524 df = 24.4 Prob = 0.002
Dunn-Sidak Adjusted Prob = 0.039

Bonferroni Adjusted Prob = 0.039
Difference in Means = 5281.377 95.00% CI = 2190.954 to 8371.799

Pooled Variance t = 3.585 df = 30 Prob = 0.001
Dunn-Sidak Adjusted Prob = 0.027
Bonferroni Adjusted Prob = 0.027
Difference in Means = 5281.377 95.00% CI = 2272.367 to 8290.386

Two-sample t test on AS grouped by MATRIX$

Group	N	Mean	SD
SB	13	8.146	2.536
SS	19	6.182	2.806

Separate Variance t = 2.061 df = 27.6 Prob = 0.049
Dunn-Sidak Adjusted Prob = 0.684
Bonferroni Adjusted Prob = 1.000
Difference in Means = 1.965 95.00% CI = 0.011 to 3.919

Pooled Variance t = 2.021 df = 30 Prob = 0.052
Dunn-Sidak Adjusted Prob = 0.709
Bonferroni Adjusted Prob = 1.000
Difference in Means = 1.965 95.00% CI = -0.021 to 3.950

Two-sample t test on BA grouped by MATRIX$

Group	N	Mean	SD
SB	13	107.669	59.457
SS	19	65.087	35.581

Separate Variance t = 2.314 df = 17.9 Prob = 0.033
Dunn-Sidak Adjusted Prob = 0.535
Bonferroni Adjusted Prob = 0.753
Difference in Means = 42.582 95.00% CI = 3.907 to 81.257

Pooled Variance t = 2.538 df = 30 Prob = 0.017
Dunn-Sidak Adjusted Prob = 0.320
Bonferroni Adjusted Prob = 0.382
Difference in Means = 42.582 95.00% CI = 8.311 to 76.854

Two-sample t test on BE grouped by MATRIX$

Group	N	Mean	SD
SB	13	0.942	0.421
SS	19	0.482	0.328

Separate Variance t = 3.305 df = 21.5 Prob = 0.003
Dunn-Sidak Adjusted Prob = 0.073
Bonferroni Adjusted Prob = 0.076
Difference in Means = 0.459 95.00% CI = 0.171 to 0.748

Pooled Variance t = 3.467 df = 30 Prob = 0.002
Dunn-Sidak Adjusted Prob = 0.036
Bonferroni Adjusted Prob = 0.037
Difference in Means = 0.459 95.00% CI = 0.189 to 0.730

Two-sample t test on CA grouped by MATRIX$

Group	N	Mean	SD
SB	13	14646.923	21498.005
SS	19	63990.526	10297.173

Separate Variance t = -2.076 df = 20.4 Prob = 0.051
Dunn-Sidak Adjusted Prob = 0.698
Bonferroni Adjusted Prob = 1.000
Difference in Means = -49343.603 95.00% CI = -98870.114 to 182.908

Pooled Variance t = -1.738 df = 30 Prob = 0.092
Dunn-Sidak Adjusted Prob = 0.893
Bonferroni Adjusted Prob = 1.000
Difference in Means = -49343.603 95.00% CI = -1.073E+05 to 8633.381

Two-sample t test on CD grouped by MATRIX$

Group	N	Mean	SD
SB	13	0.577	0.573
SS	19	0.945	0.959

Separate Variance t = -1.357 df = 29.6 Prob = 0.185
Dunn-Sidak Adjusted Prob = 0.991
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.368 95.00% CI = -0.923 to 0.186

Pooled Variance t = -1.238 df = 30 Prob = 0.225
Dunn-Sidak Adjusted Prob = 0.997
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.368 95.00% CI = -0.976 to 0.239

Two-sample t test on CO grouped by MATRIX$

Group	N	Mean	SD
SB	13	12.862	3.967
SS	19	8.492	6.053

Separate Variance t = 2.466 df = 30.0 Prob = 0.020
Dunn-Sidak Adjusted Prob = 0.366
Bonferroni Adjusted Prob = 0.451
Difference in Means = 4.369 95.00% CI = 0.751 to 7.988

Pooled Variance t = 2.283 df = 30 Prob = 0.030
Dunn-Sidak Adjusted Prob = 0.500
Bonferroni Adjusted Prob = 0.683
Difference in Means = 4.369 95.00% CI = 0.460 to 8.279

Two-sample t test on CR grouped by MATRIX$

Group	N	Mean	SD
SB	13	.369	16 846 3.
SS	19	.587	12 852 4.

