

**APPENDIX K**  
**BACKGROUND COMPARISON**  
**METHODOLOGY**

## BACKGROUND COMPARISON METHODOLOGY

The background comparison was conducted to identify chemicals of potential concern (COPCs) for the risk assessment and to support the evaluation of the nature and extent of contamination. In general, two different comparison methods were used depending upon the purpose:

- Analysis of variance (ANOVA) was used to identify COPCs for risk assessment.
- Upper tolerance limits (UTLs) were used to support the evaluation of the nature and extent of contamination.

### Selection of COPCs

In accordance with the U.S. Environmental Protection Agency (EPA) Region VIII guidance, the background comparison used to select COPCs was conducted using different tests depending on the percentage of detected values in the site and background data sets (EPA 1994d). As shown in Table K-A, analysis of variance (ANOVA) tests were used unless the frequency of detection in the background data set is low (i.e., less than 10 percent). The following tests were used in the selection of COPCs:

- Poisson upper tolerance limit (UTL)
- Mann-Whitney test
- Student's t-test.

These tests were used as follows:

**Table K-A. Background Comparison to Select COPCs**

% of Detects in Site Data Set	% of Detects in Background Data Set	Test
0 – 100	0	No comparison
>0 – 100	<10	Poisson UTL
>0 – 50	>50	Mann-Whitney test
>0 – 100	10-50	Mann-Whitney test
>50 – 100	>50 – 100	Student's t-test* or Mann-Whitney test

\* Student's t-test was used if the distributions in the site and background data sets are the same and the result of the F-test is equal; otherwise, the Mann-Whitney test was used.

For the background comparison, if both data sets (i.e., site and background) are normally distributed, the Student's t-test is conducted without transforming the data. If both are lognormal, the data are first transformed and the Student's t-test is conducted in log space. If the distributions differ (e.g., one is normal and the other is lognormal, one or both is neither normal nor lognormal), the t-test is not used, and the Mann-Whitney test (the nonparametric analog to the Student's t-test) is used instead. This is detailed in Figure K-A.

**Determining Sample Distribution**—Characterizing the distribution (e.g., normal, lognormal, or undetermined) is necessary for both the background comparison and calculating exposure point concentrations. For the background comparison, data sets with greater than 50 percent detected values were evaluated to determine the underlying sample distribution. For the exposure point concentrations, all data carried into the risk assessment was subject to distribution testing. Distribution was determined using the probability plot correlation coefficient (EPA 1992d). The following sections describe the procedures to calculate the p-plot correlation coefficient.

The probability plot correlation coefficient is a measure of the linearity of points on a scatter plot (i.e., p-plot). A relatively high coefficient indicates more linearity, supporting the determination of the underlying distribution. The sample data are arranged in order from smallest to largest, and the coefficient is estimated with the following equation:

$$r = \frac{\sum_{i=1}^n X_{(i)} M_i - n \overline{XM}}{C_n \times SD \sqrt{n-1}}$$

where:

- r = Probability plot correlation coefficient
- n = Number of samples in the data set
- X<sub>i</sub> = Sample concentration for the i<sup>th</sup> sample
- M<sub>i</sub> = Median of any of the given ordered concentrations
- C<sub>n</sub> = Calculated from M<sub>i</sub> (see equation below)
- SD = Standard deviation.

A value  $m_i$  is associated with each ordered concentration ( $X_i$ ). For a sample size of  $n$ , the values of  $m_i$  are computed as follows:

$$m_i = \begin{cases} \text{for } i = 1, & 1 - (0.5)^{1/n} \\ \text{for } 1 < i < n, & (i - 0.3175) / (n + 0.365) \\ \text{for } i = n, & (0.5)^{1/n} \end{cases}$$

As the above equations show, the first and last  $m_i$  are calculated differently than the other  $m_i$ s.  $M_i$  (as opposed to  $m_i$ ) is the median of any of the given ordered concentrations. It is derived from the inverse of the standard normal distribution for each value  $m_i$ . This is accomplished using statistical tables or the appropriate statistical function commonly found in spreadsheet software.

$C_n$  is calculated using the following equation:

$$C_n = \sqrt{\sum_i M_i^2 - n\overline{M}^2}$$

The probability plot correlation coefficient is first computed using untransformed sample data. The resulting coefficient is then compared to a table of critical values for the appropriate number of samples, at a 0.05 error rate (95 percent confidence level). If the coefficient for the untransformed data is greater than the critical value, the data are determined to be normally distributed. If the coefficient is less than the critical value, the calculation is repeated using log transformed data (natural logarithm). If the coefficient for the log transformed data is greater than the critical value, the data are determined to be lognormally distributed. If the same coefficient is less than the critical value, the distribution is undetermined. If both the normal and lognormal goodness of fit test coefficients are greater than or equal to the critical value, an effort is made to match the site and background distributions in order to perform a parametric analysis.

**Poisson Upper Tolerance Limit**—The Poisson distribution is used to describe the random occurrence of low-probability events. EPA (1992d) indicates that "... the detected samples can often be modeled as 'rare events' by using the Poisson distribution." In this case, it was used to estimate a UTL for background concentrations when detection frequencies decreased below 10 percent. The UTL was used to define an upper acceptable limit for the background

data set. The UTL is an upper confidence limit for a proportion (or percentile) of the background data set. It is the concentration below which 95 percent of the background samples fall, with a 95 percent confidence level.

The following bullets summarize the procedures that were followed to calculate the Poisson UTL:

- Calculate the total Poisson count ( $T_n$  = sum of all measurements)
- Calculate the probable occurrence rate ( $\lambda T_n$ ) assuming 95 percent confidence ( $\alpha_{.95}$ ) and 95 percent coverage ( $\beta_{.95}$ ) such that:

$$\lambda T_n = 1/(2 * n) * \chi_{.95}^2 [2 * T_n + 2]$$

where:

$\lambda T_n$  = Probable occurrence rate

n = Number of samples

$\chi_{.95}^2$  = Inverse of the one-tailed probability of the Chi-square distribution

$T_n$  = Total Poisson count.

- Find *smallest* number of degrees of freedom (i.e., at 5<sup>th</sup> percentile) such that

$$\chi_{.95}^2 [2k + 2] \leq 2 * \lambda T_n$$

where:

$\chi_{.95}^2$  = Inverse of the one-tailed probability of the Chi-square distribution

[2k+2] = Degrees of freedom of Chi-square distribution

$\lambda T_n$  = Probable occurrence rate

Solve for the Poisson UTL (which in this case is approximated by k) by setting the degrees of freedom solved in the previous step equal to (2k + 2).

**The Mann-Whitney Test**—The Mann-Whitney test is a nonparametric test that assigns ranks to the background and site sample data for a given analyte and compares the ranks of the two data sets to determine if they differ statistically. The largest value is assigned the rank of 1,

the next greatest is assigned a rank of 2, etc. The smallest value in the two data sets would then have the rank:

$$N = n_1 + n_2$$

where:

$n_1$  = Number of observations (i.e., samples) in sample set 1

$n_2$  = Number of samples in sample set 2.

The Mann-Whitney statistic is then calculated using the following equation:

$$U = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - R_1$$

where:

$n_1$  = Number of observations (i.e., samples) in sample set 1

$n_2$  = Number of samples in sample set 2

$R_1$  = Sum of the ranks of the observations in sample set 1.

The Mann-Whitney statistic is compared to a critical value in the standard normal distribution table. The table indicates a probability associated with the value, depending on the sample size (i.e., degrees of freedom).

***The Two-Sample Student's t-Test***—The t-test is a method in which the mean of the site data set is compared to the mean of the background data set. The t-test is based on the following formula:

$$t = \frac{X_1 - X_2}{S_{X_1 - X_2}}$$

where:

$X_1$  = Mean of first data set

$X_2$  = Mean of second data set

$S_{X_1 - X_2}$  = Difference in the standard deviations of the two data sets.

The t-test results in a value that is compared to values in a standard t table. As with the Mann-Whitney test, the table indicates a certain probability (described below) associated with the value, depending on the sample size (i.e., degrees of freedom). When using statistical software, this probability is automatically generated.

*Interpreting the Results of the Mann-Whitney Test and the Student's t-Test*—Two outcomes of the comparison are possible, as expressed by the following two hypotheses:

$H_0$  = Null hypothesis (there is no statistical difference between site and background)

$H_A$  = Alternate hypothesis (there is a statistical difference between site and background).

There is always some chance of making an error (selecting the wrong hypothesis). In recognition of this, a decision regarding an acceptable error rate must be selected. This background comparison uses the conventional Type I error rate of 5 percent, which means that the maximum allowable probability of erroneously rejecting the null hypothesis (and thereby wrongly selecting the alternate hypothesis) is 1 event in 20. The result of the t-test is expressed as the probability of this occurring (Type I error). If the probability is below 5 percent, we can confidently reject the null hypothesis and conclude that there is a difference between data sets. Conversely, if the probability of Type I error is greater than or equal to 5 percent, we accept the null hypothesis and conclude that there is no difference between the data sets. Therefore, for the background comparison:

- A p-value greater than or equal to 0.05 indicates no statistical difference between the site and background data sets
- A p-value below 0.05 indicates a statistical difference between the site and background data sets.

The t-test and Mann-Whitney test detect statistical differences between two sample populations (i.e., two data sets). Therefore, for a given analyte, it is possible for these tests to show a statistical difference between the data sets when the background concentrations actually exceed the site concentrations.

In order to identify such situations, an effort was made to identify the direction of the difference between site and background central tendencies. For those instances in which the

t-test or Mann-Whitney test indicated a difference between site and background, the arithmetic mean concentration of the site data set was compared to the arithmetic mean of the background data set. For a given analyte, if the background mean was equal to or greater than the mean for the site, that analyte was determined to be at higher levels in the background than at the site. This approach is consistent with EPA Region VIII guidance to consider average, rather than extreme, values in the background comparison.

If the p-value for a given inorganic analyte is greater than or equal to 0.05 (indicating concentrations that are consistent with background), the analyte was screened from the risk assessment and eliminated as a COPC. Inorganic analytes with p-values below 0.05 (and the site mean was equal to or greater than the background mean) and all organic analytes were designated as COPCs and were included in the risk assessment. The results of the background comparison are presented in this appendix.

#### **Determining the Nature and Extent of Contamination**

In order to determine the nature and extent of contamination, a threshold concentration must be identified below which levels are considered indistinguishable from background and above which levels are considered above background. Therefore for inorganic analytes identified as COPCs, a UTL was calculated.

The UTL is used to define an upper critical limit for the background data set and is an upper confidence limit for a proportion (or percentile) of the background data set. Solid waste management units (SWMUs) samples with concentrations above the UTL provide an indication of contamination.

The UTL was calculated differently, depending upon the distribution and frequency of detection of the background data. A minimum of four samples is required to determine the background UTL and characterize the distribution of the data. Not detected results for analytes in a given data set were counted as one-half the limit of detection in the calculations of the UTL. A UTL was not calculated for target analytes that were not detected in any sample for a medium within a data set. The UTLs were applied as follows:

**Table K-B. Background Comparison to Evaluate Nature and Extent of Contamination**

<b>% of Detects in Background Data Set</b>	<b>Type of UTL to Be Used</b>
0%	No comparison conducted
<10%	Poisson UTL
10-50%	Nonparametric UTL
>50% (normal or lognormal distribution)	Parametric UTL
>50% (neither)	Nonparametric UTL

For normally or lognormally distributed data, the UTL is an upper confidence limit on a percentile (in this case, the 95 percent confidence limit on the 95th percentile) of the background data set. For data sets that are not properly represented using normal statistics, a nonparametric UTL is calculated. Similar to the normal and lognormal UTL, the nonparametric UTL represents a high-end value in the distribution of background data. For a given analyte, each site sample concentration is compared to the corresponding UTL. The UTL is considered a threshold concentration that defines for each chemical the concentration considered above background. Only sample results above the background UTLs were included in the discussion of the nature and extent of contamination for each SWMU. The Poisson UTL assumes a Poisson distribution and was calculated previously for the selection of COPCs.

**Parametric UTL**—The parametric UTL assumes a normal or lognormal distribution and was calculated using the following formula (EPA 1989c):

$$UTL = \bar{X} + ks$$

where:

- X = Mean of the background data set
- k = One-sided normal tolerance factor from standard k table
- s = Standard deviation of the background data set.

For lognormally distributed data sets, the same formula was applied using the mean and standard deviation of the log-transformed data. The UTL was estimated for the 95<sup>th</sup> percentile of the data, at a 95 percent confidence level.

*Nonparametric UTL*—When the distribution of the data cannot be determined (i.e., if detection frequencies are low or the data are neither normally nor lognormally distributed), the nonparametric UTL was used. Two different formulas are recommended depending on the number of samples in the data set. For data sets with 20 or fewer samples, the nonparametric UTL was determined using the method discussed in Conover (1980).

This method uses a series of tables that provide upper and lower tolerance limits. First, the background sample data are arranged in order from the smallest to the largest, and each value is assigned a rank. For a given percentile of interest, number of samples, and desired level of confidence, the tables return a rank associated with the UTL. For the risk assessment, the 95th percentile and the 95 percent confidence level were chosen. This rank is compared to the ranks of the sample data. The sample value associated with that rank is the nonparametric UTL.

For data sets with more than 20 samples, the nonparametric UTL was calculated according to the following equation (Gilbert 1987):

$$UTL = p(n + 1) + Z_{1-\alpha} [np(1 - p)]^{1/2}$$

where:

- UTL = Upper tolerance limit on the background data set
- p = Percentile
- n = Number of samples
- Z = Z-statistic for cumulative normal distribution.

The results of the background comparison using the UTL are presented in this appendix. For inorganics, only sample results that were above the corresponding UTLs were included in the discussion of the nature and extent of contamination. For organics, all sample results were included because organic background concentrations are assumed to be zero. The nature and extent discussions and corresponding figures are presented in the summary sections for each SWMU (Sections 6 through 10).

**Table K-1. Samples Included in Data Set for Surface Soils at Background (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	3-BK-1	BORE	S1055	2	SAIC	3-BK-1	BORE	S1055	2
	3-BK-2	BORE	S1057	2		3-BK-2	BORE	S1057	2
	31-BK-1	BORE	S1019	2		31-BK-1	BORE	S1019	2
	31-BK-2	BORE	S1021	2		31-BK-2	BORE	S1021	2
	5-BK-1	BORE	S0136	2		5-BK-1	BORE	S0136	2
	5-BK-2	BORE	S0138	2		5-BK-2	BORE	S0138	2
	8-BK-1	BORE	S0773	2		8-BK-1	BORE	S0773	2
	8-BK-2	BORE	S0775	2		8-BK-2	BORE	S0775	2
	9-BK-1	BORE	S0333	2		9-BK-1	BORE	S0333	2
	9-BK-2	BORE	S0335	2		9-BK-2	BORE	S0335	2
	S-SS-05-BK	BORE	SSS-05BK	1.5		S-SS-05-BK	BORE	SSS-05BK	1.5
	S-SS-05-BK	BORE	SSS05-BK	1.5		S-SS-05-BK	BORE	SSS05-BK	1.5
	S-SS-05-BK	BORE	SSS05BK	1.5		S-SS-05-BK	BORE	SSS05BK	1.5
	S-SS-08-BK	BORE	SSS-08BK	1.5		S-SS-08-BK	BORE	SSS-08BK	1.5
	S-SS-08-BK	BORE	SSS08-BK	1.5		S-SS-08-BK	BORE	SSS08-BK	1.5
	S-SS-08-BK	BORE	SSS08BK	3		S-SS-08-BK	BORE	SSS08BK	3
	S-SS-10-BK	BORE	SSS-10BK	1.5		S-SS-10-BK	BORE	SSS-10BK	1.5
	S-SS-10-BK	BORE	SSS10-BK	1.5		S-SS-10-BK	BORE	SSS10-BK	1.5
	S-SS-14-BK	BORE	SSS-14BK	1.5		S-SS-14-BK	BORE	SSS-14BK	1.5
	S-SS-14-BK	BORE	SSS14BK	1.5		S-SS-14-BK	BORE	SSS14BK	1.5
	S-SS-19-BK	BORE	SSS-19BK	1.5		S-SS-19-BK	BORE	SSS-19BK	1.5
	S-SS-19-BK	BORE	SSS19BK	1.5		S-SS-19-BK	BORE	SSS19BK	1.5
	S-SS-22-BK	BORE	SSS-22BK	1.5		S-SS-22-BK	BORE	SSS-22BK	1.5
	S-SS-22-BK	BORE	SSS22BK	1.5		S-SS-22-BK	BORE	SSS22BK	1.5
	S-SS-26-BK	BORE	SSS-26BK	1.5		S-SS-26-BK	BORE	SSS-26BK	1.5
	S-SS-26-BK	BORE	SSS26-BK	1.5		S-SS-26-BK	BORE	SSS26-BK	1.5
	S-SS-27-BK	BORE	SSS-27BK	1.5		S-SS-27-BK	BORE	SSS-27BK	1.5
	S-SS-27-BK	BORE	SSS27-BK	1.5		S-SS-27-BK	BORE	SSS27-BK	1.5
	S-SS-29-BK	BORE	SSS-29BK	1.5		S-SS-29-BK	BORE	SSS-29BK	1.5
	S-SS-29-BK	BORE	SSS29-BK	1.5		S-SS-29-BK	BORE	SSS29-BK	1.5
	S-SS-36-BK	BORE	SSS-36BK	1.5		S-SS-36-BK	BORE	SSS-36BK	1.5
	S-SS-36-BK	BORE	SSS36-BK	1.5		S-SS-36-BK	BORE	SSS36-BK	1.5
	S-SS-36-BK	BORE	SSS36BK	1.5		S-SS-36-BK	BORE	SSS36BK	1.5
	SB-BK-01	BORE	SAIC02	1		SB-BK-01	BORE	SAIC02	1
	SB-BK-01	BORE	SAIC03	5		SB-BK-01	BORE	SAIC03	5
	SB-BK-02	BORE	SAIC02	1		SB-BK-02	BORE	SAIC02	1
	SB-BK-02	BORE	SAIC03	5		SB-BK-02	BORE	SAIC03	5
	SB-BK-02	BORE	SAIC03D	5		SB-BK-02	BORE	SAIC03D	5
	SB-BK-02	BORE	SAIC04	10		SB-BK-02	BORE	SAIC04	10
	SB-BK-03	BORE	SAIC02	1		SB-BK-03	BORE	SAIC02	1
	SB-BK-03	BORE	SAIC03	5		SB-BK-03	BORE	SAIC03	5
	SB-BK-03	BORE	SAIC03D	5		SB-BK-03	BORE	SAIC03D	5
	SB-BK-03	BORE	SAIC04	10		SB-BK-03	BORE	SAIC04	10
	SB-BK-04	BORE	SAIC02	1		SB-BK-04	BORE	SAIC02	1
	SB-BK-04	BORE	SAIC03	5		SB-BK-04	BORE	SAIC03	5
	SB-BK-05	BORE	SAIC02	1		SB-BK-05	BORE	SAIC02	1
	SB-BK-05	BORE	SAIC03	5		SB-BK-05	BORE	SAIC03	5
	SB-BK-05	BORE	SAIC04	10		SB-BK-05	BORE	SAIC04	10
	SB-BK-06	BORE	SAIC02	1		SB-BK-06	BORE	SAIC02	1
	SB-BK-06	BORE	SAIC03	5		SB-BK-06	BORE	SAIC03	5
	SB-BK-06	BORE	SAIC04	10		SB-BK-06	BORE	SAIC04	10
	SB-BK-07	BORE	SAIC02	1		SB-BK-07	BORE	SAIC02	1
	SB-BK-07	BORE	SAIC03	5		SB-BK-07	BORE	SAIC03	5
	SB-BK-07	BORE	SAIC04	10		SB-BK-07	BORE	SAIC04	10
	SB-BK-08	BORE	SAIC02	1		SB-BK-08	BORE	SAIC02	1
	SB-BK-08	BORE	SAIC03	5		SB-BK-08	BORE	SAIC03	5
	SB-BK-09	BORE	SAIC02	1		SB-BK-09	BORE	SAIC02	1
	SB-BK-09	BORE	SAIC03	5		SB-BK-09	BORE	SAIC03	5
	SB-BK-10	BORE	SAIC02	1		SB-BK-10	BORE	SAIC02	1
	SB-BK-10	BORE	SAIC03	5		SB-BK-10	BORE	SAIC03	5
	SB-BK-01	BORE	SAIC01	0		SB-BK-01	BORE	SAIC01	0
	SB-BK-02	BORE	SAIC01	0		SB-BK-02	BORE	SAIC01	0
	SB-BK-03	BORE	SAIC01	0		SB-BK-03	BORE	SAIC01	0

**Table K-1. Samples Included in Data Set for Surface Soils at Background (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
	SB-BK-04	BORE	SAIC01	0		SB-BK-04	BORE	SAIC01	0
	SB-BK-05	BORE	SAIC01	0		SB-BK-05	BORE	SAIC01	0
	SB-BK-06	BORE	SAIC01	0		SB-BK-06	BORE	SAIC01	0
	SB-BK-07	BORE	SAIC01	0		SB-BK-07	BORE	SAIC01	0
	SB-BK-08	BORE	SAIC01	0		SB-BK-08	BORE	SAIC01	0
	SB-BK-09	BORE	SAIC01	0		SB-BK-09	BORE	SAIC01	0
	SB-BK-10	BORE	SAIC01	0		SB-BK-10	BORE	SAIC01	0

**Table K-2. Summary Statistics and Exposure Point Concentrations for Surface Soils at Background (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>e</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	47 / 47	45 / 45	100%	--	--	2,260	25,200	14,545	5,716	Normal	15,977	15,977
Antimony	ug/g	1 / 57	1 / 55	2%	7.0	16	12	12	4.5	2.0	Lognormal	4.8	4.8
Arsenic	ug/g	58 / 62	56 / 60	93%	47	47	3.0	53	13	9.2	Lognormal	15	15
Barium	ug/g	47 / 47	45 / 45	100%	--	--	15	423	147	74	Lognormal	184	184
Beryllium	ug/g	57 / 57	55 / 55	100%	--	--	0.19	1.2	0.65	0.28	Lognormal	0.75	0.75
Cadmium	ug/g	41 / 57	39 / 55	71%	0.70	0.89	0.27	21	1.1	2.9	Lognormal	0.98	0.98
Calcium	ug/g	47 / 47	45 / 45	100%	--	--	6,650	250,000	103,597	58,940	Lognormal	133,942	133,942
Chromium	ug/g	57 / 57	55 / 55	100%	--	--	8.1	56	22	8.2	Lognormal	24	24
Cobalt	ug/g	44 / 47	42 / 45	93%	5.0	5.0	1.7	11	6.4	2.3	Normal	6.9	6.9
Copper	ug/g	57 / 57	55 / 55	100%	--	--	2.9	162	17	21	Lognormal	19	19
Iron	ug/g	47 / 47	45 / 45	100%	--	--	3,230	24,300	13,571	4,573	Normal	14,716	14,716
Lead	ug/g	57 / 57	55 / 55	100%	--	--	3.7	401	32	67	Lognormal	33	33
Magnesium	ug/g	47 / 47	45 / 45	100%	--	--	7,280	35,700	12,213	4,177	Lognormal	12,994	12,994
Manganese	ug/g	47 / 47	45 / 45	100%	--	--	108	739	365	167	Normal	407	407
Mercury	ug/g	15 / 57	15 / 55	27%	0.026	0.050	0.030	0.36	0.043	0.062	Lognormal	0.046	0.046
Nickel	ug/g	47 / 57	45 / 55	82%	4.9	4.9	6.0	36	15	8.0	Lognormal	21	21
Potassium	ug/g	47 / 47	45 / 45	100%	--	--	453	7,500	3,619	1,844	Normal	4,080	4,080
Selenium	ug/g	18 / 57	18 / 55	33%	0.20	5.8	0.18	0.72	0.72	1.0	Lognormal	0.89	0.72 #
Silver	ug/g	38 / 57	36 / 55	65%	0.59	1.00	0.095	3.7	0.62	0.54	Lognormal	0.75	0.75
Sodium	ug/g	54 / 57	52 / 55	95%	104	104	189	5,610	1,680	1,415	Lognormal	3,068	3,068
Thallium	ug/g	32 / 57	30 / 55	55%	1.00	33	0.44	34	6.7	9.3	Lognormal	14	14
Vanadium	ug/g	47 / 47	45 / 45	100%	--	--	8.4	63	34	12	Normal	37	37
Zinc	ug/g	57 / 57	55 / 55	100%	--	--	23	385	77	57	Lognormal	86	86

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

- 1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.
- 3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "\*" next to the EPC).

