STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
protecting the future for generations
Jim Gibbons, Governor
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July 9, 2009

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Re. **BMI Plant Sites and Common Areas Projects, Henderson, Nevada**
Significance Levels for The Gilbert Toolbox of Background Comparison Tests

Dear Sirs and Madam:

All of the parties listed above shall be referred to as “the Companies” for the purposes of this letter. Attachment A contains guidance on selection of significance levels for background comparison tests. Please consider this in all future background comparison tests.

Please contact me with any questions (tel: 702-486-2850 x247; e-mail: brakvica@ndep.nv.gov).

Sincerely,

Brian A Rakvica, P.E.
Supervisor, Special Projects Branch
Bureau of Corrective Actions
Fax: (702) 486-5733

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Attachment A (only distributed electronically)

Significance Levels for The Gilbert Toolbox of Background Comparison Tests

Prepared For:

Nevada Division of Environmental Protection
Bureau of Corrective Actions
Special Projects Branch
2030 East Flamingo Road, Suite 230
Las Vegas, NV 89119

June 2009

Prepared By:

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Overview

In February 2006, Basic Remediation Company (BRC) executed the *Settlement Agreement and Administrative Order on Consent: BMI Common Areas, Phase 3* with the Nevada Division of Environmental Protection (NDEP) for certain property located in Clark County, Nevada, which compose the "Basic Management, Inc. (BMI) Common Areas". In response, BRC has prepared a *Closure Plan* that conceptually describes the steps that BRC will undertake to assess human health and environmental risks at the Site and, hence, to make risk-based decisions. The process described in the BRC *Closure Plan* is similar to the risk-based decision making process described in United States Environmental Protection Agency (USEPA) regulatory guidance under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) programs. Other companies associated with the BMI Complex are in the process of developing similar documents that will also follow the same basic process for risk assessment, so that risk assessments conducted at the BMI Complex and Common Areas projects will be consistent. One of the important components of risk assessment is chemical of potential concern (COPC) selection, which, among other things, includes a comparison between site and background concentrations to determine if a release of chemicals has occurred.

For the BMI Complex and Common Areas projects, background comparisons are currently limited to metals and radionuclides, because it is these chemicals that can cause a level of human health risk of concern at background levels. The focus is hence, natural rather than anthropogenic background concentrations in the soils of the BMI Complex and Common Areas (hereinafter, "the Site"). A requirement of background comparisons is to properly characterize background conditions for the variable soils that comprise the Site. At least four different geologies have been identified across the Site, emanating from the McCullough and River Mountain ranges, as well as, the tertiary Muddy Creek formation. Suitable background reference areas have been found, so that background concentrations for metals and radionuclides are well characterized at the Site.

For each sub-area at the Site, the appropriate subset of the background data set must be identified before background comparisons are performed. Background comparisons then follow USEPA guidance documents on the subject. For example, USEPA guidance describes how background plays a role in the CERCLA risk assessment process, and that the guidance should be applied on a site-specific basis with assistance from a statistician familiar with the CERCLA process (USEPA, 2002). Details of the appropriate statistical methods for background comparisons are also contained in USEPA, 2002. USEPA's Office of Environmental Information (2006) describes methods for background comparisons in its Data Quality Assessment Guidance (USEPA, 2006).

The focus of these guidance documents is background comparisons for chemical concentrations in soil. However, the same basic statistical tests could be used for other media. For example, the same statistical tests might be appropriate for comparison of up gradient and down gradient groundwater or air conditions, bearing in mind that comparisons in these media might require additional analyses of release and transport, involve more complex spatial and temporal sampling strategies, and require different ways of combining and analyzing data.

The USEPA guidance documents describe exploratory methods for displaying and viewing site and background data, and formal statistical background comparison tests. The statistical tests that are recommended in these guidance documents originated in the work of Richard O. Gilbert and some of his colleagues at the Pacific Northwest National Laboratory (PNNL). Relevant papers include Gilbert and Simpson, 1990, 1992 and 1994, Hardin and Gilbert, 1993, and O'Brien and Gilbert, 1997. Dr. Gilbert is also the primary author of several of the above referenced guidance documents. This concerted effort led to the suite of statistical background comparison tests to be named "The Gilbert Toolbox", which consists of the *t*-test, the Gehan test as a modification of the Wilcoxon Rank Sum test, the quantile test, and the slippage test. Dr. Gilbert is also the author of the seminal publication on environmental statistics (Gilbert, 1987) that describes methods for analysis of environmental data from exploratory data analysis to calculation of upper confidence limits to support risk assessment.

The Gilbert Toolbox consists of a suite of four classical statistical hypothesis tests, which are usually evaluated against a default significance level, such as 0.05. However, in recognition that all four tests are often performed simultaneously on the same data set for an individual chemical, the value of 0.05 should be thought of as the familywise significance level. The familywise error rate is the probability of making one or more false discoveries of a statistical effect among all the hypotheses when performing multiple tests on the same data. A different, lower, significance level should be used for each individual statistical test to achieve the desired familywise significance level because the chance of making a false discovery in one test is less than the chance of making a false discovery in the family of tests. No adjustment would be needed if the four tests are fully dependent, and an adjustment of a factor of approximately four would be needed if the four tests are fully independent. An adjustment between these two extremes is expected.

The purpose of this paper is to evaluate the effect of running the four tests in the Gilbert Toolbox to determine appropriate adjustments to the familywise significance level that are needed to evaluate each test individually. Dr. Gilbert and his colleagues performed a similar evaluation in the 1990s, but the work was never published. Dr. Gilbert recently suggested that a similar evaluation be performed now, so that a citable document is available (Gilbert, 2009).

The remainder of this document focuses on the simulation study performed to evaluate appropriate significance levels for the four individual tests across a range of sample sizes and distributions of site and background data. BRC has been using a nominal significance level of 0.025 based on Neptune and Company's (Neptune) recommendation and Neptune's knowledge of Dr. Gilbert's and PNNL's previous simulation study performed in the 1990s. This paper will provide a citable document for the appropriate significance level to use in statistical background comparisons used in risk assessments for the Site.

Gilbert Toolbox Simulation

The Gilbert Toolbox is a suite of four statistical tests that are commonly used to test whether soil concentrations at a potentially contaminated site are similar to background soil concentrations for a given chemical. Typically, the four tests are treated as a "family" of tests, meaning that if the null hypothesis of the site is similar to background it is rejected if any of the four tests show statistical significance. Since the four tests are applied to the same set of data, using a significance level of, for example, 0.05 for each test will lead to a familywise Type I error rate of some value higher than 0.05. Thus, a significance level correction for multiple statistical comparisons, lowering the significance level used by the individual tests, is appropriate for controlling the familywise type I error rate. A Bonferroni correction to the significance level is inappropriate in this case because the four tests are not independent. However, the degree of dependence between the four tests has not been documented sufficiently to construct or recommend a proper correction. This report documents a simulation study undertaken to find an appropriate correction for multiple comparisons for the Gilbert Toolbox.

The Gilbert Toolbox consists of four tests:

1. *t-test*. The *t*-test tests for equality of the means of the site and background concentrations (e.g., Conover, 1980). The theoretical basis of the test assumes that concentrations are normally distributed at both site and background, though the test is fairly robust with respect to this assumption, if sufficient data are available. This test does not directly accommodate data

reported as non-detects – i.e. data reported as simply below some detection limit. A substitution method is required for the censored data. In practice, usually a value of half the detection limit (censoring limit) is used. The *t*-test is run as a one-sided test that reports a significant result only if the site mean concentration is higher than the background mean concentration, while not assuming equal variances for the site and background distributions.

2. *Gehan test*. The Gehan test is a modification of the Wilcoxon Rank Sum test that tests for a location shift in the site concentrations (i.e., a shift of the entire distribution), and was first presented in Gehan, 1965. This non-parametric test ignores the actual concentrations measured and utilizes only the *rank* of the concentrations, and thus it can detect any upward shift of the site concentration distribution with respect to background. The Gehan ranking system if used to rank non-detects according to their possible positions in the full data set. An equivalent ranking approach is also documented in Mantel, 1981. The Gehan test is less efficient than the *t*-test (i.e., it generally requires more data than the *t*-test to detect a difference between site and background), but it is more robust to outliers (i.e., less likely to produce a spurious significant result due to one or two outliers).
3. *Quantile Test*. The quantile test is a non-parametric test of the equality of a given quantile of the site and background distributions (e.g., Gilbert, 1992). That is, it statistically compares the numbers of values greater than the specified quantile that come from the site and background data sets. Any quantile can be tested if sufficient data are available – the more extreme the quantile, the greater the sample size required. Commonly used quantiles are the 75^{th}, 80^{th}, or 90^{th} percentiles. For purposes of this study, only the 75^{th} percentile is discussed, since the sample sizes for typical site evaluations provide little power for testing quantiles beyond the 75^{th}, and the slippage test provides evidence about more extreme quantiles. This implementation of the quantile test accommodates non-detects by using the Gehan ranking scheme.
4. *Slippage Test*. The slippage test is a non-parametric test that compares the extreme tails of the site and background distributions (e.g., Gilbert, 1992). Since the tail of a distribution can only be estimated well with a very large data set, the slippage test has low power for small data sets. The test statistic relies on the maximum concentration in the background data, and thus it is not robust to outliers in the background data set, though it is robust to outliers in the site data set. Non-detects for the slippage test are handled by removing non-detects with detection limits that are greater than the maximum detected concentration in the background data set.

The simulation study considers various conditions involving number of site and background samples, distributions of the site and background data, censoring mechanisms, and inclusion of non-detects. The approach is to develop datasets that have the same distribution, so that the background comparisons should pass the hypothesis test. However, by random chance some tests should fail. The proportion of tests that fail provides an estimate of the significance level that can be used for each individual test assuming a family-wise error rate of 0.05. Tests are evaluated initially using observed significance levels, or *p*-values, which are often compared to nominal significance levels for decision making.

It should be noted that it is not uncommon for the comparison between *p*-value and significance level to be a used definitively. However, it is difficult to argue that a *p*-value of 0.049 is different than a *p*-value of 0.051 when comparing to a significance level of 0.05. Reasonable statements might be made instead by recognizing that a very small *p*-value implies a statistical effect or a statistical difference, a very large *p*-values implies no effect or no difference, and a *p*-value close to the target significance level implies a need for more data collection. That is, the decisions are only obvious in extreme cases. Although a correction to the familywise significance is sought for The Gilbert Toolbox of statistical tests, the effect on practical decision making between using the familywise significance level directly for each test in the Toolbox, or a significance level that has been adjusted for each individual test is likely to be small. Practically, it is important to explore the site and background data using summary statistics and plots, then perform the Gilbert Toolbox of tests to see if the test results confirm what is seen in the data. If the test results do not confirm the exploratory data analysis results, then more questions need to be asked. Otherwise, the conclusions are probably clear.

Description of the Simulation

Each simulation requires the following conditions:

1. A distribution F_d for the measured concentration assuming no non-detects.
2. A mechanism for generating non-detect values (if any).
3. A mechanism for handling non-detects (if any) for the t-test.
4. A sample size N_b for background data.
5. A sample size N_s for site data.

Different combinations of these conditions are evaluated. For each simulation experiment these five conditions are chosen, and the simulation is run as follows:

1. Simulate 10,000 samples of size N_b from the distribution F_d for the background and corresponding 10,000 samples of size N_s from the distribution F_d for the site. (Since interest lies in type I error, both background and site data are identically distributed.)
2. Apply the censoring mechanism to establish a non-detect value for each data point, again applied in identical fashion for background and site, which essentially assumes that the underlying sampling and analysis methods are the same for the site and background data.
3. For each corresponding pair of N_b background samples and N_s site samples, calculate *p*-values for each of the four tests to generate 4 × 10,000 *p*-values.
4. For each set of four tests, the minimum p-value is calculated to generate 10,000 minimal *p*-values.
5. The $(100\alpha)^{th}$ percentile of these 10,000 minimal *p*-values then provides an estimate of the corrected significance level to use for each test in order to obtain a family-wise error-rate of α.

Distributions

In considering a set of possible distributions for the measured concentrations, it is notable that three of the four tests in the Gilbert toolbox are non-parametric tests, meaning that the results of the test are independent of the distribution of the data with regard to type I error. The *t*-test is the only test that is directly impacted by the distribution of the measured concentrations. For small sample sizes, the *t*-test is somewhat sensitive to the underlying distribution, but since the *t*-test relies on the distribution of the sample *mean*, the distribution will be approximately normal for larger sample sizes, regardless of the data distribution. Thus, a wide suite of distributions is not needed to demonstrate the effect on the multiple comparisons in the Gilbert Toolbox. Thus, this evaluation of significance levels is performed only for four distributions of increasing right-skewness:

1. Normal: mean = median = μ; standard deviation = σ.

2. Lognormal: median = μ; geometric standard deviation = σ = 0.5.
3. Lognormal: median = μ; geometric standard deviation = σ = 1.0.
4. Lognormal: median = μ; geometric standard deviation = σ = 1.5.

All four tests are invariant with respect to the medians of these distributions μ and with respect to σ for the normal distribution, meaning that the same results will be obtained in the simulations no matter the value of the median for each distribution, and of the standard deviation for the normal case.

Censoring Mechanisms

In practice, there are many possible reasons for a concentration to be reported as a non-detect. For example, the true mean concentration of a sample might be below detectable levels, the presence of a high concentration of a different chemical in the sample might force the chemist to dilute the sample putting the diluted concentration below detectable levels, or the variation due to the sub-sampling of the sample in the laboratory might result in the actual measured sample being below detectable levels even when the mean for the whole sample is near the detection limit.

The distribution of the measured concentration is supposed to represent both the *in-situ* variability of the samples as well as the measurement variability if no censoring were to occur. The censoring mechanism then reflects the portion of measurement variability that leads to reporting of a non-detect. The censoring mechanism can have an effect on all four tests in the Gilbert Toolbox. The *t*-test does not directly accommodate non-detects and thus substitution methods must be used to conduct the *t*-test. The non-parametric tests are sensitive to the censoring mechanism in that the sample sizes may be effectively reduced, depending on the relative value of the detection limits, since these tests only utilize rankings of the data, and non-detects can only be ranked with respect to detected concentrations greater than the detection limit.

A few censoring mechanisms are utilized in this study all of which are representative of situations that are seen with environmental data. For example, data for radionuclides are not censored in studies at this Site, data for some metals are usually completely uncensored, however, for other metals such as antimony, cadmium, selenium, silver and thallium it is not unusual to observe reported detection limits that are fully mixed with the detected data. The following four cases of censoring are included in this simulation study to represent a range of censoring conditions.

1. No censoring – all values are reported as detects, regardless of the simulated measurement concentration.
2. Single absolute detection limit censoring – all simulated measurements below some detection limit DL are reported as non-detects with detection limit DL. The same detection limit is used for each simulation run. This mechanism will result in many non-detects at the same value, but no detects lower than any non-detect.
3. Random absolute detection limit censoring – all simulated measurements below a detection limit are reported as non-detects with that detection limit, but the detection limit is generated randomly (normal distribution). Each individual measurement can have a different detection limit. This mechanism will result in few ties amongst the non-detect and may result in some detected values that are lower than non-detects.
4. "Utterly random" censoring – each simulated measurement has a chance to be reported as a non-detect regardless of the actual simulated measurement. This approach simulates the measurement first, and then decides if it is a detect or a non-detect, with a 20% chance of being a non-detect.

Handling Non-detects for the t-test

There are two common substitution methods utilized for handling non-detects in background comparison scenarios:

1. Use half the detection limit as the observed value (the most common method).
2. Use the detection limit as the observed value.

When the detection limits are low relative to the center of the detected values (in terms of a ratio), this choice should have a minor effect on the *t*-test. However, if the majority of the detected data are relatively close to the detection limits (e.g., the ratio of detected data to detection limits is generally less than 2), the *t*-test can be influenced significantly by the choice of non-detect substitution method. Although other substitution or imputation methods can be used (e.g., involving maximum likelihood estimation), the two methods listed here are the most common ones used for statistical analysis of environmental data. NDEP's guidance for detection limits and radionuclides should be used prior to applying any substitution methods. For example, sample quantitation limits should be used for metals concentrations, and radionuclides data should not be censored (NDEP, 2008; NDEP, 2009).

Sample Size Selection

Sample size is likely to have some influence on the results of conducting the tests in the Gilbert Toolbox. The three non-parametric tests rely only on ranks, and discrete distributions underlying ranking. The set of possible *p*-values for these tests is thus discrete and can take on relatively few values for small sample sizes, particularly the quantile and slippage tests, which rely on estimating the tail of the distribution. In fact, with a small enough sample size, it is impossible to fail these two tests at the 0.05 significance level. Beyond 30 samples, there is unlikely to be much change in the behavior of the *t*-test. And beyond 50, there is unlikely to be much change in the behavior of the Gehan test. The behavior and relationship of the quantile and slippage tests may continue to change for higher sample sizes. For this study, the simulation will concentrate on sample sizes from 6 to 40, but with some simulation runs with higher sample sizes.

In particular, for every combination of simulated concentration distribution, censoring mechanism, and non-detect substitution method, each of the following sample sizes is simulated.

- { N_b = i, N_s = j; i = 6, 8, 10, …, 40, j = 6, 8, 10, …, 40 }
- { N_b = i, N_s = j; i = 50, 100, 200, j = 50, 100, 150, 200 }

Combinations of Simulation Runs

	Concentration Distribution	**Censoring Mechanism**	**Detection Limit Distribution**	**Non-Detect Handling**
A.	Normal(μ=100,σ=30)	None	None	NA
B.	Logormal(μ=4,σ=0.5)	None	None	NA
C.	Logormal(μ=4,σ=1.0)	None	None	NA
D.	Logormal(μ=4,σ=1.5)	None	None	NA
E.	Normal(μ=100,σ=30)	Single DL	DL = 61.5 (10%)	=DL
F.	Normal(μ=100,σ=30)	Single DL	DL = 74.5 (20%)	=DL
G.	Normal(μ=100,σ=30)	Single DL	DL = 88.4 (35%)	=DL
H.	Normal(μ=100,σ=30)	Single DL	DL = 100 (50%)	=DL
I.	Logormal(μ=4,σ=1.5)	Single DL	DL = 8.0 (10%)	=DL

J.	Logormal(μ=4,σ=1.5)	Single DL	DL = 15.4 (20%)	=DL
K.	Logormal(μ=4,σ=1.5)	Single DL	DL = 30.6 (35%)	=DL
L.	Logormal(μ=4,σ=1.5)	Single DL	DL = 54.6 (50%)	=DL
M.	Normal(μ=100,σ=30)	Single DL	DL = 61.5 (10%)	=half DL
N.	Normal(μ=100,σ=30)	Single DL	DL = 74.5 (20%)	=half DL
O.	Logormal(μ=4,σ=1.5)	Single DL	DL = 8.0 (10%)	=half DL
P.	Logormal(μ=4,σ=1.5)	Single DL	DL = 15.4 (20%)	=half DL
Q.	Normal(μ=100,σ=30)	Random DL	Normal(61.5,10)	=DL
R.	Normal(μ=100,σ=30)	Random DL	Normal(74.5,10)	=DL
S.	Logormal(μ=4,σ=1.0)	Random DL	Lognormal(2,0.5)	=DL
T.	Logormal(μ=4,σ=1.0)	Random DL	Lognormal(2.6,0.5)	=DL
U.	Normal(μ=100,σ=30)	Utterly Random DL	20% censored, assigned to Normal(85,20)	=DL
V.	Lognormal(μ=4,σ=1.5)	Utterly Random DL	20% censored, assigned to Lognormal(3,1.0)	=DL

Results

The evaluation from the simulations is presented in this section. Some plots are included where instructive, but the full suite of plots on which this evaluation is based is provided in Appendix A. Appendix A also provides full tabular results for the simulations, including results for sample sizes bigger than 40, which are not included in the figures.

Minimum p-*Value Distribution*

Using the same significance level for each of the four individual tests to decide when to reject the null hypothesis that site is similar to background, the test will reject the null hypothesis if the minimum of the four *p*-values is below the significance level. For a single 1-sided test, when simulating data from the null hypothesis, the *p*-value should be approximately uniform from 0 to 1, although tests that rely on discrete distributions like the three non-parametric tests induce a discrete distribution for the *p*-value that can only be approximately uniform. When taking the minimum *p*-value of four tests, the distribution of the *p*-value under the null hypothesis is no longer uniform, but will have greater probability for lower values. Figures 1 and 2 show the empirical cumulative density functions (CDF) for the minimum *p*-value of the four tests along with the CDF of a single uniform random variable and the CDF for the minimum of four uniform random variables, for the normal distribution, no censoring simulation. The single uniform CDF reference curve mimics the effect of 4 perfectly correlated tests, and the reference curve CDF for the minimum of 4 tests mimics the effect of 4 uncorrelated tests.
The empirical CDF lies between the two reference curves, implying that the four tests are not independent (would be close to the CDF representing the minimum of the four *p*-values), but neither are they perfectly dependent (would be close to the uniform CDF). The vertical lines in the empirical CDF demonstrate the discrete nature of the possible *p*-values from the non-parametric tests. Figure 1 is the empirical CDF when there are 10 samples from the site and 10 samples from the background – the discrete jumps are quite pronounced. Figure 2 is the empirical CDF when there are 100 samples from the site and 50 from the background – the CDF is smoother overall, but the discrete jumps can still be seen, due primarily to the results from the slippage test.

Effect of Individual Tests

It is instructive to examine the relationships between the individual tests, and their contribution to the familywise error rate. Figure 3 shows scatter plots of the *p*-values generated by the four tests, for the simulation of 50 site and 50 background samples for the lognormal distribution with $\sigma = 0.5$, no censoring case. Figure 4 shows the same type of plot, except that the point is plotted only if one of the four tests provided a p-value less than 0.05 – i.e., for those samples where type I error would occur if a significance level of 0.05 was used, which are the main test results of interest.

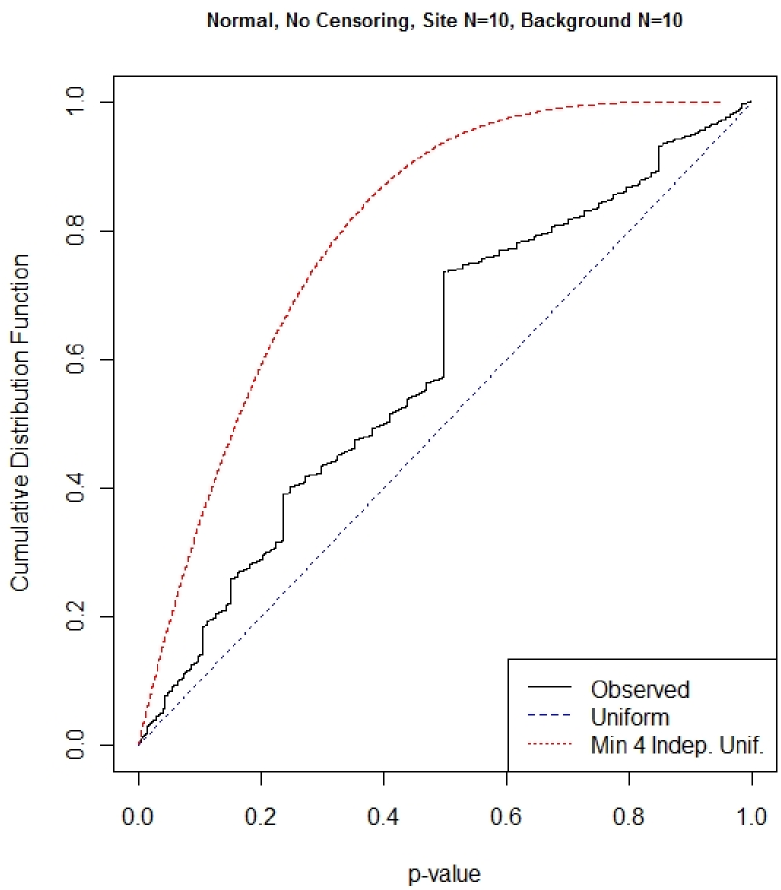

Figure 1 Cumulative distribution function for the minimum p-value from the four tests, for a normal distribution with no censoring and sample sizes for site and background equal to 10.

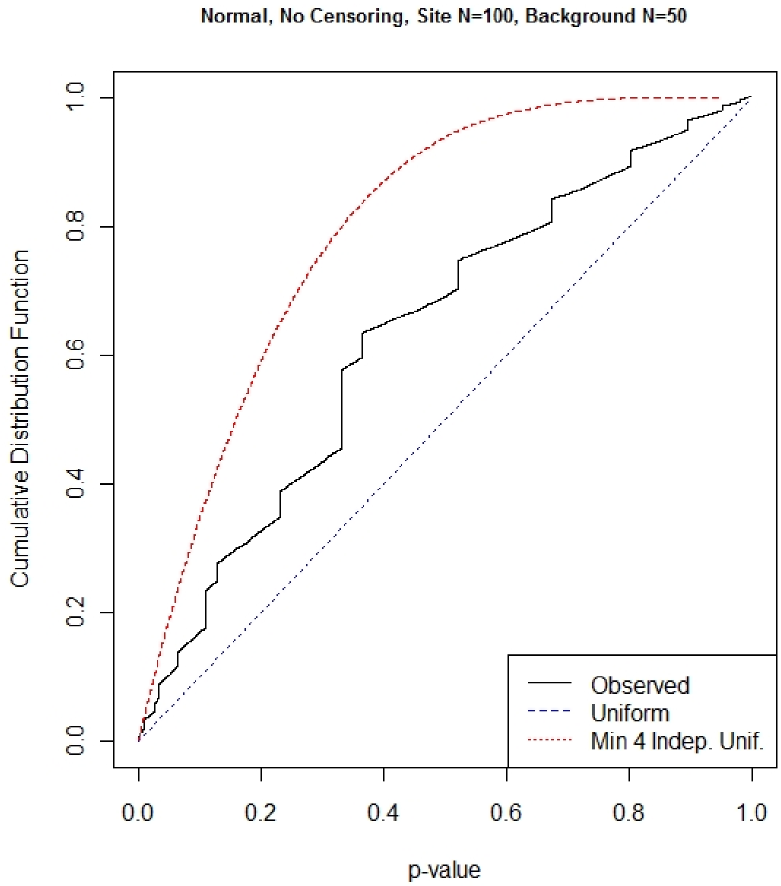

Figure 2 Cumulative distribution function for the minimum p-value of the four tests, for a normal distribution with no censoring. Background sample size is 50. Site sample size is 100.

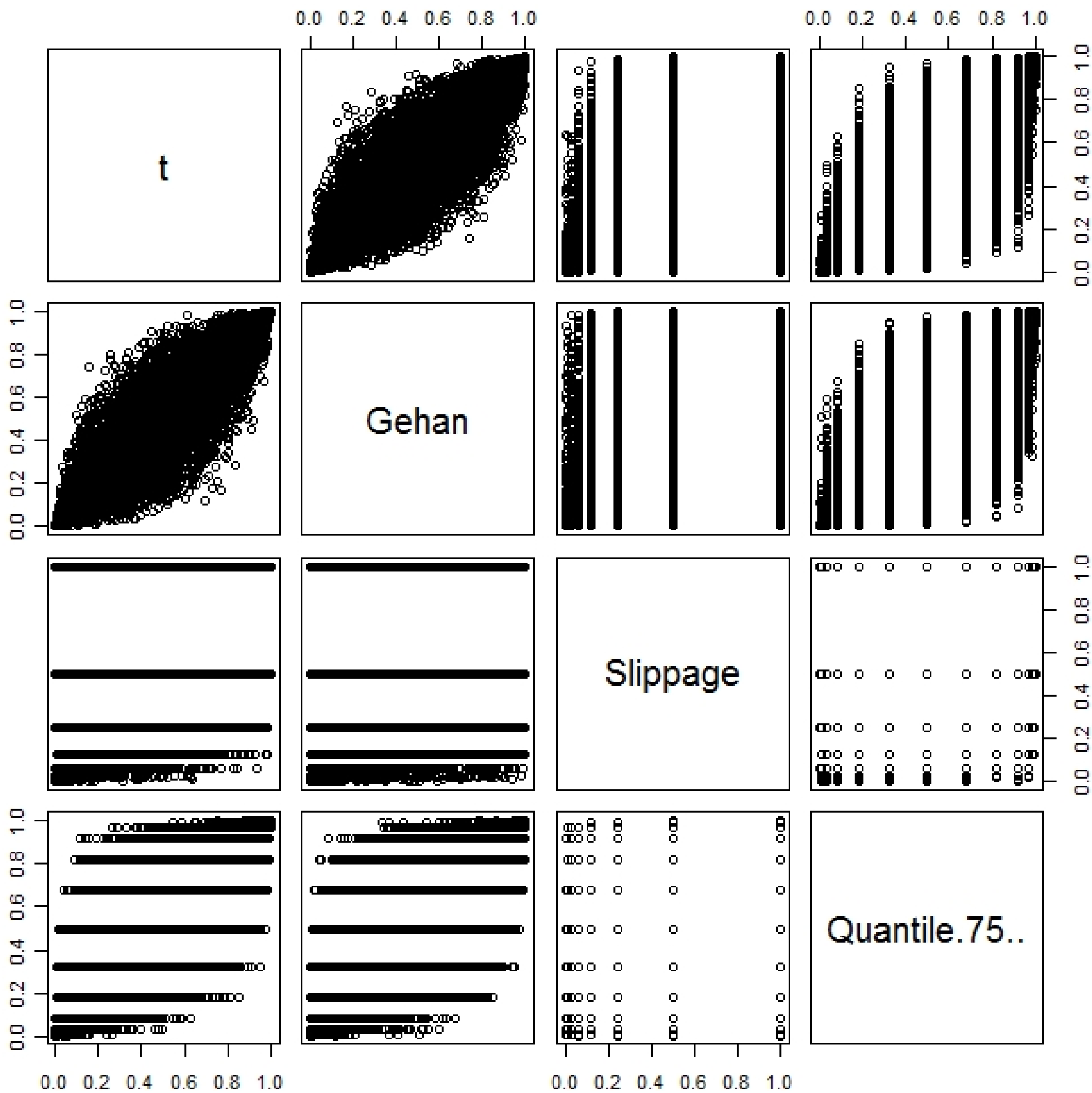

Figure 3 Scatterplots of p-values for each of the four tests versus each of the other tests, for the lognormal(4,0.5) with no censoring, N_b=N_s=50 simulation.