Separate Variance t = 2.454 df = 29.2 Prob = 0.020
Dunn-Sidak Adjusted Prob = 0.377
Bonferroni Adjusted Prob = 0.468
Difference in Means = 3.782 95.00% CI = 0.631 to 6.934

Pooled Variance t = 2.347 df = 30 Prob = 0.026
Dunn-Sidak Adjusted Prob = 0.450
Bonferroni Adjusted Prob = 0.591
Difference in Means = 3.782 95.00% CI = 0.492 to 7.073

Two-sample t test on CU grouped by MATRIX$

Group	N	Mean	SD
SB	13	.600	24 022 4.
SS	19	.597	18 450 6.

Separate Variance t = 3.239 df = 29.8 Prob = 0.003
Dunn-Sidak Adjusted Prob = 0.065
Bonferroni Adjusted Prob = 0.068
Difference in Means = 6.003 95.00% CI = 2.217 to 9.788

Pooled Variance t = 2.975 df = 30 Prob = 0.006
Dunn-Sidak Adjusted Prob = 0.124
Bonferroni Adjusted Prob = 0.132
Difference in Means = 6.003 95.00% CI = 1.881 to 10.124

Two-sample t test on FE grouped by MATRIX$

Group	N	Mean	SD
SB	13	30215.385	5989.970
SS	19	22163.158	9300.465

Separate Variance t = 2.978 df = 29.9 Prob = 0.006
Dunn-Sidak Adjusted Prob = 0.123
Bonferroni Adjusted Prob = 0.131
Difference in Means = 8052.227 95.00% CI = 2529.081 to 13575.372

Pooled Variance t = 2.748 df = 30 Prob = 0.010
Dunn-Sidak Adjusted Prob = 0.207
Bonferroni Adjusted Prob = 0.231
Difference in Means = 8052.227 95.00% CI = 2068.983 to 14035.470

Two-sample t test on HG grouped by MATRIX$

Group	N	Mean	SD
SB	13	0.031	0.008
SS	19	0.078	0.100

Separate Variance t = -2.029 df = 18.4 Prob = 0.057

Dunn-Sidak Adjusted Prob = 0.742
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.047 95.00% CI = -0.096 to 0.002

Pooled Variance t = -1.675 df = 30 Prob = 0.104
Dunn-Sidak Adjusted Prob = 0.921
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.047 95.00% CI = -0.104 to 0.010

Two-sample t test on K grouped by MATRIX$

Group	N	Mean	SD
SB	13	1447.231	383.961
SS	19	990.842	587.047

Separate Variance t = 2.658 df = 30.0 Prob = 0.012
Dunn-Sidak Adjusted Prob = 0.251
Bonferroni Adjusted Prob = 0.287
Difference in Means = 456.389 95.00% CI = 105.730 to 807.048

Pooled Variance t = 2.460 df = 30 Prob = 0.020
Dunn-Sidak Adjusted Prob = 0.370
Bonferroni Adjusted Prob = 0.457
Difference in Means = 456.389 95.00% CI = 77.447 to 835.331

Two-sample t test on MG grouped by MATRIX$

Group	N	Mean	SD
SB	13	2108.462	436.517
SS	19	6189.066	9493.331

Separate Variance t = -1.871 df = 18.1 Prob = 0.078
Dunn-Sidak Adjusted Prob = 0.844
Bonferroni Adjusted Prob = 1.000
Difference in Means = -4080.604 95.00% CI = -8661.292 to 500.084

Pooled Variance t = -1.541 df = 30 Prob = 0.134
Dunn-Sidak Adjusted Prob = 0.963
Bonferroni Adjusted Prob = 1.000
Difference in Means = -4080.604 95.00% CI = -9489.895 to 1328.686

Two-sample t test on MN grouped by MATRIX$

Group	N	Mean	SD
SB	13	585.400	445.717
SS	19	429.179	269.543

Separate Variance t = 1.130 df = 18.0 Prob = 0.273
Dunn-Sidak Adjusted Prob = 0.999
Bonferroni Adjusted Prob = 1.000
Difference in Means = 156.221 95.00% CI = -134.169 to 446.611