**Table K-3. Samples Included in Data Set for Groundwater at Background  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	S-20-88	WELL	S-20-88	1.2	SAIC	S-20-88	WELL	S-20-88	1.2
	S-20-88	WELL	S-20-88X	94.7		S-20-88	WELL	S-20-88X	94.7
	S-20-88	WELL	S-20-88Y	97		S-20-88	WELL	S-20-88Y	97
	S-20-88	WELL	S2088	97		S-20-88	WELL	S2088	97
	S-20-88	WELL	T1292	97		S-20-88	WELL	T1292	97
	S-20-88	WELL	TO668	97		S-20-88	WELL	TO668	97
	S-20-88	WELL	TO670	97		S-20-88	WELL	TO670	97
	S-20-88	WELL	TO673	97		S-20-88	WELL	TO673	97
	S-20-88	WELL	TO674	97		S-20-88	WELL	TO674	97
	S-35-90	WELL	S-35-90	271.6		S-35-90	WELL	S-35-90	271.6
	S-35-90	WELL	S3590	271.6		S-35-90	WELL	S3590	271.6
	S-35-90	WELL	T1106	271.6		S-35-90	WELL	T1106	271.6
	S-35-90	WELL	T1107	271.6		S-35-90	WELL	T1107	271.6
	S-35-90	WELL	T1108	271.6		S-35-90	WELL	T1108	271.6
	S-35-90	WELL	T1111	271.6		S-35-90	WELL	T1111	271.6
	S-35-90	WELL	T1112	271.6		S-35-90	WELL	T1112	271.6
	S-SBR-1	WELL	S-SBR-1	119.4		S-SBR-1	WELL	S-SBR-1	119.4
	S-SBR-1	WELL	S-SBR-1X	119.3		S-SBR-1	WELL	S-SBR-1X	119.3
	S-SBR-1	WELL	SBR-1	128.5		S-SBR-1	WELL	SBR-1	128.5
	S-SBR-1	WELL	SBR-1X	140		S-SBR-1	WELL	SBR-1X	140
	S-SBR-1	WELL	SBR-1Y	128		S-SBR-1	WELL	SBR-1Y	128
	S-SBR-1	WELL	SSBR1	140		S-SBR-1	WELL	SSBR1	140
	S-SBR-1	WELL	T1590	140		S-SBR-1	WELL	T1590	140
	S-SBR-1	WELL	T1591	140		S-SBR-1	WELL	T1591	140
	S-SBR-1	WELL	T1592	140		S-SBR-1	WELL	T1592	140
	S-SBR-1	WELL	T1595	140		S-SBR-1	WELL	T1595	140
	S-SBR-1	WELL	T1596	140		S-SBR-1	WELL	T1596	140

**Table K-4. Summary Statistics and Exposure Point Concentrations for Groundwater at Background  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion	Proportion	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure
		of Detects All Samples <sup>a</sup>	of Detects Temporal Samples <sup>b</sup>		Min CRL	Max CRL	Minimum	Maximum					Point Concentration <sup>e</sup>
Antimony	µg/L	1 / 9	1 / 3	33%	3.0	38	4.5	4.5	15	3.9	Undetermined	--	12 #
Arsenic	µg/L	6 / 9	3 / 3	100%	--	--	3.7	28	8.8	4.9	Undetermined	--	14 #
Barium	µg/L	1 / 2	1 / 2	50%	25	25	200	200	106	133	Undetermined	--	200 #
Beryllium	µg/L	2 / 9	2 / 3	67%	0.83	5.0	0.50	0.81	2.0	0.49	Undetermined	--	1.8 #
Cadmium	µg/L	1 / 9	1 / 3	33%	4.0	12	11	11	3.1	1.8	Undetermined	--	5.2 #
Chloride	µg/L	4 / 5	3 / 3	100%	--	--	28,000	1.4E+06	716,333	661,718	Undetermined	--	1.4E+06 #
Chromium	µg/L	3 / 9	2 / 3	67%	6.0	38	29	36	15	6.9	Undetermined	--	22 #
Copper	µg/L	5 / 9	3 / 3	100%	--	--	11	48	14	6.7	Undetermined	--	21 #
Lead	µg/L	6 / 9	3 / 3	100%	--	--	1.5	58	15	13	Undetermined	--	29 #
Nickel	µg/L	3 / 10	2 / 3	67%	9.6	65	17	45	20	4.2	Undetermined	--	24 #
Nitrite, Nitrate	µg/L	2 / 3	2 / 2	100%	--	--	1,300	5,600	3,750	2,616	Undetermined	--	5,600 #
Silver	µg/L	1 / 9	1 / 3	33%	0.14	4.6	2.0	2.0	1.9	0.61	Undetermined	--	2.2 #
Sodium	µg/L	7 / 7	3 / 3	100%	--	--	15,600	61,000	43,894	11,795	Undetermined	--	54,000 #
Zinc	µg/L	7 / 10	3 / 3	100%	--	--	36	1,200	266	221	Undetermined	--	521 #
2,4-Dinitrotoluene	µg/L	1 / 8	1 / 3	33%	0.60	5.5	2.5	2.5	1.6	0.33	Undetermined	--	1.9 #
Acetone	µg/L	1 / 3	1 / 3	33%	10.0	10.0	30	30	13	14	Undetermined	--	30 #
Butyl Benzyl Phthalate	µg/L	1 / 6	1 / 3	33%	10.0	10.0	5.0	5.0	5.0	0.0	Undetermined	--	5.0 #
Methylene Chloride	µg/L	1 / 4	1 / 3	33%	5.0	5.4	8.1	8.1	3.6	1.5	Undetermined	--	5.3 #
Toluene	µg/L	1 / 5	1 / 3	33%	5.0	8.7	7.0	7.0	4.4	0.15	Undetermined	--	4.6 #
bis(2-Ethylhexyl)phthalate	µg/L	1 / 6	1 / 3	33%	10.0	32	7.0	7.0	12	3.6	Undetermined	--	9.3 #

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-5. Samples Included in Data Set for Surface Soils at SWMU 11 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-11-001A	AHOL	SAIC01	0	SAIC	3-BK-1	BORE	S1055	2
	SB-11-002A	AHOL	SAIC01	0		3-BK-2	BORE	S1057	2
	SB-11-004A	AHOL	SAIC01	0		31-BK-1	BORE	S1019	2
	SB-11-005A	AHOL	SAIC01	0		31-BK-2	BORE	S1021	2
	SB-11-006A	AHOL	SAIC01	0		5-BK-1	BORE	S0136	2
	SB-11-007A	AHOL	SAIC01	0		5-BK-2	BORE	S0138	2
	SB-11-008A	AHOL	SAIC01	0		8-BK-1	BORE	S0773	2
	SB-11-009A	AHOL	SAIC01	0		8-BK-2	BORE	S0775	2
	SB-11-010A	AHOL	SAIC01	0		9-BK-1	BORE	S0333	2
	SB-11-011A	AHOL	SAIC01	0		9-BK-2	BORE	S0335	2
	SB-11-012A	AHOL	SAIC01	0		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-11-013A	AHOL	SAIC01	0		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-11-014A	AHOL	SAIC01	0		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-11-015A	AHOL	SAIC01	0		S-SS-08-BK	BORE	SSS-08BK	1.5
	SB-11-016A	AHOL	SAIC01	0		S-SS-08-BK	BORE	SSS08-BK	1.5
	SB-11-017A	AHOL	SAIC01	0		S-SS-08-BK	BORE	SSS08BK	3
	SB-11-018A	AHOL	SAIC01	0		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-11-019A	AHOL	SAIC01	0		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-11-020A	AHOL	SAIC01	0		S-SS-14-BK	BORE	SSS-14BK	1.5
						S-SS-14-BK	BORE	SSS14BK	1.5
						S-SS-19-BK	BORE	SSS-19BK	1.5
						S-SS-19-BK	BORE	SSS19BK	1.5
						S-SS-22-BK	BORE	SSS-22BK	1.5
						S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0

**Table K-5. Samples Included in Data Set for Surface Soils at SWMU 11 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-6. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 11 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion	Proportion	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
		of Detects All Samples <sup>a</sup>	of Detects Temporal Samples <sup>b</sup>		Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	19 / 19	19 / 19	100%	--	--	4,270	10,600	6,813	1,667	Normal	7,476	7,476
Arsenic	ug/g	19 / 19	19 / 19	100%	--	--	4.1	16	7.2	2.8	Lognormal	8.4	8.4
Barium	ug/g	19 / 19	19 / 19	100%	--	--	84	183	131	32	Normal	144	144
Beryllium	ug/g	7 / 19	7 / 19	37%	0.50	0.50	0.67	0.97	0.46	0.29	Lognormal	0.62	0.62
Cadmium	ug/g	7 / 19	7 / 19	37%	0.70	0.70	0.97	1.5	0.67	0.44	Lognormal	0.91	0.91
Calcium	ug/g	19 / 19	19 / 19	100%	--	--	67,000	120,000	87,895	16,384	Normal	94,413	94,413
Chromium	ug/g	19 / 19	19 / 19	100%	--	--	5.5	17	11	2.7	Normal	12	12
Cobalt	ug/g	19 / 19	19 / 19	100%	--	--	3.5	6.3	5.0	0.88	Normal	5.3	5.3
Copper	ug/g	19 / 19	19 / 19	100%	--	--	9.9	31	16	4.6	Lognormal	18	18
Iron	ug/g	19 / 19	19 / 19	100%	--	--	3,690	13,800	8,979	2,429	Normal	9,946	9,946
Lead	ug/g	19 / 19	19 / 19	100%	--	--	14	53	31	12	Normal	36	36
Magnesium	ug/g	19 / 19	19 / 19	100%	--	--	9,170	21,500	14,609	3,383	Normal	15,955	15,955
Manganese	ug/g	19 / 19	19 / 19	100%	--	--	338	588	465	77	Normal	496	496
Nickel	ug/g	19 / 19	19 / 19	100%	--	--	9.8	25	16	4.4	Normal	18	18
Potassium	ug/g	19 / 19	19 / 19	100%	--	--	1,020	4,010	2,529	824	Normal	2,857	2,857
Silver	ug/g	2 / 19	2 / 19	11%	0.59	0.59	0.71	1.3	0.37	0.24	Lognormal	0.42	0.42
Sodium	ug/g	19 / 19	19 / 19	100%	--	--	555	2,680	1,099	518	Lognormal	1,314	1,314
Vanadium	ug/g	19 / 19	19 / 19	100%	--	--	7.4	24	15	4.0	Normal	17	17
Zinc	ug/g	19 / 19	19 / 19	100%	--	--	34	2,170	178	483	Lognormal	183	183
Dimethyl Phthalate	ug/g	1 / 13	1 / 13	8%	0.17	0.80	0.70	0.70	0.23	0.19	Lognormal	0.38	0.38
Fluoranthene	ug/g	1 / 13	1 / 13	8%	0.068	0.30	1.00	1.00	0.13	0.26	Lognormal	0.23	0.23
Pyrene	ug/g	1 / 13	1 / 13	8%	0.033	0.20	1.00	1.00	0.11	0.27	Lognormal	0.22	0.22
Toluene	ug/g	7 / 19	7 / 19	37%	0.00078	0.0020	0.00089	0.0066	0.0014	0.0018	Lognormal	0.0022	0.0022
Trichlorofluoromethane	ug/g	6 / 19	6 / 19	32%	0.0059	0.051	0.0066	0.015	0.0077	0.0062	Lognormal	0.012	0.012

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-7. Analysis of Variance Background Comparison for Surface Soils at SWMU 11 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	10,600	25,200	Nonparametric	Unequal	1.00	6,813	14,545	--	--	-- / --	Not Site Related
Arsenic	ug/g	100%	16	53	Nonparametric	Unequal	1.00	7.2	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	183	423	Nonparametric	--	0.85	131	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	37%	0.97	1.2	Nonparametric	--	1.00	0.46	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	37%	1.5	21	Nonparametric	--	0.79	0.67	1.1	--	--	-- / --	Not Site Related
Calcium	ug/g	100%	120,000	250,000	Nonparametric	--	0.66	87,895	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	17	56	Nonparametric	--	1.00	11	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	6.3	11	Nonparametric	Unequal	1.00	5.0	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	31	162	Nonparametric	--	0.055	16	17	--	--	-- / --	Not Site Related
Iron	ug/g	100%	13,800	24,300	Nonparametric	Unequal	1.00	8,979	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	53	401	Nonparametric	--	4.16E-05	31	32	--	--	-- / --	Not Site Related
Magnesium	ug/g	100%	21,500	35,700	Nonparametric	--	0.00069	14,609	12,213	--	--	-- / --	Site Related
Manganese	ug/g	100%	588	739	Nonparametric	Unequal	0.0092	465	365	--	--	-- / --	Site Related
Nickel	ug/g	100%	25	36	Nonparametric	--	0.43	16	15	--	--	-- / --	Not Site Related
Potassium	ug/g	100%	4,010	7,500	Nonparametric	Unequal	0.99	2,529	3,619	--	--	-- / --	Not Site Related
Silver	ug/g	11%	1.3	3.7	Nonparametric	--	1.00	0.37	0.62	--	--	-- / --	Not Site Related
Sodium	ug/g	100%	2,680	5,610	Nonparametric	--	0.72	1,099	1,680	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	24	63	Nonparametric	Unequal	1.00	15	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	2,170	385	Nonparametric	--	0.28	178	77	--	--	-- / --	Not Site Related
Dimethyl Phthalate	ug/g	8%	0.70	--	Site Related	--	--	0.23	--	--	--	-- / --	Site Related
Fluoranthene	ug/g	8%	1.00	--	Site Related	--	--	0.13	--	--	--	-- / --	Site Related
Pyrene	ug/g	8%	1.00	--	Site Related	--	--	0.11	--	--	--	-- / --	Site Related
Toluene	ug/g	37%	0.0066	--	Site Related	--	--	0.0014	--	--	--	-- / --	Site Related
Trichlorofluoromethane	ug/g	32%	0.026	--	Site Related	--	--	0.0077	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct

**Table K-7. Analysis of Variance Background Comparison for Surface Soils at SWMU 11 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:50:15 PM						Probability of			Poisson	Test: Max	Proportion of	
Run Date: 11/20/00						Accepting/			Upper	Greater Than	Detected Greater	Result of
Exposure Unit: 11_SS1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Background
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>

the background comparison on the logtransformed data.

c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.

2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.

3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-8. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 11 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:50:15 PM		Proportion of Detects		Maximum	Standard		UTL	95% UTL of	Test : Max	Proportion of
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Mean	Deviation	Comparison <sup>d</sup>	Background	Detected Result	Detected Results
Exposure Unit: SS			Samples <sup>b</sup>	Result <sup>c</sup>				Data Set <sup>e</sup>	Greater Than	Greater Than
Parameter	Units								Background UTL <sup>f</sup>	Background UTL <sup>g</sup>
Aluminum	ug/g	19 / 19	19 / 19	10,600	6,813	1,667	Normal UTL	24,256	N	0 / 19
Arsenic	ug/g	19 / 19	19 / 19	2.8	7.2	2.8	Lognormal UTL	3.4	N	0 / 19
Barium	ug/g	19 / 19	19 / 19	183	131	32	Nonparametric UTL	423	N	0 / 19
Beryllium	ug/g	7 / 19	7 / 19	0.97	0.46	0.29	Nonparametric UTL	1.2	N	0 / 7
Cadmium	ug/g	7 / 19	7 / 19	1.5	0.67	0.44	Nonparametric UTL	21	N	0 / 7
Calcium	ug/g	19 / 19	19 / 19	120,000	87,895	16,384	Nonparametric UTL	250,000	N	0 / 19
Chromium	ug/g	19 / 19	19 / 19	17	11	2.7	Nonparametric UTL	56	N	0 / 19
Cobalt	ug/g	19 / 19	19 / 19	6.3	5.0	0.88	Normal UTL	10	N	0 / 19
Copper	ug/g	19 / 19	19 / 19	31	16	4.6	Nonparametric UTL	162	N	0 / 19
Iron	ug/g	19 / 19	19 / 19	13,800	8,979	2,429	Normal UTL	21,340	N	0 / 19
Lead	ug/g	19 / 19	19 / 19	53	31	12	Nonparametric UTL	401	N	0 / 19
Magnesium	ug/g	19 / 19	19 / 19	21,500	14,609	3,383	Nonparametric UTL	35,700	N	0 / 19
Manganese	ug/g	19 / 19	19 / 19	588	465	77	Normal UTL	649	N	0 / 19
Nickel	ug/g	19 / 19	19 / 19	25	16	4.4	Nonparametric UTL	33	N	0 / 19
Potassium	ug/g	19 / 19	19 / 19	4,010	2,529	824	Normal UTL	6,751	N	0 / 19
Silver	ug/g	2 / 19	2 / 19	0.23	0.37	0.24	Lognormal UTL	0.47	N	0 / 2
Sodium	ug/g	19 / 19	19 / 19	2,680	1,099	518	Nonparametric UTL	5,610	N	0 / 19
Vanadium	ug/g	19 / 19	19 / 19	24	15	4.0	Normal UTL	55	N	0 / 19
Zinc	ug/g	19 / 19	19 / 19	2,170	178	483	Nonparametric UTL	385	Y	1 / 19
Dimethyl Phthalate	ug/g	1 / 13	1 / 13	0.70	0.23	0.19	Site Related	0.0	Y	1 / 1
Fluoranthene	ug/g	1 / 13	1 / 13	1.00	0.13	0.26	Site Related	0.0	Y	1 / 1
Pyrene	ug/g	1 / 13	1 / 13	1.00	0.11	0.27	Site Related	0.0	Y	1 / 1
Toluene	ug/g	7 / 19	7 / 19	0.0066	0.0014	0.0018	Site Related	0.0	Y	7 / 7
Trichlorofluoromethane	ug/g	6 / 19	6 / 19	0.026	0.0077	0.0062	Site Related	0.0	Y	6 / 6

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

- 1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

**Table K-8. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 11 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:50:15 PM		Proportion of Detects		Maximum			95% UTL of	Test : Max	Proportion of
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Standard	UTL	Background	Detected Result	Detected Results
Exposure Unit: SS			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Background	Greater Than	Greater Than
Parameter	Units						Data Set <sup>e</sup>	Background UTL <sup>f</sup>	Background UTL <sup>g</sup>

<sup>c</sup>Y - yes; N - no.

<sup>g</sup>Counts are based on the unaveraged data set.