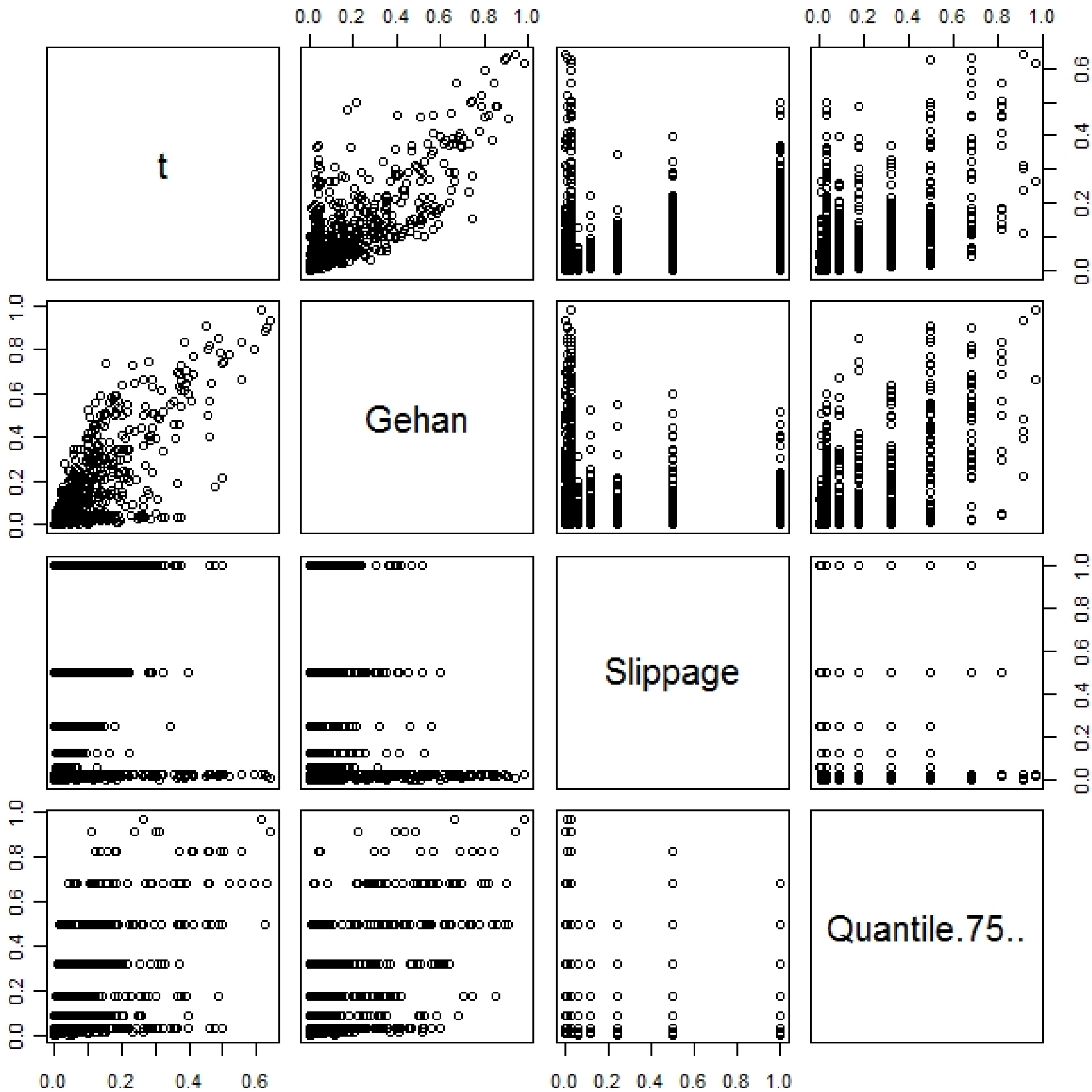

Figure 4 **Scatterplots of p-values for each of the four tests versus each of the other tests, for the lognormal(4,0.5) with no censoring, N_b=N_s=50 simulation, plotted only for cases when at least one of the four tests provided a p-value less than 0.05.**

The relatively high correlation between the *t*-tests and Gehan tests can be readily seen in Figures 3 and 4. Correlations between other pairs of tests are also positive, although the patterns are harder to see because of the discrete response for the quantile and slippage tests. The smallest correlations always involve the slippage test. The correlations for the all samples case are:

	t	Gehan	Slippage	Quantile: 75%
t	1.00	0.89	0.46	0.77
Gehan	0.89	1.00	0.20	0.73
Slippage	0.46	0.20	1.00	0.20
Quantile: 75%	0.77	0.73	0.20	1.00

The correlations conditional on having at least one p-value less than 0.05, the correlations are generally lower. The *t*-test and Gehan test tend to be providing somewhat redundant information, with the quantile test somewhat less dependent. Only the slippage test has low correlation with the others:

	t	Gehan	Slippage	Quantile: 75%
t	1.00	0.79	0.03	0.48
Gehan	0.79	1.00	-0.35	0.52
Slippage	0.03	-0.35	1.00	-0.30
Quantile: 75%	0.48	0.52	-0.30	1.00

This pattern changes somewhat for other distributions and other sample sizes. For example, for the same distribution with sample sizes of 10 for site and background, the correlation amongst samples with at least one p-value less than 0.05 are:

	t	Gehan	Slippage	Quantile: 75%
t	1.00	0.84	0.04	0.06
Gehan	0.84	1.00	-0.20	-0.08
Slippage	0.04	-0.20	1.00	0.47
Quantile: 75%	0.06	-0.08	0.47	1.00

In this case, the quantile and slippage tests are correlated to each other, but have very low correlation with the t- and Gehan tests. The differences seen in the required familywise error correction is due to this changing correlation pattern across distributions and samples sizes.

Figure 5 provides information regarding how often each of the tests is responsible for the minimum *p*-value among the four tests, plotted as a function of sample size. The color scale represents the proportion of the 10,000 sets of tests for which the specific test realized the minimum *p*-value. Consequently, the sum of the proportions across the 4 plots in a given sample size cell is 1.

The case presented in Figure 5 is for the lognormal distribution with $\sigma = 0.5$, no censoring, conditional on at least one of the p-values being less than 0.05. Some trends are quite apparent. The *t*-test is most likely to provide the minimum *p*-value when the number of background samples is small relative to the number of site samples (white are on the *t*-test plot in Figure 5). The Gehan, quantile, and slippage tests are most likely to contribute the minimum *p*-value when the number of background samples is high relative to the number of site samples, with the Gehan test providing the greatest proportion, followed by the quantile test, and rarely the slippage test.

These relationships between the *p*-values lend some support to the notion of implementing unequal familywise corrections. For example, suppose that 0.025 is the significance level required for the individual samples in order to achieve a 0.05 familywise error rate. It might be reasonable to apply a significance level of 0.02 to the *t*-test and Gehan test, while leaving the significance level at 0.04 for the quantile and slippage tests, and still achieve a familywise error rate of 0.05. Obviously this would not result in a simple rule, which is probably more desirable. However, this is a reflection of the effect of sample size on the test results.

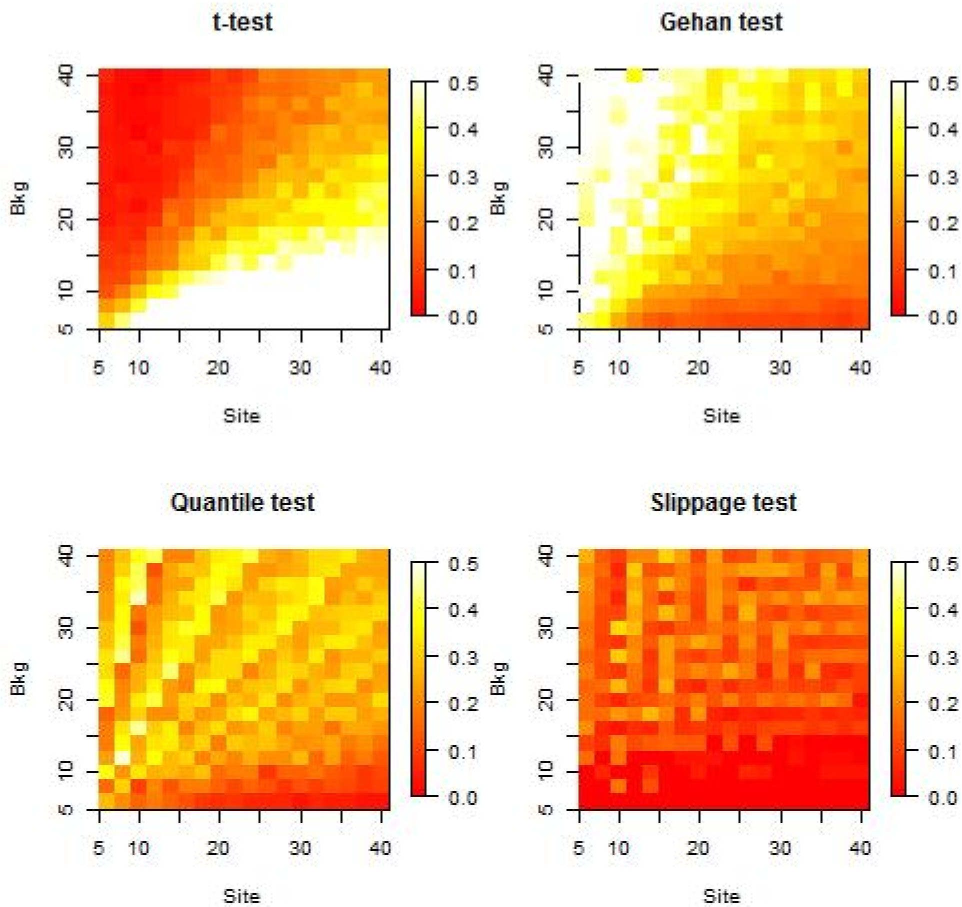

Figure 5 The proportion of simulations for which each test provides the minimum *p*-value conditional on the minimum value being less than 0.05, for a simulation of lognormal(4,0.5) random variates with no censoring.

Sample Size

Sample size appears to have the most dramatic effect on the required familywise error correction. Figure 6 shows, as a function of sample size, estimates of the significance level required for all of the individual tests to achieve a 5% family-wise error rate. The figure shows some lack of smoothness in the colors of adjacent cells, indicating non-smoothness of the required familywise error correction. This non-smoothness is far greater than that which could be caused by simulation error. Rather, it is again due to the discrete nature of the *p*-value distribution for the non-parametric tests. The color trend in the image shows that greater correction (lower significance level for each individual test) is needed as the site sample size increases, though this is most pronounced when the background sample sizes are small.

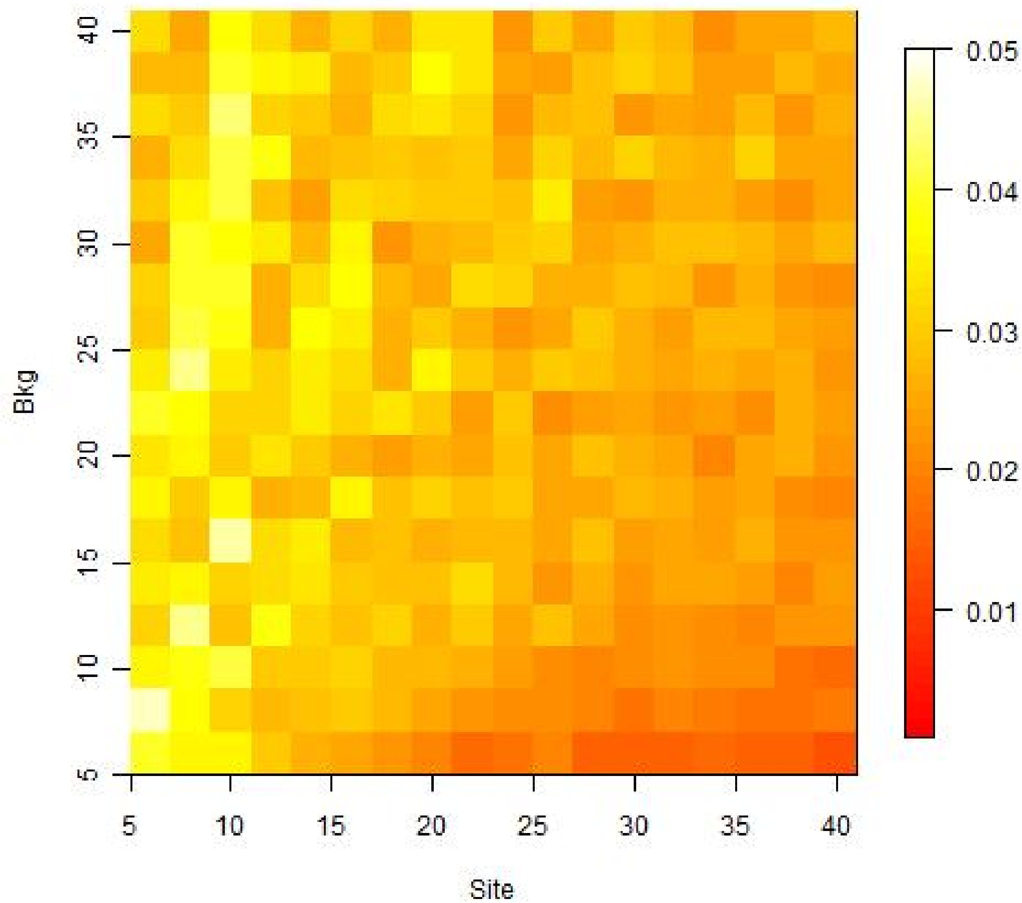

Figure 6 Image of the required significance level for all individual tests to achieve a 5% familywise error rate, for a lognormal distribution with geometric standard deviation σ = 0.5 with no censoring, as a function of site and background sample sizes.

The actual *p*-values needed for the individual tests to collectively achieve a familywise error rate of 0.05 are shown for this example in the table below. The smaller table also shows *p*-values for simulation cases involving larger sample sizes. Of interest is that an individual test *p*-value of 0.25 seems reasonable as a rule of thumb for larger sample sizes. Relevant subsets of the background data set for the Site will likely contain either approximately 30 samples, or approximately 100 samples. Site data will probably number in the 50-100 range for number of samples for most sub-areas. In which case, an individual test *p*-value of 0.025 seems reasonable for an initial evaluation.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	3.9	4.7	3.6	3.1	3.5	3.3	3.6	3.4	4.0	3.4	3.0	3.1	2.4	3.0	2.6	3.2	2.7	3.3
	8	3.5	3.7	3.8	4.5	3.6	2.9	2.9	3.6	3.7	4.5	4.0	4.0	4.0	3.6	3.3	3.0	2.7	2.5
	10	3.6	3.1	4.1	2.9	3.0	4.6	3.6	3.0	3.1	3.5	3.9	3.9	3.8	4.1	4.1	4.3	4.0	3.7

	12	2.9	2.7	3.0	3.9	3.3	3.2	2.7	3.4	3.1	3.1	2.6	2.6	3.5	2.8	3.8	3.1	3.6	3.2
	14	2.6	2.8	3.0	3.0	3.3	3.4	2.8	2.9	3.5	3.5	3.7	3.2	2.7	2.4	2.7	3.0	3.5	2.7
	16	2.5	2.9	3.1	2.9	3.0	2.8	3.6	2.6	3.1	3.2	3.5	3.7	3.6	3.2	2.9	2.6	2.8	3.1
	18	2.3	2.7	2.7	3.1	2.9	2.9	2.9	2.3	3.3	2.7	2.7	2.8	2.3	3.0	3.0	3.3	2.9	2.6
	20	2.0	2.4	2.7	2.6	2.9	2.6	3.1	2.6	2.9	3.5	3.0	2.5	2.6	3.0	2.9	3.4	3.7	3.3
	22	1.7	2.2	2.6	3.0	3.2	2.7	2.9	2.5	2.4	3.0	2.7	3.2	2.7	2.9	3.0	3.2	3.3	3.3
	24	1.8	2.1	2.4	2.4	2.7	2.7	2.9	2.9	2.9	2.6	2.3	3.1	3.0	2.9	2.5	2.2	2.5	2.2
	26	2.0	2.1	2.1	2.9	2.3	2.4	2.5	2.5	2.1	3.0	2.5	2.6	3.1	3.5	3.1	2.7	2.4	3.0
	28	1.6	2.0	2.0	2.5	2.6	2.8	2.5	2.9	2.4	2.9	3.0	2.6	2.5	2.4	2.8	2.9	2.8	2.5
	30	1.5	1.8	2.1	2.1	2.3	2.3	2.8	2.6	2.5	2.7	2.6	2.9	2.6	2.2	3.1	2.2	3.2	3.0
	32	1.5	2.0	2.2	2.3	2.5	2.5	2.6	2.5	2.2	2.5	2.4	2.8	2.9	2.6	2.7	2.4	2.8	2.8
	34	1.6	1.8	2.2	2.1	2.4	2.4	2.4	2.1	2.4	2.6	2.7	2.2	2.8	2.6	2.7	2.4	2.4	2.2
	36	1.5	1.7	2.2	2.0	2.3	2.6	2.5	2.5	2.1	2.5	2.7	2.6	2.8	2.3	3.1	2.7	2.3	2.5
	38	1.5	1.8	1.8	2.2	2.0	2.2	2.2	2.6	2.6	2.6	2.5	2.3	2.5	2.1	2.5	2.2	2.7	2.4
	40	1.2	1.9	1.7	2.2	2.4	2.3	2.0	2.3	2.3	2.2	2.4	2.1	2.7	2.5	2.4	2.6	2.4	2.7

		Background			
		50	100	150	200
Site	50	2.8	2.8	2.9	3.6
	100	2.0	2.6	2.5	2.9
	150	1.9	2.2	2.0	2.6
	200	2.0	2.0	2.0	2.3

Data Distribution

The distribution of the data has a pronounced effect on the required sample size. In particular, the more right-skewed the distribution, the greater the familywise error correction that is needed, being most pronounced when the number of site samples is much larger than the number of background samples. For example, compare Figures 6 and 7. The data for Figure 7 is lognormal (4,1.5) – an extremely right-skewed distribution. Note the darker orange in the bottom right corner indicating a need for greater correction.

The more right-skewed the data distribution, the greater the violation of the assumptions of the *t*-test, and the *t*-test will be most sensitive to the violation for smaller sample sizes. For these highly skewed distributions with small sample sizes, the *t*-test is in fact most likely to produce the minimum *p*-value for the four tests and result in the type I error. It may make most sense for these cases to use an unequal correction across the four tests, correcting the significance level for the *t*-test both for multiple comparisons and adjusting further downward due to the violation of the assumptions of the *t*-test.

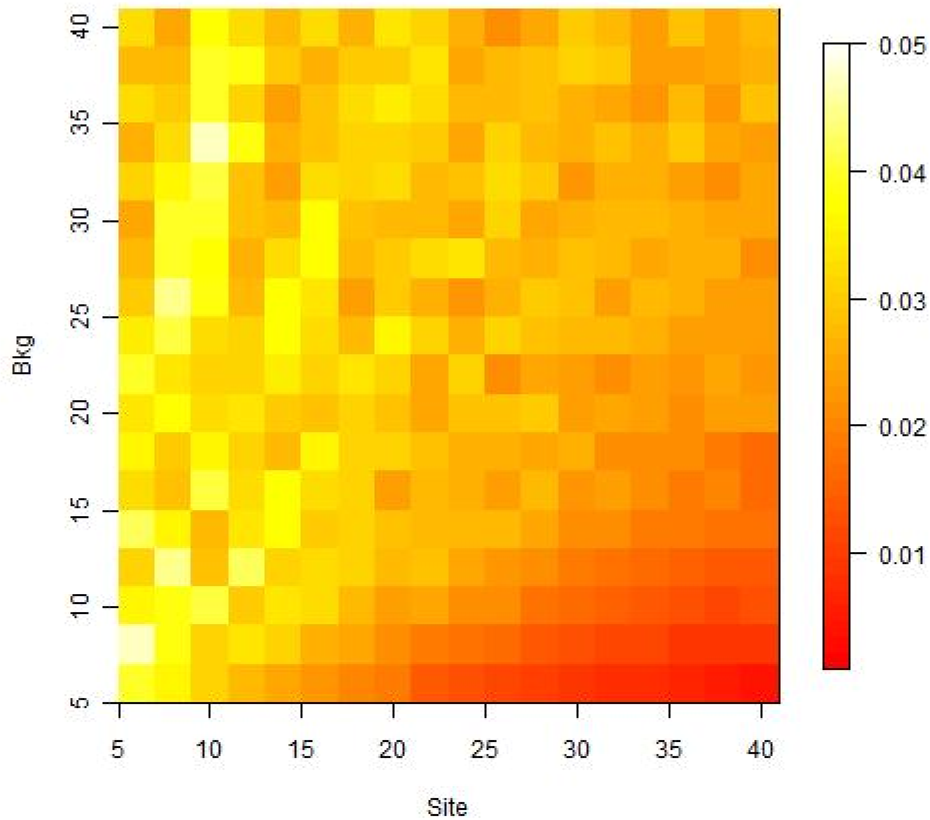

Figure 7 Required significance level for all individual tests to achieve a 5% familywise error rate, for a lognormal distribution with geometric standard deviation σ = 1.5 with no censoring, as a function of site and background sample sizes.

Censoring Mechanism

The type of censoring mechanism employed does not appear to have a major impact on the amount of familywise correction that needs to be applied. The overall patterns for sample size and the level of correction needed is fairly consistent between a single detection limit (DL), random detection limit, or utterly random censoring mechanism.

However, the *amount* of censoring does appear to have an impact. The greater the level of censoring, the more correction that needs to be applied, particularly when the number of site samples is high relative to the number of background samples. However, this is really again because of the skewness of the distribution. When censored values are replaced with values somewhat higher than the actual value, as is the case when using the detection limit as a substitution, the effective data distribution tends to become more right-skewed.

Non-Detect Handling

The method of handling non-detects did not have a major effect on the required familywise error correction, except for the case when the detection limit was relatively close to the center of the simulated measurement distribution. For that case, the effect is somewhat dramatic. If the detection limit is used as

a surrogate, then the overall trends seen in the previous section hold. However, if half the detection limit is used, the overall trends for sample size are reversed – a greater correction is needed for small background sample size and large site sample size, rather than vice-versa.
For this case, each censored sample is assigned a value well below any of the detected samples, effectively resulting in a left-skewed data distribution. The same effect is not seen in the lognormal case – assigning non-detects a lower value in this case may lower the skewness, but the data distribution as a whole is still right-skewed. Figure 8 shows histograms for the normal (100,30) distribution with 20% censoring (DL of 74.5) using half of the detection limit along with the lognormal (4,1.5) distribution with 20% censoring (DL of 15.4) using half of the detection limit. The probability mass at 74.5/2 = 37.25 for the normal distribution makes the effective skewness negative (-0.3), while the probability mass at 15.4/2 = 7.7 has little effect on the overall shape of the distribution (skewness at 10.7).

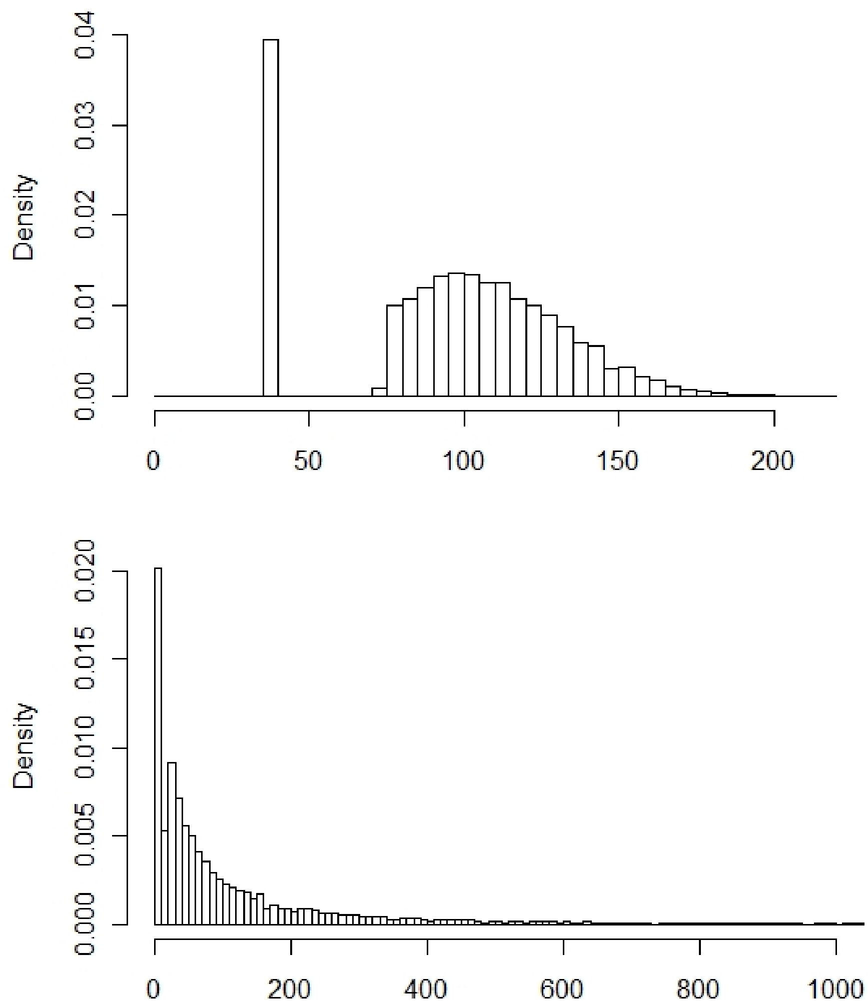

Figure 8 Top: histogram of data density for simulated normal (100,30) with detection limit at 74.5 using half-detection limit for substitution. Bottom: lognormal (4,1.5) with detection limit at 15.4.

Summary

This study has shown that a universal correction level for family-wise error correction for the Gilbert Toolbox is not ideal. Many factors affect the appropriate correction level, which is to be expected. Sample size perhaps has the largest effect, but effects are also seen for distribution (skewness effect), amount of censoring, and censoring close to the center of the distribution.

However, a multiplier between 1 and 0.25 (for individual test significance levels of 0.05 and 0.0125, respectively, when testing at a 0.05 significance level) makes sense for the four tests, since the 4 tests are not fully correlated (multiplier of 1) or fully uncorrelated (multiplier of 0.025). But, the conditions related to sample size, distribution, and censoring determine where in that range from 0.25 to 1 the multiplier should be. When the sample size for background data is approximately equal to or greater than the sample size for site data, then a rule of thumb multiplier of 0.5 to the significance level for each individual test will tend to be somewhat conservative (over-correcting slightly for type I error, or allowing more tests to fail background comparisons by random chance alone). If the number of site samples is greater than the number of background samples, and the samples come from a right-skewed distribution, a further correction may be needed: multiplier of 0.4 for site/background sample size ratio of 3, or even the extreme of 0.25 for higher site to background ratios.

Use of a multiplier of 0.5, for individual test significance levels of 0.025 when a familywise error rate of 0.05 is desired, is reasonable for most cases of larger sample sizes, but some consideration should be given to the data conditions. Which target significance level is used should not matter as much as performing exploratory data analysis and interpreting the test result *p*-values in accordance with what is seen in the data and what is expected from the conceptual site model. Accordingly, using a value of 0.025 for comparison is a reasonable point of departure.

The background data set for the Site is rich. There are several hundred samples for the various geologic and depth conditions. Subsets of the background data will be used in background comparisons for each sub-area of the Site. Those background data subsets might be as small as about 30 samples for the north River range, or as large as 100 (or more) for the McCullough range. The number of Site samples is also likely to be in the several tens, if not the low hundreds. In addition, background conditions are expected to exist across most of the Site, because confirmation sampling will be performed after remediation of the Site sub-areas, and the background distributions for metals and radionuclides do not tend to be very skewed. Under these conditions a significance level of 0.025 for each individual test seems very reasonable as a rule-of-thumb or a point of departure. The tables in Appendix A can be consulted for more specific values if needed for specific sub-areas with less available data or unusual data characteristics.

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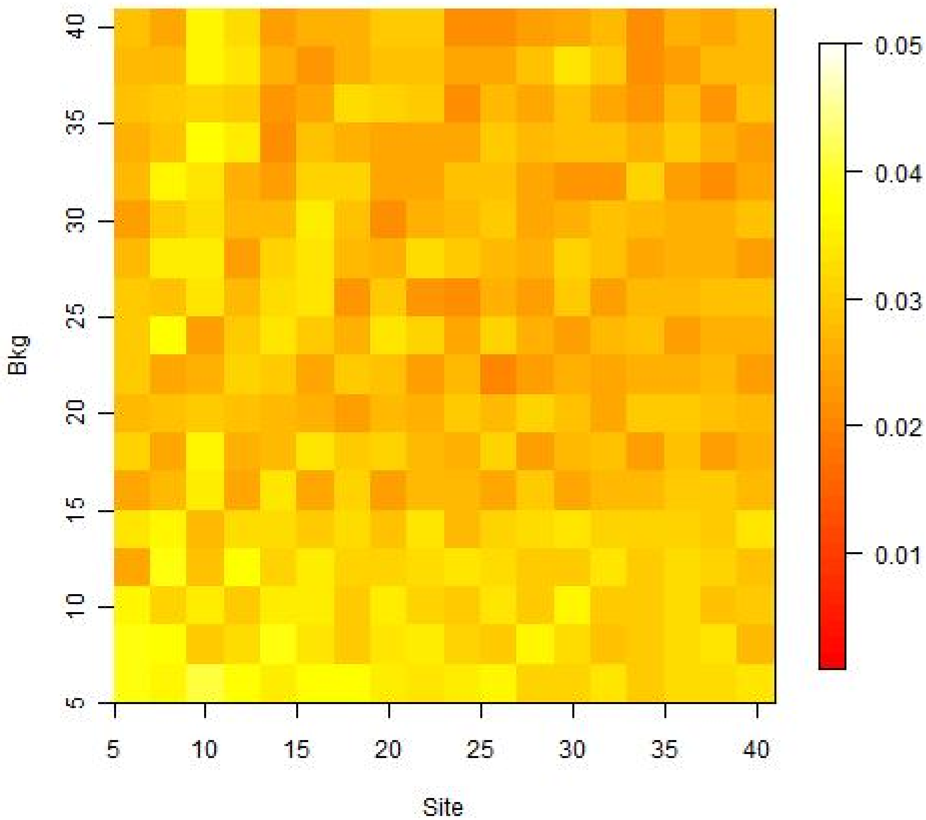
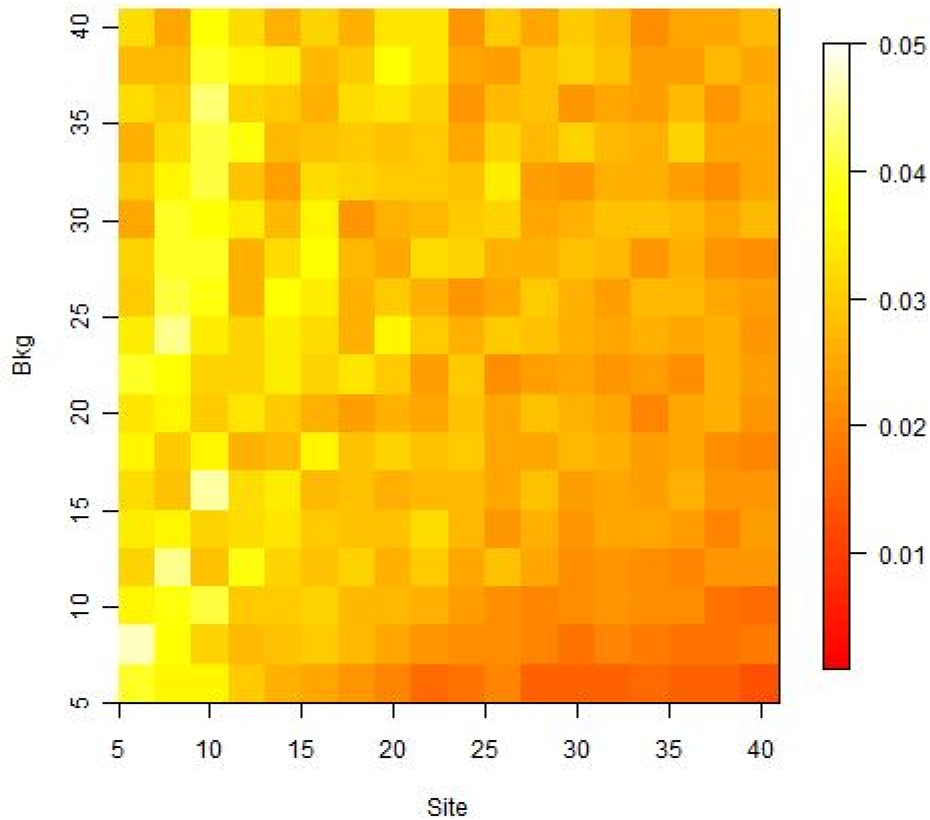
Appendix A

Plots of Required Familywise Corrections for Significance Level 0.05

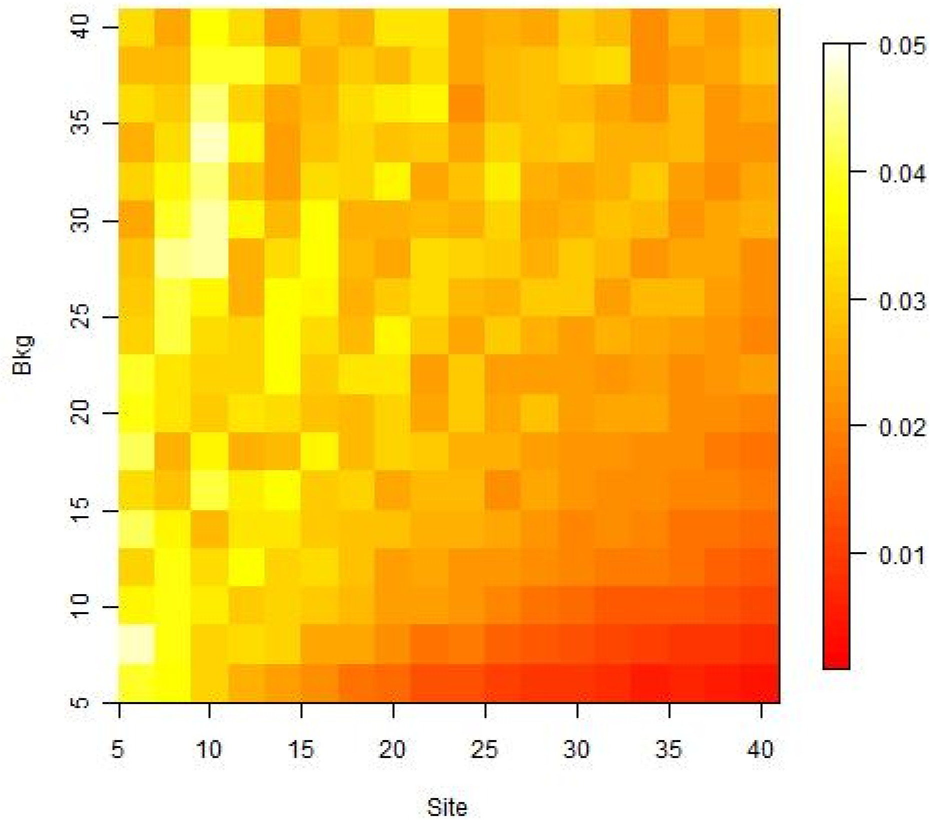
The plots shown in this section show the required familywise correction level needed to obtain a familywise error rate of 0.05, as a function of sample size.