Pooled Variance t = 1.237 df = 30 Prob = 0.226
Dunn-Sidak Adjusted Prob = 0.997
Bonferroni Adjusted Prob = 1.000
Difference in Means = 156.221 95.00% CI = -101.645 to 414.087

Two-sample t test on NA grouped by MATRIX$

Group	N	Mean	SD
SB	13	.658	.753
SS	19	.361	.458

Separate Variance t = 1.045 df = 19.9 Prob = 0.309
Dunn-Sidak Adjusted Prob = 1.000
Bonferroni Adjusted Prob = 1.000
Difference in Means = 9.297 95.00% CI = -9.268 to 27.863

Pooled Variance t = 1.116 df = 30 Prob = 0.273
Dunn-Sidak Adjusted Prob = 0.999
Bonferroni Adjusted Prob = 1.000
Difference in Means = 9.297 95.00% CI = -7.710 to 26.304

Two-sample t test on NI grouped by MATRIX$

Group	N	Mean	SD
SB	13	.308	2.947
SS	19	.866	8.483

Separate Variance t = 2.578 df = 23.8 Prob = 0.017
Dunn-Sidak Adjusted Prob = 0.319
Bonferroni Adjusted Prob = 0.381
Difference in Means = 5.442 95.00% CI = 1.084 to 9.800

Pooled Variance t = 2.214 df = 30 Prob = 0.035
Dunn-Sidak Adjusted Prob = 0.555
Bonferroni Adjusted Prob = 0.796
Difference in Means = 5.442 95.00% CI = 0.421 to 10.462

Two-sample t test on PB grouped by MATRIX$

Group	N	Mean	SD
SB	13	.208	3.825
SS	19	.847	.274

Separate Variance t = -2.780 df = 20.0 Prob = 0.012
Dunn-Sidak Adjusted Prob = 0.235
Bonferroni Adjusted Prob = 0.266
Difference in Means = -12.640 95.00% CI = -22.124 to -3.155

Pooled Variance t = -2.322 df = 30 Prob = 0.027
Dunn-Sidak Adjusted Prob = 0.470
Bonferroni Adjusted Prob = 0.626
Difference in Means = -12.640 95.00% CI = -23.757 to -1.522

Two-sample t test on SB grouped by MATRIX$

Group	N	Mean	SD
SB	13	4.062	0.631
SS	12	6.725	4.259

Separate Variance t = -2.145 df = 11.4 Prob = 0.054
Dunn-Sidak Adjusted Prob = 0.722
Bonferroni Adjusted Prob = 1.000
Difference in Means = -2.663 95.00% CI = -5.384 to 0.057

Pooled Variance t = -2.233 df = 23 Prob = 0.036
Dunn-Sidak Adjusted Prob = 0.566
Bonferroni Adjusted Prob = 0.819
Difference in Means = -2.663 95.00% CI = -5.131 to -0.196

Two-sample t test on SE grouped by MATRIX$

Group	N	Mean	SD
SB	13	0.327	0.071
SS	19	0.464	0.480

Separate Variance t = -1.226 df = 19.1 Prob = 0.235
Dunn-Sidak Adjusted Prob = 0.998
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.137 95.00% CI = -0.372 to 0.097

Pooled Variance t = -1.017 df = 30 Prob = 0.317
Dunn-Sidak Adjusted Prob = 1.000
Bonferroni Adjusted Prob = 1.000
Difference in Means = -0.137 95.00% CI = -0.413 to 0.138

Two-sample t test on TL grouped by MATRIX$

Group	N	Mean	SD
SB	13	1.505	1.074
SS	19	0.481	0.306

Separate Variance t = 3.344 df = 13.3 Prob = 0.005
Dunn-Sidak Adjusted Prob = 0.111
Bonferroni Adjusted Prob = 0.118
Difference in Means = 1.024 95.00% CI = 0.364 to 1.684

Pooled Variance t = 3.953 df = 30 Prob = 0.000
Dunn-Sidak Adjusted Prob = 0.010
Bonferroni Adjusted Prob = 0.010
Difference in Means = 1.024 95.00% CI = 0.495 to 1.553