**Table K-9. Inorganics Greater than Background UTL for SWMU 11 Surface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background Data Set <sup>a</sup>	Value <sup>b</sup>	Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
Zinc	385	2170	SB-11-004A	AHOL	SAIC01	0.00		Nonparametric UTL

<sup>a</sup>The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup>The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-10. Samples Included in Data Set for Subsurface Soils at SWMU 11 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-11-001B	AHOL	SAIC02	2	SAIC	3-BK-1	BORE	S1055	2
	SB-11-002B	AHOL	SAIC02	2.2		3-BK-2	BORE	S1057	2
	SB-11-003B	AHOL	SAIC02	2.5		31-BK-1	BORE	S1019	2
	SB-11-004B	AHOL	SAIC02	2.6		31-BK-2	BORE	S1021	2
	SB-11-005B	AHOL	SAIC02	2		5-BK-1	BORE	S0136	2
	SB-11-006B	AHOL	SAIC02	2.3		5-BK-2	BORE	S0138	2
	SB-11-007B	AHOL	SAIC02	3		8-BK-1	BORE	S0773	2
	SB-11-008B	AHOL	SAIC02	2.2		8-BK-2	BORE	S0775	2
	SB-11-009B	AHOL	SAIC02	2.3		9-BK-1	BORE	S0333	2
	SB-11-010B	AHOL	SAIC02	2.1		9-BK-2	BORE	S0335	2
	SB-11-011B	AHOL	SAIC02	2.1		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-11-012B	AHOL	SAIC02	2.2		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-11-013B	AHOL	SAIC02	2		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-11-014B	AHOL	SAIC02	1.8		S-SS-08-BK	BORE	SSS-08BK	1.5
	SB-11-015B	AHOL	SAIC02	1.9		S-SS-08-BK	BORE	SSS08-BK	1.5
	SB-11-016B	AHOL	SAIC02	1.7		S-SS-08-BK	BORE	SSS08BK	3
	SB-11-017B	AHOL	SAIC02	2.2		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-11-018B	AHOL	SAIC02	2.2		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-11-019B	AHOL	SAIC02	2		S-SS-14-BK	BORE	SSS-14BK	1.5
	SB-11-020B	AHOL	SAIC02	2		S-SS-14-BK	BORE	SSS14BK	1.5
						S-SS-19-BK	BORE	SSS-19BK	1.5
						S-SS-19-BK	BORE	SSS19BK	1.5
						S-SS-22-BK	BORE	SSS-22BK	1.5
						S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0

**Table K-10. Samples Included in Data Set for Subsurface Soils at SWMU 11 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-11. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 11 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	20 / 20	20 / 20	100%	--	--	2,180	12,800	6,588	3,061	Normal	7,771	7,771
Arsenic	ug/g	20 / 20	20 / 20	100%	--	--	4.0	13	8.1	2.3	Lognormal	9.2	9.2
Barium	ug/g	20 / 20	20 / 20	100%	--	--	30	297	103	64	Lognormal	139	139
Beryllium	ug/g	10 / 20	10 / 20	50%	0.50	0.50	0.74	1.3	0.60	0.38	Lognormal	0.87	0.87
Cadmium	ug/g	14 / 20	14 / 20	70%	0.70	0.70	0.90	2.7	1.0	0.57	Lognormal	1.4	1.4
Calcium	ug/g	20 / 20	20 / 20	100%	--	--	50,500	170,000	101,770	32,422	Normal	114,306	114,306
Chromium	ug/g	20 / 20	20 / 20	100%	--	--	6.8	20	13	4.0	Normal	14	14
Cobalt	ug/g	20 / 20	20 / 20	100%	--	--	2.1	7.8	4.9	1.7	Normal	5.6	5.6
Copper	ug/g	20 / 20	20 / 20	100%	--	--	5.1	41	15	8.5	Lognormal	19	19
Iron	ug/g	20 / 20	20 / 20	100%	--	--	4,440	15,800	9,778	3,537	Normal	11,145	11,145
Lead	ug/g	20 / 20	20 / 20	100%	--	--	9.1	120	34	24	Lognormal	44	44
Magnesium	ug/g	20 / 20	20 / 20	100%	--	--	8,130	20,700	14,557	3,692	Normal	15,984	15,984
Manganese	ug/g	20 / 20	20 / 20	100%	--	--	160	640	420	129	Normal	470	470
Nickel	ug/g	20 / 20	20 / 20	100%	--	--	8.2	33	18	6.5	Normal	21	21
Potassium	ug/g	20 / 20	20 / 20	100%	--	--	209	4,250	1,669	1,174	Normal	2,123	2,123
Sodium	ug/g	20 / 20	20 / 20	100%	--	--	528	5,600	1,392	1,199	Lognormal	1,804	1,804
Vanadium	ug/g	20 / 20	20 / 20	100%	--	--	7.9	26	16	5.1	Normal	18	18
Zinc	ug/g	20 / 20	20 / 20	100%	--	--	29	211	80	46	Lognormal	103	103
Toluene	ug/g	8 / 20	8 / 20	40%	0.00078	0.00092	0.0011	0.0025	0.00087	0.00067	Lognormal	0.0012	0.0012
Trichlorofluoromethane	ug/g	9 / 20	9 / 20	45%	0.0059	0.047	0.0067	0.026	0.010	0.0075	Lognormal	0.016	0.016

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-12. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 11 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:50:16 PM						Probability of			Poisson	Test: Max	Proportion of		
Run Date: 11/20/00		Frequency	Site	Background	Background	Accepting/	Site	Background	Upper	Greater Than	Detects Greater	Result of	
Exposure Unit: 11_SS1	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	Rejecting	Mean	Mean	Tolerance	Poisson	Than Poisson	Background	
Parameter						Null Hypothesis <sup>c</sup>			Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>	
Aluminum	ug/g	100%	12,800	25,200	Nonparametric	Unequal	1.00	6,588	14,545	--	--	-- / --	Not Site Related
Arsenic	ug/g	100%	13	53	Nonparametric	Unequal	0.99	8.1	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	297	423	Nonparametric	--	1.00	103	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	50%	1.3	1.2	Nonparametric	--	0.78	0.60	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	70%	2.7	21	Nonparametric	--	0.011	1.0	1.1	--	--	-- / --	Not Site Related
Calcium	ug/g	100%	170,000	250,000	Nonparametric	--	0.24	101,770	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	20	56	Nonparametric	--	1.00	13	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	7.8	11	t-Test (N)	Equal	0.014	4.9	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	41	162	Nonparametric	--	0.55	15	17	--	--	-- / --	Not Site Related
Iron	ug/g	100%	15,800	24,300	t-Test (N)	Equal	0.0016	9,778	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	120	401	Nonparametric	--	0.00012	34	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	20,700	35,700	Nonparametric	--	0.0019	14,557	12,213	--	--	-- / --	Site Related
Manganese	ug/g	100%	640	739	t-Test (N)	Equal	0.19	420	365	--	--	-- / --	Not Site Related
Nickel	ug/g	100%	33	36	Nonparametric	--	0.077	18	15	--	--	-- / --	Not Site Related
Potassium	ug/g	100%	4,250	7,500	Nonparametric	Unequal	1.00	1,669	3,619	--	--	-- / --	Not Site Related
Sodium	ug/g	100%	5,600	5,610	Nonparametric	--	0.53	1,392	1,680	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	26	63	Nonparametric	Unequal	1.00	16	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	211	385	Nonparametric	--	0.30	80	77	--	--	-- / --	Not Site Related
Toluene	ug/g	40%	0.0025	--	Site Related	--	--	0.00087	--	--	--	-- / --	Site Related
Trichlorofluoromethane	ug/g	45%	0.026	--	Site Related	--	--	0.010	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.
- 6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

**Table K-12. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 11 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:50:16 PM

Run Date: 11/20/00

Exposure Unit: 11\_SS1

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
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<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-13. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 11 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:50:16 PM Run Date: 11/20/00 Exposure Unit: SD		Proportion of Detects	Proportion of Detects	Maximum				95% UTL of	Test : Max	Proportion of
Parameter	Units	All Samples <sup>a</sup>	Temporal Samples <sup>b</sup>	Detected Result <sup>c</sup>	Mean	Standard Deviation	UTL Comparison <sup>d</sup>	Background Data Set <sup>e</sup>	Detected Result Greater Than Background UTL <sup>f</sup>	Detected Results Greater Than Background UTL <sup>g</sup>
Aluminum	ug/g	20 / 20	20 / 20	12,800	6,588	3,061	Normal UTL	24,256	N	0 / 20
Arsenic	ug/g	20 / 20	20 / 20	2.6	8.1	2.3	Lognormal UTL	3.4	N	0 / 20
Barium	ug/g	20 / 20	20 / 20	297	103	64	Nonparametric UTL	423	N	0 / 20
Beryllium	ug/g	10 / 20	10 / 20	1.3	0.60	0.38	Nonparametric UTL	1.2	Y	1 / 10
Cadmium	ug/g	14 / 20	14 / 20	2.7	1.0	0.57	Nonparametric UTL	21	N	0 / 14
Calcium	ug/g	20 / 20	20 / 20	170,000	101,770	32,422	Nonparametric UTL	250,000	N	0 / 20
Chromium	ug/g	20 / 20	20 / 20	20	13	4.0	Nonparametric UTL	56	N	0 / 20
Cobalt	ug/g	20 / 20	20 / 20	7.8	4.9	1.7	Normal UTL	10	N	0 / 20
Copper	ug/g	20 / 20	20 / 20	41	15	8.5	Nonparametric UTL	162	N	0 / 20
Iron	ug/g	20 / 20	20 / 20	15,800	9,778	3,537	Normal UTL	21,340	N	0 / 20
Lead	ug/g	20 / 20	20 / 20	120	34	24	Nonparametric UTL	401	N	0 / 20
Magnesium	ug/g	20 / 20	20 / 20	20,700	14,557	3,692	Nonparametric UTL	35,700	N	0 / 20
Manganese	ug/g	20 / 20	20 / 20	640	420	129	Normal UTL	649	N	0 / 20
Nickel	ug/g	20 / 20	20 / 20	33	18	6.5	Nonparametric UTL	33	N	0 / 20
Potassium	ug/g	20 / 20	20 / 20	4,250	1,669	1,174	Normal UTL	6,751	N	0 / 20
Sodium	ug/g	20 / 20	20 / 20	5,600	1,392	1,199	Nonparametric UTL	5,610	N	0 / 20
Vanadium	ug/g	20 / 20	20 / 20	26	16	5.1	Normal UTL	55	N	0 / 20
Zinc	ug/g	20 / 20	20 / 20	211	80	46	Nonparametric UTL	385	N	0 / 20
Toluene	ug/g	8 / 20	8 / 20	0.0025	0.00087	0.00067	Site Related	0.0	Y	8 / 8
Trichlorofluoromethane	ug/g	9 / 20	9 / 20	0.026	0.010	0.0075	Site Related	0.0	Y	9 / 9

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%; a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-14. Inorganics Greater than Background UTL for SWMU 11 Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background Data Set <sup>a</sup>	Value <sup>b</sup>	Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
Beryllium	1.21	1.32	SB-11-003B	AHOL	SAIC02	2.50		Nonparametric UTL

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-15. Samples Included in Data Set for Groundwater at SWMU 11  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	S-3	WELL	S-3	35	SAIC	S-20-88	WELL	S-20-88	1.2
	S-3	WELL	SAIC01	23.6		S-20-88	WELL	S-20-88X	94.7
	S-3	WELL	SAIC03	23.5		S-20-88	WELL	S-20-88Y	97
	S-45-90	WELL	S-45-90	27		S-20-88	WELL	S2088	97
	S-45-90	WELL	S4590	27		S-20-88	WELL	T1292	97
	S-45-90	WELL	SAIC01	16.7		S-20-88	WELL	TO668	97
	S-45-90	WELL	SAIC03	17		S-20-88	WELL	TO670	97
	S-45-90	WELL	T1176	27		S-20-88	WELL	TO673	97
	S-45-90	WELL	T1177	27		S-20-88	WELL	TO674	97
	S-45-90	WELL	T1178	27		S-35-90	WELL	S-35-90	271.6
	S-45-90	WELL	T1181	27		S-35-90	WELL	S3590	271.6
	S-45-90	WELL	T1182	27		S-35-90	WELL	T1106	271.6
	S-46-90	WELL	S-46-90	27		S-35-90	WELL	T1107	271.6
	S-46-90	WELL	S4688	23.5		S-35-90	WELL	T1108	271.6
	S-46-90	WELL	S4690	23.5		S-35-90	WELL	T1111	271.6
	S-46-90	WELL	SAIC01	20.4		S-35-90	WELL	T1112	271.6
	S-46-90	WELL	SAIC03	18		S-SBR-1	WELL	S-SBR-1	119.4
	S-46-90	WELL	T1183	23.5		S-SBR-1	WELL	S-SBR-1X	119.3
	S-46-90	WELL	T1184	23.5		S-SBR-1	WELL	SBR-1	128.5
	S-46-90	WELL	T1186	23.5		S-SBR-1	WELL	SBR-1X	140
	S-46-90	WELL	T1188	23.5		S-SBR-1	WELL	SBR-1Y	128
	S-46-90	WELL	T1189	23.5		S-SBR-1	WELL	SSBR1	140
	S-46-90	WELL	T2009	22.2		S-SBR-1	WELL	T1590	140
	S-74-90	WELL	S-74-90	28		S-SBR-1	WELL	T1591	140
	S-74-90	WELL	S7490	28		S-SBR-1	WELL	T1592	140
	S-74-90	WELL	SAIC01	23.25		S-SBR-1	WELL	T1595	140
	S-74-90	WELL	SAIC03	22		S-SBR-1	WELL	T1596	140
	S-74-90	WELL	T1576	28					
	S-74-90	WELL	T1577	28					
	S-74-90	WELL	T1578	28					
	S-74-90	WELL	T1581	28					
	S-74-90	WELL	T1582	28					
	S-75-90	WELL	S-75-90	24					
	S-75-90	WELL	S7590	24					
	S-75-90	WELL	SAIC01	21					
	S-75-90	WELL	SAIC03	20					
	S-75-90	WELL	T1583	24					
	S-75-90	WELL	T1584	24					
	S-75-90	WELL	T1585	24					
	S-75-90	WELL	T1588	24					
	S-75-90	WELL	T1589	24					
	S-3	WELL	S-3A	33.8					
	S-3	WELL	S-3B	35					
	S-3	WELL	SAIC05	40					
	S-45-90	WELL	SAIC04	28					
	S-46-90	WELL	SAIC04	28					
	S-74-90	WELL	SAIC04	26					
	S-75-90	WELL	SAIC04	24					
	S-3	WELL	120899	0					
	S-46-90	WELL	120899	0					
	S-74-90	WELL	120799	0					
	S-75-90	WELL	120899	0					

**Table K-16. Summary Statistics and Exposure Point Concentrations for Groundwater at SWMU 11  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects		Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>	#
		All Samples <sup>a</sup>	Temporal Samples <sup>b</sup>		Min CRL	Max CRL	Minimum	Maximum						
Aluminum	µg/L	9 / 15	5 / 5	100%	--	--	296	20,600	2,355	3,120	Lognormal	270,660	7,807	#
Antimony	µg/L	2 / 25	2 / 5	40%	7.0	50	6.5	48	20	4.0	Normal	24	24	
Arsenic	µg/L	25 / 25	5 / 5	100%	--	--	3.1	61	24	3.2	Normal	27	27	
Barium	µg/L	15 / 16	5 / 5	100%	--	--	21	184	48	27	Lognormal	94	94	
Cadmium	µg/L	1 / 25	1 / 5	20%	3.0	12	4.6	4.6	2.2	0.41	Normal	2.6	2.4	#
Calcium	µg/L	15 / 15	5 / 5	100%	--	--	1,380	551,000	267,492	69,165	Normal	333,433	333,433	
Chloride	µg/L	5 / 6	4 / 5	80%	1.4E+06	1.4E+06	1.1E+06	9.5E+06	3.66E+06	3.52E+06	Normal	7.02E+06	7.02E+06	
Chromium	µg/L	6 / 25	4 / 5	80%	6.0	38	36	75	14	6.8	Normal	21	21	
Copper	µg/L	8 / 25	5 / 5	100%	--	--	11	35	9.6	1.6	Normal	11	11	
Iron	µg/L	10 / 15	5 / 5	100%	--	--	125	25,800	2,683	4,051	Lognormal	1.11E+06	9,833	#
Lead	µg/L	19 / 25	5 / 5	100%	--	--	1.2	72	14	7.9	Normal	21	21	
Magnesium	µg/L	14 / 15	5 / 5	100%	--	--	165,000	684,000	373,883	110,422	Lognormal	620,595	449,000	#
Manganese	µg/L	8 / 15	5 / 5	100%	--	--	13	628	102	90	Normal	187	187	
Mercury	µg/L	2 / 24	2 / 5	40%	0.17	0.24	0.35	0.41	0.14	0.031	Normal	0.17	0.17	
Nickel	µg/L	6 / 25	5 / 5	100%	--	--	41	83	24	5.4	Lognormal	30	30	
Nitrite, Nitrate	µg/L	1 / 2	1 / 1	100%	--	--	350	350	1,425	0	Undetermined	--	1,425	#
Potassium	µg/L	14 / 15	5 / 5	100%	--	--	4,890	39,800	21,164	8,574	Normal	29,339	29,339	
Selenium	µg/L	15 / 25	5 / 5	100%	--	--	3.4	106	12	7.9	Normal	20	20	
Silver	µg/L	2 / 25	1 / 5	20%	4.4	4.6	0.18	0.75	2.1	0.33	Lognormal	2.6	1.5	#
Sodium	µg/L	24 / 24	5 / 5	100%	--	--	701	2.49E+06	1.17E+06	549,055	Normal	1.69E+06	1.69E+06	
Sulfate	µg/L	1 / 1	1 / 1	100%	--	--	840,000	840,000	840,000	0	Undetermined	--	840,000	#
Thallium	µg/L	2 / 25	1 / 5	20%	1.00	81	2.7	121	21	7.0	Lognormal	29	29	
Vanadium	µg/L	4 / 15	4 / 5	80%	4.7	11	6.5	48	8.7	5.6	Lognormal	20	18	#
Zinc	µg/L	10 / 25	5 / 5	100%	--	--	20	226	50	20	Normal	70	70	
2,4,6-Trinitrotoluene	µg/L	1 / 16	1 / 5	20%	0.13	6.3	3.3	3.3	0.57	0.63	Lognormal	2.9	1.7	#
Butyl Benzyl Phthalate	µg/L	2 / 25	2 / 5	40%	3.4	40	2.0	10.0	3.6	1.1	Normal	4.7	4.7	
Chloroform	µg/L	1 / 25	1 / 5	20%	0.50	5.0	0.69	0.69	0.74	0.31	Normal	1.0	0.82	#
Dimethyl Phthalate	µg/L	14 / 28	5 / 5	100%	--	--	3.7	160	57	27	Normal	83	83	
Methylene Chloride	µg/L	3 / 26	2 / 5	40%	2.3	10.0	0.70	6.2	2.1	0.70	Normal	2.7	2.7	
di-N-Butyl Phthalate	µg/L	2 / 25	1 / 5	20%	3.7	40	1.00	1.00	3.4	1.6	Lognormal	5.8	2.1	#

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

**Table K-16. Summary Statistics and Exposure Point Concentrations for Groundwater at SWMU 11  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:53:27 PM	Proportion	Proportion										Exposure
Run Date: 11/20/00	of Detects	of Detects	Frequency	NonDetects	Detects	Arithmetic	Standard		95% UCL of	Point		
Exposure Unit: 11_WD1	All Samples <sup>a</sup>	Temporal	of Detection	Min CRL	Max CRL	Minimum	Maximum	Mean <sup>c</sup>	Deviation <sup>c</sup>	Distribution <sup>d</sup>	Arith. Mean <sup>c</sup>	Concentration <sup>e</sup>
Parameter	Units	Samples <sup>b</sup>										

<sup>a</sup>For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup>The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC(denoted by a "#" next to the EPC).

**Table K-17. Analysis of Variance Background Comparison for Groundwater at SWMU 11  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	µg/L	100%	20,600	--	Site Related	--	--	2,355	--	--	--	-- / --	Site Related
Antimony	µg/L	40%	48	19	Compare Maxima	--	--	20	15	--	--	-- / --	Site Related
Arsenic	µg/L	100%	61	28	Compare Maxima	--	--	24	8.8	--	--	-- / --	Site Related
Barium	µg/L	100%	184	200	Compare Maxima	--	--	48	106	--	--	-- / --	Not Site Related
Cadmium	µg/L	20%	6.0	11	Compare Maxima	--	--	2.2	3.1	--	--	-- / --	Not Site Related
Calcium	µg/L	100%	551,000	--	Site Related	--	--	267,492	--	--	--	-- / --	Site Related
Chloride	µg/L	80%	9.5E+06	1.4E+06	Compare Maxima	--	--	3.66E+06	716,333	--	--	-- / --	Site Related
Chromium	µg/L	80%	75	36	Compare Maxima	--	--	14	15	--	--	-- / --	Site Related
Copper	µg/L	100%	35	48	Compare Maxima	--	--	9.6	14	--	--	-- / --	Not Site Related
Iron	µg/L	100%	25,800	--	Site Related	--	--	2,683	--	--	--	-- / --	Site Related
Lead	µg/L	100%	72	58	Compare Maxima	--	--	14	15	--	--	-- / --	Site Related
Magnesium	µg/L	100%	684,000	--	Site Related	--	--	373,883	--	--	--	-- / --	Site Related
Manganese	µg/L	100%	628	--	Site Related	--	--	102	--	--	--	-- / --	Site Related
Mercury	µg/L	40%	0.41	--	Site Related	--	--	0.14	--	--	--	-- / --	Site Related
Nickel	µg/L	100%	83	45	Compare Maxima	--	--	24	20	--	--	-- / --	Site Related
Nitrite, Nitrate	µg/L	100%	2,500	5,600	Compare Maxima	--	--	1,425	3,750	--	--	-- / --	Not Site Related
Potassium	µg/L	100%	39,800	--	Site Related	--	--	21,164	--	--	--	-- / --	Site Related
Selenium	µg/L	100%	106	--	Site Related	--	--	12	--	--	--	-- / --	Site Related
Silver	µg/L	20%	2.3	2.3	Compare Maxima	--	--	2.1	1.9	--	--	-- / --	Not Site Related
Sodium	µg/L	100%	2.49E+06	61,000	Compare Maxima	--	--	1.17E+06	43,894	--	--	-- / --	Site Related
Sulfate	µg/L	100%	840,000	--	Site Related	--	--	840,000	--	--	--	-- / --	Site Related
Thallium	µg/L	20%	121	--	Site Related	--	--	21	--	--	--	-- / --	Site Related
Vanadium	µg/L	80%	48	--	Site Related	--	--	8.7	--	--	--	-- / --	Site Related
Zinc	µg/L	100%	226	1,200	Compare Maxima	--	--	50	266	--	--	-- / --	Not Site Related
2,4,6-Trinitrotoluene	µg/L	20%	3.3	--	Site Related	--	--	0.57	--	--	--	-- / --	Site Related
Butyl Benzyl Phthalate	µg/L	40%	20	--	Site Related	--	--	3.6	5.0	--	--	-- / --	Site Related
Chloroform	µg/L	20%	2.5	--	Site Related	--	--	0.74	--	--	--	-- / --	Site Related
Dimethyl Phthalate	µg/L	100%	250	--	Site Related	--	--	57	--	--	--	-- / --	Site Related
Methylene Chloride	µg/L	40%	6.2	--	Site Related	--	--	2.1	3.6	--	--	-- / --	Site Related
di-N-Butyl Phthalate	µg/L	20%	20	--	Site Related	--	--	3.4	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.