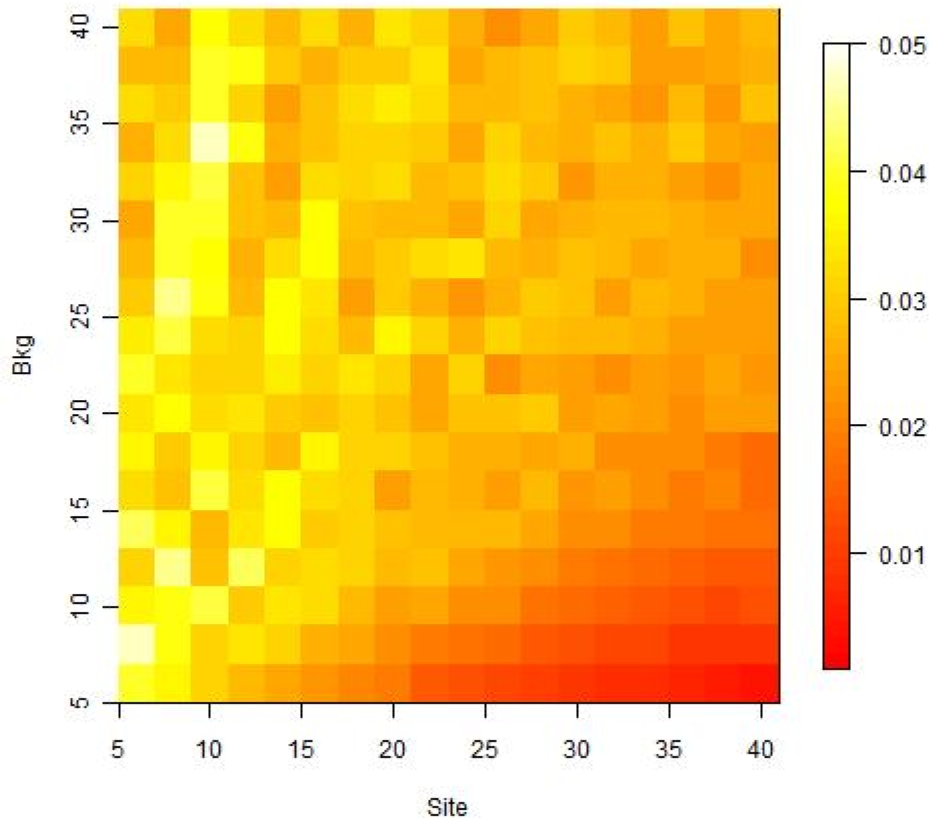
Correction Level Figure A: Normal (100,30); No Censoring.



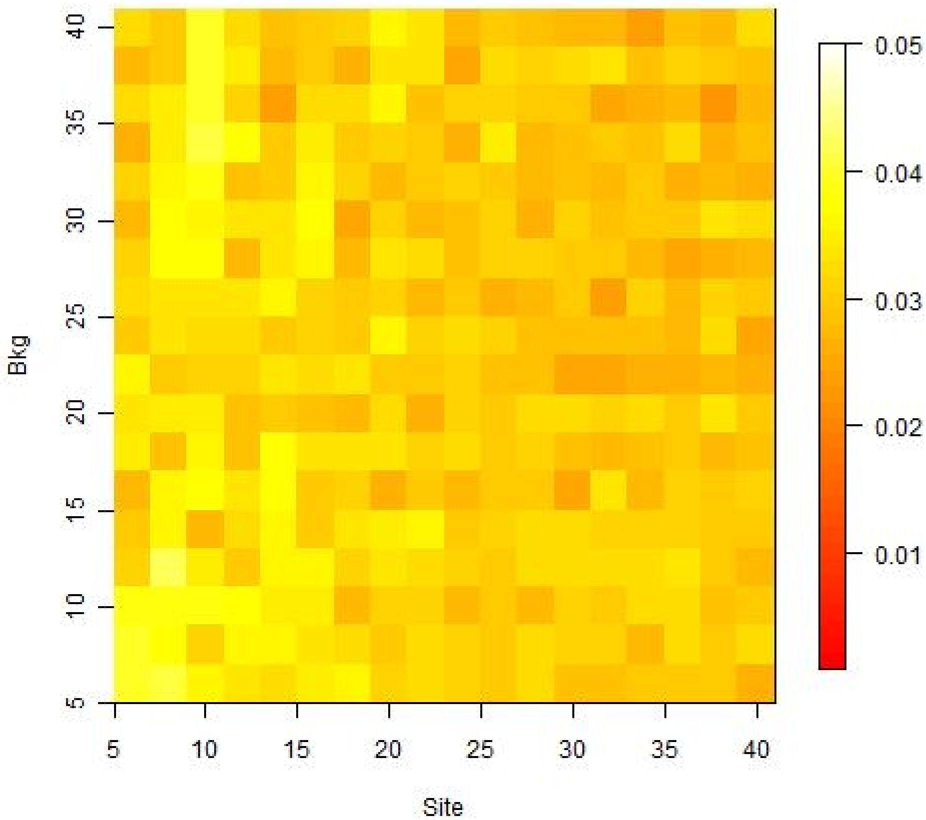
Correction Level Figure B: Lognormal (4,0.5); No Censoring.



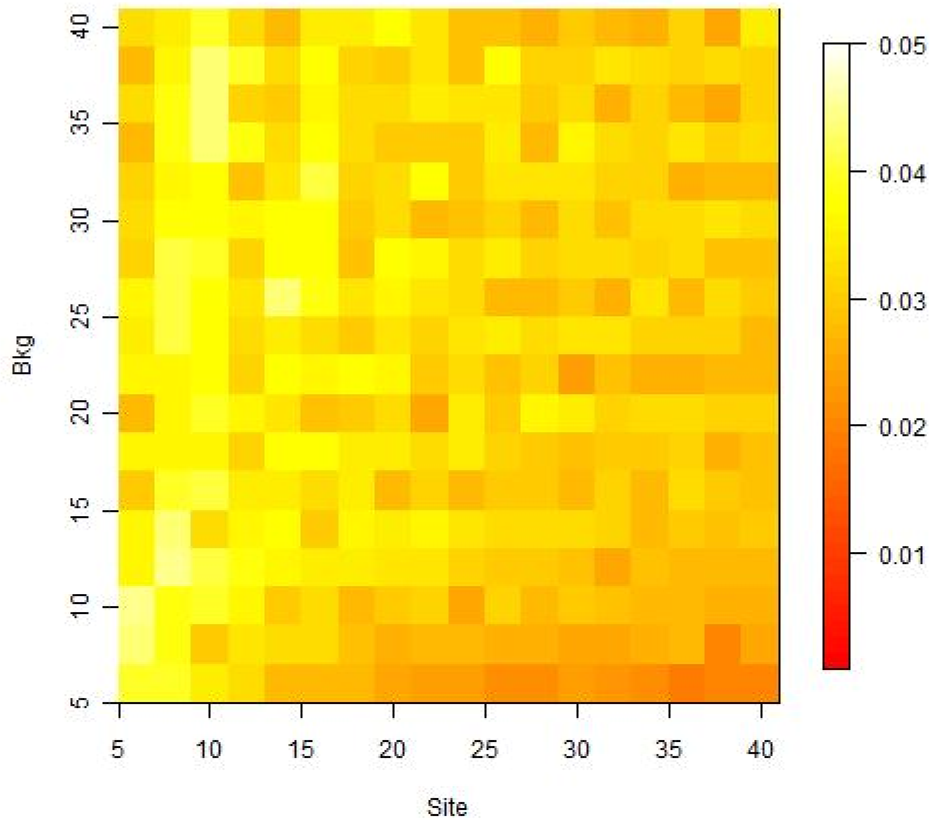
Correction Level Figure C: Lognormal (4,1.0); No Censoring.



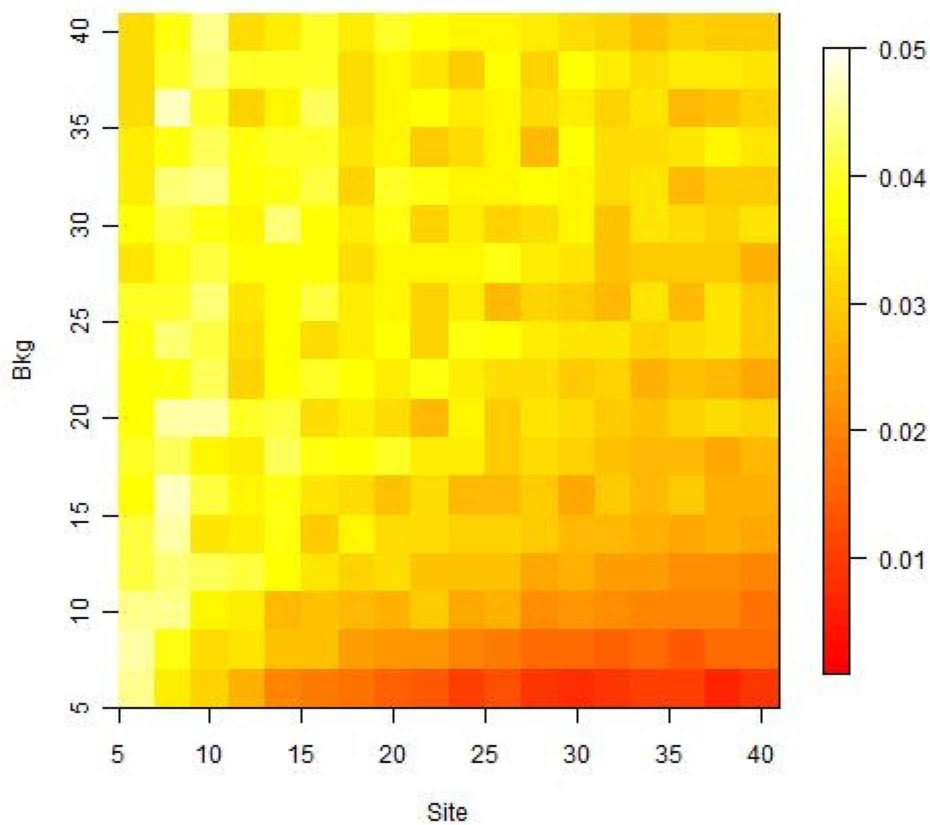
Correction Level Figure D: Lognormal (4,1.5); No Censoring.



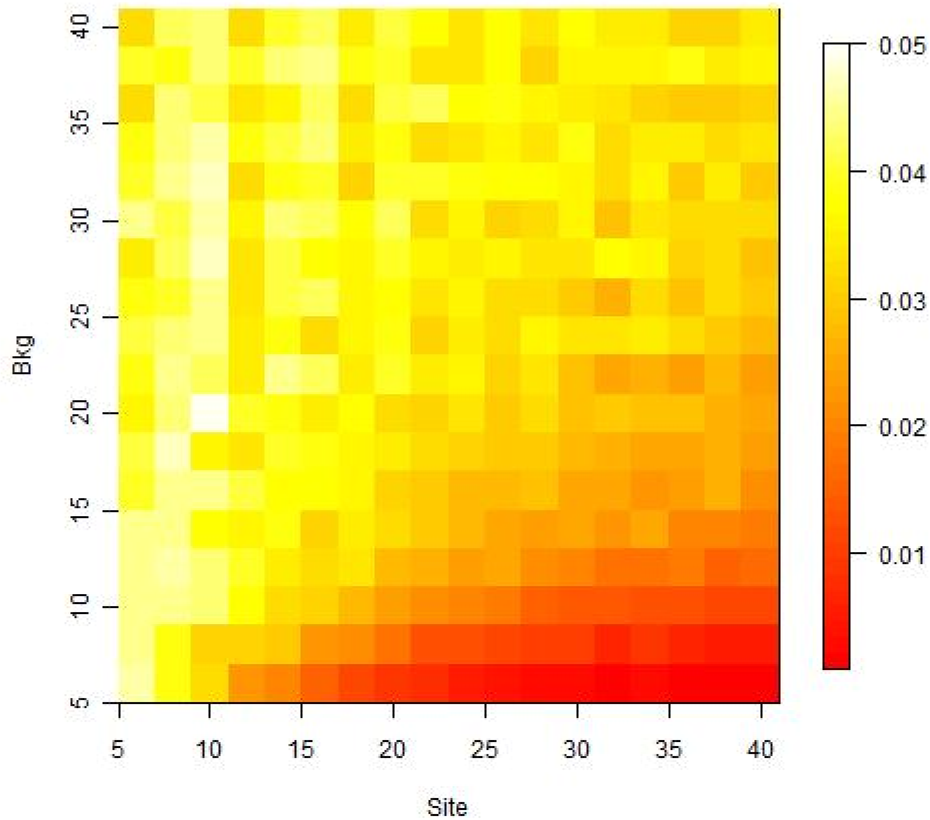
Correction Level Figure E: Normal (100,30); DL = 61.5; Non-detects set to DL.



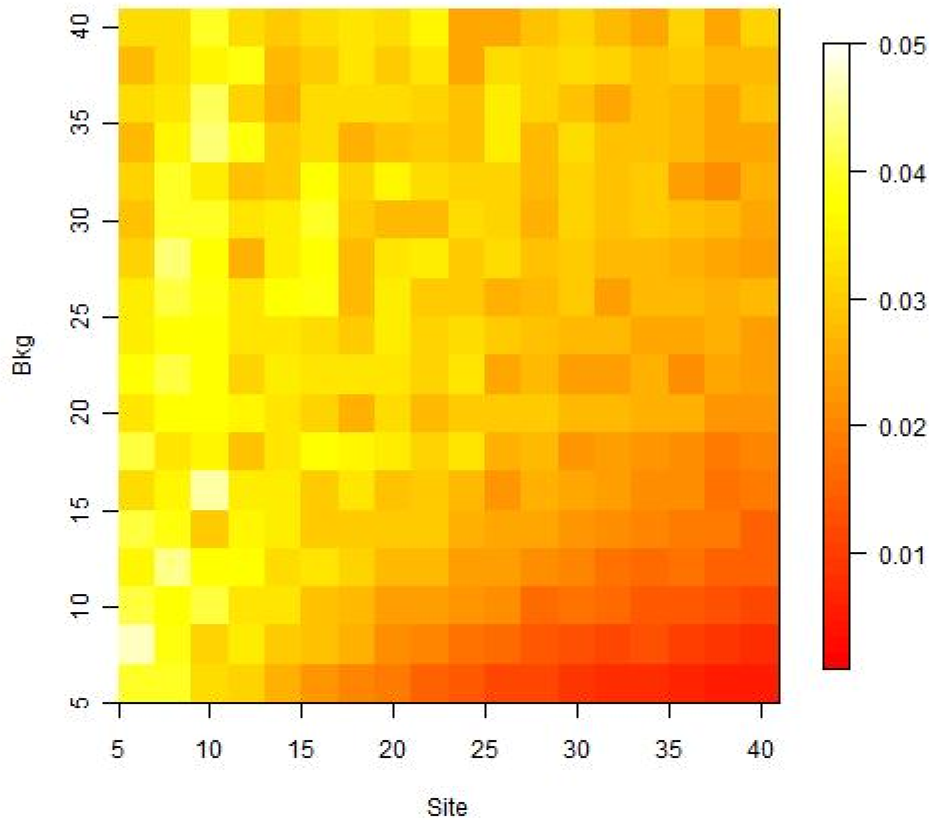
Correction Level Figure F: Normal (100,30); DL = 74.5; Non-detects set to DL.



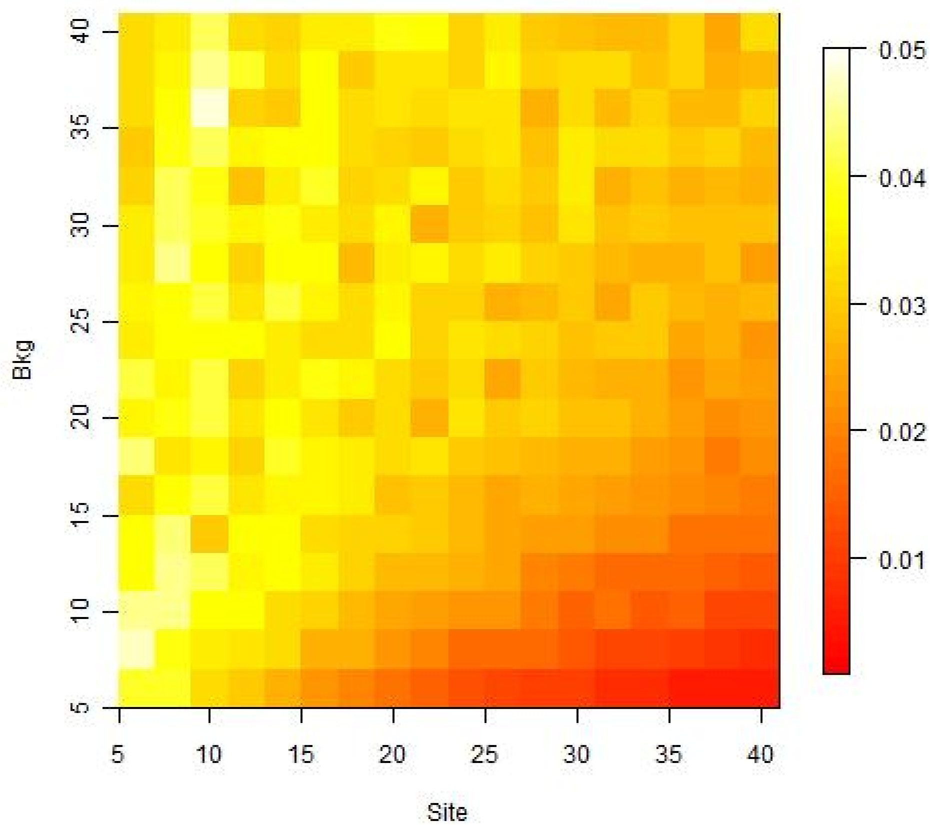
Correction Level Figure G: Normal (100,30); DL = 88.4; Non-detects set to DL.



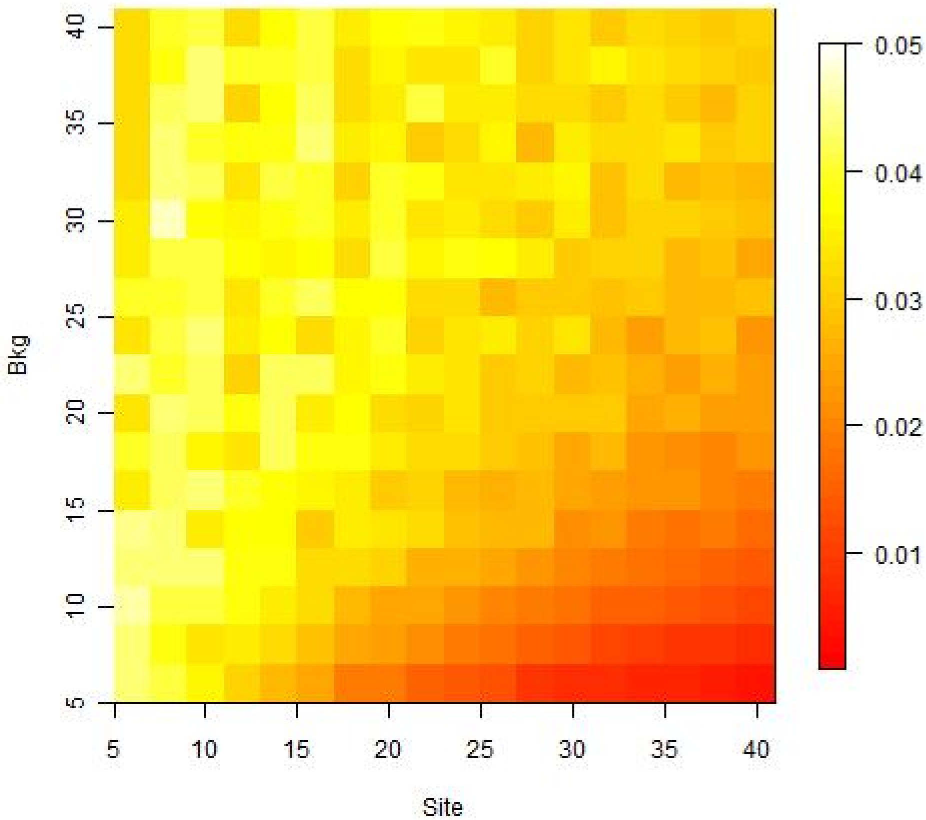
Correction Level Figure H: Normal (100,30); DL = 100; Non-detects set to DL.



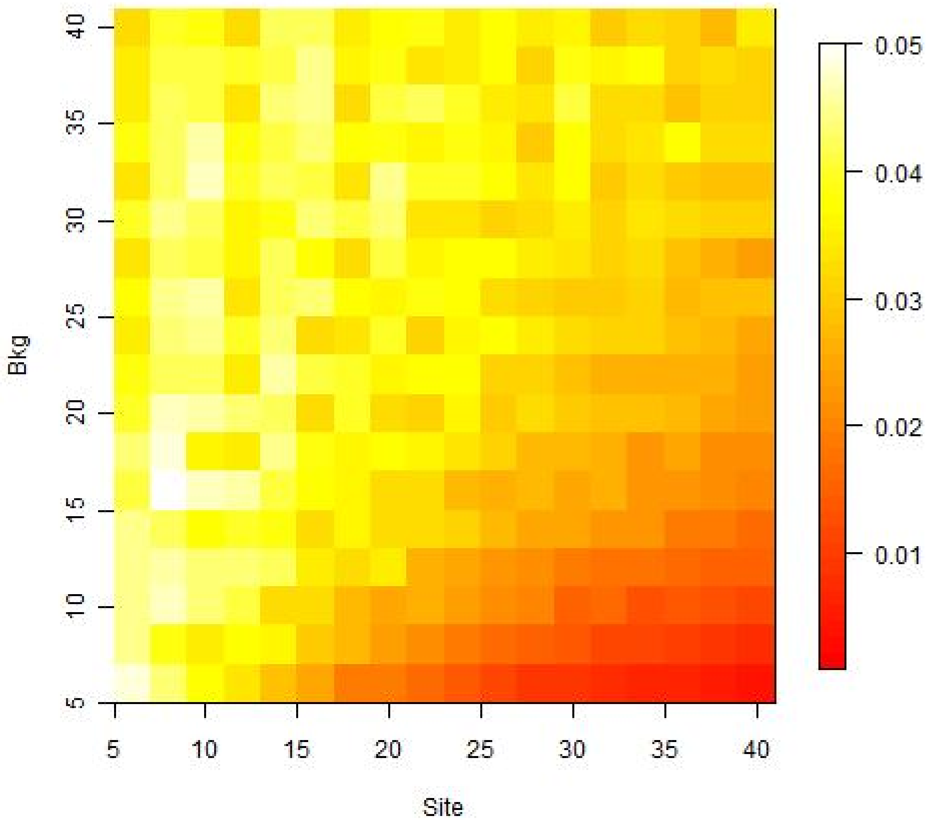
Correction Level Figure I: Lognormal (4,1.5); DL = 8.0; Non-detects set to DL.



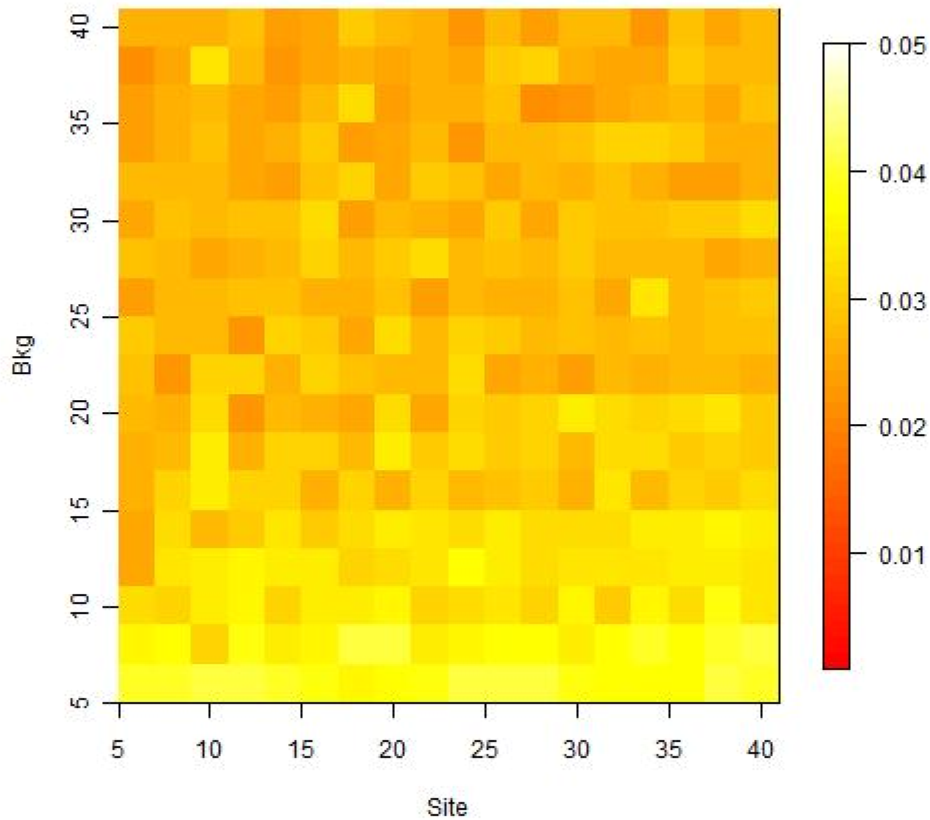
Correction Level Figure J: Lognormal (4,1.5); DL = 15.4; Non-detects set to DL.



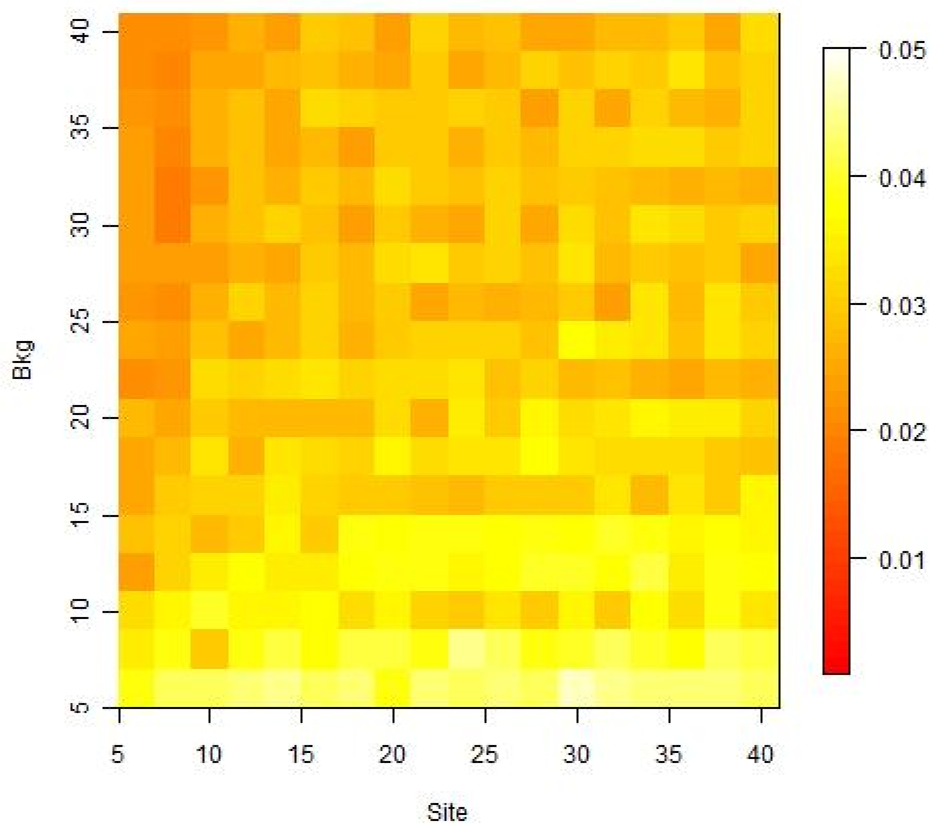
Correction Level Figure K: Lognormal (4,1.5); DL = 30.6; Non-detects set to DL.



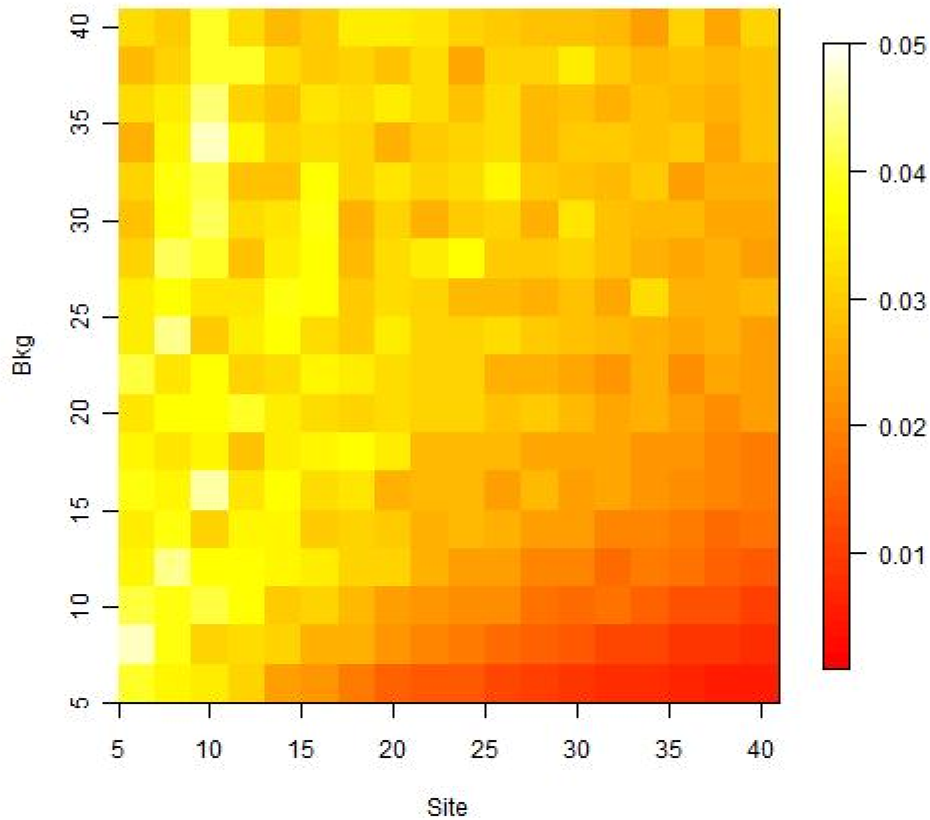
Correction Level Figure L: Lognormal (4,1.5); DL = 54.6; Non-detects set to DL.