Two-sample t test on V grouped by MATRIX$

Group	N	Mean	SD
SB	13	20 .862	6. 263
SS	19	18 .213	7. 164

Separate Variance t = 1.108 df = 28.1 Prob = 0.277

Dunn-Sidak Adjusted Prob = 0.999
Bonferroni Adjusted Prob = 1.000
Difference in Means = 2.648 95.00% CI = -2.249 to 7.546

Pooled Variance t = 1.079 df = 30 Prob = 0.289
Dunn-Sidak Adjusted Prob = 1.000
Bonferroni Adjusted Prob = 1.000
Difference in Means = 2.648 95.00% CI = -2.363 to 7.660

Two-sample t test on ZN grouped by MATRIX$

Group	N	Mean	SD
SB	13	52.462	22.345
SS	19	70.082	53.504

Separate Variance t = -1.281 df = 25.8 Prob = 0.211
Dunn-Sidak Adjusted Prob = 0.996
Bonferroni Adjusted Prob = 1.000
Difference in Means = -17.620 95.00% CI = -45.893 to 10.653

Pooled Variance t = -1.118 df = 30 Prob = 0.272
Dunn-Sidak Adjusted Prob = 0.999
Bonferroni Adjusted Prob = 1.000
Difference in Means = -17.620 95.00% CI = -49.808 to 14.567

Two-sample t test on AG grouped by MATRIX$

Group	N	Mean	SD
SB	13	0.542	0.475
SS	18	1.265	1.717

Separate Variance t = -1.698 df = 20.5 Prob = 0.105
Difference in Means = -0.723 95.00% CI = -1.609 to 0.164

Pooled Variance t = -1.471 df = 29 Prob = 0.152
Difference in Means = -0.723 95.00% CI = -1.728 to 0.282
IMPORT successfully completed.

32 cases and 50 variables processed and saved.

SYSTAT Rectangular file C:\Documents\PROJ\ABL\ANAL.SYD,
created Tue Mar 07, 2000 at 09:41:49, contains variables:

SID$	MATRIX$	AG	Q1$	AL	Q2$
AS	Q3$	BA	Q4$	BE	Q5$
CA	Q6$	CD	Q7$	CN$	Q8$
CO	Q9$	CR	Q10$	CU	Q11$
FE	Q12$	HG	Q13$	K	Q14$
MG	Q15$	MN	Q16$	NA	Q17$
NI	Q18$	PB	Q19$	SB	Q20$
SE	Q21$	TL	Q22$	V	Q23$
ZN	Q24$				

Two-sample t test on AG grouped by MATRIX$

Group	N	Mean	SD
SB	13	-0.787	0.528
SS	18	-0.187	0.822

Separate Variance t = -2.469 df = 28.7 Prob = 0.020
Difference in Means = -0.600 95.00% CI = -1.097 to -0.103

Pooled Variance t = -2.304 df = 29 Prob = 0.029
Difference in Means = -0.600 95.00% CI = -1.132 to -0.067

Two-sample t test on AL grouped by MATRIX$

Group	N	Mean	SD
SB	13	9.439	0.300
SS	19	8.804	0.651

Separate Variance t = 3.713 df = 27.0 Prob = 0.001
Difference in Means = 0.635 95.00% CI = 0.284 to 0.986

Pooled Variance t = 3.273 df = 30 Prob = 0.003
Difference in Means = 0.635 95.00% CI = 0.239 to 1.031

Two-sample t test on AS grouped by MATRIX$

Group	N	Mean	SD
SB	13	2.052	0.318
SS	19	1.657	0.693

Separate Variance t = 2.170 df = 27.0 Prob = 0.039
Difference in Means = 0.394 95.00% CI = 0.021 to 0.767

Pooled Variance t = 1.912 df = 30 Prob = 0.065
Difference in Means = 0.394 95.00% CI = -0.027 to 0.816

Two-sample t test on BA grouped by MATRIX$

Group	N	Mean	SD
SB	13	4.540	0.550
SS	19	3.907	0.908

Separate Variance t = 2.451 df = 29.7 Prob = 0.020
Difference in Means = 0.633 95.00% CI = 0.105 to 1.160

Pooled Variance t = 2.241 df = 30 Prob = 0.033
Difference in Means = 0.633 95.00% CI = 0.056 to 1.209