**Table K-17. Analysis of Variance Background Comparison for Groundwater at SWMU 11  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:53:27 PM							Probability of			Poisson	Test: Max	Proportion of	
Run Date: 11/20/00							Accepting/			Upper	Greater Than	Detects Greater	Result of
Exposure Unit: 11_WD1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Than Poisson	Background
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>

- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
- If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.
- 6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.
- <sup>b</sup>The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.
- <sup>c</sup>The Null Hypothesis assumes that site and background data are from the same population.
- <sup>d</sup>The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.
- <sup>e</sup>Y - yes; N - no
- <sup>f</sup>Counts are based on the unaveraged data set.
- <sup>g</sup>Result of Background Comparison:
- If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
  - If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
  - Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-18. Comparison with Background Upper Tolerance Limit for Groundwater at SWMU 11  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:53:27 PM		Proportion of Detects		Maximum		Standard		Test : Max		Proportion of
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Mean	Deviation	UTL	95% UTL of	Detected Result	Detected Results
Exposure Unit: WD		Units	Samples <sup>b</sup>	Result <sup>c</sup>			Comparison <sup>d</sup>	Background	Greater Than	Greater Than
Parameter	Units							Data Set <sup>e</sup>	Background UTL <sup>f</sup>	Background UTL <sup>g</sup>
Aluminum	µg/L	9 / 15	5 / 5	20,600	2,355	3,120	Site Related	0.0	Y	9 / 9
Antimony	µg/L	2 / 25	2 / 5	48	20	4.0	Compare Maxima	19	Y	1 / 2
Arsenic	µg/L	25 / 25	5 / 5	61	24	3.2	Compare Maxima	28	Y	7 / 25
Barium	µg/L	15 / 16	5 / 5	184	48	27	Compare Maxima	200	N	0 / 15
Cadmium	µg/L	1 / 25	1 / 5	6.0	2.2	0.41	Compare Maxima	11	N	0 / 1
Calcium	µg/L	15 / 15	5 / 5	551,000	267,492	69,165	Site Related	0.0	Y	15 / 15
Chloride	µg/L	5 / 6	4 / 5	9.5E+06	3.66E+06	3.52E+06	Compare Maxima	1.4E+06	Y	4 / 5
Chromium	µg/L	6 / 25	4 / 5	75	14	6.8	Compare Maxima	36	Y	6 / 6
Copper	µg/L	8 / 25	5 / 5	35	9.6	1.6	Compare Maxima	48	N	0 / 8
Iron	µg/L	10 / 15	5 / 5	25,800	2,683	4,051	Site Related	0.0	Y	10 / 10
Lead	µg/L	19 / 25	5 / 5	72	14	7.9	Compare Maxima	58	Y	1 / 19
Magnesium	µg/L	14 / 15	5 / 5	684,000	373,883	110,422	Site Related	0.0	Y	14 / 14
Manganese	µg/L	8 / 15	5 / 5	628	102	90	Site Related	0.0	Y	8 / 8
Mercury	µg/L	2 / 24	2 / 5	0.41	0.14	0.031	Site Related	0.0	Y	2 / 2
Nickel	µg/L	6 / 25	5 / 5	83	24	5.4	Compare Maxima	45	Y	4 / 6
Nitrite, Nitrate	µg/L	1 / 2	1 / 1	2,500	1,425	0	Compare Maxima	5,600	N	0 / 1
Potassium	µg/L	14 / 15	5 / 5	39,800	21,164	8,574	Site Related	0.0	Y	14 / 14
Selenium	µg/L	15 / 25	5 / 5	106	12	7.9	Site Related	0.0	Y	15 / 15
Silver	µg/L	2 / 25	1 / 5	2.3	2.1	0.33	Compare Maxima	2.3	N	0 / 2
Sodium	µg/L	24 / 24	5 / 5	2.49E+06	1.17E+06	549,055	Compare Maxima	61,000	Y	23 / 24
Sulfate	µg/L	1 / 1	1 / 1	840,000	840,000	0	Site Related	0.0	Y	1 / 1
Thallium	µg/L	2 / 25	1 / 5	121	21	7.0	Site Related	0.0	Y	2 / 2
Vanadium	µg/L	4 / 15	4 / 5	48	8.7	5.6	Site Related	0.0	Y	4 / 4
Zinc	µg/L	10 / 25	5 / 5	226	50	20	Compare Maxima	1,200	N	0 / 10
2,4,6-Trinitrotoluene	µg/L	1 / 16	1 / 5	3.3	0.57	0.63	Site Related	0.0	Y	1 / 1
Butyl Benzyl Phthalate	µg/L	2 / 25	2 / 5	20	3.6	1.1	Site Related	0.0	Y	2 / 2
Chloroform	µg/L	1 / 25	1 / 5	2.5	0.74	0.31	Site Related	0.0	Y	1 / 1
Dimethyl Phthalate	µg/L	14 / 28	5 / 5	250	57	27	Site Related	0.0	Y	14 / 14
Methylene Chloride	µg/L	3 / 26	2 / 5	6.2	2.1	0.70	Site Related	0.0	Y	3 / 3
di-N-Butyl Phthalate	µg/L	2 / 25	1 / 5	20	3.4	1.6	Site Related	0.0	Y	2 / 2

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

**Table K-18. Comparison with Background Upper Tolerance Limit for Groundwater at SWMU 11  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Maximum Detected Result <sup>c</sup>	Mean	Standard Deviation	UTL Comparison <sup>d</sup>	95% UTL of Background Data Set <sup>e</sup>	Test : Max Detected Result Greater Than Background UTL <sup>f</sup>	Proportion of Detected Results Greater Than Background UTL <sup>g</sup>
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<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-19. Inorganics Greater than Background UTL for SWMU 11 Groundwater  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>	Value <sup>b</sup>						Comparison
Aluminum	0	296	S-45-90	WELL	SAIC03	17.00		Site Related
Aluminum	0	355	S-45-90	WELL	SAIC01	16.70		Site Related
Aluminum	0	406	S-74-90	WELL	SAIC03	22.00		Site Related
Aluminum	0	909	S-74-90	WELL	SAIC01	23.25		Site Related
Aluminum	0	1150	S-3	WELL	SAIC01	23.60		Site Related
Aluminum	0	2810	S-75-90	WELL	SAIC01	21.00		Site Related
Aluminum	0	3860	S-3	WELL	SAIC03	23.50		Site Related
Aluminum	0	4760	S-46-90	WELL	SAIC03	18.00		Site Related
Aluminum	0	20600	S-75-90	WELL	SAIC03	20.00		Site Related
Antimony	19	48.2	S-74-90	WELL	T1577	28.00		Compare Maxima
Arsenic	27.7	28.8	S-3	WELL	SAIC03	23.50		Compare Maxima
Arsenic	27.7	30.7	S-3	WELL	SAIC05	40.00		Compare Maxima
Arsenic	27.7	30.9	S-3	WELL	S-3	35.00		Compare Maxima
Arsenic	27.7	36.5	S-75-90	WELL	SAIC03	20.00		Compare Maxima
Arsenic	27.7	39.4	S-74-90	WELL	T1577	28.00		Compare Maxima
Arsenic	27.7	40.1	S-75-90	WELL	T1584	24.00		Compare Maxima
Arsenic	27.7	61.2	S-46-90	WELL	T1184	23.50		Compare Maxima
Calcium	0	1380	S-46-90	WELL	SAIC01	20.40		Site Related
Calcium	0	139000	S-75-90	WELL	SAIC04	24.00		Site Related
Calcium	0	162000	S-75-90	WELL	SAIC01	21.00		Site Related
Calcium	0	197000	S-3	WELL	SAIC01	23.60		Site Related
Calcium	0	208000	S-3	WELL	SAIC03	23.50		Site Related
Calcium	0	214000	S-74-90	WELL	SAIC03	22.00		Site Related
Calcium	0	239000	S-75-90	WELL	SAIC03	20.00		Site Related
Calcium	0	267000	S-74-90	WELL	SAIC04	26.00		Site Related
Calcium	0	276000	S-45-90	WELL	SAIC01	16.70		Site Related
Calcium	0	287000	S-45-90	WELL	SAIC03	17.00		Site Related
Calcium	0	340000	S-3	WELL	SAIC05	40.00		Site Related
Calcium	0	364000	S-74-90	WELL	SAIC01	23.25		Site Related
Calcium	0	380000	S-46-90	WELL	SAIC03	18.00		Site Related
Calcium	0	387000	S-46-90	WELL	SAIC04	28.00		Site Related
Calcium	0	551000	S-45-90	WELL	SAIC04	28.00		Site Related
Chloride	1400000	3200000	S-3	WELL	S-3	35.00		Compare Maxima
Chloride	1400000	3300000	S-74-90	WELL	S-74-90	28.00		Compare Maxima
Chloride	1400000	4200000	S-3	WELL	S-3B	35.00		Compare Maxima
Chloride	1400000	9500000	S-46-90	WELL	S-46-90	27.00		Compare Maxima
Chromium	35.5	36	S-46-90	WELL	T1184	23.50		Compare Maxima
Chromium	35.5	39	S-75-90	WELL	T1584	24.00		Compare Maxima
Chromium	35.5	39.9	S-75-90	WELL	SAIC03	20.00		Compare Maxima
Chromium	35.5	42	S-45-90	WELL	T1177	27.00		Compare Maxima
Chromium	35.5	46.3	S-74-90	WELL	T1577	28.00		Compare Maxima
Chromium	35.5	75.2	S-46-90	WELL	SAIC03	18.00		Compare Maxima

**Table K-19. Inorganics Greater than Background UTL for SWMU 11 Groundwater  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>	Value <sup>b</sup>						Comparison
Iron	0	125	S-46-90	WELL	SAIC04	28.00		Site Related
Iron	0	156	S-74-90	WELL	SAIC01	23.25		Site Related
Iron	0	301	S-45-90	WELL	SAIC01	16.70		Site Related
Iron	0	374	S-74-90	WELL	SAIC03	22.00		Site Related
Iron	0	679	S-45-90	WELL	SAIC03	17.00		Site Related
Iron	0	1030	S-3	WELL	SAIC01	23.60		Site Related
Iron	0	2900	S-3	WELL	SAIC03	23.50		Site Related
Iron	0	3680	S-75-90	WELL	SAIC01	21.00		Site Related
Iron	0	5100	S-46-90	WELL	SAIC03	18.00		Site Related
Iron	0	25800	S-75-90	WELL	SAIC03	20.00		Site Related
Lead	57.7	72	S-75-90	WELL	T1584	24.00		Compare Maxima
Magnesium	0	165000	S-75-90	WELL	SAIC01	21.00		Site Related
Magnesium	0	183000	S-75-90	WELL	SAIC03	20.00		Site Related
Magnesium	0	208000	S-75-90	WELL	SAIC04	24.00		Site Related
Magnesium	0	314000	S-74-90	WELL	SAIC03	22.00		Site Related
Magnesium	0	325000	S-74-90	WELL	SAIC01	23.25		Site Related
Magnesium	0	328000	S-45-90	WELL	SAIC01	16.70		Site Related
Magnesium	0	337000	S-3	WELL	SAIC01	23.60		Site Related
Magnesium	0	353000	S-45-90	WELL	SAIC03	17.00		Site Related
Magnesium	0	354000	S-3	WELL	SAIC03	23.50		Site Related
Magnesium	0	456000	S-74-90	WELL	SAIC04	26.00		Site Related
Magnesium	0	605000	S-3	WELL	SAIC05	40.00		Site Related
Magnesium	0	630000	S-46-90	WELL	SAIC03	18.00		Site Related
Magnesium	0	666000	S-45-90	WELL	SAIC04	28.00		Site Related
Magnesium	0	684000	S-46-90	WELL	SAIC04	28.00		Site Related
Manganese	0	13.1	S-45-90	WELL	SAIC01	16.70		Site Related
Manganese	0	28.9	S-3	WELL	SAIC01	23.60		Site Related
Manganese	0	33.7	S-74-90	WELL	SAIC03	22.00		Site Related
Manganese	0	98.2	S-75-90	WELL	SAIC01	21.00		Site Related
Manganese	0	119	S-3	WELL	SAIC03	23.50		Site Related
Manganese	0	277	S-46-90	WELL	SAIC03	18.00		Site Related
Manganese	0	320	S-74-90	WELL	SAIC01	23.25		Site Related
Manganese	0	628	S-75-90	WELL	SAIC03	20.00		Site Related
Mercury	0	0.348	S-75-90	WELL	T1583	24.00	F	Site Related
Mercury	0	0.412	S-74-90	WELL	T1576	28.00	F	Site Related
Nickel	45.1	53.8	S-74-90	WELL	T1577	28.00		Compare Maxima
Nickel	45.1	55.5	S-45-90	WELL	T1177	27.00		Compare Maxima
Nickel	45.1	66	S-3	WELL	S-3	35.00		Compare Maxima
Nickel	45.1	83.4	S-75-90	WELL	T1584	24.00		Compare Maxima
Potassium	0	4890	S-75-90	WELL	SAIC04	24.00		Site Related
Potassium	0	9980	S-75-90	WELL	SAIC01	21.00		Site Related
Potassium	0	13300	S-75-90	WELL	SAIC03	20.00		Site Related

**Table K-19. Inorganics Greater than Background UTL for SWMU 11 Groundwater  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>	Value <sup>b</sup>						Comparison
Potassium	0	19900	S-45-90	WELL	SAIC01	16.70		Site Related
Potassium	0	21800	S-45-90	WELL	SAIC03	17.00		Site Related
Potassium	0	22500	S-74-90	WELL	SAIC04	26.00		Site Related
Potassium	0	22900	S-74-90	WELL	SAIC03	22.00		Site Related
Potassium	0	23700	S-74-90	WELL	SAIC01	23.25		Site Related
Potassium	0	24900	S-45-90	WELL	SAIC04	28.00		Site Related
Potassium	0	25900	S-46-90	WELL	SAIC04	28.00		Site Related
Potassium	0	28300	S-46-90	WELL	SAIC03	18.00		Site Related
Potassium	0	28800	S-3	WELL	SAIC01	23.60		Site Related
Potassium	0	30600	S-3	WELL	SAIC03	23.50		Site Related
Potassium	0	39800	S-3	WELL	SAIC05	40.00		Site Related
Selenium	0	3.41	S-74-90	WELL	SAIC01	23.25		Site Related
Selenium	0	3.73	S-46-90	WELL	SAIC03	18.00		Site Related
Selenium	0	4.05	S-3	WELL	SAIC01	23.60		Site Related
Selenium	0	4.05	S-46-90	WELL	SAIC01	20.40		Site Related
Selenium	0	4.47	S-45-90	WELL	T1176	27.00	F	Site Related
Selenium	0	4.69	S-3	WELL	SAIC03	23.50		Site Related
Selenium	0	6.71	S-46-90	WELL	T1184	23.50		Site Related
Selenium	0	6.82	S-74-90	WELL	T1576	28.00	F	Site Related
Selenium	0	8.09	S-45-90	WELL	SAIC01	16.70		Site Related
Selenium	0	8.41	S-45-90	WELL	SAIC03	17.00		Site Related
Selenium	0	22.2	S-75-90	WELL	SAIC04	24.00	S	Site Related
Selenium	0	25.5	S-74-90	WELL	SAIC04	26.00	S	Site Related
Selenium	0	40.5	S-3	WELL	SAIC05	40.00	S	Site Related
Selenium	0	41.3	S-46-90	WELL	SAIC04	28.00	S	Site Related
Selenium	0	106	S-45-90	WELL	SAIC04	28.00	S	Site Related
Sodium	61000	441000	S-75-90	WELL	SAIC01	21.00		Compare Maxima
Sodium	61000	450000	S-45-90	WELL	T1177	27.00		Compare Maxima
Sodium	61000	450000	S-45-90	WELL	T1176	27.00	F	Compare Maxima
Sodium	61000	460000	S-75-90	WELL	T1583	24.00	F	Compare Maxima
Sodium	61000	461000	S-75-90	WELL	SAIC03	20.00		Compare Maxima
Sodium	61000	510000	S-75-90	WELL	T1584	24.00		Compare Maxima
Sodium	61000	553000	S-75-90	WELL	SAIC04	24.00		Compare Maxima
Sodium	61000	960000	S-45-90	WELL	SAIC01	16.70		Compare Maxima
Sodium	61000	960000	S-74-90	WELL	SAIC01	23.25		Compare Maxima
Sodium	61000	1000000	S-74-90	WELL	T1577	28.00		Compare Maxima
Sodium	61000	1000000	S-74-90	WELL	SAIC03	22.00		Compare Maxima
Sodium	61000	1000000	S-74-90	WELL	T1576	28.00	F	Compare Maxima
Sodium	61000	1100000	S-45-90	WELL	SAIC03	17.00		Compare Maxima
Sodium	61000	1100000	S-74-90	WELL	SAIC04	26.00		Compare Maxima
Sodium	61000	1400000	S-3	WELL	SAIC03	23.50		Compare Maxima
Sodium	61000	1400000	S-3	WELL	SAIC01	23.60		Compare Maxima

**Table K-19. Inorganics Greater than Background UTL for SWMU 11 Groundwater  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Sodium	61000	1480000	S-45-90	WELL	SAIC04	28.00		Compare Maxima
Sodium	61000	1900000	S-46-90	WELL	T1184	23.50		Compare Maxima
Sodium	61000	1920000	S-3	WELL	SAIC05	40.00		Compare Maxima
Sodium	61000	2000000	S-46-90	WELL	T1183	23.50	F	Compare Maxima
Sodium	61000	2100000	S-3	WELL	S-3A	33.80		Compare Maxima
Sodium	61000	2400000	S-46-90	WELL	SAIC03	18.00		Compare Maxima
Sodium	61000	2490000	S-46-90	WELL	SAIC04	28.00		Compare Maxima
Sulfate	0	840000	S-3	WELL	S-3A	33.80		Site Related
Thallium	0	2.7	S-3	WELL	S-3	35.00		Site Related
Thallium	0	121	S-3	WELL	SAIC01	23.60		Site Related
Vanadium	0	6.5	S-46-90	WELL	SAIC04	28.00		Site Related
Vanadium	0	10.2	S-45-90	WELL	SAIC04	28.00		Site Related
Vanadium	0	12.7	S-74-90	WELL	SAIC04	26.00		Site Related
Vanadium	0	47.6	S-75-90	WELL	SAIC03	20.00		Site Related

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-20. Samples Included in Data Set for Surface Soils at SWMU 19 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	S-SS-19-03	GRAB	T2038	0	SAIC	3-BK-1	BORE	S1055	2
	S-SS-19-04	BORE	T2039	0.5		3-BK-2	BORE	S1057	2
	S-SS-19-05	BORE	T2041	0.5		31-BK-1	BORE	S1019	2
	S-SS-19-06	BORE	T2042	0.3		31-BK-2	BORE	S1021	2
	SB-19-002A	BORE	SAIC01	0		5-BK-1	BORE	S0136	2
	SB-19-003A	BORE	SAIC01	0		5-BK-2	BORE	S0138	2
	SB-19-004A	BORE	SAIC01	0		8-BK-1	BORE	S0773	2
	SB-19-005A	BORE	SAIC01	0		8-BK-2	BORE	S0775	2
	SB-19-006A	BORE	SAIC01	0		9-BK-1	BORE	S0333	2
	SB-19-007A	BORE	SAIC01	0		9-BK-2	BORE	S0335	2
	S-SS-19-04	BORE	T2039	0.5		S-SS-05-BK	BORE	SSS-05BK	1.5
	S-SS-19-04	BORE	T2040	1.8		S-SS-05-BK	BORE	SSS05-BK	1.5
						S-SS-05-BK	BORE	SSS05BK	1.5
						S-SS-08-BK	BORE	SSS-08BK	1.5
						S-SS-08-BK	BORE	SSS08-BK	1.5
						S-SS-08-BK	BORE	SSS08BK	3
						S-SS-10-BK	BORE	SSS-10BK	1.5
				S-SS-10-BK	BORE	SSS10-BK	1.5		
				S-SS-14-BK	BORE	SSS-14BK	1.5		
				S-SS-14-BK	BORE	SSS14BK	1.5		
				S-SS-19-BK	BORE	SSS-19BK	1.5		
				S-SS-19-BK	BORE	SSS19BK	1.5		
				S-SS-22-BK	BORE	SSS-22BK	1.5		
				S-SS-22-BK	BORE	SSS22BK	1.5		
				S-SS-26-BK	BORE	SSS-26BK	1.5		
				S-SS-26-BK	BORE	SSS26-BK	1.5		
				S-SS-27-BK	BORE	SSS-27BK	1.5		
				S-SS-27-BK	BORE	SSS27-BK	1.5		
				S-SS-29-BK	BORE	SSS-29BK	1.5		
				S-SS-29-BK	BORE	SSS29-BK	1.5		
				S-SS-36-BK	BORE	SSS-36BK	1.5		
				S-SS-36-BK	BORE	SSS36-BK	1.5		
				S-SS-36-BK	BORE	SSS36BK	1.5		
				SB-BK-01	BORE	SAIC02	1		
				SB-BK-01	BORE	SAIC03	5		
				SB-BK-02	BORE	SAIC02	1		
				SB-BK-02	BORE	SAIC03	5		
				SB-BK-02	BORE	SAIC03D	5		
				SB-BK-02	BORE	SAIC04	10		
				SB-BK-03	BORE	SAIC02	1		
				SB-BK-03	BORE	SAIC03	5		
				SB-BK-03	BORE	SAIC03D	5		
				SB-BK-03	BORE	SAIC04	10		
				SB-BK-04	BORE	SAIC02	1		
				SB-BK-04	BORE	SAIC03	5		
				SB-BK-05	BORE	SAIC02	1		
				SB-BK-05	BORE	SAIC03	5		
				SB-BK-05	BORE	SAIC04	10		
				SB-BK-06	BORE	SAIC02	1		
				SB-BK-06	BORE	SAIC03	5		
				SB-BK-06	BORE	SAIC04	10		
				SB-BK-07	BORE	SAIC02	1		
				SB-BK-07	BORE	SAIC03	5		
				SB-BK-07	BORE	SAIC04	10		
				SB-BK-08	BORE	SAIC02	1		
				SB-BK-08	BORE	SAIC03	5		
				SB-BK-09	BORE	SAIC02	1		
				SB-BK-09	BORE	SAIC03	5		
				SB-BK-10	BORE	SAIC02	1		
				SB-BK-10	BORE	SAIC03	5		
				SB-BK-01	BORE	SAIC01	0		
				SB-BK-02	BORE	SAIC01	0		
				SB-BK-03	BORE	SAIC01	0		

**Table K-20. Samples Included in Data Set for Surface Soils at SWMU 19 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-21. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 19 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure
					Min CRL	Max CRL	Minimum	Maximum					Point Concentration <sup>e</sup>
Toluene	ug/g	5 / 6	5 / 6	83%	0.00078	0.00078	0.00082	0.0026	0.0014	0.00085	Normal	0.0021	0.0021
Trichloroethylene	ug/g	1 / 6	1 / 6	17%	0.0028	0.0028	0.0035	0.0035	0.0018	0.00086	Lognormal	0.0026	0.0026
Trichlorofluoromethane	ug/g	2 / 6	2 / 6	33%	0.0059	0.0059	0.0076	0.014	0.0056	0.0045	Lognormal	0.014	0.014 #

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

- 1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated.
- 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.
- 3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-22. Analysis of Variance Background Comparison for Surface Soils at SWMU 19 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:56:36 PM						Probability of			Poisson	Test: Max	Proportion of	
Run Date: 11/20/00		Frequency	Site	Background	Background	Accepting/	Site	Background	Upper	Greater Than	Detects Greater	Result of
Exposure Unit: 19_SS1	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	Rejecting	Mean	Mean	Tolerance	Poisson	Than Poisson	Background
Parameter						Null Hypothesis <sup>f</sup>			Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>e</sup>	Comparison <sup>g</sup>
					Result of	F-Test <sup>b</sup>						
Toluene	ug/g	83%	0.0026	--	Site Related	--	0.0014	--	--	--	-- / --	Site Related
Trichloroethylene	ug/g	17%	0.0035	--	Site Related	--	0.0018	--	--	--	-- / --	Site Related
Trichlorofluoromethane	ug/g	33%	0.014	--	Site Related	--	0.0056	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup>For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.
- 6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup>The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup>The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup>The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup>Y - yes; N - no

<sup>f</sup>Counts are based on the unaveraged data set.