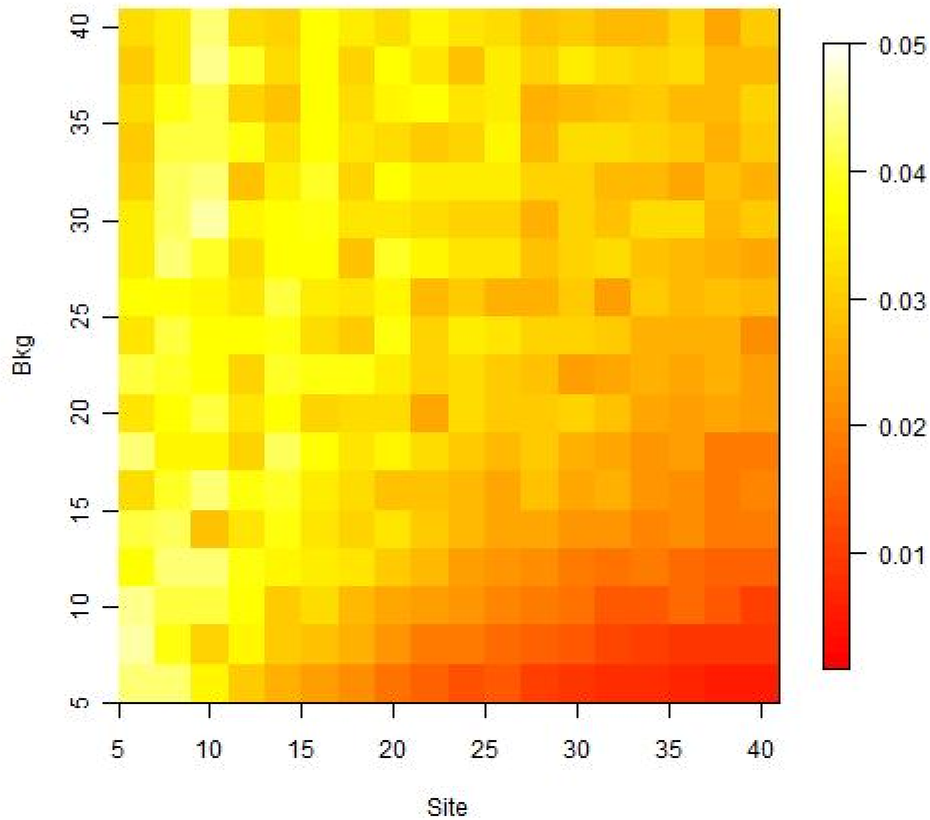
Correction Level Figure M: Normal (100,30); DL = 61.5; Non-detects set to half-DL.



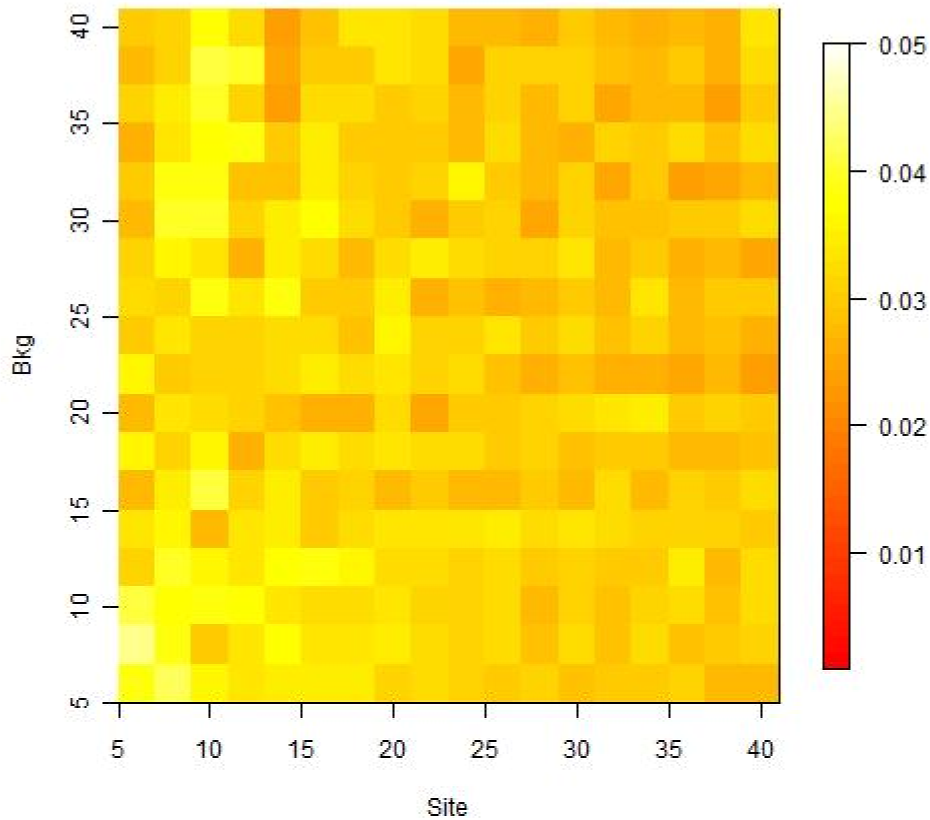
Correction Level Figure N: Normal (100,30); DL = 74.5; Non-detects set to half-DL.



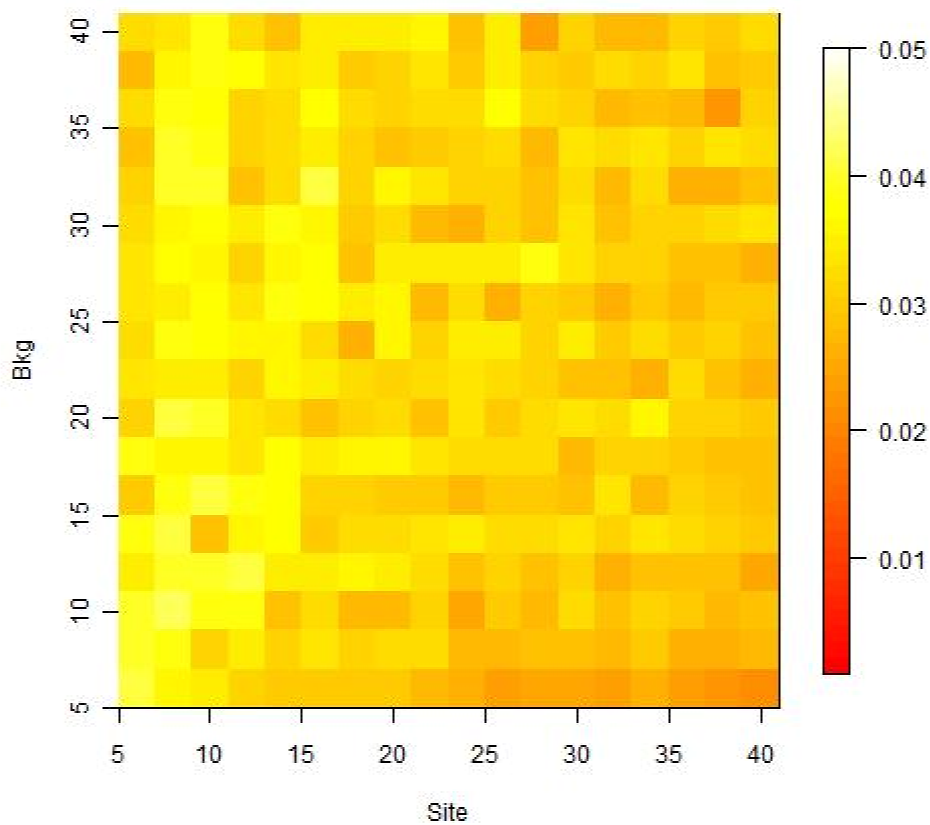
Correction Level Figure O: Lognormal (4,1.5); DL = 8.0; Non-detects set to half-DL.



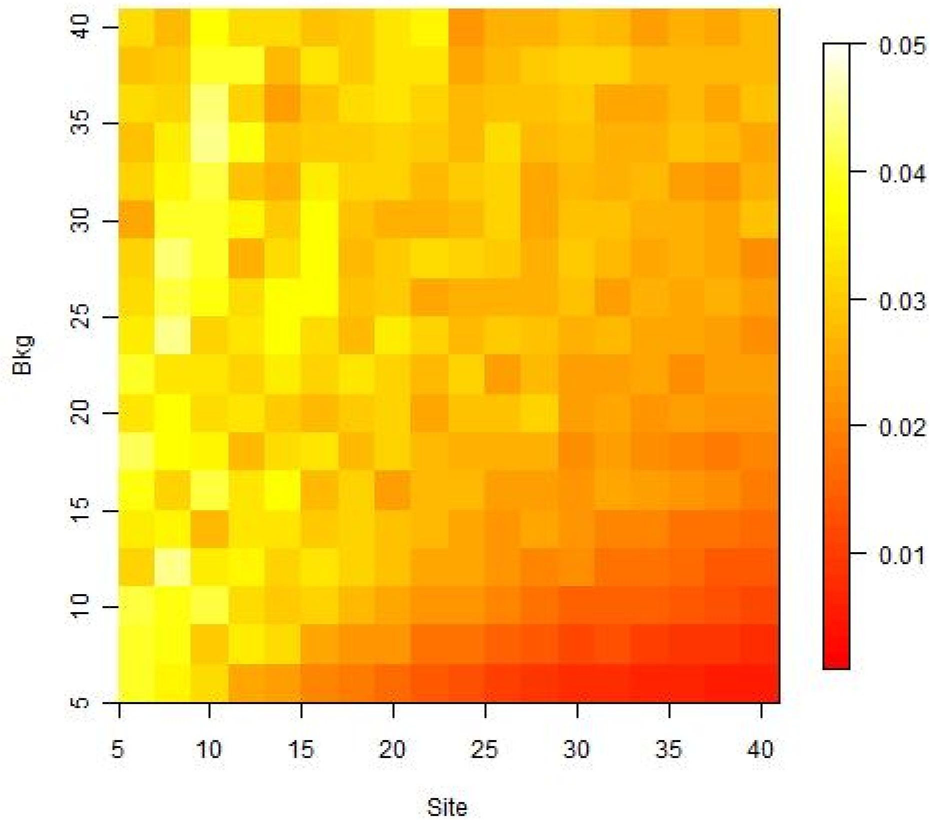
Correction Level Figure P: Lognormal (4,1.5); DL = 15.4; Non-detects set to half-DL.



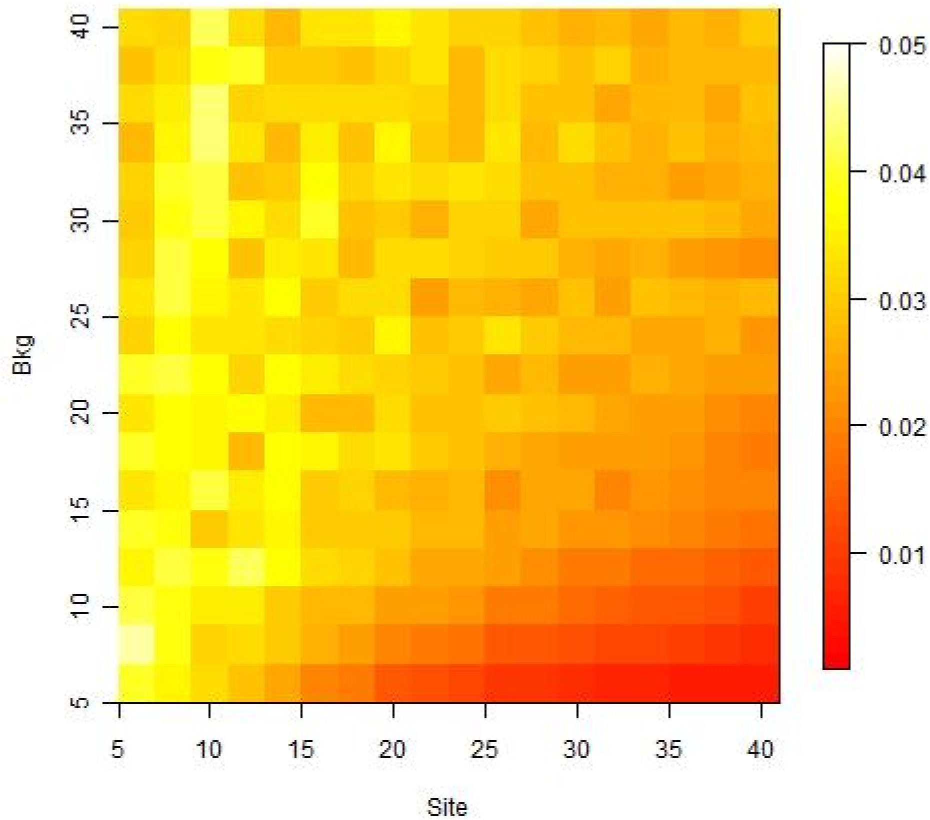
Correction Level Figure Q: Normal (100,30); DL~ Normal(61.5,10); Non-detects set to DL.



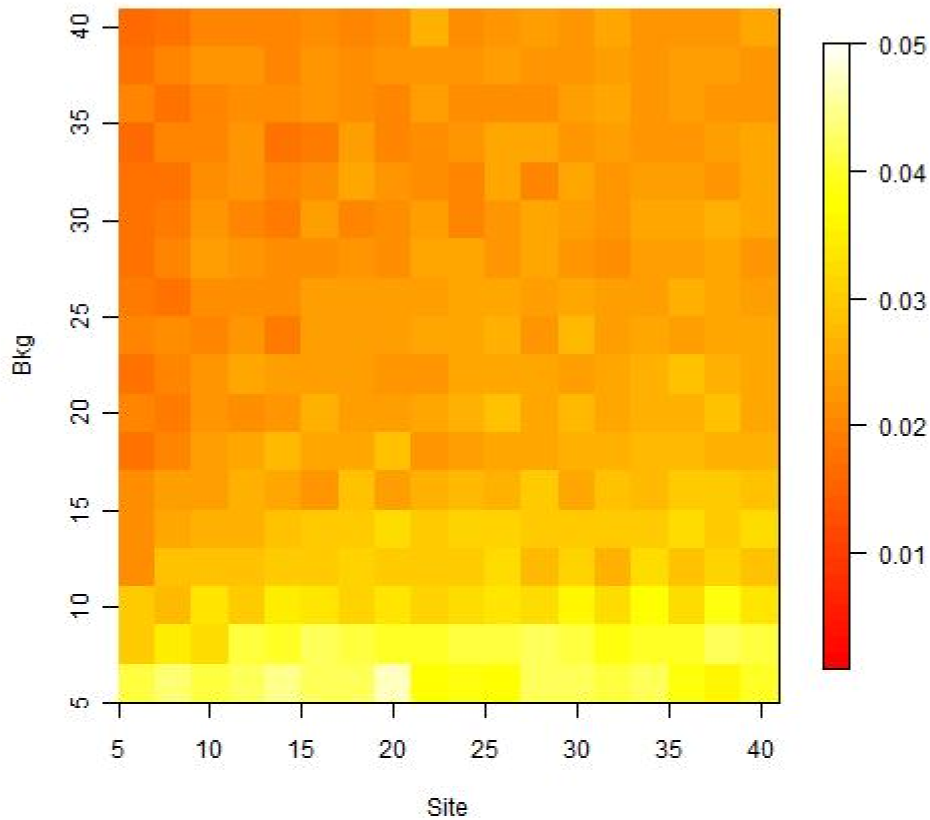
Correction Level Figure R: Normal (100,30); DL~ Normal(74.5,10); Non-detects set to DL.



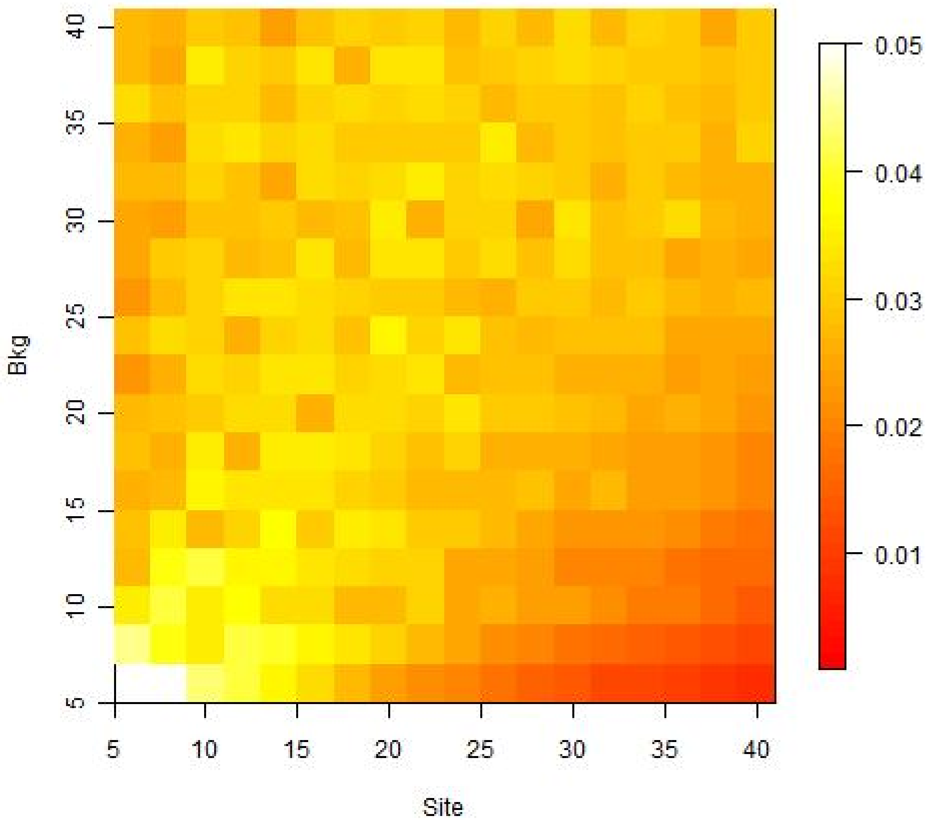
Correction Level Figure S:
Lognormal (4,1.0); DL~ Lognormal(2,0.5); Non-detects set to DL.



Correction Level Figure T:
Lognormal (4,1.0); DL~ Lognormal(2.6,0.5); Non-detects set to DL.



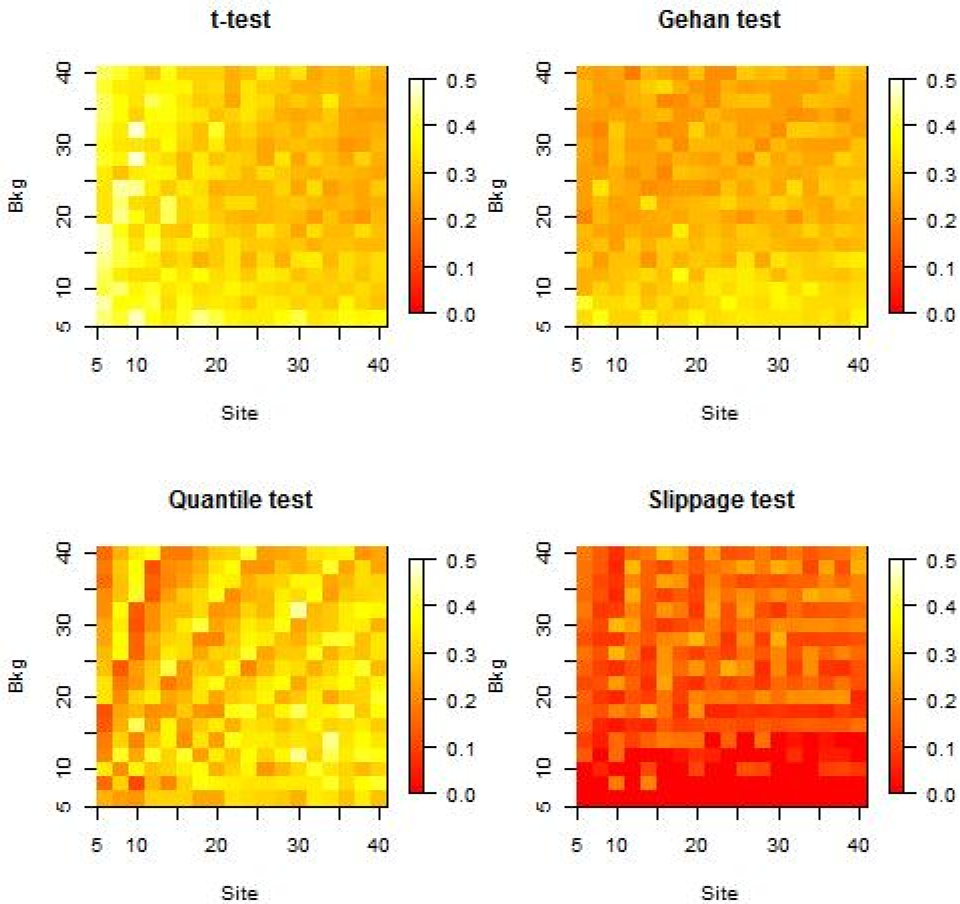
Correction Level Figure U:
Normal (100,30); 20% chance of censoring –
assigned as non-detect with DL~ Normal(85,20).



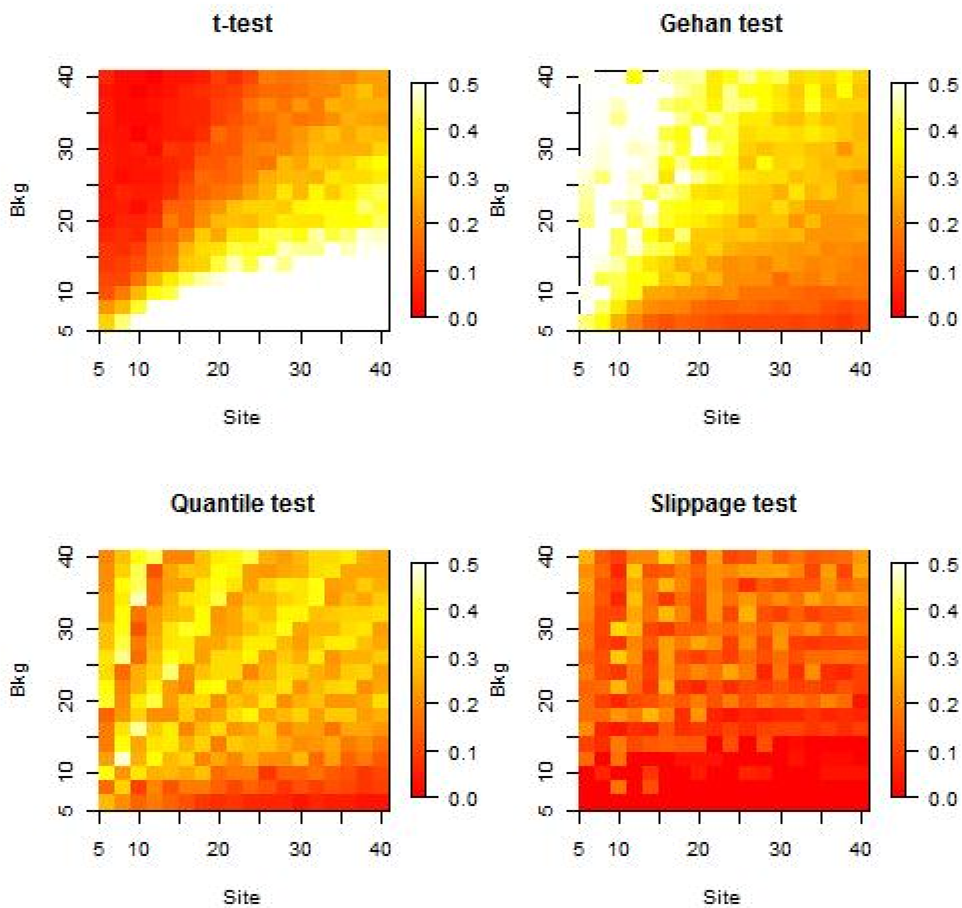
Correction Level Figure V:
Normal (4,1.5); 20% chance of censoring –
assigned as non-detect with DL~ Lognormal(3,1.0).

Plots Showing the Contribution of the Four Tests

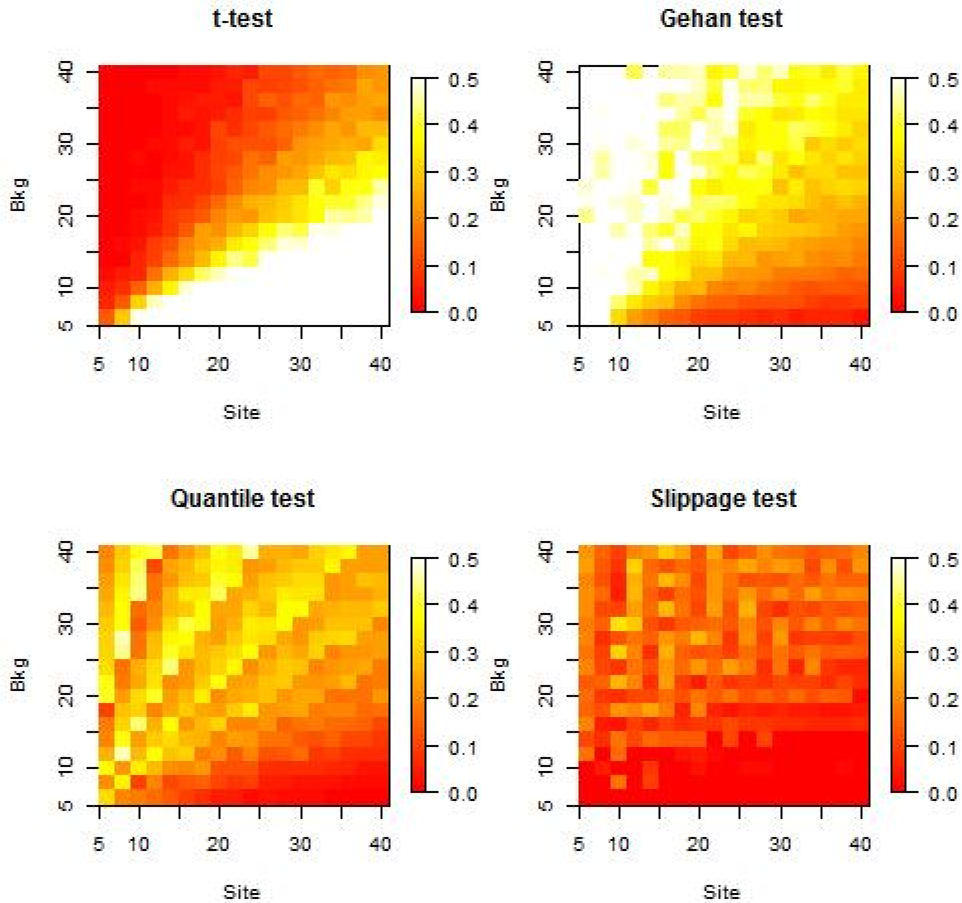
The plots shown in this section show the proportion of time that each of the four tests is responsible for the minimum *p*-value, among samples where the minimum *p*-value is less than 0.05.



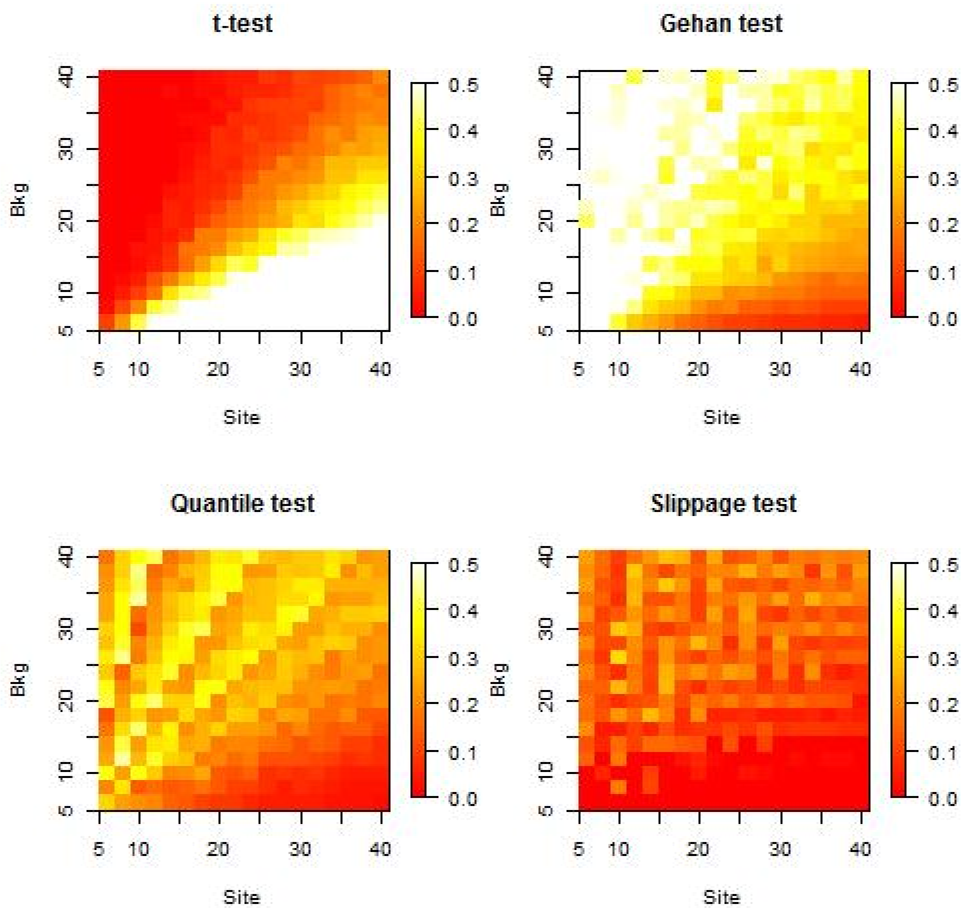
Test Attribution Figure A: Normal (100,30); No Censoring.



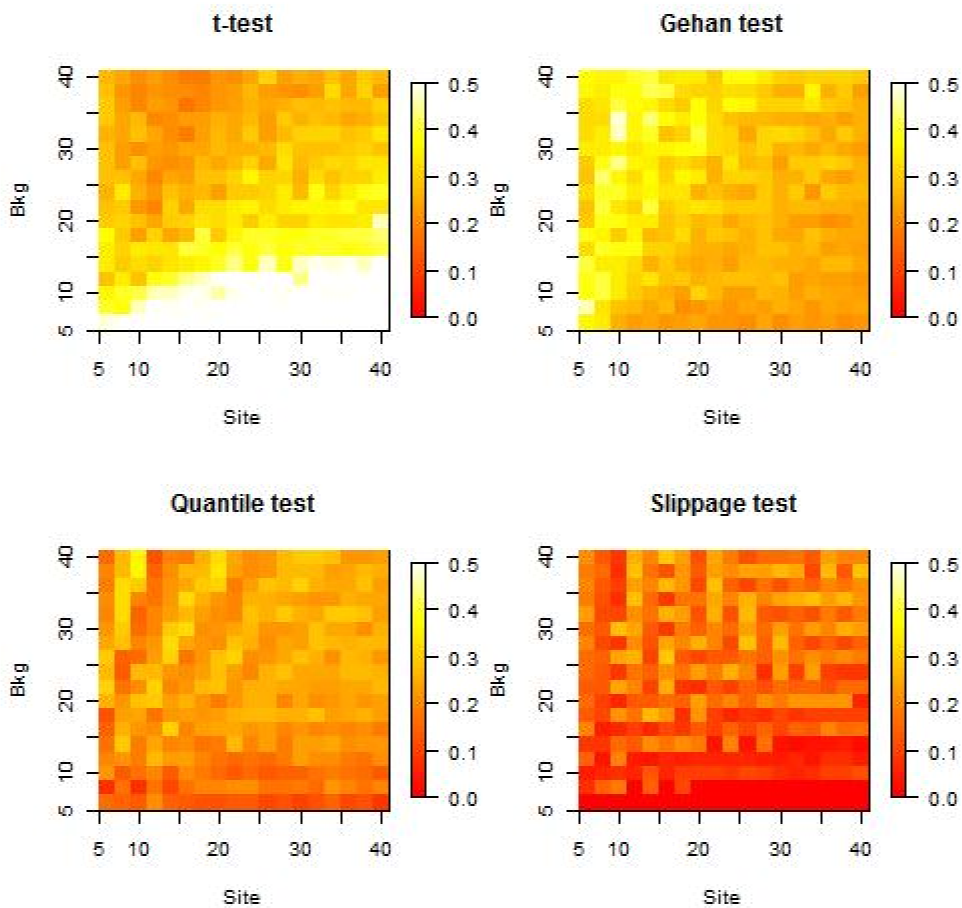
Test Attribution Figure B: Lognormal (4,0.5); No Censoring.