Two-sample t test on BE grouped by MATRIX$

Group	N	Mean	SD
SB	13	-0.171	0.509
SS	19	-0.971	0.767

Separate Variance t = 3.545 df = 30.0 Prob = 0.001
Difference in Means = 0.800 95.00% CI = 0.339 to 1.261

Pooled Variance t = 3.288 df = 30 Prob = 0.003
Difference in Means = 0.800 95.00% CI = 0.303 to 1.297

Two-sample t test on CA grouped by MATRIX$

Group	N	Mean	SD
SB	13	8.905	1.092
SS	19	9.826	1.656

Separate Variance t = -1.896 df = 30.0 Prob = 0.068
Difference in Means = -0.921 95.00% CI = -1.913 to 0.071

Pooled Variance t = -1.756 df = 30 Prob = 0.089
Difference in Means = -0.921 95.00% CI = -1.992 to 0.150

Two-sample t test on CD grouped by MATRIX$

Group	N	Mean	SD
SB	13	-0.810	0.651
SS	19	-0.490	0.920

Separate Variance t = -1.149 df = 29.9 Prob = 0.260
Difference in Means = -0.319 95.00% CI = -0.887 to 0.248

Pooled Variance t = -1.078 df = 30 Prob = 0.290
Difference in Means = -0.319 95.00% CI = -0.924 to 0.286

Two-sample t test on CO grouped by MATRIX$

Group	N	Mean	SD
SB	13	2.494	0.395
SS	19	1.736	1.099

Separate Variance t = 2.758 df = 24.2 Prob = 0.011
Difference in Means = 0.758 95.00% CI = 0.191 to 1.326

Pooled Variance t = 2.374 df = 30 Prob = 0.024
Difference in Means = 0.758 95.00% CI = 0.106 to 1.411

Two-sample t test on CR grouped by MATRIX$

Group	N	Mean	SD
SB	13	2.772	0.219
SS	19	2.426	0.540

Separate Variance t = 2.511 df = 25.5 Prob = 0.019
Difference in Means = 0.346 95.00% CI = 0.063 to 0.630

Pooled Variance t = 2.185 df = 30 Prob = 0.037
Difference in Means = 0.346 95.00% CI = 0.023 to 0.670

Two-sample t test on CU grouped by MATRIX$

Group	N	Mean	SD
SB	13	3.191	0.158
SS	19	2.825	0.543

Separate Variance t = 2.768 df = 22.2 Prob = 0.011
Difference in Means = 0.366 95.00% CI = 0.092 to 0.639

Pooled Variance t = 2.349 df = 30 Prob = 0.026
Difference in Means = 0.366 95.00% CI = 0.048 to 0.683

Two-sample t test on FE grouped by MATRIX$

Group	N	Mean	SD
SB	13	10 .296	0. 215
SS	19	9. 862	0. 643

Separate Variance t = 2.730 df = 23.4 Prob = 0.012
Difference in Means = 0.434 95.00% CI = 0.106 to 0.763

Pooled Variance t = 2.337 df = 30 Prob = 0.026
Difference in Means = 0.434 95.00% CI = 0.055 to 0.814

Two-sample t test on HG grouped by MATRIX$

Group	N	Mean	SD
SB	13	-3.498	0.243
SS	19	-2.967	0.803

Separate Variance t = -2.707 df = 22.5 Prob = 0.013
Difference in Means = -0.531 95.00% CI = -0.937 to -0.125

Pooled Variance t = -2.303 df = 30 Prob = 0.028
Difference in Means = -0.531 95.00% CI = -1.002 to -0.060

Two-sample t test on K grouped by MATRIX$

Group	N	Mean	SD
SB	13	7.227	0.373
SS	19	6.689	0.709

Separate Variance t = 2.792 df = 28.5 Prob = 0.009
Difference in Means = 0.538 95.00% CI = 0.144 to 0.933

Pooled Variance t = 2.501 df = 30 Prob = 0.018
Difference in Means = 0.538 95.00% CI = 0.099 to 0.978

Two-sample t test on MG grouped by MATRIXS

Group	N	Mean	SD
SB	13	7.630	0.239
SS	19	8.090	1.070

Separate Variance t = -1.808 df = 20.5 Prob = 0.085
Difference in Means = -0.460 95.00% CI = -0.989 to 0.070