<sup>g</sup>Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-23. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 19 (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects	Proportion of Detects	Maximum	Mean	Standard	UTL	95% UTL of	Test : Max	Proportion of
		All Samples <sup>a</sup>	Temporal	Detected					Detected Result	Detected Results
Exposure Unit: SS			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Greater Than	Background UTL <sup>f</sup>	Greater Than
										Background UTL <sup>g</sup>
Toluene	ug/g	5 / 6	5 / 6	0.0026	0.0014	0.00085	Site Related	0.0	Y	5 / 5
Trichloroethylene	ug/g	1 / 6	1 / 6	0.0035	0.0018	0.00086	Site Related	0.0	Y	1 / 1
Trichlorofluoromethane	ug/g	2 / 6	2 / 6	0.014	0.0056	0.0045	Site Related	0.0	Y	2 / 2

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-24. Samples Included in Data Set for Subsurface Soils at SWMU 19 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	S-SS-19-01	BORE	S-SS1901	1.5	SAIC	3-BK-1	BORE	S1055	2
	S-SS-19-01	BORE	SSS-19-1	1.5		3-BK-2	BORE	S1057	2
	S-SS-19-01	BORE	SSS-1901	1.5		31-BK-1	BORE	S1019	2
	S-SS-19-01	BORE	SSS1901	1.5		31-BK-2	BORE	S1021	2
	S-SS-19-02	BORE	S-SS1902	1.5		5-BK-1	BORE	S0136	2
	S-SS-19-02	BORE	SSS-19-2	1.5		5-BK-2	BORE	S0138	2
	S-SS-19-02	BORE	SSS-1902	1.5		8-BK-1	BORE	S0773	2
	S-SS-19-02	BORE	SSS1902	1.5		8-BK-2	BORE	S0775	2
	S-SS-19-04	BORE	T2040	1.8		9-BK-1	BORE	S0333	2
	S-SS-19-06	BORE	T2043	1.3		9-BK-2	BORE	S0335	2
	SB-19-001B	BORE	SAIC02	15		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-19-002B	BORE	SAIC02	7		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-19-007B	BORE	SAIC02	15		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-19-007D	BORE	SAIC04	7		S-SS-08-BK	BORE	SSS-08BK	1.5
	S-SS-19-04	BORE	T2040	1.8		S-SS-08-BK	BORE	SSS08-BK	1.5
						S-SS-08-BK	BORE	SSS08BK	3
						S-SS-10-BK	BORE	SSS-10BK	1.5
						S-SS-10-BK	BORE	SSS10-BK	1.5
						S-SS-14-BK	BORE	SSS-14BK	1.5
						S-SS-14-BK	BORE	SSS14BK	1.5
						S-SS-19-BK	BORE	SSS-19BK	1.5
						S-SS-19-BK	BORE	SSS19BK	1.5
						S-SS-22-BK	BORE	SSS-22BK	1.5
						S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0

**Table K-24. Samples Included in Data Set for Subsurface Soils at SWMU 19 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-25. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 19 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects		Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure
		All Samples <sup>a</sup>	Temporal Samples <sup>b</sup>		Min CRL	Max CRL	Minimum	Maximum					Point Concentration <sup>e</sup>
Arsenic	ug/g	2 / 4	2 / 4	50%	47	47	17	20	21	3.2	Lognormal	26	20 #
Beryllium	ug/g	2 / 2	2 / 2	100%	--	--	0.24	0.26	0.25	0.015	Undetermined	--	0.26 #
Chromium	ug/g	2 / 2	2 / 2	100%	--	--	26	44	35	12	Undetermined	--	44 #
Copper	ug/g	2 / 2	2 / 2	100%	--	--	28	31	29	1.6	Undetermined	--	31 #
Lead	ug/g	4 / 4	4 / 4	100%	--	--	87	175	115	41	Normal	164	164
Mercury	ug/g	2 / 2	2 / 2	100%	--	--	0.15	0.20	0.18	0.035	Undetermined	--	0.20 #
Silver	ug/g	2 / 4	2 / 4	50%	16	16	0.63	0.93	4.3	4.1	Lognormal	6,890	0.93 #
Zinc	ug/g	2 / 2	2 / 2	100%	--	--	109	142	126	23	Undetermined	--	142 #
Toluene	ug/g	2 / 4	2 / 4	50%	0.00078	0.00078	0.0011	0.0013	0.00080	0.00047	Normal	0.0014	0.0013 #
Trichlorofluoromethane	ug/g	1 / 4	1 / 4	25%	0.0059	0.0059	0.0097	0.0097	0.0046	0.0034	Lognormal	0.020	0.0097 #

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-26. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 19 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/ Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson	Test: Max	Proportion of	Result of Background Comparison <sup>d</sup>
										Upper Tolerance Limit <sup>d</sup>	Greater Than Poisson UTL <sup>e</sup>	Detects Greater Than Poisson UTL <sup>f</sup>	
Arsenic	ug/g	50%	24	53	Nonparametric	Equal	0.0088	21	13	--	--	-- / --	Site Related
Beryllium	ug/g	100%	0.26	1.2	Compare Maxima	--	--	0.25	0.65	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	44	56	Compare Maxima	--	--	35	22	--	--	-- / --	Not Site Related
Copper	ug/g	100%	31	162	Compare Maxima	--	--	29	17	--	--	-- / --	Not Site Related
Lead	ug/g	100%	175	401	Nonparametric	--	0.0022	115	32	--	--	-- / --	Site Related
Mercury	ug/g	100%	0.20	0.36	Compare Maxima	--	--	0.18	0.043	--	--	-- / --	Not Site Related
Silver	ug/g	50%	7.9	3.7	Nonparametric	Unequal	0.0057	4.3	0.62	--	--	-- / --	Site Related
Zinc	ug/g	100%	142	385	Compare Maxima	--	--	126	77	--	--	-- / --	Not Site Related
Toluene	ug/g	50%	0.0013	--	Site Related	--	--	0.00080	--	--	--	-- / --	Site Related
Trichlorofluoromethane	ug/g	25%	0.0097	--	Site Related	--	--	0.0046	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.
- 6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site

**Table K-26. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 19 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:56:36 PM						Probability of			Poisson	Test: Max	Proportion of	
Run Date: 11/20/00						Accepting/			Upper	Greater Than	Detects Greater	Result of
Exposure Unit: 19_SS1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Background
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>

mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.

3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-27. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 19 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects		Maximum Detected Result <sup>c</sup>	Mean	Standard Deviation	UTL Comparison <sup>d</sup>	95% UTL of Background Data Set <sup>e</sup>	Test : Max	Proportion of
		All Samples <sup>a</sup>	Temporal Samples <sup>b</sup>						Detected Result Greater Than Background UTL <sup>f</sup>	Detected Results Greater Than Background UTL <sup>g</sup>
Arsenic	ug/g	2 / 4	2 / 4	3.2	21	3.2	Lognormal UTL	3.4	N	0 / 2
Beryllium	ug/g	2 / 2	2 / 2	0.26	0.25	0.015	Nonparametric UTL	1.2	N	0 / 2
Chromium	ug/g	2 / 2	2 / 2	44	35	12	Nonparametric UTL	56	N	0 / 2
Copper	ug/g	2 / 2	2 / 2	31	29	1.6	Nonparametric UTL	162	N	0 / 2
Lead	ug/g	4 / 4	4 / 4	175	115	41	Nonparametric UTL	401	N	0 / 4
Mercury	ug/g	2 / 2	2 / 2	0.20	0.18	0.035	Nonparametric UTL	0.36	N	0 / 2
Silver	ug/g	2 / 4	2 / 4	2.1	4.3	4.1	Lognormal UTL	0.47	N	0 / 2
Zinc	ug/g	2 / 2	2 / 2	142	126	23	Nonparametric UTL	385	N	0 / 2
Toluene	ug/g	2 / 4	2 / 4	0.0013	0.00080	0.00047	Site Related	0.0	Y	2 / 2
Trichlorofluoromethane	ug/g	1 / 4	1 / 4	0.0097	0.0046	0.0034	Site Related	0.0	Y	1 / 1

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-28. Samples Included in Data Set for Groundwater at SWMU 19  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	S-113-94	WELL	SAIC01	110	SAIC	S-20-88	WELL	S-20-88	1.2
	S-113-94	WELL	SAIC03	109		S-20-88	WELL	S-20-88X	94.7
	S-114-94	WELL	SAIC01	110		S-20-88	WELL	S-20-88Y	97
	S-114-94	WELL	SAIC03	109		S-20-88	WELL	S2088	97
	S-115-94	WELL	SAIC01	111		S-20-88	WELL	T1292	97
	S-115-94	WELL	SAIC03	111		S-20-88	WELL	TO668	97
	S-116-94	WELL	SAIC01	130		S-20-88	WELL	TO670	97
	S-116-94	WELL	SAIC03	134		S-20-88	WELL	TO673	97
	S-113-94	WELL	SAIC04	125		S-20-88	WELL	TO674	97
	S-114-94	WELL	SAIC04	130		S-35-90	WELL	S-35-90	271.6
	S-115-94	WELL	SAIC04	130		S-35-90	WELL	S3590	271.6
	S-116-94	WELL	SAIC04	200		S-35-90	WELL	T1106	271.6
	S-115-94	WELL	121099	0		S-35-90	WELL	T1107	271.6
	S-115-94	WELL	GW-15	0		S-35-90	WELL	T1108	271.6
	S-116-94	WELL	121099	0		S-35-90	WELL	T1111	271.6
						S-35-90	WELL	T1112	271.6
						S-SBR-1	WELL	S-SBR-1	119.4
						S-SBR-1	WELL	S-SBR-1X	119.3
						S-SBR-1	WELL	SBR-1	128.5
						S-SBR-1	WELL	SBR-1X	140
						S-SBR-1	WELL	SBR-1Y	128
						S-SBR-1	WELL	SSBR1	140
						S-SBR-1	WELL	T1590	140
						S-SBR-1	WELL	T1591	140
						S-SBR-1	WELL	T1592	140
						S-SBR-1	WELL	T1595	140
						S-SBR-1	WELL	T1596	140

**Table K-29. Summary Statistics and Exposure Point Concentrations for Groundwater at SWMU 19  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Alkalinity	mg/L	4 / 4	4 / 4	100%	--	--	62	128	92	27	Normal	124	124
Barium	µg/L	3 / 3	1 / 1	100%	--	--	0.11	113	38	0	Undetermined	--	38 #
Biochemical Oxygen Demand	mg/L	1 / 4	1 / 4	25%	1.00	1.00	1.2	1.2	0.68	0.35	Lognormal	1.6	1.2 #
Calcium	µg/L	1 / 1	1 / 1	100%	--	--	53	53	53	0	Undetermined	--	53 #
Chemical Oxygen Demand	mg/L	1 / 4	1 / 4	25%	5.0	5.0	11	11	4.7	4.4	Lognormal	45	11 #
Chloride	µg/L	4 / 4	4 / 4	100%	--	--	130,000	160,000	142,500	12,583	Normal	157,306	157,306
Hardness	mg/L	4 / 4	4 / 4	100%	--	--	138	298	250	75	Lognormal	486	298 #
Magnesium	µg/L	1 / 1	1 / 1	100%	--	--	34	34	34	0	Undetermined	--	34 #
Nitrite, Nitrate	µg/L	4 / 4	4 / 4	100%	--	--	3,000	3,700	3,475	330	Normal	3,864	3,700 #
Sodium	µg/L	1 / 1	1 / 1	100%	--	--	47	47	47	0	Undetermined	--	47 #
Specific Conductance	UMHC	4 / 4	4 / 4	100%	--	--	686	803	764	53	Normal	825	803 #
Total Dissolved Solids	mg/L	4 / 4	4 / 4	100%	--	--	347	537	466	84	Normal	564	537 #
Total Organic Carbon	mg/L	4 / 4	4 / 4	100%	--	--	1.5	2.5	1.8	0.50	Lognormal	2.6	2.5 #
pH	0	4 / 4	4 / 4	100%	--	--	6.4	7.5	6.9	0.56	Normal	7.5	7.5 #
1,3-Dinitrobenzene	µg/L	4 / 4	2 / 2	100%	--	--	0.72	0.73	0.73	0.0071	Undetermined	--	0.73 #
Chloroform	µg/L	1 / 14	1 / 4	25%	0.50	5.0	1.1	1.1	0.60	0.27	Normal	0.92	0.53 #
Dimethyl Phthalate	µg/L	3 / 15	3 / 4	75%	1.5	900	1.00	700	122	88	Normal	225	225
Toluene	µg/L	2 / 12	2 / 4	50%	0.50	0.50	1.3	2.1	0.49	0.30	Normal	0.84	0.84
bis(2-Ethylhexyl)phthalate	µg/L	7 / 16	3 / 4	75%	4.8	4.8	1.00	15	4.7	3.8	Normal	9.1	9.1
di-N-Octyl Phthalate	µg/L	4 / 16	2 / 4	50%	15	15	2.0	4.0	6.7	1.1	Normal	8.0	6.6 #

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-30. Analysis of Variance Background Comparison for Groundwater at SWMU 19  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:59:34 PM											Probability of	Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00											Accepting/	Upper	Greater Than	Detects Greater	Background
Exposure Unit: 19_WD1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	UTL <sup>e</sup>	Than Poisson	UTL <sup>f</sup>	Comparison <sup>g</sup>	
Parameter	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	UTL <sup>f</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>	
Alkalinity	mg/L	100%	128	--	Site Related	--	92	--	--	--	-- / --	-- / --	-- / --	Site Related	
Barium	µg/L	100%	113	200	Compare Maxima	--	38	106	--	--	-- / --	-- / --	-- / --	Not Site Related	
Biochemical Oxygen Demand	mg/L	25%	1.2	--	Site Related	--	0.68	--	--	--	-- / --	-- / --	-- / --	Site Related	
Calcium	µg/L	100%	53	--	Site Related	--	53	--	--	--	-- / --	-- / --	-- / --	Site Related	
Chemical Oxygen Demand	mg/L	25%	11	--	Site Related	--	4.7	--	--	--	-- / --	-- / --	-- / --	Site Related	
Chloride	µg/L	100%	160,000	1.4E+06	Compare Maxima	--	142,500	716,333	--	--	-- / --	-- / --	-- / --	Not Site Related	
Hardness	mg/L	100%	298	--	Site Related	--	250	--	--	--	-- / --	-- / --	-- / --	Site Related	
Magnesium	µg/L	100%	34	--	Site Related	--	34	--	--	--	-- / --	-- / --	-- / --	Site Related	
Nitrite, Nitrate	µg/L	100%	3,700	5,600	Compare Maxima	--	3,475	3,750	--	--	-- / --	-- / --	-- / --	Not Site Related	
Sodium	µg/L	100%	47	61,000	Compare Maxima	--	47	43,894	--	--	-- / --	-- / --	-- / --	Not Site Related	
Specific Conductance	UMHC	100%	803	--	Site Related	--	764	--	--	--	-- / --	-- / --	-- / --	Site Related	
Total Dissolved Solids	mg/L	100%	537	--	Site Related	--	466	--	--	--	-- / --	-- / --	-- / --	Site Related	
Total Organic Carbon	mg/L	100%	2.5	--	Site Related	--	1.8	--	--	--	-- / --	-- / --	-- / --	Site Related	
pH	0	100%	7.5	--	Site Related	--	6.9	--	--	--	-- / --	-- / --	-- / --	Site Related	
1,3-Dinitrobenzene	µg/L	100%	0.73	--	Site Related	--	0.73	--	--	--	-- / --	-- / --	-- / --	Site Related	
Chloroform	µg/L	25%	2.5	--	Site Related	--	0.60	--	--	--	-- / --	-- / --	-- / --	Site Related	
Dimethyl Phthalate	µg/L	75%	700	--	Site Related	--	122	--	--	--	-- / --	-- / --	-- / --	Site Related	
Toluene	µg/L	50%	2.1	--	Site Related	--	0.49	4.4	--	--	-- / --	-- / --	-- / --	Site Related	
bis(2-Ethylhexyl)phthalate	µg/L	75%	15	--	Site Related	--	4.7	12	--	--	-- / --	-- / --	-- / --	Site Related	
di-N-Octyl Phthalate	µg/L	50%	7.5	--	Site Related	--	6.7	--	--	--	-- / --	-- / --	-- / --	Site Related	

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup>For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.
- 6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

**Table K-30. Analysis of Variance Background Comparison for Groundwater at SWMU 19  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 4:59:34 PM								Probability of	Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00								Accepting/	Upper	Greater Than	Detects Greater	Background
Exposure Unit: 19_WD1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Background
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-31. Comparison with Background Upper Tolerance Limit for Groundwater at SWMU 19  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects	Proportion of Detects	Maximum	Mean	Standard	UTL	95% UTL of	Test : Max	Proportion of
		All Samples <sup>a</sup>	Temporal	Detected					Background	
Exposure Unit: WD			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Greater Than	Background UTL <sup>f</sup>	Greater Than
										Background UTL <sup>g</sup>
Alkalinity	mg/L	4 / 4	4 / 4	128	92	27	Site Related	0.0	Y	4 / 4
Barium	µg/L	3 / 3	1 / 1	113	38	0	Compare Maxima	200	N	0 / 3
Biochemical Oxygen Demand	mg/L	1 / 4	1 / 4	1.2	0.68	0.35	Site Related	0.0	Y	1 / 1
Calcium	µg/L	1 / 1	1 / 1	53	53	0	Site Related	0.0	Y	1 / 1
Chemical Oxygen Demand	mg/L	1 / 4	1 / 4	11	4.7	4.4	Site Related	0.0	Y	1 / 1
Chloride	µg/L	4 / 4	4 / 4	160,000	142,500	12,583	Compare Maxima	1.4E+06	N	0 / 4
Hardness	mg/L	4 / 4	4 / 4	298	250	75	Site Related	0.0	Y	4 / 4
Magnesium	µg/L	1 / 1	1 / 1	34	34	0	Site Related	0.0	Y	1 / 1
Nitrite, Nitrate	µg/L	4 / 4	4 / 4	3,700	3,475	330	Compare Maxima	5,600	N	0 / 4
Sodium	µg/L	1 / 1	1 / 1	47	47	0	Compare Maxima	61,000	N	0 / 1
Specific Conductance	UMHC	4 / 4	4 / 4	803	764	53	Site Related	0.0	Y	4 / 4
Total Dissolved Solids	mg/L	4 / 4	4 / 4	537	466	84	Site Related	0.0	Y	4 / 4
Total Organic Carbon	mg/L	4 / 4	4 / 4	2.5	1.8	0.50	Site Related	0.0	Y	4 / 4
pH	0	4 / 4	4 / 4	7.5	6.9	0.56	Site Related	0.0	Y	4 / 4
1,3-Dinitrobenzene	µg/L	4 / 4	2 / 2	0.73	0.73	0.0071	Site Related	0.0	Y	4 / 4
Chloroform	µg/L	1 / 14	1 / 4	2.5	0.60	0.27	Site Related	0.0	Y	1 / 1
Dimethyl Phthalate	µg/L	3 / 15	3 / 4	700	122	88	Site Related	0.0	Y	3 / 3
Toluene	µg/L	2 / 12	2 / 4	2.1	0.49	0.30	Site Related	0.0	Y	2 / 2
bis(2-Ethylhexyl)phthalate	µg/L	7 / 16	3 / 4	15	4.7	3.8	Site Related	0.0	Y	7 / 7
di-N-Octyl Phthalate	µg/L	4 / 16	2 / 4	7.5	6.7	1.1	Site Related	0.0	Y	4 / 4

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%; a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-32. Inorganics Greater than Background UTL for SWMU 19 Groundwater  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Alkalinity	0	62	S-116-94	WELL	SAIC04	200.00		Site Related
Alkalinity	0	84	S-113-94	WELL	SAIC04	125.00		Site Related
Alkalinity	0	92	S-114-94	WELL	SAIC04	130.00		Site Related
Alkalinity	0	128	S-115-94	WELL	SAIC04	130.00		Site Related
Biochemical Oxygen Demand	0	1.2	S-113-94	WELL	SAIC04	125.00		Site Related
Calcium	0	52.7	S-115-94	WELL	GW-15	0.00		Site Related
Chemical Oxygen Demand	0	11.3	S-116-94	WELL	SAIC04	200.00		Site Related
Hardness	0	138	S-116-94	WELL	SAIC04	200.00		Site Related
Hardness	0	274	S-114-94	WELL	SAIC04	130.00		Site Related
Hardness	0	288	S-113-94	WELL	SAIC04	125.00		Site Related
Hardness	0	298	S-115-94	WELL	SAIC04	130.00		Site Related
Magnesium	0	33.8	S-115-94	WELL	GW-15	0.00		Site Related
Specific Conductance	0	686	S-116-94	WELL	SAIC04	200.00		Site Related
Specific Conductance	0	779	S-114-94	WELL	SAIC04	130.00		Site Related
Specific Conductance	0	786	S-113-94	WELL	SAIC04	125.00		Site Related
Specific Conductance	0	803	S-115-94	WELL	SAIC04	130.00		Site Related
Total Dissolved Solids	0	347	S-116-94	WELL	SAIC04	200.00		Site Related
Total Dissolved Solids	0	473	S-115-94	WELL	SAIC04	130.00		Site Related
Total Dissolved Solids	0	507	S-114-94	WELL	SAIC04	130.00		Site Related
Total Dissolved Solids	0	537	S-113-94	WELL	SAIC04	125.00		Site Related
Total Organic Carbon	0	1.46	S-115-94	WELL	SAIC04	130.00		Site Related
Total Organic Carbon	0	1.46	S-116-94	WELL	SAIC04	200.00		Site Related
Total Organic Carbon	0	1.64	S-114-94	WELL	SAIC04	130.00		Site Related
Total Organic Carbon	0	2.5	S-113-94	WELL	SAIC04	125.00		Site Related
pH	0	6.36	S-113-94	WELL	SAIC04	125.00		Site Related
pH	0	6.44	S-115-94	WELL	SAIC04	130.00		Site Related
pH	0	7.29	S-114-94	WELL	SAIC04	130.00		Site Related
pH	0	7.45	S-116-94	WELL	SAIC04	200.00		Site Related

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-33. Samples Included in Data Set for Subsurface Soils at SWMU 20 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-20-03	BORE	SAIC01	3	SAIC	3-BK-1	BORE	S1055	2
	SB-20-03	BORE	SAIC02	8		3-BK-2	BORE	S1057	2
	SB-20-03	BORE	SAIC03	10		31-BK-1	BORE	S1019	2
	SB-20-04	BORE	SAIC01	5		31-BK-2	BORE	S1021	2
	SB-20-05	BORE	SAIC01	5		5-BK-1	BORE	S0136	2
	SB-20-05	BORE	SAIC02	8		5-BK-2	BORE	S0138	2
	SB-20-05	BORE	SAIC03	11		8-BK-1	BORE	S0773	2
	SB-20-06	BORE	SAIC01	5		8-BK-2	BORE	S0775	2
	SB-20-06	BORE	SAIC02	8		9-BK-1	BORE	S0333	2
	SB-20-06	BORE	SAIC03	11.5		9-BK-2	BORE	S0335	2
	SB-20-07	BORE	SAIC01	5		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-20-07	BORE	SAIC02	8		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-20-07	BORE	SAIC03	11.5		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-20-08	BORE	SAIC01	5		S-SS-08-BK	BORE	SSS-08BK	1.5
	SB-20-08	BORE	SAIC02	9		S-SS-08-BK	BORE	SSS08-BK	1.5
	SB-20-08	BORE	SAIC03	14		S-SS-08-BK	BORE	SSS08BK	3
	SB-20-09	BORE	SAIC01	5		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-20-09	BORE	SAIC02	9		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-20-09	BORE	SAIC03	14		S-SS-14-BK	BORE	SSS-14BK	1.5
	SB-20-10	BORE	SAIC01	5		S-SS-14-BK	BORE	SSS14BK	1.5
	SB-20-10	BORE	SAIC02	10		S-SS-19-BK	BORE	SSS-19BK	1.5
	SB-20-10	BORE	SAIC03	15		S-SS-19-BK	BORE	SSS19BK	1.5
	SB-20-11	BORE	SAIC01	4		S-SS-22-BK	BORE	SSS-22BK	1.5
	SB-20-11	BORE	SAIC02	9		S-SS-22-BK	BORE	SSS22BK	1.5
	SB-20-11	BORE	SAIC03	14		S-SS-26-BK	BORE	SSS-26BK	1.5
	SB-20-12	BORE	SAIC01	4		S-SS-26-BK	BORE	SSS26-BK	1.5
	SB-20-12	BORE	SAIC02	9		S-SS-27-BK	BORE	SSS-27BK	1.5
	SB-20-12	BORE	SAIC03	14		S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0

**Table K-33. Samples Included in Data Set for Subsurface Soils at SWMU 20 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-34. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 20 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
4-Chloroaniline	ug/g	1 / 28	1 / 28	4%	0.17	0.17	47	47	1.8	8.8	Lognormal	0.40	0.40
Anthracene	ug/g	2 / 28	2 / 28	7%	0.17	3.4	0.20	0.20	0.15	0.31	Lognormal	0.15	0.15
Benzo(a)anthracene	ug/g	5 / 28	5 / 28	18%	0.17	0.17	0.23	7.1	0.42	1.3	Lognormal	0.40	0.40
Benzo(a)pyrene	ug/g	4 / 28	4 / 28	14%	0.17	0.17	0.44	4.1	0.27	0.77	Lognormal	0.26	0.26
Benzo(b)fluoranthene	ug/g	4 / 28	4 / 28	14%	0.17	0.17	0.60	6.2	0.36	1.1	Lognormal	0.32	0.32
Benzo(g,h,i)perylene	ug/g	3 / 28	3 / 28	11%	0.17	3.4	0.19	0.23	0.16	0.31	Lognormal	0.16	0.16
Benzo(k)fluoranthene	ug/g	3 / 28	3 / 28	11%	0.17	3.4	0.19	0.22	0.16	0.31	Lognormal	0.16	0.16
Butyl Benzyl Phthalate	ug/g	1 / 28	1 / 28	4%	0.17	0.17	8.5	8.5	0.38	1.6	Lognormal	0.22	0.22
Chrysene	ug/g	5 / 28	5 / 28	18%	0.17	0.17	0.26	7.1	0.43	1.3	Lognormal	0.41	0.41
Fluoranthene	ug/g	4 / 28	4 / 28	14%	0.17	3.4	0.37	1.3	0.28	0.47	Lognormal	0.36	0.36
Indeno(1,2,3-cd)pyrene	ug/g	2 / 28	2 / 28	7%	0.17	3.4	0.18	0.22	0.15	0.31	Lognormal	0.15	0.15
Phenanthrene	ug/g	4 / 28	4 / 28	14%	0.17	3.4	0.19	0.70	0.21	0.34	Lognormal	0.25	0.25
Pyrene	ug/g	4 / 28	4 / 28	14%	0.17	3.4	0.29	1.2	0.26	0.43	Lognormal	0.33	0.33
bis(2-Ethylhexyl)phthalate	ug/g	3 / 28	3 / 28	11%	0.17	0.17	0.22	30	1.2	5.6	Lognormal	0.37	0.37

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

- 1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.
- 3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "\*" next to the EPC).