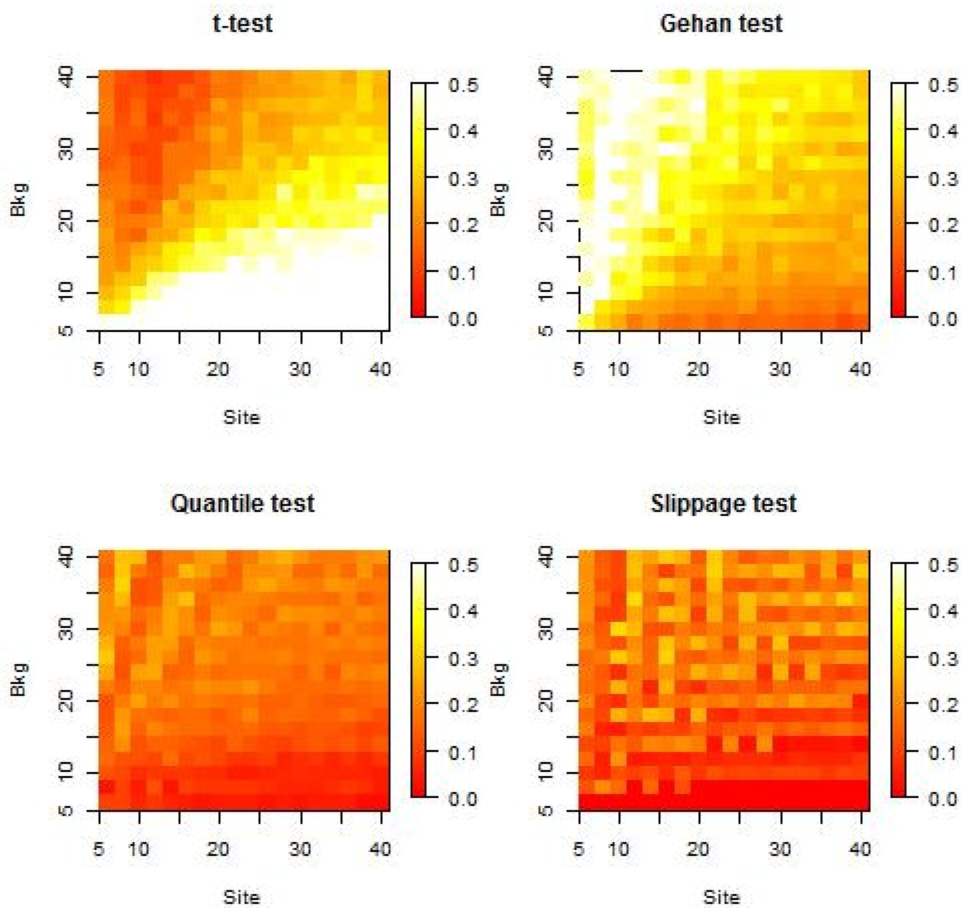
Test Attribution Figure C: Lognormal (4,1.0); No Censoring.



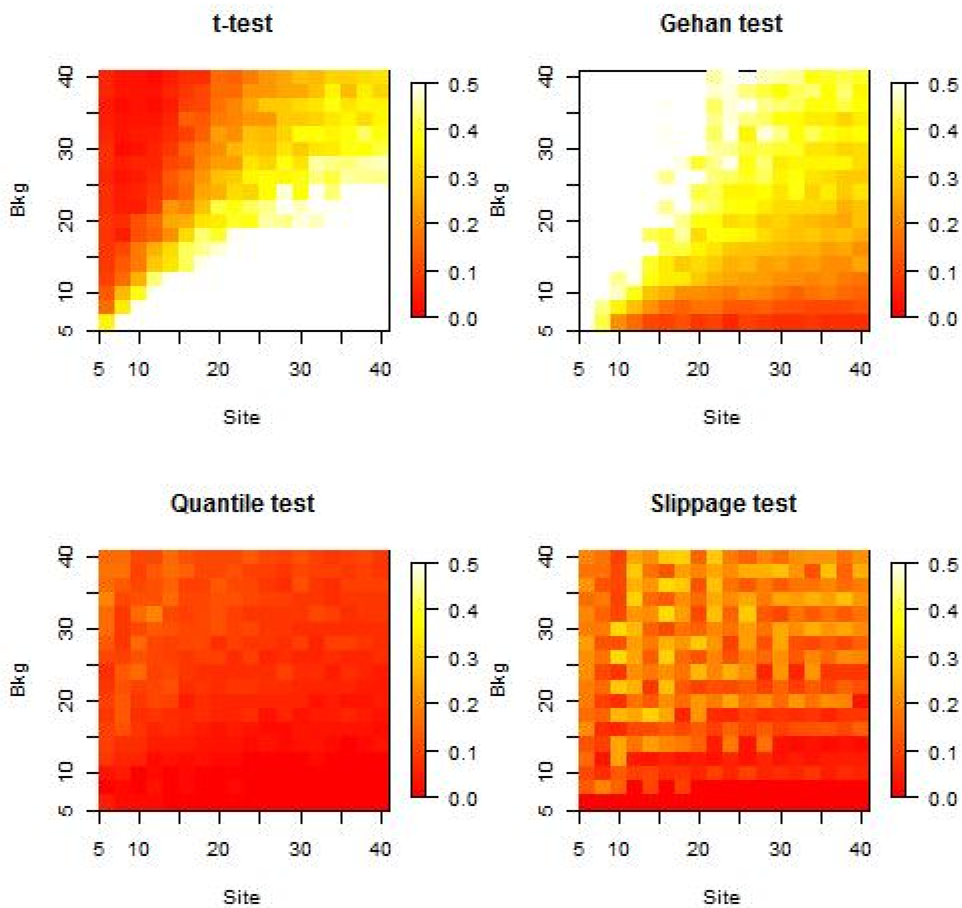
Test Attribution Figure D: Lognormal (4,1.5); No Censoring.



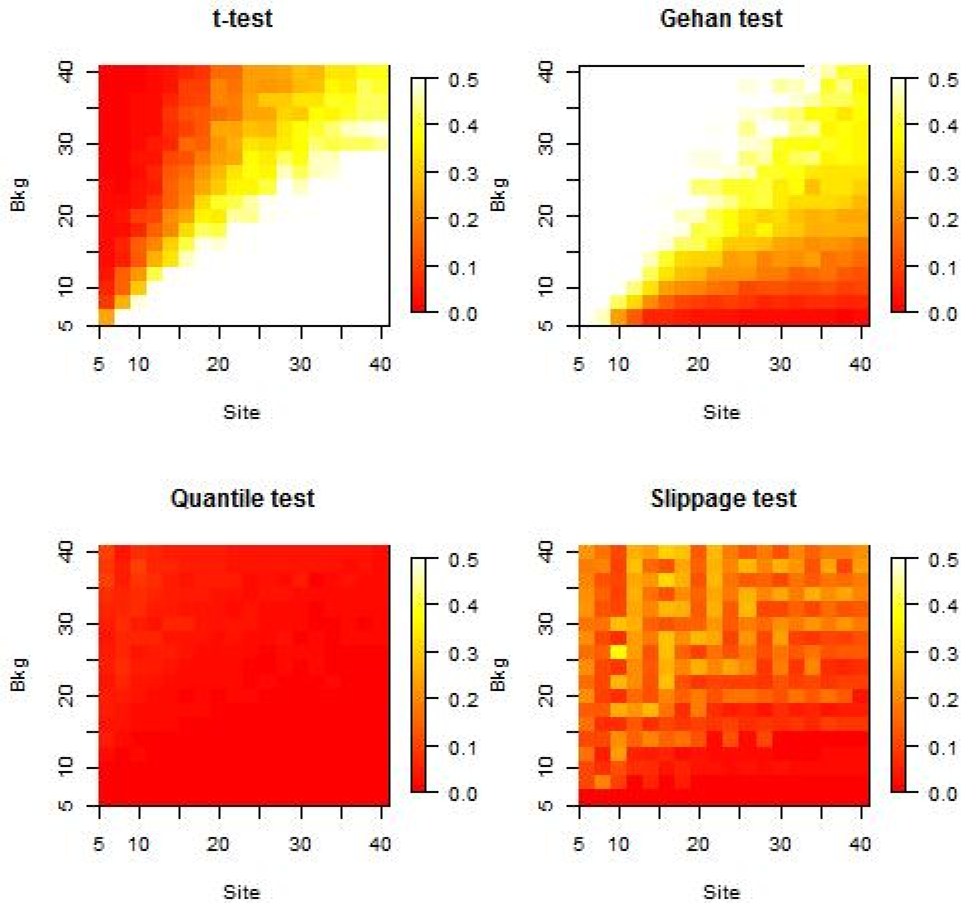
Test Attribution Figure E: Normal (100,30); DL = 61.5; Non-detects set to DL.



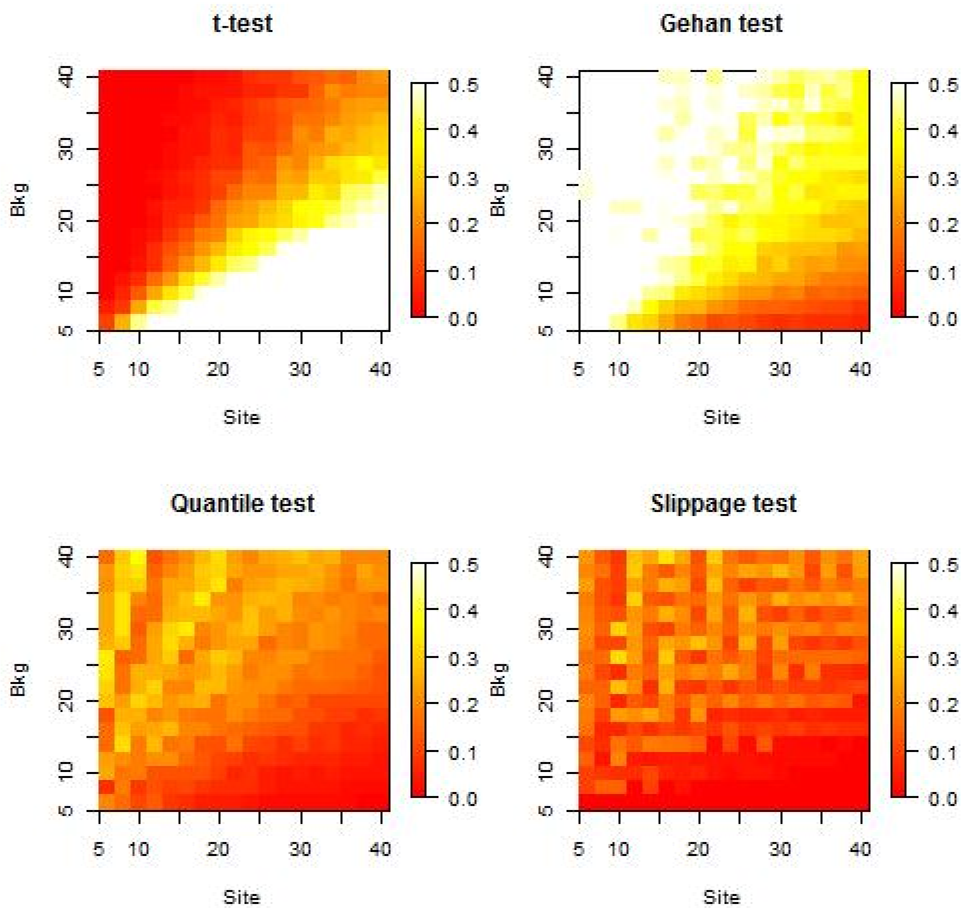
Test Attribution Figure F: Normal (100,30); DL = 74.5; Non-detects set to DL.



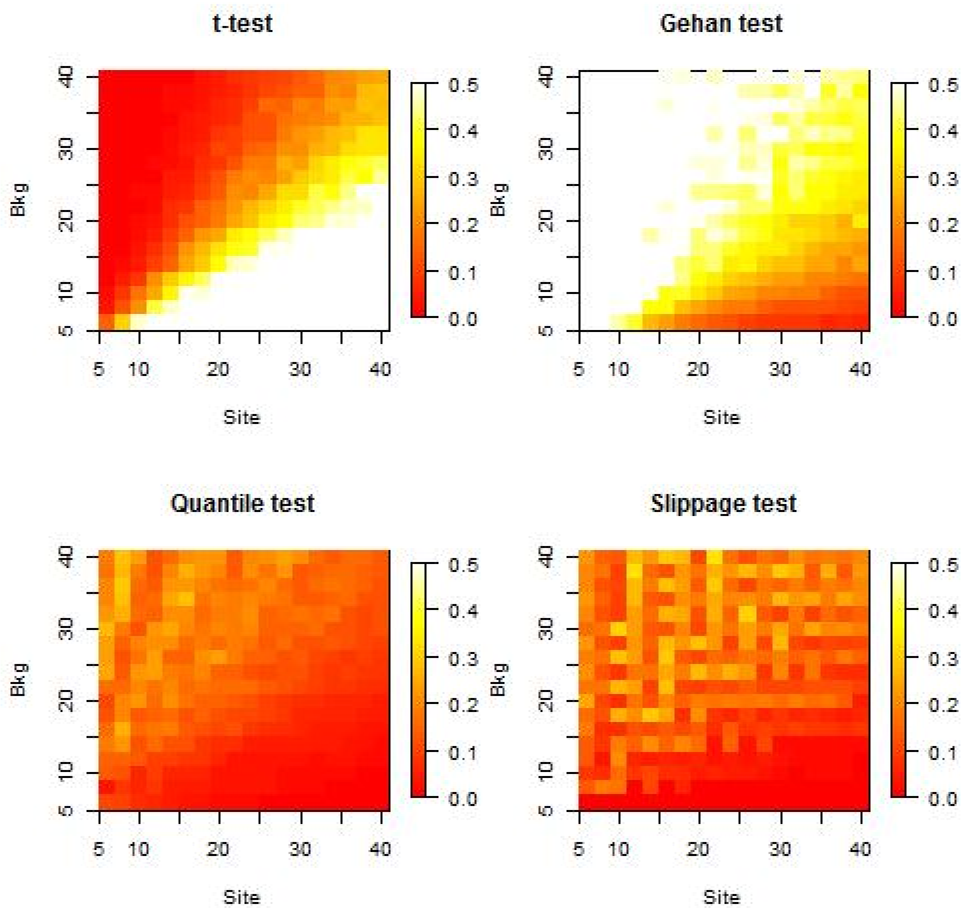
Test Attribution Figure G: Normal (100,30); DL = 88.4; Non-detects set to DL.



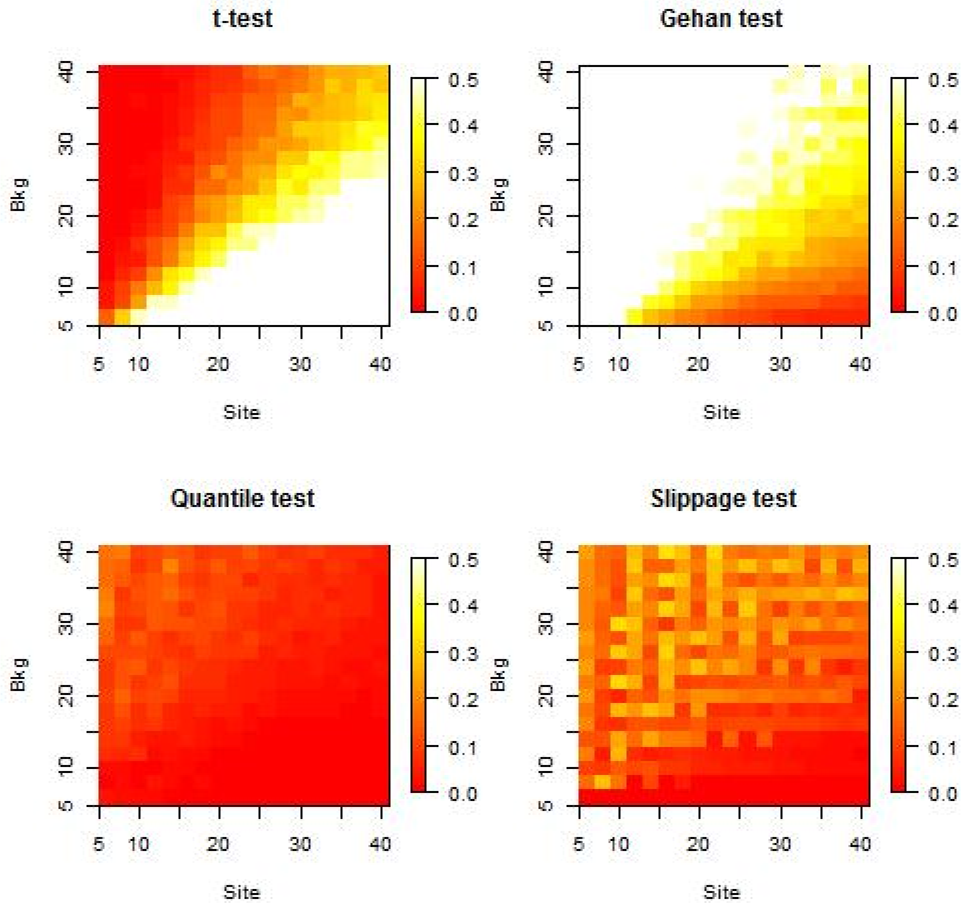
Test Attribution Figure H: Normal (100,30); DL = 100; Non-detects set to DL.



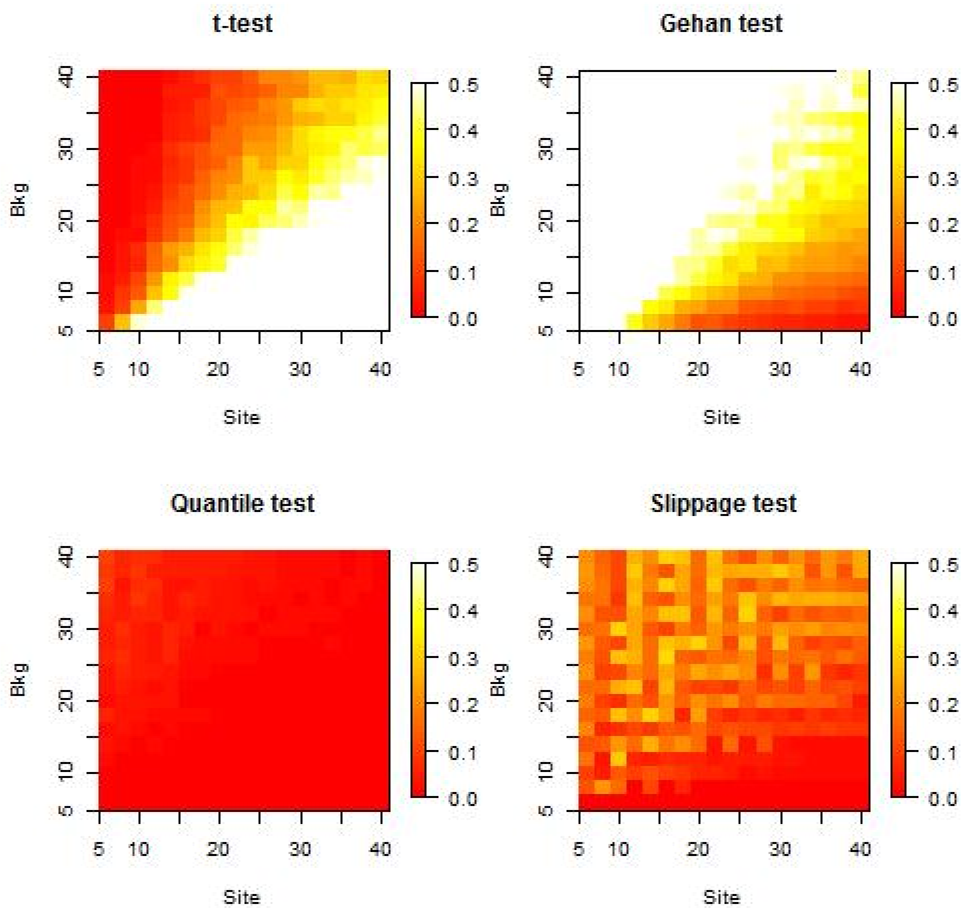
Test Attribution Figure I: Lognormal (4,1.5); DL = 8.0; Non-detects set to DL.



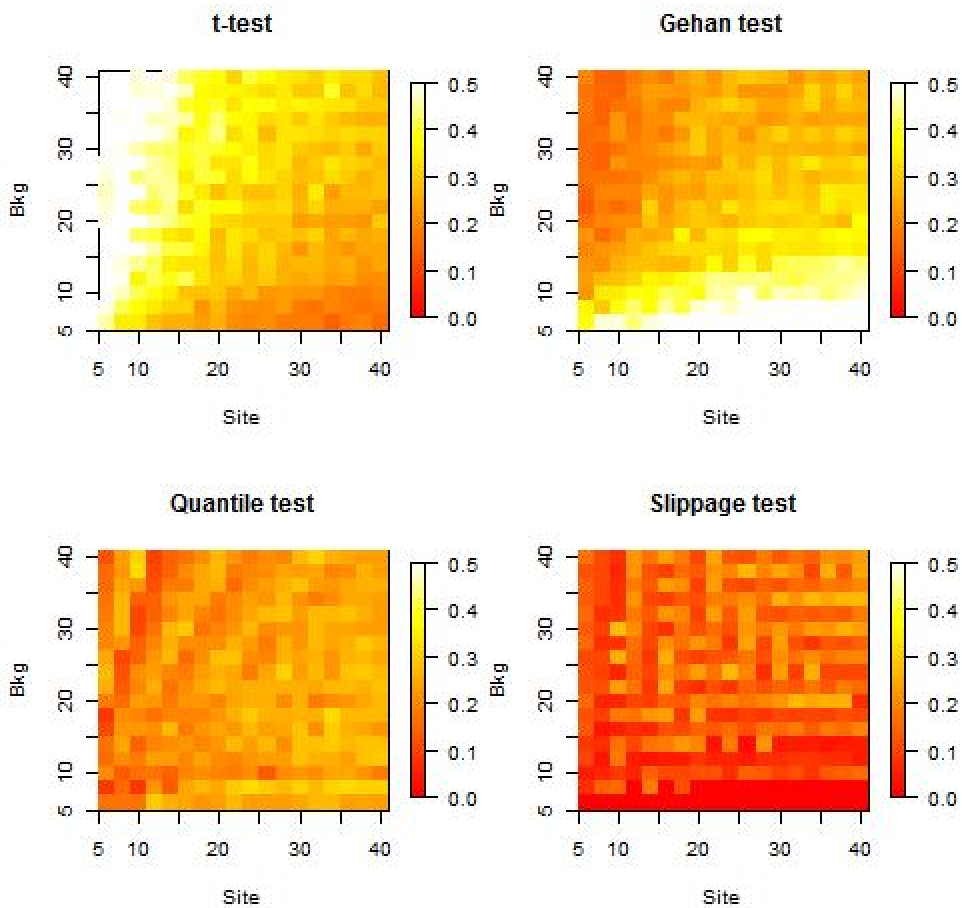
Test Attribution Figure J: Lognormal (4,1.5); DL = 15.4; Non-detects set to DL.



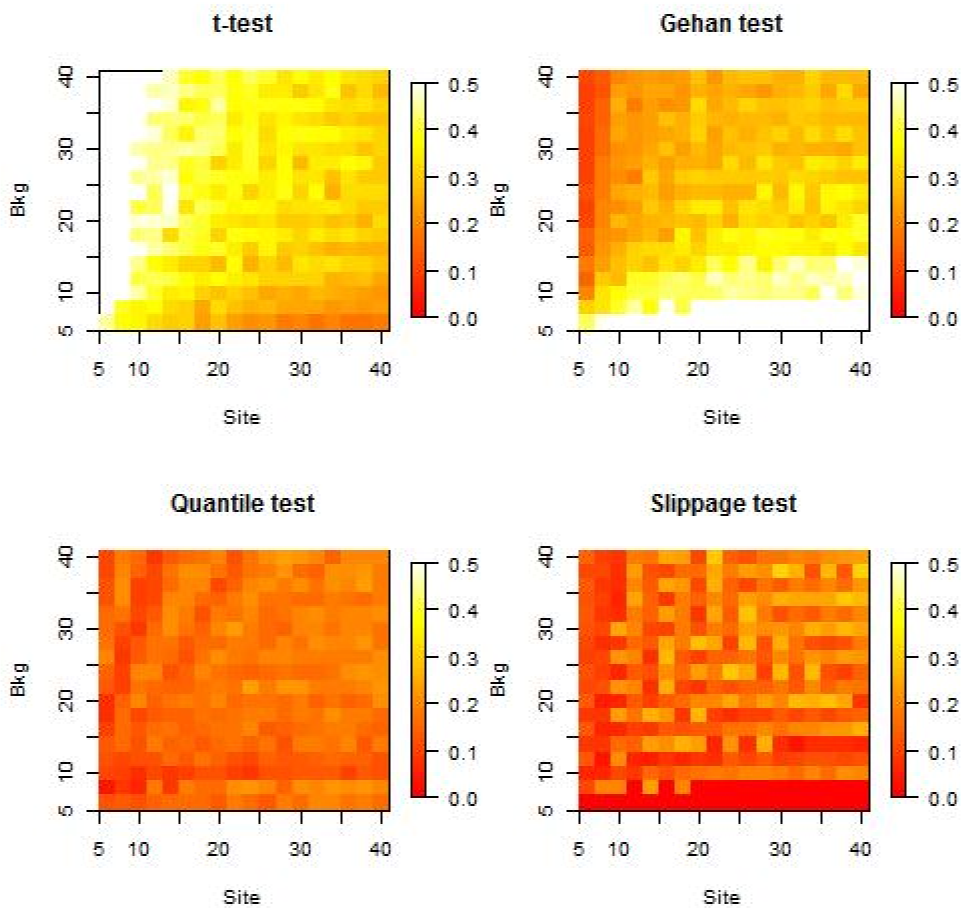
Test Attribution Figure K: Lognormal (4,1.5); DL = 30.6; Non-detects set to DL.



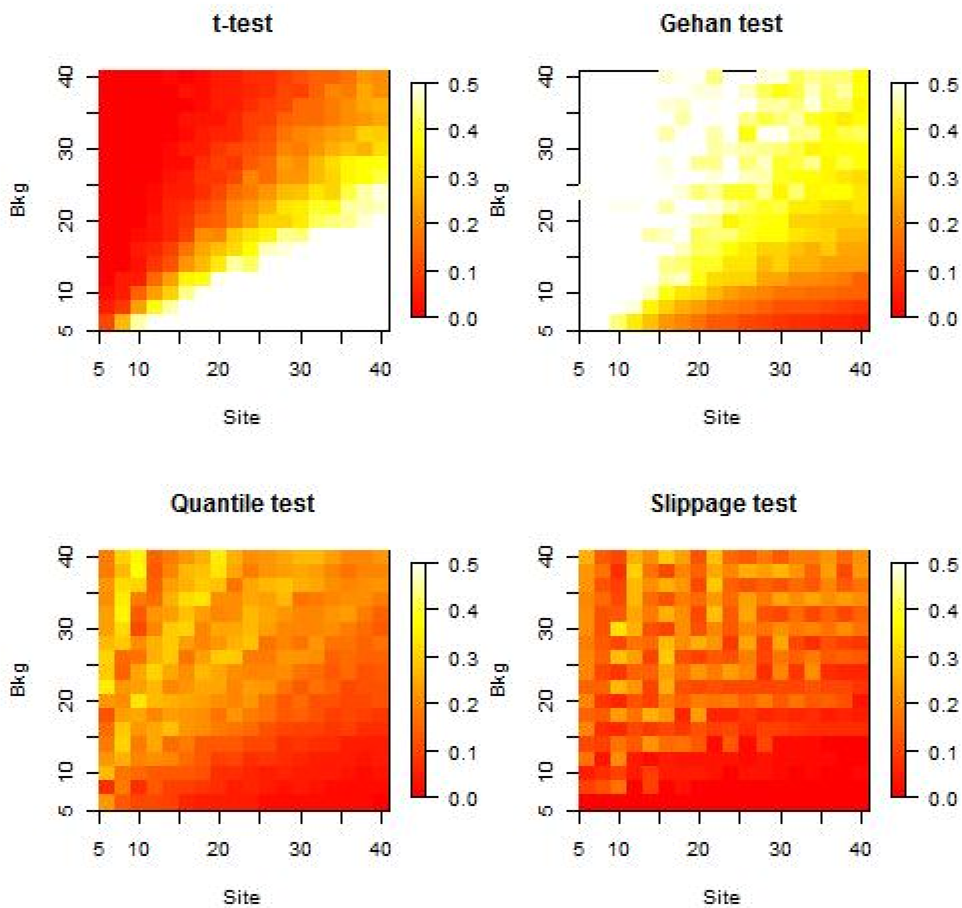
Test Attribution Figure L: Lognormal (4,1.5); DL = 54.6; Non-detects set to DL.



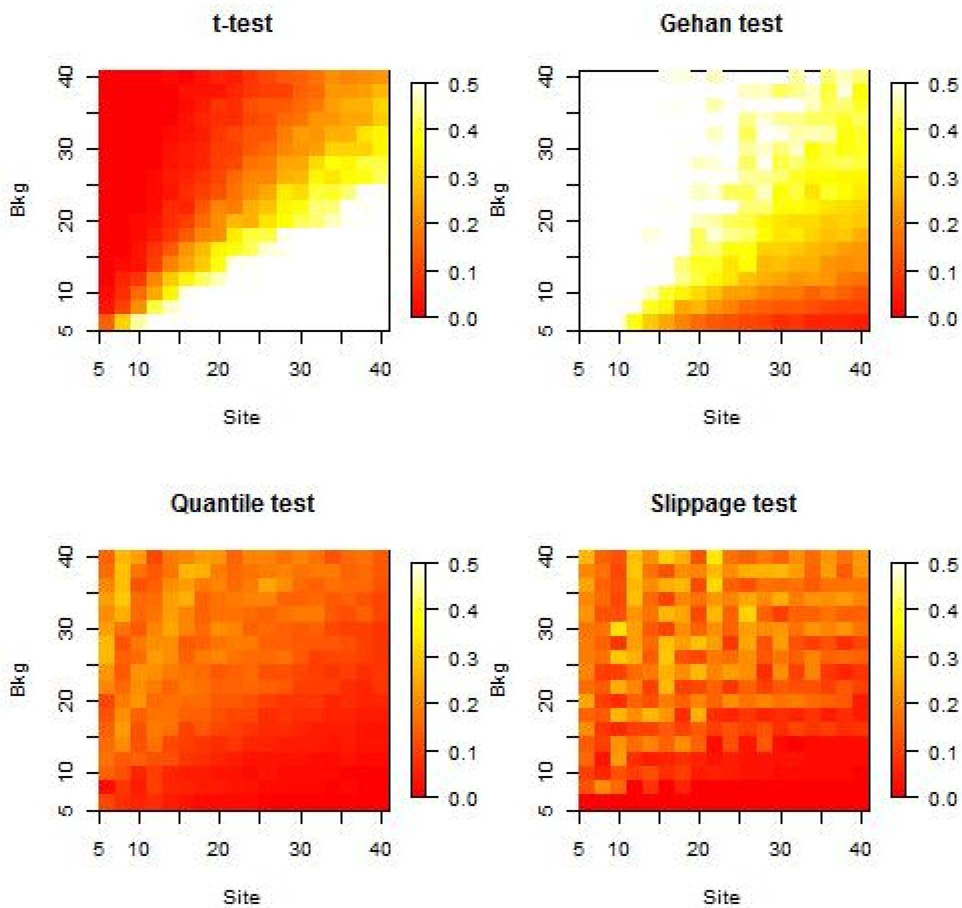
Test Attribution Figure M: Normal (100,30); DL = 61.5; Non-detects set to half-DL.