Pooled Variance t = -1.516 df = 30 Prob = 0.140
Difference in Means = -0.460 95.00% CI = -1.079 to 0.160

Two-sample t test on MN grouped by MATRIX$

Group	N	Mean	SD
SB	13	6.026	0.942
SS	19	5.835	0.746

Separate Variance t = 0.614 df = 21.8 Prob = 0.546
Difference in Means = 0.192 95.00% CI = -0.456 to 0.840

Pooled Variance t = 0.642 df = 30 Prob = 0.526
Difference in Means = 0.192 95.00% CI = -0.418 to 0.802

Two-sample t test on NA grouped by MATRIX$

Group	N	Mean	SD
SB	13	3.625	0.547
SS	19	3.386	0.571

Separate Variance t = 1.195 df = 26.7 Prob = 0.243
Difference in Means = 0.240 95.00% CI = -0.172 to 0.651

Pooled Variance t = 1.185 df = 30 Prob = 0.245
Difference in Means = 0.240 95.00% CI = -0.173 to 0.653

Two-sample t test on NI grouped by MATRIX$

Group	N	Mean	SD
SB	13	3.097	0.135
SS	19	2.581	0.888

Separate Variance t = 2.491 df = 19.2 Prob = 0.022
Difference in Means = 0.516 95.00% CI = 0.083 to 0.949

Pooled Variance t = 2.068 df = 30 Prob = 0.047
Difference in Means = 0.516 95.00% CI = 0.006 to 1.025

Two-sample t test on PB grouped by MATRIXS

Group	N	Mean	SD
SB	13	2.693	0.251
SS	19	3.087	0.734

Separate Variance t = -2.163 df = 23.7 Prob = 0.041
Difference in Means = -0.394 95.00% CI = -0.770 to -0.018

Pooled Variance t = -1.855 df = 30 Prob = 0.073
Difference in Means = -0.394 95.00% CI = -0.828 to 0.040

Two-sample t test on SB grouped by MATRIX$

Group	N	Mean	SD
SB	13	1.389	0.166
SS	12	1.761	0.532

Separate Variance t = -2.320 df = 13.0 Prob = 0.037
Difference in Means = -0.372 95.00% CI = -0.718 to -0.025

Pooled Variance t = -2.401 df = 23 Prob = 0.025
Difference in Means = -0.372 95.00% CI = -0.692 to -0.051

Two-sample t test on SE grouped by MATRIX$

Group	N	Mean	SD
SB	13	-1.139	0.206
SS	19	-0.966	0.516

Separate Variance t = -1.318 df = 25.3 Prob = 0.199
Difference in Means = -0.173 95.00% CI = -0.444 to 0.097

Pooled Variance t = -1.145 df = 30 Prob = 0.261
Difference in Means = -0.173 95.00% CI = -0.482 to 0.136

Two-sample t test on TL grouped by MATRIX$

Group	N	Mean	SD
SB	13	0.010	1.049
SS	19	-0.868	0.494

Separate Variance t = 2.813 df = 15.7 Prob = 0.013
Difference in Means = 0.879 95.00% CI = 0.215 to 1.542

Pooled Variance t = 3.186 df = 30 Prob = 0.003
Difference in Means = 0.879 95.00% CI = 0.315 to 1.442

Two-sample t test on V grouped by MATRIXS

Group	N	Mean	SD
SB	13	3.000	0.281
SS	19	2.734	0.742

Separate Variance t = 1.420 df = 24.7 Prob = 0.168
Difference in Means = 0.266 95.00% CI = -0.120 to 0.651

Pooled Variance t = 1.227 df = 30 Prob = 0.229
Difference in Means = 0.266 95.00% CI = -0.176 to 0.708

Two-sample t test on ZN grouped by MATRIX$

Group	N	Mean	SD
SB	13	3.878	0.420
SS	19	4.064	0.591

Separate Variance t = -1.039 df = 29.9 Prob = 0.307
Difference in Means = -0.186 95.00% CI = -0.551 to 0.180

Pooled Variance t = -0.974 df = 30 Prob = 0.338
Difference in Means = -0.186 95.00% CI = -0.575 to 0.204