**Table K-35. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 20 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
4-Chloroaniline	ug/g	4%	47	--	Site Related	--	--	1.8	--	--	--	-- / --	Site Related
Anthracene	ug/g	7%	1.7	--	Site Related	--	--	0.15	--	--	--	-- / --	Site Related
Benzo(a)anthracene	ug/g	18%	7.1	--	Site Related	--	--	0.42	--	--	--	-- / --	Site Related
Benzo(a)pyrene	ug/g	14%	4.1	--	Site Related	--	--	0.27	--	--	--	-- / --	Site Related
Benzo(b)fluoranthene	ug/g	14%	6.2	--	Site Related	--	--	0.36	--	--	--	-- / --	Site Related
Benzo(g,h,i)perylene	ug/g	11%	1.7	--	Site Related	--	--	0.16	--	--	--	-- / --	Site Related
Benzo(k)fluoranthene	ug/g	11%	1.7	--	Site Related	--	--	0.16	--	--	--	-- / --	Site Related
Butyl Benzyl Phthalate	ug/g	4%	8.5	--	Site Related	--	--	0.38	--	--	--	-- / --	Site Related
Chrysene	ug/g	18%	7.1	--	Site Related	--	--	0.43	--	--	--	-- / --	Site Related
Fluoranthene	ug/g	14%	1.7	--	Site Related	--	--	0.28	--	--	--	-- / --	Site Related
Indeno(1,2,3-cd)pyrene	ug/g	7%	1.7	--	Site Related	--	--	0.15	--	--	--	-- / --	Site Related
Phenanthrene	ug/g	14%	1.7	--	Site Related	--	--	0.21	--	--	--	-- / --	Site Related
Pyrene	ug/g	14%	1.7	--	Site Related	--	--	0.26	--	--	--	-- / --	Site Related
bis(2-Ethylhexyl)phthalate	ug/g	11%	30	--	Site Related	--	--	1.2	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.
- 6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

**Table K-35. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 20 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:02:25 PM							Probability of			Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00							Accepting/	Site	Background	Upper	Greater Than	Detected Greater	Background
Exposure Unit: 20_SD1	Frequency	Site	Background	Background	Result of	Rejecting	Mean	Mean	Tolerance	Poisson	Than Poisson	Than Poisson	Comparison
Parameter	Units	of Detect	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>			Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>		Comparison <sup>g</sup>

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-36. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 20 (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects	Proportion of Detects	Maximum	Mean	Standard	UTL	95% UTL of	Test : Max	Proportion of
		All Samples <sup>a</sup>	Temporal	Detected					Detected Result	Detected Results
Exposure Unit: SD			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Background	Background UTL <sup>e</sup>	Greater Than	Greater Than
							Data Set <sup>f</sup>		Background UTL <sup>g</sup>	Background UTL <sup>h</sup>
4-Chloroaniline	ug/g	1 / 28	1 / 28	47	1.8	8.8	Site Related	0.0	Y	1 / 1
Anthracene	ug/g	2 / 28	2 / 28	1.7	0.15	0.31	Site Related	0.0	Y	2 / 2
Benzo(a)anthracene	ug/g	5 / 28	5 / 28	7.1	0.42	1.3	Site Related	0.0	Y	5 / 5
Benzo(a)pyrene	ug/g	4 / 28	4 / 28	4.1	0.27	0.77	Site Related	0.0	Y	4 / 4
Benzo(b)fluoranthene	ug/g	4 / 28	4 / 28	6.2	0.36	1.1	Site Related	0.0	Y	4 / 4
Benzo(g,h,i)perylene	ug/g	3 / 28	3 / 28	1.7	0.16	0.31	Site Related	0.0	Y	3 / 3
Benzo(k)fluoranthene	ug/g	3 / 28	3 / 28	1.7	0.16	0.31	Site Related	0.0	Y	3 / 3
Butyl Benzyl Phthalate	ug/g	1 / 28	1 / 28	8.5	0.38	1.6	Site Related	0.0	Y	1 / 1
Chrysene	ug/g	5 / 28	5 / 28	7.1	0.43	1.3	Site Related	0.0	Y	5 / 5
Fluoranthene	ug/g	4 / 28	4 / 28	1.7	0.28	0.47	Site Related	0.0	Y	4 / 4
Indeno(1,2,3-cd)pyrene	ug/g	2 / 28	2 / 28	1.7	0.15	0.31	Site Related	0.0	Y	2 / 2
Phenanthrene	ug/g	4 / 28	4 / 28	1.7	0.21	0.34	Site Related	0.0	Y	4 / 4
Pyrene	ug/g	4 / 28	4 / 28	1.7	0.26	0.43	Site Related	0.0	Y	4 / 4
bis(2-Ethylhexyl)phthalate	ug/g	3 / 28	3 / 28	30	1.2	5.6	Site Related	0.0	Y	3 / 3

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-37. Samples Included in Data Set for Surface Soils at SWMU 33A - Inside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	S-SS-33-01	GRAB	T2001	0.3	SAIC	3-BK-1	BORE	S1055	2
	S-SS-33-01	GRAB	T2051	0.3		3-BK-2	BORE	S1057	2
	S-SS-33-02	GRAB	T2002	0.3		31-BK-1	BORE	S1019	2
	S-SS-33-03	GRAB	T2003	0.3		31-BK-2	BORE	S1021	2
	S-SS-33-04	GRAB	T2004	0.3		5-BK-1	BORE	S0136	2
	S-SS-33-05	GRAB	T2005	0.3		5-BK-2	BORE	S0138	2
	S-SS-33-06	GRAB	T2006	0.3		8-BK-1	BORE	S0773	2
	SB-33-004A	BORE	SAIC01	0		8-BK-2	BORE	S0775	2
	SB-33-004B	BORE	SAIC02	0.5		9-BK-1	BORE	S0333	2
	SB-33-005A	BORE	SAIC01	0		9-BK-2	BORE	S0335	2
	SB-33-005B	BORE	SAIC02	0.5		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-33-006A	BORE	SAIC01	0		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-33-006B	BORE	SAIC02	0.5		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-33-007A	BORE	SAIC01	0		S-SS-08-BK	BORE	SSS-08BK	1.5
	SB-33-007B	BORE	SAIC02	0.5		S-SS-08-BK	BORE	SSS08-BK	1.5
	SB-33-008A	BORE	SAIC01	0		S-SS-08-BK	BORE	SSS08BK	3
	SB-33-008B	BORE	SAIC02	0.5		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-33-009A	BORE	SAIC01	0		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-33-009B	BORE	SAIC02	0.5		S-SS-14-BK	BORE	SSS-14BK	1.5
	SB-33-010A	BORE	SAIC01	0		S-SS-14-BK	BORE	SSS14BK	1.5
	SB-33-010B	BORE	SAIC02	0.5		S-SS-19-BK	BORE	SSS-19BK	1.5
	SB-33A-11	BORE	SAIC01	0		S-SS-19-BK	BORE	SSS19BK	1.5
	SB-33A-12	BORE	SAIC01	0		S-SS-22-BK	BORE	SSS-22BK	1.5
	SB-33A-13	BORE	SAIC01	0		S-SS-22-BK	BORE	SSS22BK	1.5
	SB-33A-14	BORE	SAIC01	0		S-SS-26-BK	BORE	SSS-26BK	1.5
	SB-33A-15	BORE	SAIC01	0		S-SS-26-BK	BORE	SSS26-BK	1.5
	SB-33A-16	BORE	SAIC01	0		S-SS-27-BK	BORE	SSS-27BK	1.5
	SB-33A-17	BORE	SAIC01	0		S-SS-27-BK	BORE	SSS27-BK	1.5
	SB-33A-18	BORE	SAIC01	0		S-SS-29-BK	BORE	SSS-29BK	1.5
	SB-33A-19	BORE	SAIC01	0		S-SS-29-BK	BORE	SSS29-BK	1.5
	SB-33A-20	BORE	SAIC01	0		S-SS-36-BK	BORE	SSS-36BK	1.5
	SB-33A-21	BORE	SAIC01	0		S-SS-36-BK	BORE	SSS36-BK	1.5
	SB-33A-22	BORE	SAIC01	0		S-SS-36-BK	BORE	SSS36BK	1.5
	SB-33A-23	BORE	SAIC01	0		SB-BK-01	BORE	SAIC02	1
	SB-33A-24	BORE	SAIC01	0		SB-BK-01	BORE	SAIC03	5
	SB-33A-25	BORE	SAIC01	0		SB-BK-02	BORE	SAIC02	1
	SB-33A-26	BORE	SAIC01	0		SB-BK-02	BORE	SAIC03	5
	SB-33A-27	BORE	SAIC01	0		SB-BK-02	BORE	SAIC03D	5
	SB-33A-28	BORE	SAIC01	0		SB-BK-02	BORE	SAIC04	10
	SB-33A-29	BORE	SAIC01	0		SB-BK-03	BORE	SAIC02	1
	SS-33-007	BORE	SAIC01	0		SB-BK-03	BORE	SAIC03	5
	SS-33-008	BORE	SAIC01	0		SB-BK-03	BORE	SAIC03D	5
	SS-33-009	BORE	SAIC01	0		SB-BK-03	BORE	SAIC04	10
	SS-33-010	BORE	SAIC01	0		SB-BK-04	BORE	SAIC02	1
	SS-33-011	BORE	SAIC01	0		SB-BK-04	BORE	SAIC03	5
	SS-33-012	BORE	SAIC01	0		SB-BK-05	BORE	SAIC02	1
	SS-33-005	BORE	SAIC01	0		SB-BK-05	BORE	SAIC03	5
	SS-33-006	BORE	SAIC01	0		SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
				SB-BK-07	BORE	SAIC01	0		
				SB-BK-08	BORE	SAIC01	0		
				SB-BK-09	BORE	SAIC01	0		
				SB-BK-10	BORE	SAIC01	0		

**Table K-38. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 33A - Inside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>e</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	41 / 41	41 / 41	100%	--	--	1,180	10,900	4,945	2,598	Normal	5,628	5,628
Antimony	ug/g	7 / 47	7 / 47	15%	6.0	340	7.1	24	11	27	Lognormal	11	11
Arsenic	ug/g	47 / 47	47 / 47	100%	--	--	2.3	19	8.6	3.6	Lognormal	9.8	9.8
Barium	ug/g	41 / 41	41 / 41	100%	--	--	25	183	58	27	Lognormal	65	65
Beryllium	ug/g	1 / 47	1 / 47	2%	0.50	0.78	0.56	0.56	0.27	0.063	Lognormal	0.29	0.29
Cadmium	ug/g	29 / 47	29 / 47	62%	0.20	4.2	0.40	23	1.7	3.3	Lognormal	2.1	2.1
Calcium	ug/g	41 / 41	41 / 41	100%	--	--	80,400	210,000	149,151	34,249	Normal	158,158	158,158
Chromium	ug/g	43 / 47	43 / 47	91%	4.1	39	6.9	116	31	25	Lognormal	40	40
Cobalt	ug/g	19 / 41	19 / 41	46%	1.4	5.0	1.7	6.4	2.5	0.96	Lognormal	2.8	2.8
Copper	ug/g	45 / 47	45 / 47	96%	20	20	5.2	69	19	13	Lognormal	23	23
Cyanide	ug/g	1 / 41	1 / 41	2%	0.50	0.92	1.3	1.3	0.38	0.18	Lognormal	0.42	0.42
Iron	ug/g	41 / 41	41 / 41	100%	--	--	2,520	32,000	7,525	4,569	Lognormal	8,549	8,549
Lead	ug/g	47 / 47	47 / 47	100%	--	--	11	685	125	142	Lognormal	183	183
Magnesium	ug/g	41 / 41	41 / 41	100%	--	--	6,990	27,900	11,881	3,854	Lognormal	12,814	12,814
Manganese	ug/g	41 / 41	41 / 41	100%	--	--	144	374	224	50	Normal	237	237
Mercury	ug/g	25 / 47	25 / 47	53%	0.026	0.12	0.051	0.61	0.088	0.12	Lognormal	0.11	0.11
Nickel	ug/g	41 / 47	41 / 47	87%	25	25	5.8	27	12	4.0	Lognormal	13	13
Potassium	ug/g	41 / 41	41 / 41	100%	--	--	337	2,370	1,149	575	Normal	1,300	1,300
Silver	ug/g	6 / 47	6 / 47	13%	0.59	1.00	0.082	0.40	0.37	0.11	Lognormal	0.41	0.40 #
Sodium	ug/g	47 / 47	47 / 47	100%	--	--	267	11,400	1,933	1,963	Lognormal	2,315	2,315
Thallium	ug/g	5 / 47	5 / 47	11%	1.00	170	8.2	11	13	28	Lognormal	25	11 #
Vanadium	ug/g	41 / 41	41 / 41	100%	--	--	6.1	39	15	7.1	Lognormal	17	17
Zinc	ug/g	44 / 47	44 / 47	94%	80	80	29	594	110	112	Lognormal	132	132
Isopropyl methylphosphonate	ug/g	30 / 42	30 / 42	71%	0.50	50	1.2	2,300	159	390	Lognormal	6,426	2,300 #
Methylphosphonic acid	ug/g	32 / 42	32 / 42	76%	0.50	50	0.80	530	48	95	Lognormal	483	483
Thiodiglycol	ug/g	3 / 47	3 / 47	6%	3.9	42	4.0	4.5	6.6	8.1	Lognormal	8.4	4.5 #

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "\*" next to the EPC).

**Table K-39. Analysis of Variance Background Comparison for Surface Soils at SWMU 33A - Inside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:10:17 PM													
Run Date: 11/20/00													
Exposure Unit: 33A_SS1													
Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	10,900	25,200	Nonparametric	Unequal	1.00	4,945	14,545	--	--	-- / --	Not Site Related
Antimony	ug/g	15%	170	12	Poisson UTL	--	0.14	11	4.5	8.5	Y	5 / 7	Site Related
Arsenic	ug/g	100%	19	53	Nonparametric	Unequal	1.00	8.6	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	183	423	Nonparametric	--	1.00	58	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	2%	0.56	1.2	Nonparametric	--	1.00	0.27	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	62%	23	21	Nonparametric	--	0.0018	1.7	1.1	--	--	-- / --	Site Related
Calcium	ug/g	100%	210,000	250,000	Nonparametric	--	6.17E-06	149,151	103,597	--	--	-- / --	Site Related
Chromium	ug/g	91%	116	56	Nonparametric	--	0.21	31	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	46%	6.4	11	Nonparametric	--	1.00	2.5	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	96%	69	162	Nonparametric	--	0.13	19	17	--	--	-- / --	Not Site Related
Cyanide	ug/g	2%	1.3	--	Site Related	--	--	0.38	--	--	--	-- / --	Site Related
Iron	ug/g	100%	32,000	24,300	Nonparametric	--	1.00	7,525	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	685	401	Nonparametric	--	4.07E-11	125	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	27,900	35,700	Nonparametric	--	0.79	11,881	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	374	739	Nonparametric	Unequal	1.00	224	365	--	--	-- / --	Not Site Related
Mercury	ug/g	53%	0.61	0.36	Nonparametric	--	9.32E-05	0.088	0.043	--	--	-- / --	Site Related
Nickel	ug/g	87%	27	36	Nonparametric	--	1.00	12	15	--	--	-- / --	Not Site Related
Potassium	ug/g	100%	2,370	7,500	Nonparametric	Unequal	1.00	1,149	3,619	--	--	-- / --	Not Site Related
Silver	ug/g	13%	0.50	3.7	Nonparametric	--	1.00	0.37	0.62	--	--	-- / --	Not Site Related
Sodium	ug/g	100%	11,400	5,610	Nonparametric	--	0.19	1,933	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	11%	85	34	Nonparametric	--	0.45	13	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	39	63	Nonparametric	--	1.00	15	34	--	--	-- / --	Not Site Related
Zinc	ug/g	94%	594	385	Nonparametric	--	0.15	110	77	--	--	-- / --	Not Site Related
Isopropyl methylphosphonate	ug/g	71%	2,300	--	Site Related	--	--	159	--	--	--	-- / --	Site Related
Methylphosphonic acid	ug/g	76%	530	--	Site Related	--	--	48	--	--	--	-- / --	Site Related
Thiodiglycol	ug/g	6%	21	--	Site Related	--	--	6.6	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct

**Table K-39. Analysis of Variance Background Comparison for Surface Soils at SWMU 33A - Inside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:10:17 PM						Probability of			Poisson	Test: Max	Proportion of		
Run Date: 11/20/00						Accepting/ Rejecting	Site	Background	Upper	Greater Than	Detects Greater		
Exposure Unit: 33A_SS1	Frequency	Site	Background	Background	Result of	Null Hypothesis <sup>c</sup>	Mean	Mean	Tolerance	Poisson	Than Poisson		
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>				Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>	

the background comparison on the untransformed data.

b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.

c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-40. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 33A - Inside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:10:17 PM									Test : Max	Proportion of
Run Date: 11/20/00		Proportion of Detects	Proportion of Detects	Maximum				95% UTL of	Detected Result	Detected Results
Exposure Unit: SS		All Samples <sup>a</sup>	Temporal	Detected	Mean	Standard	UTL	Background	Greater Than	Greater Than
Parameter	Units		Samples <sup>b</sup>	Result <sup>c</sup>		Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Background UTL <sup>f</sup>	Background UTL <sup>g</sup>
Aluminum	ug/g	41 / 41	41 / 41	10,900	4,945	2,598	Normal UTL	24,256	N	0 / 41
Antimony	ug/g	7 / 47	7 / 47	170	11	27	Poisson UTL	12	Y	2 / 7
Arsenic	ug/g	47 / 47	47 / 47	2.9	8.6	3.6	Lognormal UTL	3.4	N	0 / 47
Barium	ug/g	41 / 41	41 / 41	183	58	27	Nonparametric UTL	423	N	0 / 41
Beryllium	ug/g	1 / 47	1 / 47	0.56	0.27	0.063	Nonparametric UTL	1.2	N	0 / 1
Cadmium	ug/g	29 / 47	29 / 47	23	1.7	3.3	Nonparametric UTL	21	Y	1 / 29
Calcium	ug/g	41 / 41	41 / 41	210,000	149,151	34,249	Nonparametric UTL	250,000	N	0 / 41
Chromium	ug/g	43 / 47	43 / 47	116	31	25	Nonparametric UTL	56	Y	5 / 43
Cobalt	ug/g	19 / 41	19 / 41	6.4	2.5	0.96	Normal UTL	10	N	0 / 19
Copper	ug/g	45 / 47	45 / 47	69	19	13	Nonparametric UTL	162	N	0 / 45
Cyanide	ug/g	1 / 41	1 / 41	1.3	0.38	0.18	Site Related	0.0	Y	1 / 1
Iron	ug/g	41 / 41	41 / 41	32,000	7,525	4,569	Normal UTL	21,340	Y	1 / 41
Lead	ug/g	47 / 47	47 / 47	685	125	142	Nonparametric UTL	401	Y	2 / 47
Magnesium	ug/g	41 / 41	41 / 41	27,900	11,881	3,854	Nonparametric UTL	35,700	N	0 / 41
Manganese	ug/g	41 / 41	41 / 41	374	224	50	Normal UTL	649	N	0 / 41
Mercury	ug/g	25 / 47	25 / 47	0.61	0.088	0.12	Nonparametric UTL	0.36	Y	2 / 25
Nickel	ug/g	41 / 47	41 / 47	27	12	4.0	Nonparametric UTL	33	N	0 / 41
Potassium	ug/g	41 / 41	41 / 41	2,370	1,149	575	Normal UTL	6,751	N	0 / 41
Silver	ug/g	6 / 47	6 / 47	-6.93E-01	0.37	0.11	Lognormal UTL	0.47	N	0 / 6
Sodium	ug/g	47 / 47	47 / 47	11,400	1,933	1,963	Nonparametric UTL	5,610	Y	2 / 47
Thallium	ug/g	5 / 47	5 / 47	85	13	28	Nonparametric UTL	34	N	0 / 5
Vanadium	ug/g	41 / 41	41 / 41	39	15	7.1	Normal UTL	55	N	0 / 41
Zinc	ug/g	44 / 47	44 / 47	594	110	112	Nonparametric UTL	385	Y	2 / 44
Isopropyl methylphosphonate	ug/g	30 / 42	30 / 42	2,300	159	390	Site Related	0.0	Y	30 / 30
Methylphosphonic acid	ug/g	32 / 42	32 / 42	530	48	95	Site Related	0.0	Y	32 / 32
Thiodiglycol	ug/g	3 / 47	3 / 47	21	6.6	8.1	Site Related	0.0	Y	3 / 3

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal,

"Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases,

"Nonparametric UTL" is indicated.