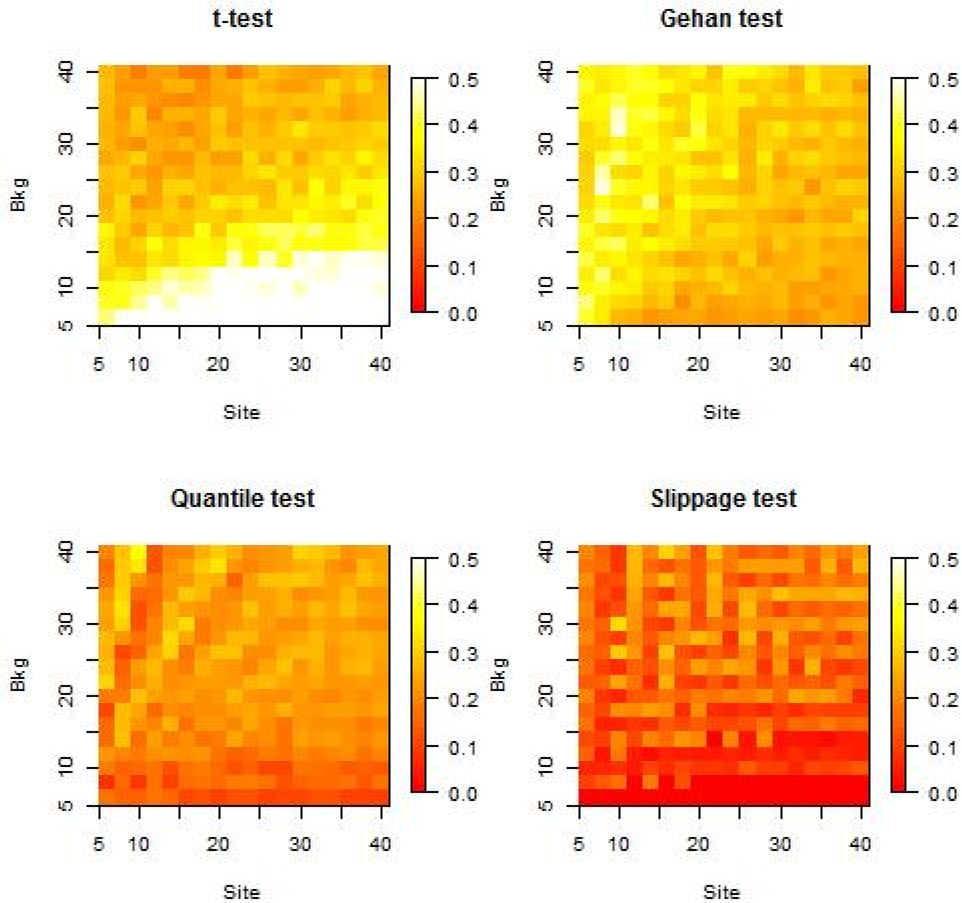
Test Attribution Figure N: Normal (100,30); DL = 74.5; Non-detects set to half-DL.



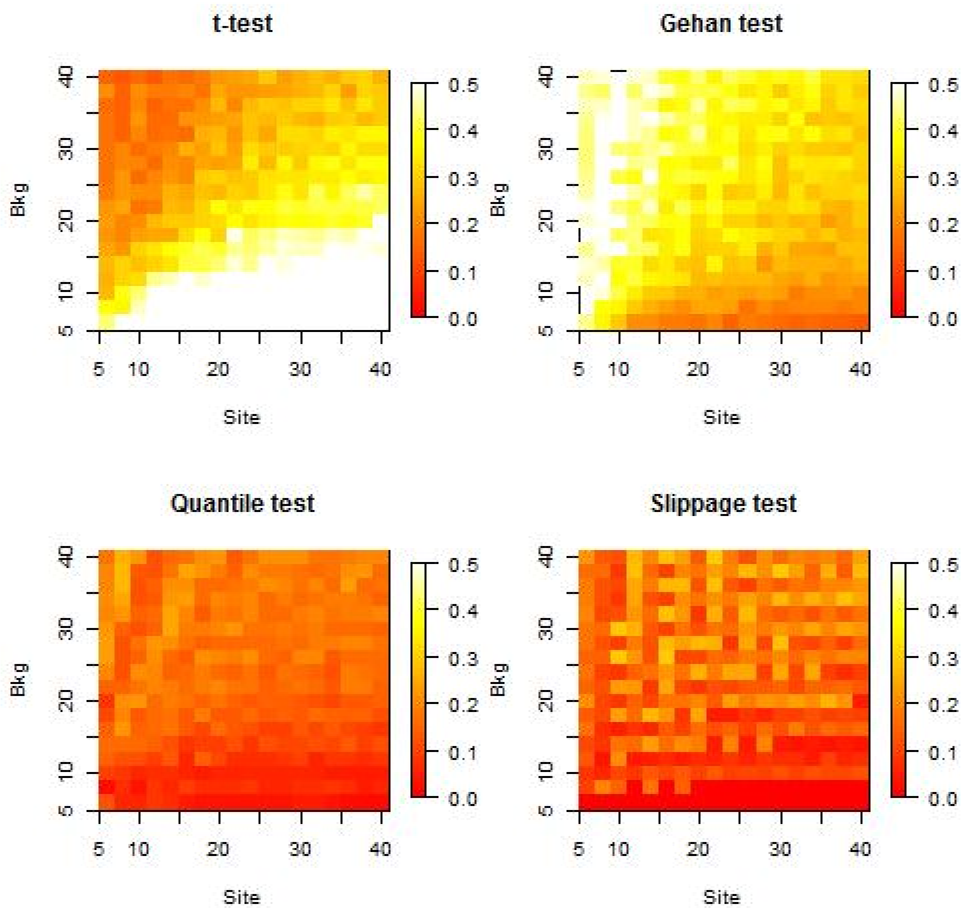
Test Attribution Figure O: Lognormal (4,1.5); DL = 8.0; Non-detects set to half-DL.



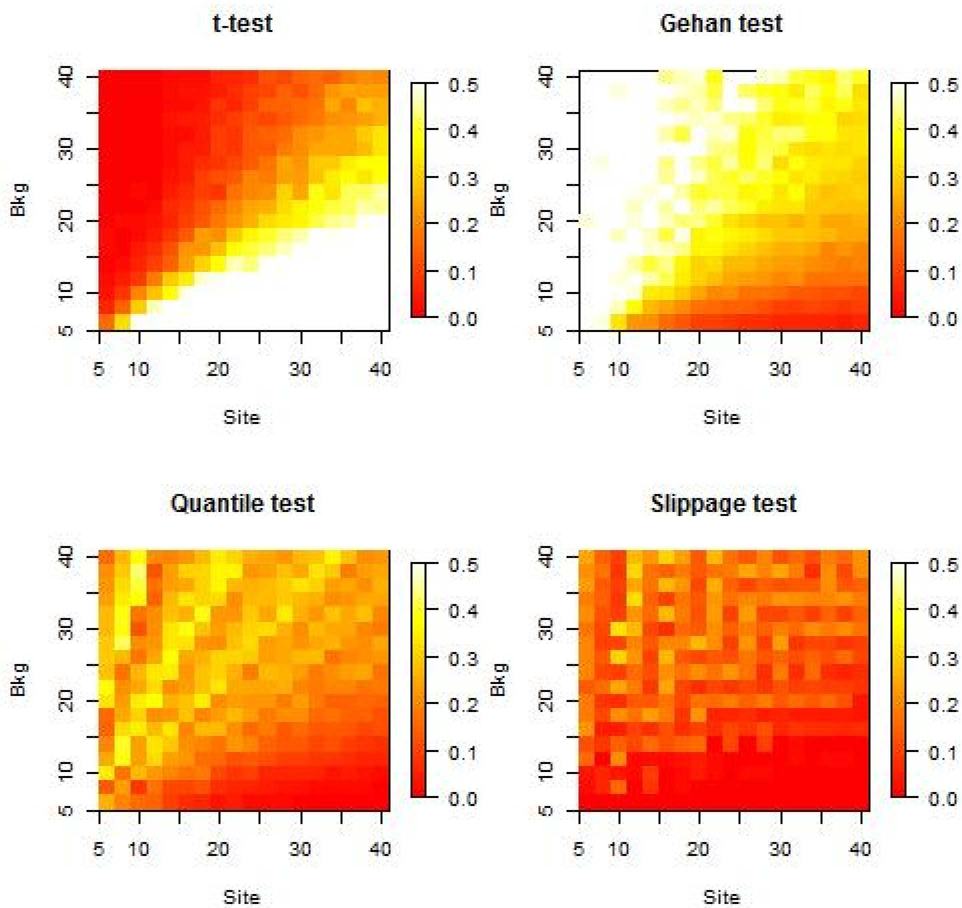
Test Attribution Figure P: Lognormal (4,1.5); DL = 15.4; Non-detects set to half-DL.



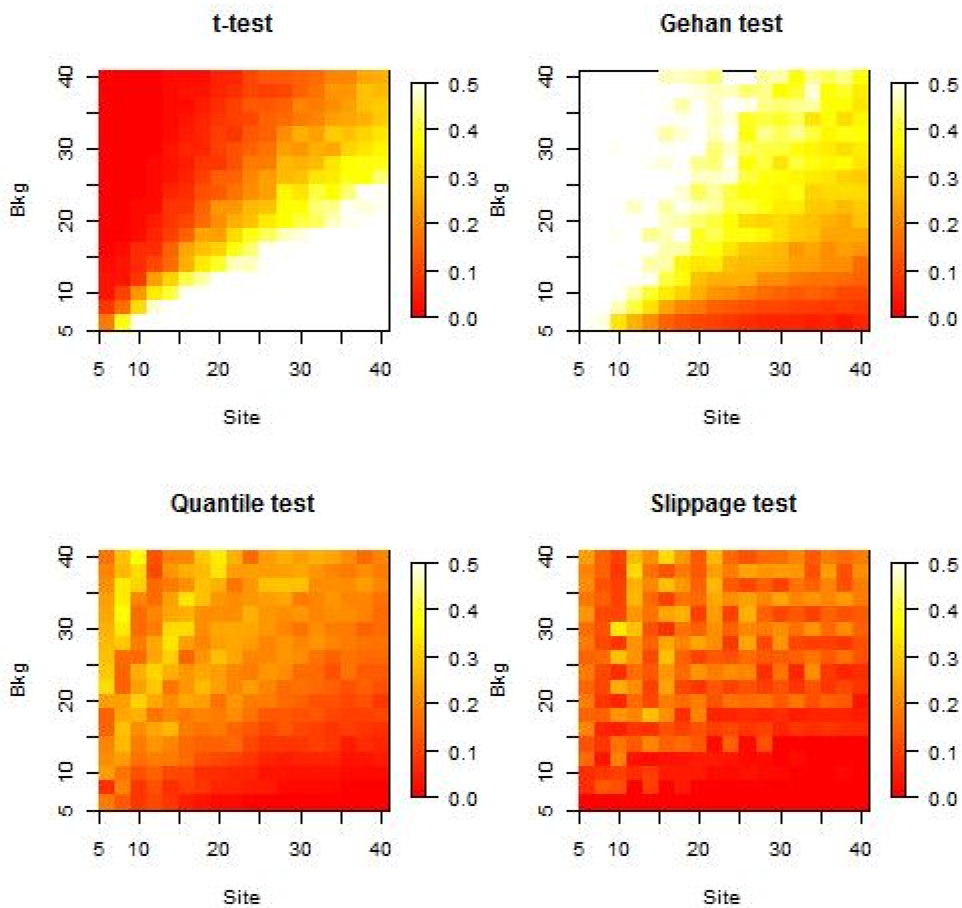
Test Attribution Figure Q: Normal (100,30); DL~ Normal(61.5,10); Non-detects set to DL.



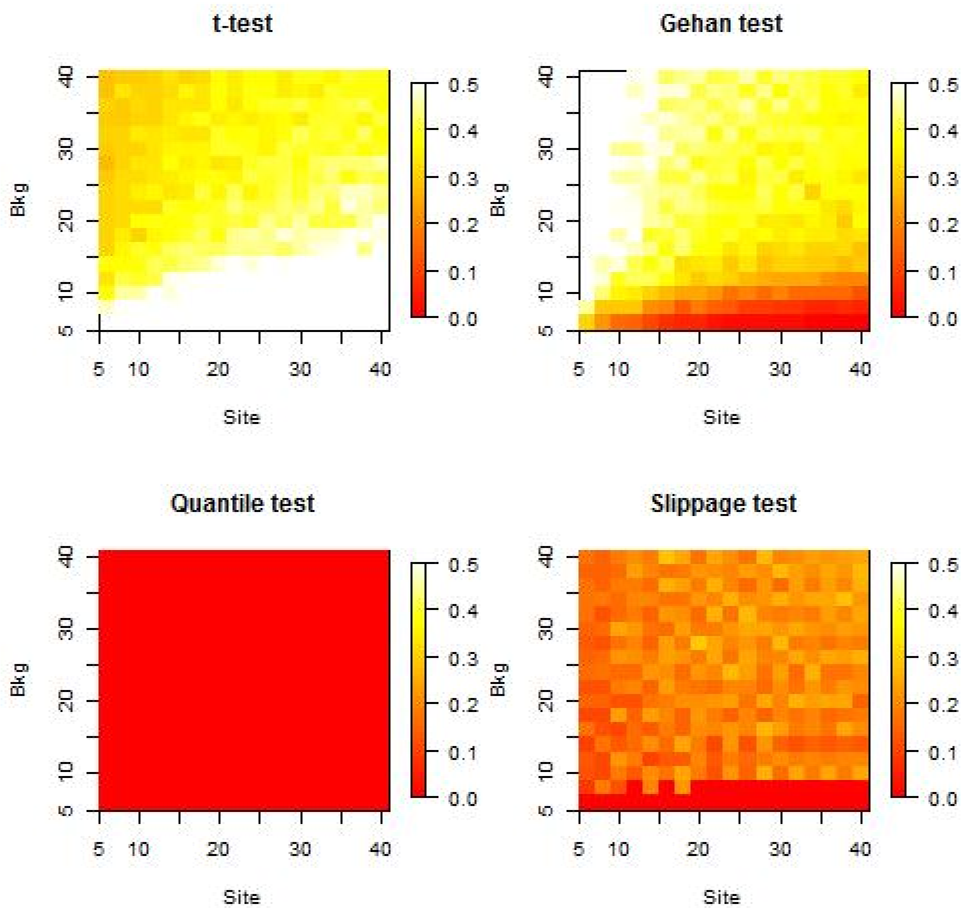
Test Attribution Figure R: Normal (100,30); DL~ Normal(74.5,10); Non-detects set to DL.



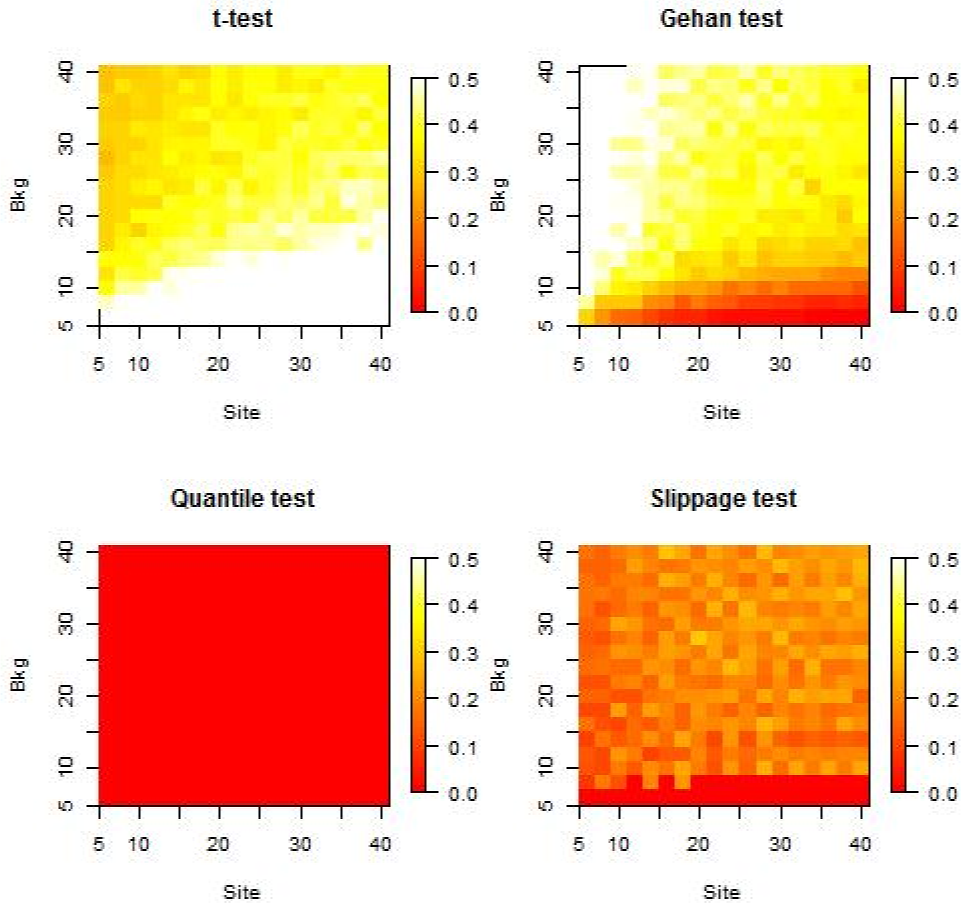
Test Attribution Figure S:
Lognormal (4,1.0); DL~ Lognormal(2,0.5); Non-detects set to DL.



Test Attribution Figure T:
Lognormal (4,1.0); DL~ Lognormal(2.6,0.5); Non-detects set to DL.



Test Attribution Figure U:
Normal (100,30); 20% chance of censoring –
assigned as non-detect with DL~ Normal(85,20).



Test Attribution Figure V:
Normal (4,1.5); 20% chance of censoring –
assigned as non-detect with DL~ Lognormal(3,1.0).

Tables of Required Familywise Corrections for Significance Level 0.05

This section provides tabular versions of the figures given previously in Appendix A, though these tables also include values for a few sample sizes greater than 40. Values listed in the table are the required *p*-value, converted to percentage, for better legibility (i.e., divide by 100 to get the familywise error rate corrected significance level).

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	3.8	3.8	3.6	2.5	3.4	2.5	3.1	2.8	3.0	2.9	2.9	2.7	2.4	2.7	2.6	2.8	2.7	2.9
	8	3.5	3.7	3.1	3.8	3.6	2.8	2.5	2.9	2.5	3.7	2.8	3.5	2.9	3.6	2.9	3.0	2.7	2.5
	10	4.1	2.9	3.5	2.9	2.8	3.5	3.6	3.0	2.6	2.4	3.3	3.4	3.3	3.4	3.7	3.1	3.5	3.6
	12	3.8	3.2	3.0	3.7	3.2	2.4	2.7	2.8	3.1	3.0	2.8	2.4	2.7	2.6	3.4	3.0	3.4	3.2
	14	3.5	3.8	3.5	3.0	3.2	3.4	2.8	2.7	3.0	3.4	3.3	3.1	2.7	2.4	2.1	2.2	2.6	2.4
	16	3.7	3.3	3.5	3.5	3.0	2.5	3.4	2.6	2.5	3.0	3.4	3.4	3.4	3.2	2.9	2.5	2.3	2.6
	18	3.7	2.9	3.0	3.1	3.3	3.1	3.0	2.3	3.0	2.7	2.3	2.8	2.8	3.0	2.6	3.3	2.6	2.6
	20	3.5	3.3	3.5	3.1	2.9	2.3	3.1	2.8	2.9	3.3	3.0	2.7	2.1	2.5	2.5	3.1	2.9	3.0
	22	3.3	3.5	3.0	3.2	3.4	2.7	2.7	2.6	2.4	3.1	2.2	3.2	2.6	2.4	2.5	3.0	2.9	3.0
	24	3.5	3.0	2.9	3.4	2.7	2.7	2.6	3.0	2.7	2.5	2.2	2.9	2.7	2.9	2.5	2.2	2.5	2.1
	26	3.6	3.0	3.3	3.2	3.1	2.4	3.1	2.7	2.0	3.1	2.6	2.8	2.9	2.8	3.0	2.7	2.4	2.2
	28	3.1	3.6	2.9	2.9	3.2	3.0	2.4	3.1	2.4	2.6	2.3	2.6	2.5	2.5	2.8	2.4	2.8	2.4
	30	3.2	3.2	3.5	3.0	3.3	2.5	2.8	2.9	2.6	2.4	3.0	3.1	2.6	2.2	2.8	2.9	3.4	2.5
	32	3.4	2.9	3.0	3.4	3.1	2.8	2.9	2.5	2.5	2.8	2.4	2.9	2.9	2.3	2.8	2.4	2.9	2.8
	34	3.0	3.0	3.0	3.0	3.1	2.7	2.4	3.0	2.6	2.8	2.7	2.5	2.7	3.1	2.7	2.3	2.2	2.2
	36	3.3	3.2	3.2	3.2	3.1	2.9	2.9	3.0	2.6	2.3	2.7	2.6	2.6	2.3	3.0	2.7	2.3	2.7
	38	3.3	3.3	2.8	3.1	3.0	3.0	2.4	2.8	2.8	2.6	2.9	2.7	2.6	2.1	2.6	2.3	2.7	2.5
	40	3.4	2.8	2.9	2.9	3.3	2.8	2.7	2.8	2.3	2.6	2.8	2.4	2.9	2.5	2.4	2.8	2.7	2.7

		Background			
		50	100	150	200
Site	50	2.8	2.8	2.5	2.3
	100	2.2	2.9	2.5	2.0
	150	2.5	2.2	2.4	2.7
	200	2.5	2.4	2.0	2.3

Table A: Normal (100,30), no censoring.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
ple Size	**6**	3.9	4.7	3.6	3.1	3.5	3.3	3.6	3.4	4.0	3.4	3.0	3.1	2.4	3.0	2.6	3.2	2.7	3.3

	8	3.5	3.7	3.8	4.5	3.6	2.9	2.9	3.6	3.7	4.5	4.0	4.0	4.0	3.6	3.3	3.0	2.7	2.5
	10	3.6	3.1	4.1	2.9	3.0	4.6	3.6	3.0	3.1	3.5	3.9	3.9	3.8	4.1	4.1	4.3	4.0	3.7
	12	2.9	2.7	3.0	3.9	3.3	3.2	2.7	3.4	3.1	3.1	2.6	2.6	3.5	2.8	3.8	3.1	3.6	3.2
	14	2.6	2.8	3.0	3.0	3.3	3.4	2.8	2.9	3.5	3.5	3.7	3.2	2.7	2.4	2.7	3.0	3.5	2.7
	16	2.5	2.9	3.1	2.9	3.0	2.8	3.6	2.6	3.1	3.2	3.5	3.7	3.6	3.2	2.9	2.6	2.8	3.1
	18	2.3	2.7	2.7	3.1	2.9	2.9	2.9	2.3	3.3	2.7	2.7	2.8	2.3	3.0	3.0	3.3	2.9	2.6
	20	2.0	2.4	2.7	2.6	2.9	2.6	3.1	2.6	2.9	3.5	3.0	2.5	2.6	3.0	2.9	3.4	3.7	3.3
	22	1.7	2.2	2.6	3.0	3.2	2.7	2.9	2.5	2.4	3.0	2.7	3.2	2.7	2.9	3.0	3.2	3.3	3.3
	24	1.8	2.1	2.4	2.4	2.7	2.7	2.9	2.9	2.9	2.6	2.3	3.1	3.0	2.9	2.5	2.2	2.5	2.2
	26	2.0	2.1	2.1	2.9	2.3	2.4	2.5	2.5	2.1	3.0	2.5	2.6	3.1	3.5	3.1	2.7	2.4	3.0
	28	1.6	2.0	2.0	2.5	2.6	2.8	2.5	2.9	2.4	2.9	3.0	2.6	2.5	2.4	2.8	2.9	2.8	2.5
	30	1.5	1.8	2.1	2.1	2.3	2.3	2.8	2.6	2.5	2.7	2.6	2.9	2.6	2.2	3.1	2.2	3.2	3.0
	32	1.5	2.0	2.2	2.3	2.5	2.5	2.6	2.5	2.2	2.5	2.4	2.8	2.9	2.6	2.7	2.4	2.8	2.8
	34	1.6	1.8	2.2	2.1	2.4	2.4	2.4	2.1	2.4	2.6	2.7	2.2	2.8	2.6	2.7	2.4	2.4	2.2
	36	1.5	1.7	2.2	2.0	2.3	2.6	2.5	2.5	2.1	2.5	2.7	2.6	2.8	2.3	3.1	2.7	2.3	2.5
	38	1.5	1.8	1.8	2.2	2.0	2.2	2.2	2.6	2.6	2.6	2.5	2.3	2.5	2.1	2.5	2.2	2.7	2.4
	40	1.2	1.9	1.7	2.2	2.4	2.3	2.0	2.3	2.3	2.2	2.4	2.1	2.7	2.5	2.4	2.6	2.4	2.7

		Background			
		50	100	150	200
Site	50	2.8	2.8	2.9	3.6
	100	2.0	2.6	2.5	2.9
	150	1.9	2.2	2.0	2.6
	200	2.0	2.0	2.0	2.3

Table B: Lognormal (4,0.5), no censoring.

Sample Size Site	Sample Size Background																	
	6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
6	3.9	4.7	3.6	3.1	4.2	3.3	4.2	3.9	4.0	3.1	3.0	2.9	2.4	3.1	2.6	3.2	2.7	3.3
8	3.7	3.8	3.8	3.8	3.6	2.9	2.6	3.4	3.4	4.1	4.0	4.4	4.0	3.6	3.3	3.0	2.7	2.5
10	3.1	3.1	3.5	3.2	2.8	4.1	3.6	3.0	3.1	3.2	3.6	4.5	4.6	4.3	4.6	4.3	4.0	3.7
12	2.6	3.2	3.0	3.7	3.3	3.5	2.7	3.4	3.1	3.1	2.6	2.6	3.6	2.9	3.6	3.1	4.0	3.2
14	2.4	3.1	3.0	3.0	3.3	3.7	2.8	3.2	3.7	3.7	3.7	3.2	2.7	2.4	2.4	2.5	3.2	2.4
16	2.1	2.5	3.0	3.2	3.0	3.0	3.6	2.8	2.9	3.2	3.6	3.7	3.7	3.2	2.9	2.7	2.7	2.8
18	1.7	2.5	2.7	2.8	2.9	3.1	2.7	2.7	3.3	2.7	2.7	2.8	2.6	3.0	3.1	3.3	2.9	2.6
20	1.6	2.2	2.4	2.4	2.9	2.5	3.1	3.1	3.3	3.6	3.0	2.5	2.6	3.5	2.9	3.5	2.8	3.3
22	1.3	1.7	2.3	2.5	2.6	2.7	3.0	2.5	2.4	3.0	3.3	3.2	2.7	2.5	3.0	3.6	3.2	3.4
24	1.3	1.8	2.3	2.2	2.6	2.7	2.6	2.9	2.9	2.5	2.7	3.1	2.7	2.9	2.5	2.2	2.5	2.5
26	1.0	1.5	2.0	2.3	2.5	2.2	2.7	2.5	2.3	3.0	2.6	3.0	3.1	3.4	3.1	2.7	2.7	2.6
28	0.8	1.4	1.8	2.1	2.3	2.4	2.4	2.8	2.4	2.6	3.0	2.6	2.5	2.6	2.8	2.8	2.8	2.5
30	0.9	1.3	1.7	2.0	2.0	2.2	2.3	2.4	2.3	2.3	3.0	3.0	2.6	2.5	3.0	2.7	3.1	3.0
32	0.7	1.2	1.4	1.9	2.1	2.1	2.3	2.5	2.2	2.6	2.4	2.7	2.9	2.6	2.6	2.4	3.2	2.7
34	0.6	1.0	1.4	1.9	2.0	2.1	2.1	2.5	2.3	2.5	2.7	2.2	2.7	3.0	2.7	2.3	2.1	2.2
36	0.6	0.9	1.4	1.7	1.8	2.0	2.1	2.1	2.2	2.3	2.7	2.5	2.3	2.3	2.7	2.7	2.4	2.6
38	0.5	0.9	1.2	1.5	1.7	2.0	1.8	2.1	2.3	2.3	2.4	2.4	2.5	2.1	2.2	2.2	2.5	2.4
40	0.4	0.8	1.1	1.3	1.6	1.9	1.7	2.0	2.3	2.0	2.2	2.1	2.6	2.5	2.2	2.5	2.8	2.7

Site	Background			
	50	100	150	200
50	2.8	2.8	2.8	3.4
100	1.7	2.3	2.4	2.9
150	1.4	2.0	1.9	2.2
200	1.2	1.6	1.9	1.9

Table C: Lognormal (4,1.0), no censoring.

	Sample Size Background																	
Sample Size Site	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
6	3.9	4.7	3.6	3.1	4.2	3.3	3.6	3.4	4.0	3.4	3.0	2.7	2.4	3.1	2.6	3.2	2.7	3.3
8	3.5	3.8	3.8	4.5	3.6	2.9	2.9	3.8	3.4	4.1	4.4	4.0	4.0	3.6	3.3	3.0	2.7	2.5
10	3.1	3.1	4.1	2.9	2.8	4.1	3.6	3.2	3.1	3.2	3.9	3.7	4.0	4.1	4.6	3.9	4.0	3.7
12	2.8	3.4	3.0	4.2	3.3	3.2	3.1	3.4	3.1	3.1	2.8	2.6	2.9	2.8	3.8	3.1	3.8	3.2
14	2.5	3.1	3.3	3.0	3.7	3.7	2.8	2.9	3.5	3.7	3.7	3.2	2.7	2.4	2.6	2.3	3.0	2.8
16	2.3	2.7	3.3	3.2	3.0	3.2	3.6	2.8	3.1	3.2	3.3	3.7	3.7	3.2	2.9	2.8	2.6	3.2
18	2.0	2.4	2.7	3.1	3.1	3.1	3.1	3.1	3.3	2.7	2.4	2.8	2.9	3.0	3.1	3.3	2.9	2.7
20	1.9	2.1	2.3	2.7	2.9	2.3	3.1	2.9	3.1	3.6	3.0	3.0	2.7	3.3	3.1	3.5	3.0	3.3
22	1.4	1.9	2.5	2.8	2.8	2.7	2.9	2.5	2.4	3.1	2.7	3.2	2.7	2.7	3.0	3.3	3.3	3.1
24	1.3	1.7	2.2	2.4	2.7	2.7	2.6	2.8	3.1	2.6	2.2	3.3	2.5	2.9	2.5	2.8	2.5	2.6
26	1.1	1.6	2.1	2.3	2.7	2.4	2.7	2.8	2.1	3.1	2.6	2.7	3.1	3.2	3.1	2.7	2.7	2.2
28	1.0	1.4	1.8	2.2	2.5	2.8	2.5	3.0	2.5	2.8	3.0	2.6	2.5	3.0	2.8	2.9	2.8	2.5
30	0.9	1.3	1.7	1.9	2.1	2.3	2.7	2.4	2.3	2.8	2.9	2.9	2.6	2.3	2.6	2.7	3.1	3.0
32	0.8	1.1	1.5	1.8	2.1	2.4	2.1	2.5	2.1	2.7	2.4	2.7	2.8	2.6	2.9	2.4	2.9	2.8
34	0.8	1.1	1.4	1.6	1.9	2.1	2.1	2.3	2.3	2.6	2.7	2.5	2.7	2.6	2.7	2.3	2.4	2.4
36	0.7	0.9	1.3	1.5	1.9	1.9	2.1	2.1	2.2	2.3	2.6	2.6	2.6	2.3	3.0	2.7	2.4	2.8
38	0.5	0.9	1.2	1.4	1.8	2.0	1.9	2.4	2.5	2.4	2.4	2.6	2.5	2.1	2.5	2.2	2.5	2.5
40	0.4	0.8	1.2	1.3	1.8	1.7	1.6	2.4	2.3	2.4	2.4	2.1	2.5	2.5	2.4	2.9	2.6	2.7

	Background			
Site	50	100	150	200
50	2.8	2.8	2.9	3.8
100	1.7	2.4	2.5	3.0
150	1.3	1.7	1.9	2.3
200	1.0	1.6	1.9	2.2

Table D: Lognormal (4,1.5), no censoring.

	Sample Size Background																	
Sample Size Site	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
6	3.9	3.9	3.8	3.0	2.9	2.8	3.4	3.4	3.7	2.9	3.2	3.1	2.7	3.1	2.6	3.2	2.7	3.3
8	4.1	3.7	3.8	4.2	3.6	3.6	2.9	3.5	3.0	3.4	3.4	3.8	3.7	3.6	3.4	3.4	3.0	3.0
10	3.6	3.1	3.8	3.5	2.8	3.8	3.6	3.5	3.1	3.2	3.3	3.7	3.6	3.8	4.0	3.9	4.0	4.0
12	3.4	3.6	3.7	3.0	3.2	3.3	2.8	2.8	3.1	3.2	3.4	2.7	3.4	2.8	3.7	3.1	3.5	3.2
14	3.2	3.6	3.5	3.5	3.6	3.7	3.7	2.9	3.3	3.0	3.5	3.4	3.3	2.9	2.9	2.4	2.7	2.8
16	3.4	3.3	3.5	3.6	3.0	3.0	3.3	2.8	3.2	3.1	3.1	3.6	3.7	3.6	3.5	3.2	2.9	3.0
18	3.5	3.3	2.7	3.1	3.3	3.1	3.3	2.7	3.3	3.0	3.0	2.8	2.5	3.0	3.0	3.3	2.6	3.1
20	3.1	3.0	3.1	3.3	3.4	2.6	3.4	3.2	2.9	3.6	3.1	3.3	3.1	2.8	3.1	3.6	3.4	3.6
22	3.2	3.2	3.0	3.2	3.6	3.0	3.1	2.6	3.0	3.1	2.7	3.2	2.7	3.0	3.0	2.8	3.3	3.4
24	3.1	3.0	2.8	3.1	3.0	2.7	3.3	3.1	3.1	3.2	3.0	2.9	2.9	3.1	2.7	3.1	2.5	2.7
26	3.0	3.0	3.0	3.0	3.1	2.9	2.9	3.0	2.8	3.1	2.6	3.1	3.1	3.0	3.5	3.1	3.3	3.0
28	3.2	3.2	2.8	3.2	3.3	3.0	3.1	3.3	2.9	2.9	2.7	3.1	2.6	2.7	2.8	3.0	3.1	2.8
30	2.8	3.0	3.1	3.2	3.3	2.5	2.9	3.2	2.5	2.9	3.0	3.0	3.1	2.8	2.8	3.0	3.3	2.8
32	2.9	3.1	3.0	3.2	3.1	3.3	2.8	3.1	2.5	2.9	2.4	2.9	2.9	2.8	3.0	2.4	3.4	2.8
34	3.0	2.8	3.2	3.2	3.1	2.7	2.8	3.3	2.7	2.9	3.1	2.7	3.0	3.0	2.9	2.7	2.9	2.4
36	3.0	3.3	3.2	3.4	3.1	3.1	2.9	2.9	2.7	2.8	2.7	2.5	3.0	2.6	3.3	2.8	3.1	2.9
38	3.0	3.0	2.9	3.0	3.0	3.0	2.8	3.3	2.8	3.2	3.0	2.7	3.3	2.8	2.7	2.3	3.0	2.7
40	2.6	3.2	2.9	2.7	3.0	3.1	2.9	3.0	2.6	2.5	3.0	2.8	3.2	2.6	2.9	2.8	2.9	3.2

	Background			
Site	50	100	150	200
50	3.1	2.8	2.9	3.7
100	2.6	2.4	2.9	3.1
150	2.6	2.2	2.6	2.6
200	2.8	2.4	2.4	2.5

Table E: Normal (100,30); DL = 61.5; Non-detects set to DL.

Sample Size Site		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
	6	3.9	4.3	4.4	3.6	3.6	3.0	3.6	2.8	3.6	3.4	3.6	3.1	3.3	3.1	2.7	3.2	2.7	3.3
	8	3.9	3.8	3.8	4.4	4.4	4.0	3.6	3.6	3.6	4.1	4.1	4.1	3.7	3.6	3.9	3.8	3.6	3.4
	10	3.5	3.0	4.0	4.1	3.3	4.0	3.6	3.9	3.7	3.8	3.8	4.0	3.7	3.7	4.4	4.4	4.3	4.0
	12	3.2	3.4	3.6	3.9	3.6	3.5	3.1	3.6	3.1	3.2	3.4	3.1	3.6	2.8	3.8	3.1	3.9	3.2
	14	2.8	3.3	3.0	3.6	3.7	3.4	3.7	3.4	3.7	3.4	4.3	3.7	3.7	3.4	3.2	3.0	3.2	2.7
	16	2.7	3.2	3.2	3.5	3.0	3.2	3.7	2.8	3.6	3.2	3.8	3.7	3.8	4.1	3.7	3.6	3.7	3.5
	18	2.7	2.9	2.7	3.4	3.6	3.5	3.4	2.9	3.7	3.0	3.3	2.9	3.0	3.0	3.2	3.3	3.1	3.5
	20	2.4	2.6	2.9	3.3	3.5	2.8	3.5	3.2	3.6	3.3	3.6	3.8	3.3	3.3	3.0	3.3	3.0	3.7
	22	2.4	2.7	3.0	3.4	3.5	3.1	3.2	2.5	3.0	3.1	3.3	3.5	2.7	3.7	3.0	3.5	3.3	3.4
	24	2.4	2.8	2.5	3.1	3.3	2.7	3.5	3.5	3.2	3.3	3.2	3.2	2.8	2.9	3.0	3.3	2.8	2.8
	26	2.1	2.6	3.1	3.0	3.2	3.0	3.2	3.0	2.8	3.4	2.7	3.4	3.1	3.4	3.5	3.4	3.7	2.9
	28	2.1	2.6	2.8	2.9	3.2	3.0	3.0	3.6	3.1	3.3	2.8	3.1	2.8	3.4	2.8	3.0	3.1	2.6
	30	2.4	2.5	3.0	2.9	3.2	2.7	2.8	3.4	2.4	3.3	3.0	3.2	3.3	3.4	3.6	3.2	3.1	3.0
	32	2.3	2.5	2.8	2.5	3.1	3.1	3.0	3.1	2.9	3.4	2.7	3.2	2.9	3.1	3.3	2.6	3.4	2.8
	34	2.1	2.6	2.7	2.8	2.8	2.7	3.0	3.3	2.6	3.1	3.3	3.1	3.2	3.1	3.1	3.1	3.3	2.6
	36	1.9	2.7	2.7	2.7	2.9	3.3	3.1	3.2	2.6	3.2	2.7	3.2	3.2	2.6	3.4	2.8	3.0	3.1
	38	2.0	2.0	2.6	2.8	2.9	3.0	2.6	3.1	2.8	3.1	3.3	2.9	3.3	2.8	3.2	2.5	3.2	2.5
	40	1.9	2.4	2.6	2.7	3.0	2.8	2.9	3.1	2.8	2.7	3.0	2.9	3.3	2.7	3.2	3.0	3.1	3.5

Site		Background			
		50	100	150	200
	50	3.1	2.8	3.1	3.6
	100	2.5	2.8	3.1	2.8
	150	2.6	2.6	2.8	2.7
	200	2.8	2.6	2.6	2.6

Table F: Normal (100,30); DL = 74.5; Non-detects set to DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	4.5	4.6	4.4	4.1	4.0	3.7	4.0	3.7	3.7	3.8	4.0	3.3	3.7	3.5	3.4	3.2	3.2	3.3
	8	3.5	3.8	4.4	4.3	4.6	4.7	4.2	4.6	3.8	4.3	4.0	3.8	4.1	4.4	3.8	4.7	4.0	3.8
	10	3.1	3.2	3.6	4.2	3.3	4.1	3.6	4.6	4.2	4.1	4.3	4.0	3.9	4.4	4.2	4.0	4.4	4.4
	12	2.6	3.4	3.5	4.1	3.5	3.6	3.5	3.9	3.1	3.3	3.4	3.8	3.6	3.7	3.8	3.1	4.0	3.2
	14	2.0	2.9	2.8	3.7	3.8	3.9	4.2	4.1	3.7	3.7	3.7	3.7	4.4	3.9	4.0	3.5	4.0	3.4
	16	1.9	2.9	2.9	3.3	3.0	3.4	3.8	3.2	3.9	3.2	4.1	3.7	3.7	4.1	4.0	4.2	3.9	4.0
	18	1.8	2.4	2.7	3.1	3.6	3.2	3.7	3.5	3.7	3.4	3.5	3.2	3.5	3.0	3.4	3.3	3.2	3.5
	20	1.5	2.3	2.6	3.2	3.2	2.9	3.9	3.2	3.5	3.8	3.6	3.6	3.8	4.0	3.6	3.6	3.5	4.0
	22	1.4	2.3	2.9	2.8	3.2	3.2	3.5	2.8	3.8	3.1	3.1	3.5	3.1	3.8	3.0	3.7	3.3	3.8
	24	1.1	1.9	2.5	2.8	3.1	2.7	3.5	3.6	3.5	3.8	3.4	3.6	3.5	3.6	3.3	3.5	3.0	3.6
	26	1.2	1.8	2.6	2.9	3.1	2.7	3.0	3.0	3.3	3.7	2.7	3.8	3.1	3.6	3.5	3.6	3.7	3.6
	28	1.0	1.6	2.1	2.5	3.0	3.0	3.3	3.4	3.2	3.4	3.2	3.5	3.2	3.7	2.8	3.3	3.1	3.5
	30	0.8	1.7	2.2	2.6	2.7	2.5	3.1	3.2	2.9	3.3	3.0	3.4	3.6	3.6	3.7	3.4	3.7	3.3
	32	0.9	1.5	2.2	2.4	2.7	3.0	2.9	3.0	3.1	3.4	2.7	2.9	2.9	3.2	3.3	3.1	3.5	3.1
	34	1.0	1.7	2.0	2.3	2.6	2.7	2.8	2.9	2.6	3.2	3.3	3.0	3.4	3.3	3.2	3.3	3.2	2.8
	36	1.1	1.4	2.0	2.2	2.5	3.0	2.7	3.1	2.8	3.2	2.7	2.9	3.2	2.8	3.3	2.8	3.5	3.1
	38	0.7	1.6	2.0	2.2	2.6	2.6	2.5	3.2	2.8	3.4	3.4	3.0	3.1	2.9	3.5	2.8	3.4	3.0
	40	0.9	1.6	1.8	2.0	2.5	2.6	2.8	3.1	2.4	3.0	3.0	2.6	3.3	2.9	3.3	3.0	3.4	3.0

		Background			
		50	100	150	200
Site	50	3.2	2.9	3.2	3.0
	100	2.8	3.3	3.1	3.3
	150	2.6	2.8	3.1	2.7
	200	2.8	3.1	2.7	2.8

Table G: Normal (100,30); DL = 88.4; Non-detects set to DL.

Sample Size Site	Sample Size Background → 6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
6	4.6	4.5	4.5	4.4	4.4	4.0	4.0	3.5	3.9	4.1	3.8	3.4	4.4	4.0	3.9	3.3	4.0	3.3
8	3.9	3.8	4.4	4.6	4.4	4.4	4.6	4.3	4.5	4.3	4.0	4.2	4.1	4.5	4.3	4.3	3.8	4.1
10	3.2	3.1	4.3	4.3	3.7	4.4	3.6	5.0	4.2	4.5	4.5	4.7	4.6	4.7	4.5	4.1	4.3	4.3
12	2.2	3.1	3.7	3.9	3.6	4.1	3.3	3.9	3.5	3.5	3.4	3.4	3.6	3.3	3.8	3.4	4.0	3.2
14	2.0	2.9	3.2	3.4	3.8	3.7	4.0	3.9	4.5	3.9	4.0	4.1	4.3	3.8	4.1	3.5	4.4	4.0
16	1.5	2.3	3.1	3.2	3.1	3.8	3.8	3.5	4.3	3.2	4.2	3.7	4.2	4.0	4.3	4.2	4.5	4.2
18	1.1	2.1	2.7	3.4	3.5	3.5	3.6	3.7	3.5	3.6	3.6	3.6	3.8	3.0	3.4	3.3	3.8	3.5
20	1.0	1.8	2.4	2.7	3.2	3.1	3.4	3.2	3.9	3.8	3.7	4.0	4.2	3.9	3.9	4.1	4.0	4.0
22	0.7	1.3	2.1	2.6	3.0	3.0	3.3	3.1	3.4	3.1	3.4	3.5	3.2	3.9	3.2	4.2	3.3	3.7
24	0.5	1.2	2.0	2.4	2.7	2.7	3.1	3.3	3.6	3.5	3.6	3.5	3.6	3.8	3.3	3.8	3.4	3.4
26	0.4	1.2	1.8	2.5	2.5	2.7	3.0	3.0	3.1	3.2	3.2	3.6	3.1	3.7	3.6	3.9	3.8	3.8
28	0.3	1.0	1.5	2.1	2.4	2.8	2.9	3.2	3.4	3.5	3.2	3.4	3.2	3.7	3.3	3.5	3.1	3.3
30	0.3	1.0	1.4	2.0	2.5	2.5	2.8	2.9	2.8	3.4	3.0	3.4	3.5	3.6	3.8	3.4	3.6	3.7
32	0.2	0.7	1.4	1.8	2.2	2.5	2.6	3.0	2.4	3.3	2.6	3.7	2.9	3.2	3.3	3.3	3.6	3.4
34	0.2	0.9	1.3	1.8	2.5	2.3	2.4	2.9	2.6	3.5	3.3	3.6	3.4	3.6	3.5	3.1	3.6	3.5
36	0.1	0.6	1.3	1.9	1.9	2.4	2.5	2.9	2.4	3.2	2.9	3.1	3.2	3.0	3.5	3.0	3.8	3.1
38	0.1	0.6	1.2	1.5	1.9	2.7	2.6	2.6	2.8	3.0	3.2	3.2	3.2	3.4	3.2	3.0	3.4	3.1
40	0.1	0.5	1.1	1.6	1.9	2.2	2.3	2.5	2.4	2.8	3.0	2.8	3.3	3.0	3.3	3.0	3.5	3.5

Site	Background → 50	100	150	200
50	3.2	3.2	3.2	3.4
100	2.5	3.2	3.1	3.4
150	2.6	3.0	3.0	2.9
200	2.4	2.8	2.9	2.9

Table H: Normal (100,30); DL = 100; Non-detects set to DL.

	Sample Size Background																	
Sample Size Site	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
6	3.9	4.7	4.1	3.6	4.1	3.3	4.1	3.4	3.7	3.4	3.4	3.1	2.8	3.1	2.7	3.2	2.7	3.3
8	3.9	3.8	3.8	4.4	3.8	3.6	3.3	3.8	4.1	3.7	4.0	4.3	4.0	3.9	3.6	3.4	3.3	3.2
10	3.3	3.1	4.1	3.7	3.0	4.6	3.6	3.7	3.7	3.8	3.8	3.7	4.0	3.5	4.4	4.2	3.6	4.0
12	3.1	3.5	3.3	3.7	3.6	3.5	2.8	3.6	3.2	3.4	3.4	2.6	3.4	2.8	3.8	3.1	3.8	3.2
14	2.6	3.0	3.3	3.2	3.5	3.5	3.4	3.3	3.5	3.3	3.7	3.4	3.4	2.9	2.9	2.6	2.7	2.9
16	2.3	2.9	2.9	3.3	3.0	3.0	3.7	3.1	3.3	3.2	3.8	3.7	3.9	3.7	3.3	3.2	3.0	3.2
18	2.0	2.6	2.7	3.1	3.0	3.4	3.6	2.6	3.3	3.0	2.7	2.8	3.0	3.0	2.7	3.3	3.4	3.3
20	1.8	2.1	2.4	2.8	3.0	2.9	3.5	3.2	3.3	3.4	3.4	3.4	2.7	3.6	2.9	3.3	3.0	3.2
22	1.5	2.0	2.4	2.8	2.9	3.0	3.1	2.7	3.1	3.1	3.0	3.5	2.7	3.2	3.0	3.2	3.3	3.6
24	1.3	1.8	2.2	2.4	2.6	2.7	3.3	3.0	3.4	3.2	3.0	3.0	3.2	3.1	2.8	2.9	2.5	2.5
26	1.1	1.7	2.1	2.4	2.5	2.3	2.6	3.0	2.5	3.0	2.6	3.2	3.1	3.1	3.5	3.4	3.2	2.5
28	1.1	1.4	1.7	2.2	2.4	2.6	2.8	3.0	2.7	2.8	2.7	2.9	2.6	2.7	2.8	3.1	3.1	2.8
30	0.9	1.3	1.7	2.0	2.3	2.5	2.3	2.7	2.4	2.8	3.0	3.0	3.1	3.1	3.2	2.8	3.2	3.1
32	0.8	1.1	1.6	1.8	2.1	2.3	2.3	2.7	2.4	2.7	2.4	2.8	2.9	2.9	2.9	2.4	3.1	2.8
34	0.8	1.2	1.4	1.6	2.1	2.1	2.3	2.6	2.6	2.5	2.7	2.7	3.0	3.0	2.9	2.8	2.9	2.5
36	0.7	1.0	1.4	1.7	1.8	2.1	2.1	2.6	2.2	2.5	2.7	2.6	2.8	2.4	2.8	2.8	3.0	3.1
38	0.6	0.9	1.3	1.5	1.9	1.8	1.8	2.3	2.5	2.6	2.6	2.5	2.8	2.1	2.5	2.5	2.7	2.5
40	0.5	0.8	1.1	1.5	1.6	1.8	2.0	2.2	2.3	2.4	2.7	2.4	2.5	2.6	2.5	2.8	2.7	3.1

	Background			
Site	50	100	150	200
50	2.9	2.8	3.1	3.2
100	1.7	2.3	2.8	2.6
150	1.3	2.1	2.4	2.5
200	1.0	1.7	2.0	2.5

Table I: Lognormal (4,1.5); DL = 8.0; Non-detects set to DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	3.9	4.6	4.4	3.7	3.7	3.3	4.3	3.6	4.1	3.4	3.6	3.4	3.4	3.1	3.0	3.2	3.2	3.3
	8	3.9	3.8	4.5	4.4	4.3	3.8	3.3	3.9	3.6	3.7	3.7	4.4	4.2	4.2	3.9	3.7	3.6	3.4
	10	3.3	3.5	3.7	4.2	3.0	4.1	3.6	4.1	4.1	3.7	4.1	3.7	3.9	3.8	4.2	4.8	4.4	4.2
	12	3.0	3.4	3.7	3.6	3.8	3.3	3.1	3.3	3.1	3.7	3.4	3.1	3.6	2.8	3.6	3.1	4.0	3.2
	14	2.6	3.2	3.2	3.8	3.8	3.6	4.0	3.7	3.5	3.5	4.0	3.7	3.8	3.4	3.7	2.9	3.3	3.1
	16	2.3	2.7	3.1	3.4	3.2	3.6	3.6	3.3	3.8	3.2	3.6	3.7	3.5	3.9	3.7	3.7	3.7	3.5
	18	2.0	2.6	2.7	3.1	3.1	3.5	3.5	3.0	3.6	3.2	3.2	2.8	3.2	3.0	3.2	3.3	2.9	3.5
	20	1.7	2.2	2.5	2.7	3.2	2.9	3.2	3.2	3.2	3.7	3.5	3.4	3.5	3.3	3.1	3.4	3.4	3.9
	22	1.5	2.0	2.4	2.7	3.0	3.0	3.4	2.6	3.0	3.1	3.1	3.5	2.6	3.6	3.0	3.3	3.3	3.7
	24	1.3	1.6	2.2	2.6	2.8	2.7	3.0	3.3	3.2	3.3	3.1	3.2	3.0	3.0	3.2	3.4	3.1	3.1
	26	1.1	1.6	2.2	2.5	2.5	2.5	2.8	3.0	2.5	3.2	2.6	3.4	3.1	3.2	3.4	3.3	3.6	3.5
	28	1.0	1.6	1.9	2.0	2.3	2.6	2.8	3.1	3.0	3.1	2.8	3.1	2.8	3.0	2.9	2.7	3.1	2.9
	30	1.0	1.4	1.6	1.9	2.4	2.5	2.6	2.9	2.7	2.8	3.0	3.0	3.4	3.4	3.5	3.3	3.3	2.8
	32	0.8	1.1	1.7	1.7	2.1	2.4	2.6	2.9	2.6	3.0	2.5	2.8	2.9	2.6	3.3	2.8	3.2	2.8
	34	0.8	1.2	1.3	1.6	2.1	2.3	2.3	2.7	2.6	3.0	3.0	2.6	3.0	2.9	3.3	3.1	2.8	2.7
	36	0.6	1.0	1.5	1.6	1.8	2.1	2.3	2.4	2.2	2.5	2.7	2.6	2.8	2.7	3.0	2.8	3.1	3.1
	38	0.5	0.9	1.2	1.5	1.8	2.0	1.9	2.2	2.4	2.6	2.6	2.8	2.9	2.8	3.1	2.8	2.6	2.5
	40	0.6	0.8	1.2	1.4	1.7	1.9	2.1	2.2	2.3	2.3	2.8	2.4	2.9	2.6	2.8	3.0	2.7	3.2

		Background			
		50	100	150	200
Site	50	2.8	2.8	3.2	3.4
	100	1.7	2.6	3.0	2.6
	150	1.3	2.2	2.4	2.5
	200	0.9	1.8	2.0	2.5

Table J: Lognormal (4,1.5); DL = 15.4; Non-detects set to DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	4.3	4.3	4.5	4.3	4.4	3.5	4.0	3.4	4.3	3.3	4.0	3.4	3.4	3.2	3.2	3.2	3.2	3.3
	8	4.1	3.8	4.1	4.3	4.4	4.3	4.2	4.3	3.9	4.0	3.9	4.1	4.6	4.3	4.3	4.2	3.8	4.0
	10	3.6	3.4	4.1	4.3	3.5	4.3	3.6	4.2	4.2	4.3	4.1	4.1	3.7	4.2	3.9	4.3	4.3	4.1
	12	3.1	3.5	3.8	3.9	3.7	3.9	3.3	3.8	3.1	3.4	3.4	3.8	3.6	3.3	3.8	3.1	4.0	3.2
	14	2.7	3.2	3.4	3.8	3.8	3.7	4.2	4.2	4.2	3.7	4.0	3.6	3.9	4.1	3.8	3.8	4.0	3.7
	16	2.5	2.9	3.3	3.2	3.0	3.6	3.8	3.5	4.2	3.2	4.2	3.7	4.0	4.0	4.3	4.2	4.1	4.1
	18	1.9	2.5	2.7	3.2	3.5	3.5	3.9	3.7	3.6	3.6	3.8	3.2	3.4	3.0	3.5	3.3	3.2	3.5
	20	1.8	2.3	2.5	3.1	3.4	2.9	3.5	3.2	3.8	3.9	3.7	4.0	3.9	3.9	3.6	3.5	3.6	3.7
	22	1.5	2.1	2.5	2.7	3.2	3.1	3.3	3.1	3.5	3.1	3.2	3.5	3.3	3.9	3.0	4.1	3.3	3.8
	24	1.3	1.9	2.2	2.6	2.9	2.7	3.3	3.3	3.4	3.4	3.2	3.8	3.5	3.3	3.2	3.5	3.4	3.6
	26	1.2	1.7	2.0	2.5	2.7	2.6	3.0	3.0	3.0	3.5	2.8	3.7	3.3	3.4	3.6	3.5	4.0	3.5
	28	0.9	1.5	1.9	2.2	2.7	2.7	2.8	3.0	3.1	3.2	2.9	3.5	3.0	3.4	2.8	3.2	3.1	3.1
	30	0.8	1.4	1.7	2.0	2.1	2.5	2.4	2.9	2.7	3.3	3.0	3.0	3.5	3.6	3.4	3.3	3.4	3.3
	32	0.8	1.2	1.5	1.9	2.2	2.3	2.7	2.9	2.8	2.8	2.9	3.1	2.9	2.9	3.3	3.0	3.6	3.0
	34	0.6	1.1	1.5	1.8	1.9	2.3	2.3	2.5	2.6	2.4	3.0	3.1	3.1	3.2	3.3	3.2	3.4	3.2
	36	0.6	0.9	1.4	1.6	1.8	2.2	2.2	2.6	2.4	2.7	2.7	2.7	3.1	2.8	3.3	2.9	3.3	3.1
	38	0.5	0.8	1.3	1.5	1.8	2.0	2.0	2.3	2.6	2.8	2.7	2.8	2.9	2.8	3.0	2.7	3.1	3.0
	40	0.5	0.7	1.2	1.3	1.7	1.9	2.2	2.4	2.3	2.2	2.8	2.4	2.9	2.7	3.1	3.0	3.0	3.1

		Background			
		50	100	150	200
Site	50	3.1	2.8	3.2	3.5
	100	1.8	2.7	3.1	2.9
	150	1.3	2.2	2.6	2.7
	200	0.9	1.7	2.2	2.4

Table K: Lognormal (4,1.5); DL = 30.6; Non-detects set to DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	4.8	4.5	4.5	4.4	4.4	4.1	4.3	3.9	3.9	3.5	3.8	3.3	4.0	3.4	3.9	3.4	3.4	3.3
	8	4.3	3.8	4.7	4.6	4.2	5.1	4.8	4.7	4.2	4.3	4.4	4.2	4.5	4.2	4.2	4.2	4.1	3.9
	10	3.7	3.5	4.3	4.3	3.7	4.7	3.6	4.5	4.2	4.4	4.6	4.1	4.3	4.6	4.6	4.1	4.1	3.9
	12	3.4	3.7	4.1	4.4	4.0	4.6	3.5	4.3	3.5	3.9	3.4	3.6	3.6	4.0	3.8	3.4	4.0	3.2
	14	2.9	3.6	3.2	4.3	3.8	4.1	4.4	4.2	4.6	4.3	4.2	4.2	3.8	4.2	4.1	4.3	4.1	4.2
	16	2.5	3.0	3.2	3.5	3.2	3.7	3.8	3.2	4.1	3.3	4.3	3.7	4.3	4.1	4.3	4.4	4.5	4.2
	18	1.9	2.7	2.7	3.2	3.7	3.6	3.6	4.0	3.9	3.3	3.7	3.3	4.1	3.4	3.7	3.3	3.6	3.5
	20	1.9	2.3	2.5	3.4	3.2	3.2	3.8	3.2	3.6	4.0	3.6	4.1	4.3	4.4	3.9	4.1	3.8	3.7
	22	1.6	2.2	2.6	2.6	3.2	3.3	3.6	3.1	3.8	3.1	3.9	3.5	3.3	3.9	3.6	4.2	3.3	3.8
	24	1.3	1.8	2.4	2.5	3.1	2.7	3.4	3.5	3.8	3.6	3.8	3.7	3.4	4.0	3.8	3.9	3.4	3.5
	26	1.1	1.7	2.1	2.3	2.8	2.7	3.1	3.0	3.2	3.7	3.3	3.7	3.1	3.7	3.6	3.5	3.7	3.7
	28	0.9	1.5	2.0	2.2	2.5	2.8	2.7	3.3	3.1	3.4	3.1	3.5	3.2	3.3	3.0	3.4	3.1	3.5
	30	0.9	1.4	1.6	1.9	2.4	2.5	2.8	3.0	2.8	3.2	3.0	3.4	3.5	3.7	3.7	4.1	3.9	3.5
	32	0.8	1.2	1.6	1.8	2.2	2.6	2.6	2.9	2.6	3.1	2.9	3.1	3.1	3.0	3.3	3.3	3.6	2.9
	34	0.6	1.1	1.3	1.8	2.2	2.2	2.3	2.8	2.6	3.2	3.1	3.2	3.4	3.2	3.3	3.2	3.7	3.3
	36	0.6	1.0	1.3	1.6	1.9	2.2	2.5	2.8	2.7	2.8	2.7	2.9	3.2	3.0	3.7	2.8	3.1	3.1
	38	0.5	0.8	1.2	1.5	1.9	2.1	2.1	2.5	2.7	2.7	2.9	2.6	3.1	2.8	3.3	3.1	3.2	2.8
	40	0.5	0.8	1.1	1.5	1.6	2.0	2.1	2.4	2.3	2.5	2.8	2.4	3.1	2.8	3.2	3.0	3.1	3.5

		Background			
		50	100	150	200
Site	50	3.2	3.3	3.2	3.6
	100	2.0	2.7	3.1	3.4
	150	1.2	2.2	2.8	2.7
	200	1.0	1.8	2.0	2.6

Table L: Lognormal (4,1.5); DL = 54.6; Non-detects set to DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	3.9	3.5	3.3	2.5	2.5	2.6	2.7	2.8	2.8	2.9	2.4	2.9	2.4	2.7	2.4	2.3	2.1	2.6
	8	4.0	3.7	3.1	3.3	3.3	3.1	2.7	2.7	2.2	2.8	2.8	2.7	2.9	2.8	2.6	2.7	2.5	2.6
	10	4.1	3.1	3.5	3.5	2.8	3.5	3.4	3.3	3.1	2.7	2.8	2.5	2.8	2.7	2.8	2.8	3.3	2.6
	12	4.1	3.8	3.6	3.6	3.0	3.1	2.7	2.3	3.1	2.2	2.9	2.6	2.8	2.5	2.5	2.5	2.7	2.9
	14	4.0	3.5	3.2	3.4	3.4	3.1	3.1	2.8	2.6	3.1	2.9	2.7	2.9	2.4	2.6	2.3	2.2	2.4
	16	3.9	3.6	3.5	3.5	3.0	2.6	3.1	2.6	3.1	3.0	2.6	3.1	3.2	2.9	3.0	2.7	2.5	2.5
	18	3.6	4.0	3.4	3.1	3.2	3.1	2.8	2.5	2.8	2.4	2.6	2.8	2.3	3.0	2.3	3.3	2.6	2.9
	20	3.8	4.1	3.5	3.2	3.5	2.6	3.5	3.2	2.8	3.2	2.9	2.9	2.7	2.5	2.5	2.4	2.5	2.7
	22	3.9	3.5	3.0	3.3	3.4	3.1	3.0	2.5	2.7	2.7	2.4	3.2	2.6	2.9	2.7	2.6	2.6	2.6
	24	4.0	3.6	3.2	3.7	3.2	2.7	3.2	3.1	3.2	3.1	2.7	2.8	2.5	2.9	2.3	2.6	2.5	2.2
	26	4.1	3.7	3.3	3.5	3.5	2.8	2.9	3.0	2.5	3.0	2.6	2.9	2.9	2.5	2.7	2.9	3.0	2.7
	28	4.0	3.7	3.2	3.3	3.3	3.0	3.1	3.1	2.6	2.7	2.6	2.7	2.5	2.7	2.7	2.1	3.1	2.4
	30	3.8	3.5	3.5	3.3	3.3	2.6	2.8	3.4	2.4	2.9	2.9	3.0	2.9	2.7	2.8	2.2	2.6	2.7
	32	3.7	3.7	3.0	3.4	3.2	3.3	3.3	3.2	2.8	2.8	2.5	2.8	2.9	2.9	3.1	2.4	2.4	2.8
	34	3.7	3.9	3.6	3.3	3.5	2.7	3.2	3.1	2.6	2.8	3.3	2.7	2.8	2.6	3.1	2.6	2.5	2.3
	36	3.8	3.7	3.2	3.4	3.5	3.1	3.0	3.2	2.7	2.8	2.7	2.8	2.9	2.4	3.0	2.8	2.9	2.9
	38	4.1	4.0	3.8	3.5	3.6	3.0	3.1	3.3	2.8	2.9	2.9	2.5	3.0	2.4	2.7	2.4	2.8	2.5
	40	3.9	4.1	3.4	3.4	3.5	3.2	3.0	3.0	2.6	2.9	3.0	2.6	3.2	2.6	2.6	2.8	2.7	2.7

		Background			
		50	100	150	200
Site	50	3.1	2.4	2.2	3.0
	100	2.3	2.5	2.7	2.3
	150	2.6	2.2	2.2	2.2
	200	2.8	2.4	2.4	2.5

Table M: Normal (100,30); DL = 61.5; Non-detects set to half-DL.