**Table K-40. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 33A - Inside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Maximum Detected Result <sup>c</sup>	Mean	Standard Deviation	UTL Comparison <sup>d</sup>	95% UTL of Background Data Set <sup>e</sup>	Test : Max Detected Result Greater Than Background UTL <sup>f</sup>	Proportion of Detected Results Greater Than Background UTL <sup>g</sup>
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<sup>a</sup>The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup>Y - yes; N - no.

<sup>g</sup>Counts are based on the unaveraged data set.

**Table K-41. Inorganics Greater than Background UTL for SWMU 33A - Inside Building Surface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>	Value <sup>b</sup>						Comparison
Antimony	11.9	12.3	SB-33A-14	BORE	SAIC01	0.00		Poisson UTL
Antimony	11.9	24	SB-33A-23	BORE	SAIC01	0.00		Poisson UTL
Cadmium	21.1	22.9	SB-33-005A	BORE	SAIC01	0.00		Nonparametric UTL
Chromium	56.2	70.9	SS-33-006	BORE	SAIC01	0.00		Nonparametric UTL
Chromium	56.2	77.2	SB-33A-24	BORE	SAIC01	0.00		Nonparametric UTL
Chromium	56.2	83.9	SB-33A-14	BORE	SAIC01	0.00		Nonparametric UTL
Chromium	56.2	110	S-SS-33-01	GRAB	T2001	0.30		Nonparametric UTL
Chromium	56.2	116	SS-33-009	BORE	SAIC01	0.00		Nonparametric UTL
Cyanide	0	1.31	SB-33-005A	BORE	SAIC01	0.00		Site Related
Iron	21339.95549	32000	SB-33-006A	BORE	SAIC01	0.00		Normal UTL
Lead	401	500	S-SS-33-01	GRAB	T2001	0.30		Nonparametric UTL
Lead	401	685	SS-33-009	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.568	SB-33A-16	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.61	SB-33-008B	BORE	SAIC02	0.50		Nonparametric UTL
Sodium	5610	7800	S-SS-33-03	GRAB	T2003	0.30	T	Nonparametric UTL
Sodium	5610	11400	SS-33-009	BORE	SAIC01	0.00		Nonparametric UTL
Zinc	385	450	SB-33-010B	BORE	SAIC02	0.50		Nonparametric UTL
Zinc	385	594	SB-33-010A	BORE	SAIC01	0.00		Nonparametric UTL

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-42. Samples Included in Data Set for Subsurface Soils at SWMU 33A - Inside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-33-004C	BORE	SAIC03	1	SAIC	3-BK-1	BORE	S1055	2
	SB-33-005C	BORE	SAIC03	1		3-BK-2	BORE	S1057	2
	SB-33-006C	BORE	SAIC03	1		31-BK-1	BORE	S1019	2
	SB-33-007C	BORE	SAIC03	1		31-BK-2	BORE	S1021	2
	SB-33-008C	BORE	SAIC03	1		5-BK-1	BORE	S0136	2
	SB-33-009C	BORE	SAIC03	1		5-BK-2	BORE	S0138	2
	SB-33-010C	BORE	SAIC03	1		8-BK-1	BORE	S0773	2
	SB-33A-11	BORE	SAIC02	1		8-BK-2	BORE	S0775	2
	SB-33A-11	BORE	SAIC03	3.5		9-BK-1	BORE	S0333	2
	SB-33A-12	BORE	SAIC02	1		9-BK-2	BORE	S0335	2
	SB-33A-12	BORE	SAIC03	4		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-33A-12	BORE	SAIC04	10		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-33A-12	BORE	SAIC05	12		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-33A-13	BORE	SAIC02	1		S-SS-08-BK	BORE	SSS-08BK	1.5
	SB-33A-13	BORE	SAIC03	3.5		S-SS-08-BK	BORE	SSS08-BK	1.5
	SB-33A-13	BORE	SAIC04	5		S-SS-08-BK	BORE	SSS08BK	3
	SB-33A-13	BORE	SAIC05	10		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-33A-14	BORE	SAIC02	1		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-33A-14	BORE	SAIC03	3.5		S-SS-14-BK	BORE	SSS-14BK	1.5
	SB-33A-15	BORE	SAIC02	1		S-SS-14-BK	BORE	SSS14BK	1.5
	SB-33A-15	BORE	SAIC03	3		S-SS-19-BK	BORE	SSS-19BK	1.5
	SB-33A-16	BORE	SAIC02	1.5		S-SS-19-BK	BORE	SSS19BK	1.5
	SB-33A-16	BORE	SAIC03	5		S-SS-22-BK	BORE	SSS-22BK	1.5
	SB-33A-16	BORE	SAIC04	10		S-SS-22-BK	BORE	SSS22BK	1.5
	SB-33A-16	BORE	SAIC05	12		S-SS-26-BK	BORE	SSS-26BK	1.5
	SB-33A-17	BORE	SAIC02	1.5		S-SS-26-BK	BORE	SSS26-BK	1.5
	SB-33A-17	BORE	SAIC03	5		S-SS-27-BK	BORE	SSS-27BK	1.5
	SB-33A-17	BORE	SAIC04	10		S-SS-27-BK	BORE	SSS27-BK	1.5
	SB-33A-17	BORE	SAIC05	12		S-SS-29-BK	BORE	SSS-29BK	1.5
	SB-33A-18	BORE	SAIC02	1		S-SS-29-BK	BORE	SSS29-BK	1.5
	SB-33A-18	BORE	SAIC03	5		S-SS-36-BK	BORE	SSS-36BK	1.5
	SB-33A-18	BORE	SAIC04	10		S-SS-36-BK	BORE	SSS36-BK	1.5
	SB-33A-18	BORE	SAIC05	12		S-SS-36-BK	BORE	SSS36BK	1.5
	SB-33A-19	BORE	SAIC02	1		SB-BK-01	BORE	SAIC02	1
	SB-33A-19	BORE	SAIC03	5		SB-BK-01	BORE	SAIC03	5
	SB-33A-20	BORE	SAIC02	1		SB-BK-02	BORE	SAIC02	1
	SB-33A-20	BORE	SAIC03	5		SB-BK-02	BORE	SAIC03	5
	SB-33A-21	BORE	SAIC02	1		SB-BK-02	BORE	SAIC03D	5
	SB-33A-21	BORE	SAIC03	5		SB-BK-02	BORE	SAIC04	10
	SB-33A-21	BORE	SAIC04	10		SB-BK-03	BORE	SAIC02	1
	SB-33A-21	BORE	SAIC05	12		SB-BK-03	BORE	SAIC03	5
	SB-33A-22	BORE	SAIC02	1		SB-BK-03	BORE	SAIC03D	5
	SB-33A-22	BORE	SAIC03	5		SB-BK-03	BORE	SAIC04	10
	SB-33A-22	BORE	SAIC04	10		SB-BK-04	BORE	SAIC02	1
	SB-33A-22	BORE	SAIC05	12		SB-BK-04	BORE	SAIC03	5
	SB-33A-23	BORE	SAIC02	1		SB-BK-05	BORE	SAIC02	1
	SB-33A-23	BORE	SAIC03	5		SB-BK-05	BORE	SAIC03	5
	SB-33A-23	BORE	SAIC04	10		SB-BK-05	BORE	SAIC04	10
	SB-33A-23	BORE	SAIC05	12		SB-BK-06	BORE	SAIC02	1
	SB-33A-24	BORE	SAIC02	1		SB-BK-06	BORE	SAIC03	5
	SB-33A-24	BORE	SAIC03	5		SB-BK-06	BORE	SAIC04	10
	SB-33A-24	BORE	SAIC04	10		SB-BK-07	BORE	SAIC02	1
	SB-33A-24	BORE	SAIC05	12		SB-BK-07	BORE	SAIC03	5
	SB-33A-25	BORE	SAIC02	1		SB-BK-07	BORE	SAIC04	10
	SB-33A-25	BORE	SAIC03	5		SB-BK-08	BORE	SAIC02	1
	SB-33A-25	BORE	SAIC04	10		SB-BK-08	BORE	SAIC03	5
	SB-33A-26	BORE	SAIC02	1		SB-BK-09	BORE	SAIC02	1
	SB-33A-26	BORE	SAIC03	5		SB-BK-09	BORE	SAIC03	5
	SB-33A-26	BORE	SAIC04	10		SB-BK-10	BORE	SAIC02	1
	SB-33A-26	BORE	SAIC05	13		SB-BK-10	BORE	SAIC03	5
	SB-33A-27	BORE	SAIC02	1		SB-BK-01	BORE	SAIC01	0
	SB-33A-27	BORE	SAIC03	5		SB-BK-02	BORE	SAIC01	0
	SB-33A-27	BORE	SAIC04	10		SB-BK-03	BORE	SAIC01	0
	SB-33A-27	BORE	SAIC05	12		SB-BK-04	BORE	SAIC01	0
	SB-33A-28	BORE	SAIC02	1		SB-BK-05	BORE	SAIC01	0
	SB-33A-28	BORE	SAIC03	5		SB-BK-06	BORE	SAIC01	0
	SB-33A-28	BORE	SAIC04	10		SB-BK-07	BORE	SAIC01	0
	SB-33A-28	BORE	SAIC05	15		SB-BK-08	BORE	SAIC01	0
	SB-33A-29	BORE	SAIC02	1		SB-BK-09	BORE	SAIC01	0
	SB-33A-29	BORE	SAIC03	5		SB-BK-10	BORE	SAIC01	0
	SB-33A-29	BORE	SAIC04	10					
	SB-33A-29	BORE	SAIC05	12					

**Table K-43. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 33A - Inside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	72 / 72	72 / 72	100%	--	--	2,280	25,200	16,264	5,902	Lognormal	18,770	18,770
Antimony	ug/g	4 / 55	4 / 55	7%	6.0	7.1	6.7	12	3.5	1.6	Lognormal	3.7	3.7
Arsenic	ug/g	72 / 72	72 / 72	100%	--	--	3.4	23	10	3.3	Lognormal	11	11
Barium	ug/g	72 / 72	72 / 72	100%	--	--	42	297	129	43	Lognormal	140	140
Beryllium	ug/g	62 / 72	62 / 72	86%	0.50	0.50	0.60	1.2	0.78	0.27	Lognormal	0.89	0.89
Cadmium	ug/g	65 / 72	65 / 72	90%	0.20	0.70	0.20	7.5	0.86	1.0	Lognormal	1.0	1.0
Calcium	ug/g	72 / 72	72 / 72	100%	--	--	33,300	213,000	115,790	35,521	Lognormal	124,400	124,400
Chromium	ug/g	72 / 72	72 / 72	100%	--	--	6.5	46	28	7.6	Normal	29	29
Cobalt	ug/g	13 / 72	13 / 72	18%	5.0	5.0	2.2	6.7	2.9	1.2	Lognormal	3.1	3.1
Copper	ug/g	72 / 72	72 / 72	100%	--	--	4.1	152	19	21	Lognormal	20	20
Cyanide	ug/g	1 / 72	1 / 72	1%	0.50	0.92	1.3	1.3	0.28	0.14	Lognormal	0.29	0.29
Iron	ug/g	72 / 72	72 / 72	100%	--	--	4,860	20,800	14,488	3,977	Lognormal	15,641	15,641
Lead	ug/g	72 / 72	72 / 72	100%	--	--	6.4	544	44	75	Lognormal	48	48
Magnesium	ug/g	72 / 72	72 / 72	100%	--	--	7,120	19,600	12,283	2,119	Lognormal	12,734	12,734
Manganese	ug/g	72 / 72	72 / 72	100%	--	--	155	667	396	125	Normal	420	420
Mercury	ug/g	19 / 72	19 / 72	26%	0.050	0.050	0.058	1.5	0.11	0.23	Lognormal	0.11	0.11
Nickel	ug/g	72 / 72	72 / 72	100%	--	--	8.7	32	21	5.5	Normal	22	22
Potassium	ug/g	72 / 72	72 / 72	100%	--	--	600	6,760	4,069	1,680	Lognormal	4,740	4,740
Selenium	ug/g	2 / 72	2 / 72	3%	0.25	0.50	0.65	0.66	0.25	0.078	Lognormal	0.26	0.26
Silver	ug/g	23 / 72	23 / 72	32%	0.59	1.00	0.90	3.3	0.82	0.56	Lognormal	0.91	0.91
Sodium	ug/g	72 / 72	72 / 72	100%	--	--	194	1,800	466	273	Lognormal	508	508
Thallium	ug/g	14 / 72	14 / 72	19%	1.00	6.6	1.0	17	1.6	3.3	Lognormal	1.4	1.4
Vanadium	ug/g	72 / 72	72 / 72	100%	--	--	9.5	59	39	11	Normal	41	41
Zinc	ug/g	72 / 72	72 / 72	100%	--	--	33	439	99	71	Lognormal	110	110
Isopropyl methylphosphonate	ug/g	26 / 72	26 / 72	36%	0.50	0.50	0.68	64	3.0	8.5	Lognormal	3.2	3.2
Methylphosphonic acid	ug/g	13 / 72	13 / 72	18%	0.50	0.50	1.2	22	1.4	4.2	Lognormal	1.1	1.1

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-44. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 33A - Inside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	25,200	25,200	Nonparametric	--	0.071	16,264	14,545	--	--	-- / --	Not Site Related
Antimony	ug/g	7%	12	12	Poisson UTL	--	1.00	3.5	4.5	8.5	Y	-- / --	Site Related
Arsenic	ug/g	100%	23	53	Nonparametric	--	0.71	10	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	297	423	Nonparametric	--	0.93	129	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	86%	1.2	1.2	Nonparametric	--	0.0064	0.78	0.65	--	--	-- / --	Site Related
Cadmium	ug/g	90%	7.5	21	Nonparametric	--	0.19	0.86	1.1	--	--	-- / --	Not Site Related
Calcium	ug/g	100%	213,000	250,000	Nonparametric	--	0.0034	115,790	103,597	--	--	-- / --	Site Related
Chromium	ug/g	100%	46	56	Nonparametric	--	3.65E-07	28	22	--	--	-- / --	Site Related
Cobalt	ug/g	18%	6.7	11	Nonparametric	--	1.00	2.9	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	152	162	Nonparametric	--	0.55	19	17	--	--	-- / --	Not Site Related
Cyanide	ug/g	1%	1.3	--	Site Related	--	--	0.28	--	--	--	-- / --	Site Related
Iron	ug/g	100%	20,800	24,300	Nonparametric	--	0.15	14,488	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	544	401	Nonparametric	--	9.50E-05	44	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	19,600	35,700	Nonparametric	--	0.090	12,283	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	667	739	Nonparametric	Unequal	0.11	396	365	--	--	-- / --	Not Site Related
Mercury	ug/g	26%	1.5	0.36	Nonparametric	--	0.043	0.11	0.043	--	--	-- / --	Site Related
Nickel	ug/g	100%	32	36	Nonparametric	--	1.09E-05	21	15	--	--	-- / --	Site Related
Potassium	ug/g	100%	6,760	7,500	Nonparametric	--	0.097	4,069	3,619	--	--	-- / --	Not Site Related
Selenium	ug/g	3%	0.66	2.9	Nonparametric	--	0.64	0.25	0.72	--	--	-- / --	Not Site Related
Silver	ug/g	32%	3.3	3.7	Nonparametric	--	0.019	0.82	0.62	--	--	-- / --	Site Related
Sodium	ug/g	100%	1,800	5,610	Nonparametric	--	1.00	466	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	19%	17	34	Nonparametric	--	1.00	1.6	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	59	63	t-Test (N)	Equal	0.061	39	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	439	385	Nonparametric	--	0.0033	99	77	--	--	-- / --	Site Related
Isopropyl methylphosphonate	ug/g	36%	64	--	Site Related	--	--	3.0	--	--	--	-- / --	Site Related
Methylphosphonic acid	ug/g	18%	22	--	Site Related	--	--	1.4	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup>For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct

**Table K-44. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 33A - Inside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:10:17 PM					Probability of	Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00					Accepting/ Rejecting	Upper	Greater Than	Detected Greater	Background
Exposure Unit: 33A_SS1	Frequency	Site	Background	Background	Result of	Tolerance	Poisson	Than Poisson	Comparison <sup>g</sup>
Parameter	Units	of Detect	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Mean

the background comparison on the untransformed data.

b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.

c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.

2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.

3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-45. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 33A - Inside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:10:17 PM		Proportion of Detects		Maximum				95% UTL of	Test : Max	Proportion of
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Mean	Standard	UTL	Background	Detected Result	Detected Results
Exposure Unit: SD			Samples <sup>b</sup>	Result <sup>c</sup>		Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Greater Than	Greater Than
Parameter	Units								Background UTL <sup>f</sup>	Background UTL <sup>g</sup>
Aluminum	ug/g	72 / 72	72 / 72	25,200	16,264	5,902	Normal UTL	24,256	Y	4 / 72
Antimony	ug/g	4 / 55	4 / 55	12	3.5	1.6	Poisson UTL	12	Y	1 / 4
Arsenic	ug/g	72 / 72	72 / 72	3.1	10	3.3	Lognormal UTL	3.4	N	0 / 72
Barium	ug/g	72 / 72	72 / 72	297	129	43	Nonparametric UTL	423	N	0 / 72
Beryllium	ug/g	62 / 72	62 / 72	1.2	0.78	0.27	Nonparametric UTL	1.2	N	0 / 62
Cadmium	ug/g	65 / 72	65 / 72	7.5	0.86	1.0	Nonparametric UTL	21	N	0 / 65
Calcium	ug/g	72 / 72	72 / 72	213,000	115,790	35,521	Nonparametric UTL	250,000	N	0 / 72
Chromium	ug/g	72 / 72	72 / 72	46	28	7.6	Nonparametric UTL	56	N	0 / 72
Cobalt	ug/g	13 / 72	13 / 72	6.7	2.9	1.2	Normal UTL	10	N	0 / 13
Copper	ug/g	72 / 72	72 / 72	152	19	21	Nonparametric UTL	162	N	0 / 72
Cyanide	ug/g	1 / 72	1 / 72	1.3	0.28	0.14	Site Related	0.0	Y	1 / 1
Iron	ug/g	72 / 72	72 / 72	20,800	14,488	3,977	Normal UTL	21,340	N	0 / 72
Lead	ug/g	72 / 72	72 / 72	544	44	75	Nonparametric UTL	401	Y	1 / 72
Magnesium	ug/g	72 / 72	72 / 72	19,600	12,283	2,119	Nonparametric UTL	35,700	N	0 / 72
Manganese	ug/g	72 / 72	72 / 72	667	396	125	Normal UTL	649	Y	1 / 72
Mercury	ug/g	19 / 72	19 / 72	1.5	0.11	0.23	Nonparametric UTL	0.36	Y	8 / 19
Nickel	ug/g	72 / 72	72 / 72	32	21	5.5	Nonparametric UTL	33	N	0 / 72
Potassium	ug/g	72 / 72	72 / 72	6,760	4,069	1,680	Normal UTL	6,751	Y	1 / 72
Selenium	ug/g	2 / 72	2 / 72	0.66	0.25	0.078	Nonparametric UTL	2.9	N	0 / 2
Silver	ug/g	23 / 72	23 / 72	1.2	0.82	0.56	Lognormal UTL	0.47	Y	5 / 23
Sodium	ug/g	72 / 72	72 / 72	1,800	466	273	Nonparametric UTL	5,610	N	0 / 72
Thallium	ug/g	14 / 72	14 / 72	17	1.6	3.3	Nonparametric UTL	34	N	0 / 14
Vanadium	ug/g	72 / 72	72 / 72	59	39	11	Normal UTL	55	Y	4 / 72
Zinc	ug/g	72 / 72	72 / 72	439	99	71	Nonparametric UTL	385	Y	2 / 72
Isopropyl methylphosphonate	ug/g	26 / 72	26 / 72	64	3.0	8.5	Site Related	0.0	Y	26 / 26
Methylphosphonic acid	ug/g	13 / 72	13 / 72	22	1.4	4.2	Site Related	0.0	Y	13 / 13

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

- 1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated.
- 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL".
- 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated.
- 4) In all other cases, "Nonparametric UTL" is indicated.