Sample Size Site		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
	6	3.8	3.5	3.2	2.4	2.9	2.5	2.4	2.7	2.1	2.5	2.3	2.4	2.3	2.4	2.3	2.3	2.2	2.1
	8	4.2	3.8	3.6	3.1	3.0	3.0	2.8	2.5	2.3	2.4	2.1	2.4	1.9	1.9	2.0	2.1	2.0	2.1
	10	4.2	3.0	3.9	3.5	2.8	3.1	3.4	3.0	3.3	2.9	2.7	2.4	2.7	2.3	2.6	2.6	2.5	2.3
	12	4.3	3.8	3.6	3.7	3.0	3.1	2.7	2.7	3.1	2.5	3.1	2.6	2.8	2.8	2.8	2.8	2.5	2.6
	14	4.4	4.0	3.6	3.5	3.6	3.5	3.4	2.8	3.2	2.8	2.8	2.4	3.1	2.6	2.5	2.5	2.7	2.4
	16	4.2	3.8	3.7	3.5	3.0	3.1	3.3	2.7	3.4	3.1	3.1	3.0	2.9	3.0	2.8	3.2	2.9	2.9
	18	4.4	4.1	3.2	3.7	3.8	3.0	3.1	2.7	3.1	2.6	2.8	2.8	2.4	2.7	2.3	3.1	2.6	2.8
	20	3.9	4.1	3.5	3.8	3.7	2.9	3.6	3.2	3.2	3.0	2.9	3.3	2.9	3.2	2.9	3.0	2.5	2.4
	22	4.4	3.9	3.0	3.8	3.8	2.8	3.2	2.6	3.2	3.1	2.5	3.3	2.6	3.0	3.0	2.9	2.9	3.1
	24	4.3	4.4	3.0	3.6	3.9	2.7	3.3	3.5	3.3	3.1	2.8	3.0	2.5	2.8	2.6	3.1	2.5	2.7
	26	4.4	4.3	3.3	3.8	3.8	3.0	3.4	3.0	2.9	3.1	2.6	3.1	3.1	3.1	3.0	3.0	2.7	2.9
	28	4.3	3.8	3.0	4.0	3.8	3.0	3.7	3.6	3.1	2.9	2.7	2.9	2.5	2.8	2.8	2.3	3.1	2.5
	30	4.6	3.9	3.5	3.9	3.7	3.0	3.3	3.2	2.8	3.7	3.0	3.3	3.2	2.9	3.2	3.1	2.8	2.5
	32	4.4	4.2	3.0	3.7	4.0	3.3	3.2	3.3	2.9	3.4	2.4	2.7	2.9	2.8	3.1	2.5	3.1	2.8
	34	4.4	3.9	3.7	4.1	3.8	2.7	3.2	3.5	2.7	3.3	3.3	3.0	3.3	2.7	3.2	3.1	3.0	2.7
	36	4.4	3.8	3.2	3.5	3.6	3.4	3.2	3.4	2.5	2.9	2.7	2.8	3.2	2.6	3.2	2.8	3.4	3.0
	38	4.3	4.2	3.9	3.9	3.8	3.0	3.0	3.4	2.8	3.3	3.3	2.9	3.0	2.8	3.0	2.7	2.9	2.5
	40	4.3	4.1	3.4	3.7	3.6	3.6	2.9	3.1	2.6	3.1	3.0	2.5	3.1	2.6	3.1	3.0	3.0	3.2

Site		Background			
		50	100	150	200
	50	3.2	2.8	2.4	2.4
	100	2.6	2.7	2.5	2.6
	150	2.6	2.5	2.6	2.6
	200	2.8	2.7	2.6	2.5

Table N: Normal (100,30); DL = 74.5; Non-detects set to half-DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	3.9	4.6	4.1	3.6	3.5	3.8	3.6	3.4	4.1	3.5	3.4	3.1	2.8	3.1	2.7	3.2	2.7	3.3
	8	3.5	3.8	3.8	4.5	3.8	3.6	3.3	3.7	3.4	4.5	3.7	4.2	3.7	3.8	3.6	3.4	3.1	3.0
	10	3.5	3.1	4.1	3.7	3.0	4.6	3.6	3.7	3.7	3.0	3.3	3.9	4.2	4.1	4.6	4.3	4.0	4.0
	12	3.0	3.2	3.7	3.7	3.6	3.3	2.8	4.0	3.1	3.5	3.4	2.8	3.2	2.8	3.6	3.1	4.0	3.2
	14	2.4	3.1	3.0	3.6	3.6	3.7	3.4	3.4	3.2	3.7	3.8	3.4	3.3	2.8	3.1	2.8	3.2	2.8
	16	2.2	2.6	3.1	3.5	3.0	3.2	3.6	3.2	3.6	3.2	3.7	3.7	3.8	3.7	3.2	3.4	3.0	3.0
	18	1.9	2.6	2.7	3.1	3.1	3.4	3.7	3.1	3.4	3.0	3.0	2.8	2.6	3.0	3.1	3.3	3.1	3.5
	20	1.5	2.3	2.4	3.0	3.0	2.7	3.5	3.2	3.2	3.5	3.3	3.2	3.2	3.4	2.6	3.5	2.9	3.4
	22	1.4	2.0	2.2	2.6	2.7	2.7	2.8	3.0	3.1	3.1	3.1	3.5	2.6	3.1	3.0	3.2	3.3	3.4
	24	1.4	1.8	2.1	2.4	2.7	2.7	2.7	3.0	3.2	3.1	2.7	3.7	3.0	3.2	3.1	2.9	2.5	3.1
	26	1.2	1.7	2.1	2.4	2.6	2.4	2.7	2.8	2.6	3.2	2.7	3.0	3.1	3.6	3.3	3.2	3.1	2.9
	28	1.1	1.6	1.8	2.0	2.4	2.7	2.5	3.0	2.6	2.9	2.6	3.0	2.6	3.0	2.8	2.7	3.1	2.8
	30	0.9	1.4	1.6	2.0	2.4	2.4	2.5	2.8	2.5	2.8	2.8	3.1	3.3	2.8	2.9	2.9	3.4	2.8
	32	0.8	1.2	1.7	1.7	2.0	2.5	2.5	2.5	2.3	2.7	2.5	2.8	2.9	2.7	3.0	2.6	3.0	2.8
	34	0.7	1.1	1.6	1.8	2.0	2.2	2.3	2.6	2.6	2.7	3.2	2.6	2.7	3.0	2.9	2.8	2.7	2.4
	36	0.7	0.9	1.2	1.8	1.9	2.1	2.3	2.4	2.1	2.5	2.6	2.5	2.8	2.3	3.0	2.8	2.9	3.1
	38	0.6	0.9	1.3	1.5	1.6	2.0	2.0	2.1	2.5	2.6	2.6	2.6	2.5	2.6	2.5	2.6	2.8	2.5
	40	0.5	0.8	1.1	1.3	1.8	1.9	1.9	2.3	2.3	2.4	2.7	2.4	2.5	2.6	2.8	2.9	2.8	3.1

		Background			
		50	100	150	200
Site	50	3.0	2.8	3.2	3.5
	100	1.7	2.3	2.9	3.2
	150	1.2	1.9	2.1	2.2
	200	1.0	1.5	2.0	2.4

Table O: Lognormal (4,1.5); DL = 8.0; Non-detects set to half-DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	4.3	4.6	4.4	3.8	4.1	3.3	4.3	3.3	4.1	3.3	3.7	3.4	3.4	3.1	3.0	3.2	3.0	3.3
	8	4.3	3.8	4.1	4.4	4.2	3.9	3.6	3.7	3.9	4.1	3.7	4.3	4.2	4.2	4.1	3.8	3.4	3.4
	10	3.6	3.1	4.1	4.3	2.9	4.3	3.6	4.1	3.7	3.8	3.6	4.0	4.5	4.3	4.1	4.1	4.5	4.4
	12	2.9	3.6	3.7	3.9	3.3	3.9	3.1	3.3	3.1	3.7	3.4	3.2	3.6	2.8	3.8	3.1	4.0	3.2
	14	2.6	3.0	3.0	3.5	3.8	3.9	4.2	3.7	4.0	3.9	4.0	3.7	3.7	3.4	3.2	2.8	3.2	3.1
	16	2.4	2.9	3.2	3.5	3.3	3.4	3.7	3.1	3.9	3.2	3.4	3.7	3.8	4.0	3.7	3.7	3.7	3.7
	18	2.1	2.6	2.7	3.3	3.1	3.2	3.4	3.2	3.8	3.0	3.3	2.9	3.3	3.0	3.3	3.3	3.1	3.5
	20	1.7	2.3	2.4	3.0	3.4	2.9	3.6	3.2	3.5	3.8	3.6	3.9	3.3	3.7	3.3	3.6	3.8	3.2
	22	1.5	1.9	2.4	2.7	3.0	2.9	3.2	2.5	3.1	3.1	2.7	3.5	3.2	3.5	3.0	3.7	3.3	3.6
	24	1.3	1.9	2.2	2.4	2.7	2.7	3.0	3.3	3.2	3.5	3.0	3.4	3.0	3.4	3.1	3.3	2.9	3.3
	26	1.3	1.6	2.0	2.3	2.5	2.4	2.7	3.0	3.0	3.4	2.6	3.3	3.1	3.5	3.6	3.4	3.5	3.3
	28	1.0	1.5	1.9	2.1	2.5	2.9	2.9	2.9	2.9	3.1	2.6	2.9	2.6	3.1	2.8	2.6	3.1	2.9
	30	0.9	1.4	1.8	1.9	2.2	2.5	2.6	3.1	2.4	3.1	3.0	3.1	3.1	3.1	3.3	2.7	3.5	2.9
	32	0.8	1.2	1.4	1.8	2.2	2.6	2.5	2.8	2.5	3.0	2.4	3.2	2.9	2.8	3.2	2.9	3.2	2.8
	34	0.8	1.1	1.4	1.9	2.0	2.3	2.3	2.5	2.6	2.7	3.0	2.9	3.2	2.7	3.1	3.0	3.2	2.8
	36	0.6	0.9	1.6	1.7	2.1	2.1	2.3	2.4	2.4	2.6	2.7	2.7	3.2	2.5	3.0	2.8	3.2	3.1
	38	0.5	0.9	1.3	1.5	1.9	1.9	1.9	2.4	2.6	2.6	2.9	2.6	2.8	2.9	2.6	2.7	2.8	2.5
	40	0.5	0.9	1.0	1.5	1.8	2.0	1.8	2.3	2.3	2.2	2.8	2.5	3.0	2.6	3.0	3.0	2.7	3.0

		Background			
		50	100	150	200
Site	50	2.9	2.8	3.1	3.5
	100	1.7	2.5	2.6	2.7
	150	1.4	2.2	2.5	2.6
	200	0.9	1.7	2.1	2.5

Table P: Lognormal (4,1.5); DL = 15.4; Non-detects set to half-DL.

Sample Size Site		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
	6	3.9	4.5	4.0	3.0	3.3	2.7	3.6	2.8	3.6	3.0	3.2	3.1	2.8	3.0	2.6	3.1	2.7	3.0
	8	4.1	3.8	3.7	3.9	3.6	3.5	3.2	3.3	3.0	3.3	3.1	3.6	4.0	3.8	3.4	3.4	3.1	3.1
	10	3.6	3.0	3.8	3.6	2.8	4.1	3.6	3.3	3.1	3.1	3.8	3.3	4.0	3.8	3.7	4.0	4.1	3.7
	12	3.3	3.4	3.7	3.3	3.3	3.1	2.7	3.1	3.1	3.1	3.4	2.6	3.1	2.8	3.8	3.1	4.0	3.2
	14	3.4	3.7	3.4	3.8	3.5	3.4	3.2	2.8	3.2	3.2	3.9	3.4	3.4	2.8	2.9	2.4	2.4	2.4
	16	3.5	3.3	3.2	3.9	3.0	2.9	3.5	2.6	3.5	3.2	3.0	3.2	3.7	3.5	3.5	3.2	3.0	2.9
	18	3.5	3.4	3.2	3.6	3.2	3.1	3.2	2.6	3.2	2.8	2.9	2.8	3.2	3.0	3.0	3.3	3.0	3.3
	20	3.1	3.5	3.3	3.2	3.3	2.8	3.3	3.2	3.4	3.6	3.4	3.2	3.0	3.0	3.0	2.9	3.4	3.4
	22	3.2	3.2	3.0	3.2	3.4	3.0	3.2	2.5	3.1	3.1	2.7	3.5	2.6	3.1	3.0	3.1	3.2	3.3
	24	3.1	3.0	3.1	3.1	3.3	2.7	3.2	3.0	3.3	3.1	2.9	3.2	2.9	3.5	2.7	2.7	2.5	2.8
	26	3.0	3.2	3.3	3.2	3.5	2.8	2.9	3.0	2.9	3.3	2.6	3.1	3.1	3.0	3.2	3.1	3.1	2.7
	28	3.1	2.9	2.8	2.9	3.3	3.0	3.1	3.1	2.7	3.0	2.7	3.1	2.5	2.7	2.8	2.7	3.1	2.7
	30	2.8	3.2	3.1	3.0	3.3	2.7	2.9	3.2	2.8	3.3	3.0	3.3	3.1	3.1	2.7	3.1	3.1	3.0
	32	2.9	2.9	2.9	3.0	3.2	3.2	3.0	3.4	2.7	2.9	2.8	2.7	2.9	2.5	3.1	2.4	2.9	2.8
	34	3.0	3.2	3.1	3.0	3.1	2.7	2.9	3.5	2.6	3.1	3.3	3.0	2.9	2.9	3.0	2.7	2.7	2.7
	36	3.1	2.9	3.2	3.4	3.1	3.1	2.8	3.0	2.5	2.8	2.7	2.7	3.0	2.3	3.2	2.8	3.0	2.8
	38	2.8	3.0	2.9	2.8	3.1	3.0	2.7	3.1	2.8	2.9	3.0	2.7	3.0	2.5	2.8	2.3	2.6	2.6
	40	2.8	3.1	3.2	3.3	3.0	3.2	2.9	3.0	2.4	2.6	3.0	2.5	3.2	2.7	3.2	2.9	3.2	3.3

Site		Background			
		50	100	150	200
	50	2.9	2.8	3.1	3.0
	100	2.8	3.1	2.9	2.7
	150	2.6	2.4	2.4	2.6
	200	2.8	2.6	2.5	2.5

Table Q: Normal (100,30); DL~ Normal(61.5,10); Non-detects set to DL.

Sample Size Site	Sample Size Background																	
	6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
6	4.0	4.0	4.0	3.5	3.8	2.9	3.8	3.1	3.4	3.2	3.3	3.3	3.2	3.1	2.8	3.2	2.7	3.3
8	3.6	3.8	4.2	4.0	4.1	3.8	3.6	4.1	3.4	3.8	3.5	3.7	3.6	4.0	4.0	3.9	3.5	3.3
10	3.4	3.1	3.8	3.9	2.9	4.1	3.6	4.0	3.5	3.7	3.7	3.5	3.7	4.0	3.9	3.7	3.9	3.9
12	3.1	3.5	3.8	4.0	3.5	3.8	3.3	3.3	3.1	3.5	3.4	3.1	3.5	2.8	3.1	3.1	3.7	3.2
14	2.9	3.1	2.9	3.5	3.8	3.7	3.8	3.2	3.6	3.6	3.9	3.6	3.8	3.2	3.2	3.2	3.4	2.9
16	2.9	3.4	3.3	3.5	3.0	3.1	3.5	2.9	3.5	3.2	3.7	3.7	3.6	4.1	3.5	3.7	3.5	3.5
18	2.9	3.2	2.7	3.6	3.2	3.1	3.6	3.1	3.2	2.6	3.5	2.9	3.0	3.0	3.1	3.3	3.0	3.5
20	3.0	3.3	2.8	3.4	3.3	2.9	3.6	3.2	3.1	3.6	3.6	3.5	3.3	3.6	2.8	3.2	3.1	3.4
22	2.8	3.2	3.0	3.2	3.4	3.0	3.4	2.9	3.2	3.1	2.8	3.4	2.8	3.3	3.0	3.2	3.3	3.6
24	2.7	2.8	2.5	2.9	3.5	2.7	3.3	3.3	3.3	3.5	3.2	3.5	2.6	3.1	3.1	3.2	3.0	2.9
26	2.4	2.8	3.0	3.1	3.2	3.0	3.2	3.0	3.2	3.5	2.7	3.4	3.1	3.2	3.2	3.7	3.4	3.5
28	2.5	2.8	2.7	2.9	3.3	3.0	3.3	3.2	3.1	3.1	3.0	3.8	2.8	2.8	2.8	3.2	3.1	2.4
30	2.4	2.9	3.3	3.1	3.3	2.8	2.7	3.4	2.8	3.5	3.0	3.4	3.3	3.2	3.4	3.0	2.9	3.1
32	2.3	2.7	2.9	2.6	3.2	3.3	3.0	3.2	2.9	3.0	2.6	3.1	2.9	2.7	3.3	2.8	3.2	2.8
34	2.6	2.9	3.1	2.9	3.3	2.7	3.1	3.6	2.6	3.2	3.0	3.1	3.1	3.2	3.3	2.8	3.0	2.7
36	2.4	2.6	2.9	2.8	3.2	3.1	3.0	3.1	3.2	3.0	2.7	2.9	3.1	2.6	3.1	2.8	3.4	3.1
38	2.3	2.6	2.7	2.9	3.1	3.0	2.9	3.1	2.9	3.1	3.0	2.9	3.2	2.7	3.3	2.2	2.9	3.0
40	2.2	2.8	2.9	2.5	3.0	2.9	2.8	3.0	2.6	2.8	3.0	2.6	3.3	2.8	3.3	3.0	3.0	3.2

Site	Background			
	50	100	150	200
50	3.0	2.8	2.7	3.1
100	2.6	2.8	3.0	2.6
150	2.6	2.8	2.8	2.7
200	2.8	2.7	2.6	2.6

Table R: Normal (100,30); DL~ Normal(74.5,10); Non-detects set to DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	3.9	4.0	4.1	3.1	3.5	3.8	4.2	3.4	4.0	3.4	3.2	3.1	2.5	3.1	2.9	3.2	2.9	3.3
	8	3.5	3.8	3.8	4.5	3.6	3.2	3.8	3.8	3.4	4.5	4.0	4.3	4.0	3.6	3.4	3.1	3.0	2.7
	10	3.3	2.9	4.1	3.5	2.8	4.0	3.6	3.3	3.4	3.1	3.9	3.9	4.0	4.1	4.5	4.3	4.0	3.7
	12	2.5	3.4	3.2	3.6	3.3	3.3	2.7	3.4	3.1	3.4	3.2	2.6	3.6	2.8	3.8	3.1	4.0	3.2
	14	2.4	3.2	3.0	3.0	3.3	3.7	3.2	2.9	3.4	3.7	3.7	3.2	2.9	2.7	2.8	2.4	2.7	3.2
	16	2.0	2.5	3.0	3.3	3.0	2.7	3.4	2.7	3.1	3.2	3.7	3.7	3.7	3.5	3.0	2.9	3.3	2.8
	18	1.8	2.3	2.7	3.1	3.1	3.1	2.7	3.0	3.3	2.7	2.8	2.8	2.8	3.0	3.0	3.3	2.9	2.9
	20	1.6	2.2	2.4	2.8	2.9	2.3	3.1	3.1	3.1	3.5	3.0	3.0	2.6	3.1	3.1	3.4	3.3	3.3
	22	1.4	1.7	2.3	2.5	2.7	2.7	2.8	2.5	2.7	3.1	2.5	3.2	2.6	2.7	3.0	3.1	3.3	3.6
	24	1.2	1.8	2.2	2.4	2.5	2.7	2.7	2.9	3.1	2.7	2.6	3.1	2.8	3.0	2.7	2.7	2.5	2.3
	26	1.0	1.6	1.9	2.2	2.3	2.4	2.6	2.8	2.3	3.0	2.6	2.9	3.1	3.1	3.3	2.9	2.7	2.6
	28	0.9	1.4	1.7	2.0	2.4	2.3	2.6	3.1	2.7	2.8	2.6	2.6	2.5	2.4	2.8	2.8	3.0	2.6
	30	0.8	1.2	1.5	2.1	2.2	2.3	2.1	2.4	2.3	2.6	2.8	2.9	2.8	2.7	2.8	3.0	3.1	2.8
	32	0.8	1.2	1.5	1.7	1.9	2.5	2.4	2.5	2.3	2.8	2.4	2.7	2.9	2.6	2.6	2.4	3.0	2.8
	34	0.7	1.0	1.4	1.8	2.0	2.4	2.1	2.2	2.5	2.5	2.6	2.5	2.6	2.7	2.7	2.5	2.7	2.4
	36	0.6	0.9	1.4	1.6	1.8	2.2	2.0	2.3	2.2	2.4	2.5	2.6	2.6	2.3	2.8	2.8	2.7	2.7
	38	0.5	0.9	1.3	1.3	1.7	2.1	1.9	2.3	2.4	2.4	2.6	2.5	2.5	2.3	2.7	2.5	2.7	2.5
	40	0.5	0.8	1.1	1.4	1.6	1.8	2.0	2.3	2.3	2.1	2.4	2.1	2.8	2.6	2.5	2.9	2.7	2.7

		Background			
		50	100	150	200
Site	50	2.8	2.8	3.0	3.0
	100	1.9	2.3	2.6	2.4
	150	1.3	2.2	2.2	2.4
	200	1.1	1.7	2.0	2.0

Table S: Lognormal (4,1.0); DL~ Normal(2.0,0.5); Non-detects set to DL.

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	4.0	4.6	4.1	3.6	4.0	3.4	4.0	3.4	4.0	3.1	3.3	3.1	3.0	3.1	2.8	3.2	2.8	3.3
	8	3.6	3.8	3.9	4.1	3.8	3.6	3.7	3.7	4.1	3.7	4.0	4.1	3.9	4.0	3.6	3.4	3.2	3.1
	10	3.3	3.1	3.5	3.9	3.0	4.1	3.6	3.6	3.7	3.3	3.6	3.7	4.1	4.1	4.4	4.4	3.8	4.2
	12	2.9	3.2	3.5	4.2	3.3	3.4	2.7	3.8	3.1	3.4	3.4	2.8	3.6	2.8	3.4	3.1	4.0	3.2
	14	2.5	2.9	3.0	3.7	3.6	3.7	3.7	3.4	3.7	3.2	3.7	3.4	3.2	2.9	2.7	3.2	3.0	2.8
	16	2.0	2.6	2.7	3.2	3.0	3.0	3.5	2.8	3.5	3.1	3.0	3.4	3.9	3.7	3.5	3.2	3.0	3.3
	18	1.9	2.4	2.7	3.1	3.0	3.1	3.2	2.7	3.2	3.0	3.2	2.8	2.9	3.0	2.8	3.3	2.8	3.4
	20	1.4	2.0	2.4	2.8	2.9	2.7	3.4	3.2	3.2	3.6	3.3	3.3	3.0	3.4	3.6	3.3	3.1	3.6
	22	1.3	1.9	2.3	2.5	2.8	2.6	3.0	2.9	2.9	2.9	2.4	3.2	2.6	3.2	3.0	3.1	3.3	3.3
	24	1.1	1.7	2.2	2.5	2.8	2.7	2.8	2.9	2.8	3.0	2.8	3.1	3.1	3.4	2.7	2.7	2.7	3.1
	26	1.0	1.4	1.9	2.4	2.4	2.2	2.6	2.9	2.5	3.3	2.6	3.0	3.1	3.2	3.4	3.3	3.3	3.1
	28	0.9	1.3	1.9	2.1	2.5	2.5	2.5	2.8	2.7	2.9	2.5	3.0	2.5	2.8	2.8	2.9	3.1	2.9
	30	0.7	1.2	1.6	1.9	2.2	2.4	2.4	2.7	2.3	2.7	2.9	2.6	2.8	2.8	3.2	2.8	2.9	2.7
	32	0.7	1.1	1.5	1.9	2.2	2.1	2.4	2.5	2.3	2.7	2.4	2.5	2.9	2.6	2.9	2.4	3.0	2.8
	34	0.6	1.1	1.4	1.7	2.1	2.2	2.4	2.4	2.6	2.5	2.8	2.6	2.9	2.6	2.6	2.7	2.6	2.5
	36	0.6	1.0	1.4	1.6	2.0	2.1	2.2	2.3	2.4	2.4	2.7	2.4	2.9	2.3	2.9	2.8	2.8	2.7
	38	0.5	0.9	1.3	1.6	1.9	2.0	2.0	2.1	2.3	2.6	2.6	2.3	2.8	2.5	2.6	2.5	2.7	2.6
	40	0.5	0.8	1.1	1.3	1.7	2.0	1.8	2.0	2.3	2.2	2.7	2.2	2.5	2.6	2.7	2.9	2.7	3.0

		Background			
		50	100	150	200
Site	50	2.9	2.8	2.8	3.0
	100	1.8	2.2	2.7	2.6
	150	1.4	2.2	2.4	2.5
	200	1.3	1.7	2.2	2.3

Table T: Lognormal (4,1.0); DL~ Normal(2.6,0.5); Non-detects set to DL.

Sample Size Site	Sample Size Background																	
	6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
6	4.1	3.0	3.0	2.2	2.1	2.1	1.8	2.0	1.8	2.0	1.8	1.7	1.7	1.8	1.6	2.1	1.8	1.7
8	4.3	3.5	2.7	2.9	2.5	2.4	2.0	1.9	1.9	2.1	1.7	2.0	1.9	1.7	2.0	1.7	2.0	1.7
10	4.1	3.2	3.3	2.8	2.6	2.4	2.4	2.3	2.2	2.0	2.1	2.4	2.3	2.1	2.0	2.0	2.2	2.0
12	4.2	4.0	3.0	2.9	2.6	2.6	2.5	2.2	2.4	2.2	2.1	2.2	2.0	2.2	2.2	2.2	2.2	2.0
14	4.5	3.9	3.4	2.9	2.8	2.4	2.7	2.2	2.4	1.9	2.2	2.2	1.9	2.1	1.8	2.1	2.0	2.0
16	4.3	4.2	3.4	2.9	3.0	2.3	2.4	2.6	2.3	2.3	2.4	2.1	2.3	2.1	1.9	2.3	2.3	2.1
18	4.2	4.1	3.1	3.1	2.9	2.8	2.5	2.4	2.4	2.3	2.4	2.3	2.0	2.5	2.3	2.2	2.1	2.1
20	4.7	3.9	3.3	2.9	3.2	2.3	2.8	2.4	2.3	2.3	2.3	2.1	2.1	2.2	2.0	2.0	2.3	2.1
22	3.8	3.9	3.1	3.0	3.0	2.7	2.3	2.5	2.3	2.5	2.3	2.4	2.4	2.2	2.1	2.4	2.3	2.6
24	3.8	4.1	3.3	3.0	3.1	2.7	2.4	2.6	2.4	2.4	2.5	2.5	2.0	2.1	2.3	2.1	2.2	2.1
26	3.7	4.0	3.3	3.2	3.0	2.6	2.5	2.8	2.5	2.6	2.5	2.3	2.2	2.5	2.5	2.1	2.3	2.2
28	4.2	4.2	3.2	2.7	2.9	3.0	2.5	2.5	2.5	2.2	2.4	2.5	2.5	2.0	2.5	2.1	2.2	2.4
30	4.2	4.0	3.5	3.0	3.0	2.5	2.6	2.7	2.4	2.7	2.5	2.3	2.4	2.5	2.3	2.4	2.2	2.2
32	4.1	3.8	3.3	2.7	3.0	2.8	2.6	2.5	2.5	2.4	2.4	2.2	2.3	2.3	2.3	2.4	2.3	2.5
34	4.2	3.9	3.7	3.2	3.0	2.7	2.8	2.7	2.6	2.5	2.4	2.4	2.5	2.3	2.2	2.3	2.3	2.3
36	3.9	4.0	3.2	2.8	3.2	3.0	2.7	2.6	2.9	2.3	2.6	2.4	2.4	2.3	2.3	2.3	2.3	2.3
38	3.6	4.2	3.9	3.1	3.0	3.0	2.6	2.8	2.6	2.5	2.5	2.5	2.6	2.3	2.3	2.2	2.3	2.2
40	3.9	4.1	3.4	2.8	3.3	2.9	2.6	2.4	2.4	2.5	2.4	2.2	2.4	2.5	2.4	2.2	2.3	2.5

Site	Background			
	50	100	150	200
50	2.2	2.1	2.1	1.8
100	2.3	2.2	2.1	2.1
150	2.5	2.2	2.1	2.3
200	2.6	2.2	2.0	2.1

Table U: Normal (100,30); 20% chance of censoring – assigned as non-detect with DL~ Normal(85,20).

		Sample Size Background																	
		6	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
Sample Size Site	**6**	5.4	4.5	3.5	2.7	2.9	2.7	2.8	2.8	2.2	2.8	2.3	2.5	2.4	2.7	2.6	3.2	2.7	2.8
	8	5.1	3.8	4.0	3.8	3.5	2.8	2.6	2.9	2.6	3.2	2.7	3.0	2.3	2.7	2.4	2.9	2.5	2.6
	10	4.4	3.5	3.5	4.1	2.8	3.6	3.5	3.0	3.2	3.1	3.1	3.1	2.9	3.1	3.2	3.0	3.4	3.0
	12	4.1	4.1	3.7	3.6	3.1	3.3	2.7	3.2	3.1	2.6	3.4	2.7	2.8	2.8	3.3	3.1	3.1	2.9
	14	3.6	3.9	3.2	3.6	3.7	3.3	3.5	3.2	3.3	3.1	3.3	2.9	3.0	2.5	3.2	2.8	3.0	2.4
	16	3.2	3.5	3.3	3.3	3.0	3.3	3.4	2.6	3.4	3.2	3.2	3.3	2.8	3.2	3.2	3.1	3.3	2.8
	18	2.7	3.3	2.8	3.2	3.5	3.0	3.3	3.2	3.1	2.8	3.2	2.8	2.9	3.0	2.9	3.3	2.6	3.1
	20	2.4	3.1	2.8	3.1	3.4	2.9	3.1	3.2	3.2	3.6	3.0	3.4	3.5	3.2	3.0	3.1	3.3	2.9
	22	2.1	2.7	3.0	3.1	2.9	2.8	2.9	3.1	3.3	3.1	2.9	3.4	2.6	3.5	3.0	3.3	3.3	3.1
	24	2.0	2.5	2.5	2.4	3.0	2.7	3.1	3.4	2.7	3.3	2.7	2.9	3.0	3.1	3.0	3.1	2.8	2.8
	26	1.7	2.2	2.7	2.5	2.7	2.8	2.7	3.0	2.9	2.9	2.6	3.2	3.1	3.2	3.4	2.8	2.9	3.1
	28	1.5	2.0	2.4	2.4	2.5	2.9	2.6	3.0	2.9	2.8	3.0	2.9	2.5	3.1	2.8	3.0	3.1	2.7
	30	1.4	1.8	2.3	2.0	2.3	2.5	2.6	2.8	2.6	2.9	3.0	3.2	3.3	2.9	3.0	3.0	3.2	3.2
	32	1.2	1.6	2.2	2.1	2.3	2.7	2.5	2.7	2.6	2.9	2.7	2.9	2.9	2.6	2.9	2.8	3.2	2.8
	34	1.1	1.5	1.9	2.0	2.3	2.4	2.4	2.5	2.6	2.9	3.0	2.8	3.0	2.9	3.0	3.1	3.0	3.0
	36	1.1	1.4	1.9	1.8	2.1	2.4	2.3	2.7	2.4	2.5	2.7	2.5	3.2	2.8	2.9	2.8	3.0	3.0
	38	0.9	1.3	1.6	1.6	1.9	2.2	2.3	2.4	2.5	2.5	2.6	2.6	2.7	2.7	2.6	2.7	2.9	2.5
	40	0.8	1.2	1.4	1.6	1.8	2.0	2.0	2.3	2.3	2.5	2.8	2.5	2.7	2.6	3.1	3.0	3.0	3.0

		Background			
		50	100	150	200
Site	50	2.9	2.8	3.2	2.5
	100	1.8	2.8	2.7	2.8
	150	1.2	2.0	2.4	2.6
	200	0.9	1.6	2.1	2.5

Table V: Lognormal (4,1.5); 20% chance of censoring – assigned as non-detect with DL~ Lognormal(3,1.0).