**Table K-45. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 33A - Inside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:10:17 PM								Test : Max	Proportion of
Run Date: 11/20/00		Proportion of Detects	Proportion of Detects	Maximum			95% UTL of	Detected Result	Detected Results
Exposure Unit: SD		All Samples <sup>a</sup>	Temporal	Detected	Standard	UTL	Background	Greater Than	Greater Than
Parameter	Units		Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Background UTL <sup>f</sup>	Background UTL <sup>g</sup>

<sup>a</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>c</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-46. Inorganics Greater than Background UTL for SWMU 33A - Inside Building Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background Data Set <sup>a</sup>	Value <sup>b</sup>	Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
Aluminum	24255.75146	24300	SB-33A-12	BORE	SAIC02	1.00		Normal UTL
Aluminum	24255.75146	24500	SB-33A-29	BORE	SAIC02	1.00		Normal UTL
Aluminum	24255.75146	24700	SB-33A-29	BORE	SAIC03	5.00		Normal UTL
Aluminum	24255.75146	25200	SB-33A-19	BORE	SAIC02	1.00		Normal UTL
Antimony	11.9	12.4	SB-33A-14	BORE	SAIC03	3.50		Poisson UTL
Cyanide	0	1.33	SB-33-008C	BORE	SAIC03	1.00		Site Related
Lead	401	544	SB-33-008C	BORE	SAIC03	1.00		Nonparametric UTL
Manganese	648.7565583	667	SB-33A-22	BORE	SAIC02	1.00		Normal UTL
Mercury	0.359	0.366	SB-33A-18	BORE	SAIC02	1.00		Nonparametric UTL
Mercury	0.359	0.481	SB-33A-12	BORE	SAIC02	1.00		Nonparametric UTL
Mercury	0.359	0.506	SB-33A-16	BORE	SAIC02	1.50		Nonparametric UTL
Mercury	0.359	0.544	SB-33-007C	BORE	SAIC03	1.00		Nonparametric UTL
Mercury	0.359	0.555	SB-33A-17	BORE	SAIC02	1.50		Nonparametric UTL
Mercury	0.359	0.566	SB-33A-11	BORE	SAIC02	1.00		Nonparametric UTL
Mercury	0.359	0.66	SB-33-008C	BORE	SAIC03	1.00		Nonparametric UTL
Mercury	0.359	1.5	SB-33A-28	BORE	SAIC02	1.00		Nonparametric UTL
Potassium	6751.278819	6760	SB-33A-12	BORE	SAIC02	1.00		Normal UTL
Silver	0.467452072	1.94	SB-33A-21	BORE	SAIC02	1.00		Lognormal UTL
Silver	0.467452072	2	SB-33A-17	BORE	SAIC02	1.50		Lognormal UTL
Silver	0.467452072	2.06	SB-33-007C	BORE	SAIC03	1.00		Lognormal UTL
Silver	0.467452072	2.1	SB-33A-16	BORE	SAIC02	1.50		Lognormal UTL
Silver	0.467452072	3.27	SB-33-008C	BORE	SAIC03	1.00		Lognormal UTL
Vanadium	55.28143391	55.3	SB-33A-18	BORE	SAIC04	10.00		Normal UTL
Vanadium	55.28143391	56	SB-33A-19	BORE	SAIC02	1.00		Normal UTL
Vanadium	55.28143391	58	SB-33A-29	BORE	SAIC02	1.00		Normal UTL
Vanadium	55.28143391	59.3	SB-33A-29	BORE	SAIC03	5.00		Normal UTL
Zinc	385	410	SB-33-010C	BORE	SAIC03	1.00		Nonparametric UTL
Zinc	385	439	SB-33-008C	BORE	SAIC03	1.00		Nonparametric UTL

<sup>a</sup>The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup>The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-47. Samples Included in Data Set for Surface Soils at SWMU 33B - Outside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SS-33-001	BORE	SAIC01	0	SAIC	3-BK-1	BORE	S1055	2
	SS-33-002	BORE	SAIC01	0		3-BK-2	BORE	S1057	2
	SS-33-003	BORE	SAIC01	0		31-BK-1	BORE	S1019	2
	SS-33-004	BORE	SAIC01	0		31-BK-2	BORE	S1021	2
	SS-33-013	BORE		40248		5-BK-1	BORE	S0136	2
	SS-33-014	BORE		40249		5-BK-2	BORE	S0138	2
	SS-33-015	BORE		40252		8-BK-1	BORE	S0773	2
	SS-33-016	BORE		40253		8-BK-2	BORE	S0775	2
	SS-33-017	BORE		40255		9-BK-1	BORE	S0333	2
	SS-33-018	BORE		40256		9-BK-2	BORE	S0335	2
	SS-33-019	BORE		40257		S-SS-05-BK	BORE	SSS-05BK	1.5
	SS-33-020	BORE		40258		S-SS-05-BK	BORE	SSS05-BK	1.5
	SS-33-021	BORE		40259		S-SS-05-BK	BORE	SSS05BK	1.5
	SS-33-022	BORE		40260		S-SS-08-BK	BORE	SSS-08BK	1.5
	SS-33-023	BORE		40261		S-SS-08-BK	BORE	SSS08-BK	1.5
	SS-33-024	BORE		40263		S-SS-08-BK	BORE	SSS08BK	3
	SS-33-025	BORE		40264		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-33B-30	BORE	SAIC01	0		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-33B-31	BORE	SAIC01	0		S-SS-14-BK	BORE	SSS-14BK	1.5
	SB-33B-32	BORE	SAIC01	0		S-SS-14-BK	BORE	SSS14BK	1.5
	SB-33B-33	BORE	SAIC01	0		S-SS-19-BK	BORE	SSS-19BK	1.5
	SB-33B-34	BORE	SAIC01	0		S-SS-19-BK	BORE	SSS19BK	1.5
	SB-33B-35	BORE	SAIC01	0		S-SS-22-BK	BORE	SSS-22BK	1.5
	SB-33B-36	BORE	SAIC01	0		S-SS-22-BK	BORE	SSS22BK	1.5
	SB-33B-37	BORE	SAIC01	0		S-SS-26-BK	BORE	SSS-26BK	1.5
	SB-33B-38	BORE	SAIC01	0		S-SS-26-BK	BORE	SSS26-BK	1.5
	SB-33B-39	BORE	SAIC01	0		S-SS-27-BK	BORE	SSS-27BK	1.5
	SB-33B-40	BORE	SAIC01	0		S-SS-27-BK	BORE	SSS27-BK	1.5
	SB-33B-41	BORE	SAIC01	0		S-SS-29-BK	BORE	SSS-29BK	1.5
	SB-33B-42	BORE	SAIC01	0		S-SS-29-BK	BORE	SSS29-BK	1.5
	SB-33B-43	BORE	SAIC01	0		S-SS-36-BK	BORE	SSS-36BK	1.5
	SB-33B-44	BORE	SAIC01	0		S-SS-36-BK	BORE	SSS36-BK	1.5
	SB-33B-45	BORE	SAIC01	0		S-SS-36-BK	BORE	SSS36BK	1.5
	SB-33B-46	BORE	SAIC01	0		SB-BK-01	BORE	SAIC02	1
	SB-33B-47	BORE	SAIC01	0		SB-BK-01	BORE	SAIC03	5
	SB-33B-48	BORE	SAIC01	0		SB-BK-02	BORE	SAIC02	1
	SB-33B-49	BORE	SAIC01	0		SB-BK-02	BORE	SAIC03	5
	SB-33B-50	BORE	SAIC01	0		SB-BK-02	BORE	SAIC03D	5
	SB-33B-51	BORE	SAIC01	0		SB-BK-02	BORE	SAIC04	10
	SB-33B-52	BORE	SAIC01	0		SB-BK-03	BORE	SAIC02	1
	SB-33B-53	BORE	SAIC01	0		SB-BK-03	BORE	SAIC03	5
	SB-33B-54	BORE	SAIC01	0		SB-BK-03	BORE	SAIC03D	5
	SB-33B-55	BORE	SAIC01	0		SB-BK-03	BORE	SAIC04	10
	SB-33B-56	BORE	SAIC01	0		SB-BK-04	BORE	SAIC02	1
	SB-33-001A	BORE	SAIC01	0		SB-BK-04	BORE	SAIC03	5
	SB-33-001B	BORE	SAIC02	0.5		SB-BK-05	BORE	SAIC02	1
	SB-33-002A	BORE	SAIC01	0		SB-BK-05	BORE	SAIC03	5
	SB-33-002B	BORE	SAIC02	0.5		SB-BK-05	BORE	SAIC04	10
	SB-33-003A	BORE	SAIC01	0		SB-BK-06	BORE	SAIC02	1
	SB-33-003B	BORE	SAIC02	0.5		SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-48. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 33B - Outside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	10 / 10	10 / 10	100%	--	--	4,640	19,000	9,936	5,493	Normal	13,120	13,120
Antimony	ug/g	2 / 10	2 / 10	20%	7.1	7.1	12	12	5.2	3.5	Lognormal	7.5	7.5
Arsenic	ug/g	10 / 10	10 / 10	100%	--	--	6.6	64	19	17	Lognormal	34	34
Barium	ug/g	10 / 10	10 / 10	100%	--	--	59	173	123	40	Normal	146	146
Beryllium	ug/g	7 / 10	7 / 10	70%	0.50	0.50	0.59	1.1	0.63	0.31	Normal	0.81	0.81
Cadmium	ug/g	10 / 10	10 / 10	100%	--	--	1.8	12	4.7	3.4	Lognormal	8.0	8.0
Calcium	ug/g	10 / 10	10 / 10	100%	--	--	75,000	160,000	113,300	29,315	Normal	130,293	130,293
Chromium	ug/g	10 / 10	10 / 10	100%	--	--	8.4	32	21	7.2	Normal	25	25
Cobalt	ug/g	10 / 10	10 / 10	100%	--	--	3.1	7.4	4.9	1.8	Normal	5.9	5.9
Copper	ug/g	10 / 10	10 / 10	100%	--	--	30	427	135	131	Lognormal	320	320
Iron	ug/g	10 / 10	10 / 10	100%	--	--	7,020	19,500	11,978	4,935	Normal	14,839	14,839
Lead	ug/g	10 / 10	10 / 10	100%	--	--	91	958	347	264	Lognormal	622	622
Magnesium	ug/g	10 / 10	10 / 10	100%	--	--	8,990	16,600	12,672	2,598	Normal	14,178	14,178
Manganese	ug/g	10 / 10	10 / 10	100%	--	--	237	689	466	167	Normal	563	563
Mercury	ug/g	48 / 50	48 / 50	96%	0.20	0.20	0.067	236	17	50	Lognormal	28	28
Nickel	ug/g	10 / 10	10 / 10	100%	--	--	11	29	18	7.2	Lognormal	24	24
Potassium	ug/g	10 / 10	10 / 10	100%	--	--	1,790	6,400	3,346	1,541	Normal	4,239	4,239
Selenium	ug/g	1 / 10	1 / 10	10%	0.25	0.25	0.68	0.68	0.18	0.17	Lognormal	0.26	0.26
Silver	ug/g	7 / 10	7 / 10	70%	0.59	0.59	0.84	6.6	2.1	2.1	Lognormal	9.1	6.6 #
Sodium	ug/g	10 / 10	10 / 10	100%	--	--	394	697	549	105	Normal	609	609
Thallium	ug/g	8 / 10	8 / 10	80%	6.6	6.6	8.6	19	11	5.0	Normal	14	14
Vanadium	ug/g	10 / 10	10 / 10	100%	--	--	12	33	20	7.8	Normal	25	25
Zinc	ug/g	10 / 10	10 / 10	100%	--	--	110	655	296	174	Normal	397	397

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

- 1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.
- 3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-49. Analysis of Variance Background Comparison for Surface Soils at SWMU 33B - Outside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/ Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	19,000	25,200	t-Test (N)	Equal	0.024	9,936	14,545	--	--	-- / --	Not Site Related
Antimony	ug/g	20%	12	12	Poisson UTL	--	0.0014	5.2	4.5	8.5	Y	2 / 2	Site Related
Arsenic	ug/g	100%	64	53	Nonparametric	Unequal	0.097	19	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	173	423	Nonparametric	--	0.86	123	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	70%	1.1	1.2	Nonparametric	--	0.60	0.63	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	100%	12	21	Nonparametric	--	1.63E-06	4.7	1.1	--	--	-- / --	Site Related
Calcium	ug/g	100%	160,000	250,000	Nonparametric	--	0.097	113,300	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	32	56	Nonparametric	--	0.58	21	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	7.4	11	t-Test (N)	Equal	0.061	4.9	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	427	162	Nonparametric	--	7.58E-07	135	17	--	--	-- / --	Site Related
Iron	ug/g	100%	19,500	24,300	t-Test (N)	Equal	0.33	11,978	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	958	401	Nonparametric	--	1.42E-06	347	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	16,600	35,700	Nonparametric	--	0.17	12,672	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	689	739	t-Test (N)	Equal	0.090	466	365	--	--	-- / --	Not Site Related
Mercury	ug/g	96%	236	0.36	Nonparametric	--	0.0	17	0.043	--	--	-- / --	Site Related
Nickel	ug/g	100%	29	36	Nonparametric	--	0.25	18	15	--	--	-- / --	Not Site Related
Potassium	ug/g	100%	6,400	7,500	t-Test (N)	Equal	0.67	3,346	3,619	--	--	-- / --	Not Site Related
Selenium	ug/g	10%	0.68	2.9	Nonparametric	--	1.00	0.18	0.72	--	--	-- / --	Not Site Related
Silver	ug/g	70%	6.6	3.7	Nonparametric	Unequal	0.013	2.1	0.62	--	--	-- / --	Site Related
Sodium	ug/g	100%	697	5,610	Nonparametric	--	0.97	549	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	80%	19	34	Nonparametric	--	0.016	11	6.7	--	--	-- / --	Site Related
Vanadium	ug/g	100%	33	63	t-Test (N)	Equal	0.0014	20	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	655	385	Nonparametric	--	1.70E-06	296	77	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup>For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.

**Table K-49. Analysis of Variance Background Comparison for Surface Soils at SWMU 33B - Outside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:13:46 PM							Probability of			Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00							Accepting/			Upper	Greater Than	Detects Greater	Background
Exposure Unit: 33B_SS1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Background	
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>	

c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.

2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.

3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-50. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 33B - Outside Building (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects	Proportion of Detects	Maximum	Mean	Standard	UTL	95% UTL of	Test : Max	Proportion of
		All Samples <sup>a</sup>	Temporal	Detected					Detected Result <sup>c</sup>	
Exposure Unit: SS			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Background UTL <sup>f</sup>	Greater Than	Greater Than
Aluminum	ug/g	10 / 10	10 / 10	19,000	9,936	5,493	Normal UTL	24,256	N	0 / 10
Antimony	ug/g	2 / 10	2 / 10	12	5.2	3.5	Poisson UTL	12	Y	1 / 2
Arsenic	ug/g	10 / 10	10 / 10	4.2	19	17	Lognormal UTL	3.4	Y	1 / 10
Barium	ug/g	10 / 10	10 / 10	173	123	40	Nonparametric UTL	423	N	0 / 10
Beryllium	ug/g	7 / 10	7 / 10	1.1	0.63	0.31	Nonparametric UTL	1.2	N	0 / 7
Cadmium	ug/g	10 / 10	10 / 10	12	4.7	3.4	Nonparametric UTL	21	N	0 / 10
Calcium	ug/g	10 / 10	10 / 10	160,000	113,300	29,315	Nonparametric UTL	250,000	N	0 / 10
Chromium	ug/g	10 / 10	10 / 10	32	21	7.2	Nonparametric UTL	56	N	0 / 10
Cobalt	ug/g	10 / 10	10 / 10	7.4	4.9	1.8	Normal UTL	10	N	0 / 10
Copper	ug/g	10 / 10	10 / 10	427	135	131	Nonparametric UTL	162	Y	3 / 10
Iron	ug/g	10 / 10	10 / 10	19,500	11,978	4,935	Normal UTL	21,340	N	0 / 10
Lead	ug/g	10 / 10	10 / 10	958	347	264	Nonparametric UTL	401	Y	3 / 10
Magnesium	ug/g	10 / 10	10 / 10	16,600	12,672	2,598	Nonparametric UTL	35,700	N	0 / 10
Manganese	ug/g	10 / 10	10 / 10	689	466	167	Normal UTL	649	Y	1 / 10
Mercury	ug/g	48 / 50	48 / 50	236	17	50	Nonparametric UTL	0.36	Y	34 / 48
Nickel	ug/g	10 / 10	10 / 10	29	18	7.2	Nonparametric UTL	33	N	0 / 10
Potassium	ug/g	10 / 10	10 / 10	6,400	3,346	1,541	Normal UTL	6,751	N	0 / 10
Selenium	ug/g	1 / 10	1 / 10	0.68	0.18	0.17	Nonparametric UTL	2.9	N	0 / 1
Silver	ug/g	7 / 10	7 / 10	1.9	2.1	2.1	Lognormal UTL	0.47	Y	4 / 7
Sodium	ug/g	10 / 10	10 / 10	697	549	105	Nonparametric UTL	5,610	N	0 / 10
Thallium	ug/g	8 / 10	8 / 10	19	11	5.0	Nonparametric UTL	34	N	0 / 8
Vanadium	ug/g	10 / 10	10 / 10	33	20	7.8	Normal UTL	55	N	0 / 10
Zinc	ug/g	10 / 10	10 / 10	655	296	174	Nonparametric UTL	385	Y	2 / 10

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-51. Inorganics Greater than Background UTL for SWMU 33B - Outside Building Surface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>	Value <sup>b</sup>						Comparison
Antimony	11.9	12	SS-33-004	BORE	SAIC01	0.00		Poisson UTL
Arsenic	3.37044058	64	SS-33-003	BORE	SAIC01	0.00		Lognormal UTL
Copper	162	172	SS-33-001	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	301	SS-33-003	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	427	SS-33-002	BORE	SAIC01	0.00		Nonparametric UTL
Lead	401	425	SB-33-002A	BORE	SAIC01	0.00		Nonparametric UTL
Lead	401	635	SS-33-001	BORE	SAIC01	0.00		Nonparametric UTL
Lead	401	958	SS-33-003	BORE	SAIC01	0.00		Nonparametric UTL
Manganese	648.7565583	689	SS-33-001	BORE	SAIC01	0.00		Normal UTL
Mercury	0.359	0.36	SB-33B-39	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.394	SB-33B-45	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.4	SS-33-017	BORE	40255	0.00		Nonparametric UTL
Mercury	0.359	0.4	SS-33-014	BORE	40249	0.00		Nonparametric UTL
Mercury	0.359	0.43	SB-33-001B	BORE	SAIC02	0.50		Nonparametric UTL
Mercury	0.359	0.471	SB-33-001A	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.485	SB-33B-56	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.52	SS-33-004	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.6	SS-33-021	BORE	40259	0.00		Nonparametric UTL
Mercury	0.359	0.615	SB-33-003B	BORE	SAIC02	0.50		Nonparametric UTL
Mercury	0.359	0.7	SS-33-015	BORE	40252	0.00		Nonparametric UTL
Mercury	0.359	0.7	SS-33-019	BORE	40257	0.00		Nonparametric UTL
Mercury	0.359	0.7	SS-33-023	BORE	40261	0.00		Nonparametric UTL
Mercury	0.359	0.772	SB-33B-31	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.8	SS-33-018	BORE	40256	0.00		Nonparametric UTL
Mercury	0.359	0.82	SB-33B-32	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	0.958	SS-33-003	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	1.45	SB-33B-30	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	1.53	SB-33B-33	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	1.77	SB-33B-54	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	2.07	SB-33B-35	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	2.1	SS-33-013	BORE	40248	0.00		Nonparametric UTL
Mercury	0.359	2.62	SB-33B-34	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	2.7	SB-33-002B	BORE	SAIC02	0.50		Nonparametric UTL
Mercury	0.359	3	SS-33-024	BORE	40263	0.00		Nonparametric UTL
Mercury	0.359	3.8	SB-33-002A	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	6.22	SB-33B-52	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	17.5	SB-33B-53	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	25	SS-33-001	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	42	SS-33-020	BORE	40258	0.00		Nonparametric UTL
Mercury	0.359	118	SB-33B-37	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	167	SB-33B-36	BORE	SAIC01	0.00		Nonparametric UTL
Mercury	0.359	190	SB-33B-38	BORE	SAIC01	0.00		Nonparametric UTL

**Table K-51. Inorganics Greater than Background UTL for SWMU 33B - Outside Building Surface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>	Value <sup>b</sup>						Comparison
Mercury	0.359	236	SS-33-022	BORE	40260	0.00		Nonparametric UTL
Silver	0.467452072	3	SB-33-002B	BORE	SAIC02	0.50		Lognormal UTL
Silver	0.467452072	3.34	SB-33-002A	BORE	SAIC01	0.00		Lognormal UTL
Silver	0.467452072	3.73	SS-33-001	BORE	SAIC01	0.00		Lognormal UTL
Silver	0.467452072	6.55	SS-33-003	BORE	SAIC01	0.00		Lognormal UTL
Zinc	385	515	SS-33-001	BORE	SAIC01	0.00		Nonparametric UTL
Zinc	385	655	SS-33-003	BORE	SAIC01	0.00		Nonparametric UTL

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-52. Samples Included in Data Set for Subsurface Soils at SWMU 33B - Outside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-33-001C	BORE	SAIC03	1	SAIC	3-BK-1	BORE	S1055	2
	SB-33-002C	BORE	SAIC03	1		3-BK-2	BORE	S1057	2
	SB-33-003C	BORE	SAIC03	1		31-BK-1	BORE	S1019	2
	SB-33B-30	BORE	SAIC02	1		31-BK-2	BORE	S1021	2
	SB-33B-30	BORE	SAIC03	5		5-BK-1	BORE	S0136	2
	SB-33B-31	BORE	SAIC02	1		5-BK-2	BORE	S0138	2
	SB-33B-31	BORE	SAIC03	5		8-BK-1	BORE	S0773	2
	SB-33B-32	BORE	SAIC02	1		8-BK-2	BORE	S0775	2
	SB-33B-32	BORE	SAIC03	5		9-BK-1	BORE	S0333	2
	SB-33B-33	BORE	SAIC02	1		9-BK-2	BORE	S0335	2
	SB-33B-33	BORE	SAIC03	5		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-33B-34	BORE	SAIC02	1		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-33B-34	BORE	SAIC03	5		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-33B-35	BORE	SAIC02	1		S-SS-08-BK	BORE	SSS-08BK	1.5
	SB-33B-35	BORE	SAIC03	5		S-SS-08-BK	BORE	SSS08-BK	1.5
	SB-33B-36	BORE	SAIC02	1		S-SS-08-BK	BORE	SSS08BK	3
	SB-33B-36	BORE	SAIC03	5		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-33B-37	BORE	SAIC02	1		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-33B-37	BORE	SAIC03	5		S-SS-14-BK	BORE	SSS-14BK	1.5
	SB-33B-37	BORE	SAIC04	10		S-SS-14-BK	BORE	SSS14BK	1.5
	SB-33B-38	BORE	SAIC02	1		S-SS-19-BK	BORE	SSS-19BK	1.5
	SB-33B-38	BORE	SAIC03	5		S-SS-19-BK	BORE	SSS19BK	1.5
	SB-33B-39	BORE	SAIC02	1		S-SS-22-BK	BORE	SSS-22BK	1.5
	SB-33B-39	BORE	SAIC03	5		S-SS-22-BK	BORE	SSS22BK	1.5
	SB-33B-40	BORE	SAIC02	1		S-SS-26-BK	BORE	SSS-26BK	1.5
	SB-33B-40	BORE	SAIC03	5		S-SS-26-BK	BORE	SSS26-BK	1.5
	SB-33B-41	BORE	SAIC02	1		S-SS-27-BK	BORE	SSS-27BK	1.5
	SB-33B-41	BORE	SAIC03	5		S-SS-27-BK	BORE	SSS27-BK	1.5
	SB-33B-41	BORE	SAIC04	10		S-SS-29-BK	BORE	SSS-29BK	1.5
	SB-33B-42	BORE	SAIC02	1		S-SS-29-BK	BORE	SSS29-BK	1.5
	SB-33B-42	BORE	SAIC03	5		S-SS-36-BK	BORE	SSS-36BK	1.5
	SB-33B-42	BORE	SAIC04	10		S-SS-36-BK	BORE	SSS36-BK	1.5
	SB-33B-43	BORE	SAIC02	1		S-SS-36-BK	BORE	SSS36BK	1.5
	SB-33B-43	BORE	SAIC03	5		SB-BK-01	BORE	SAIC02	1
	SB-33B-43	BORE	SAIC04	10		SB-BK-01	BORE	SAIC03	5
	SB-33B-44	BORE	SAIC02	1		SB-BK-02	BORE	SAIC02	1
	SB-33B-44	BORE	SAIC03	5		SB-BK-02	BORE	SAIC03	5
	SB-33B-44	BORE	SAIC04	10		SB-BK-02	BORE	SAIC03D	5
	SB-33B-45	BORE	SAIC02	1		SB-BK-02	BORE	SAIC04	10
	SB-33B-45	BORE	SAIC03	5		SB-BK-03	BORE	SAIC02	1
	SB-33B-45	BORE	SAIC04	10		SB-BK-03	BORE	SAIC03	5
	SB-33B-46	BORE	SAIC02	1		SB-BK-03	BORE	SAIC03D	5
	SB-33B-46	BORE	SAIC03	5		SB-BK-03	BORE	SAIC04	10
	SB-33B-46	BORE	SAIC04	10		SB-BK-04	BORE	SAIC02	1
	SB-33B-47	BORE	SAIC02	1		SB-BK-04	BORE	SAIC03	5
	SB-33B-47	BORE	SAIC03	5		SB-BK-05	BORE	SAIC02	1
	SB-33B-47	BORE	SAIC04	10		SB-BK-05	BORE	SAIC03	5
	SB-33B-48	BORE	SAIC02	1		SB-BK-05	BORE	SAIC04	10
	SB-33B-48	BORE	SAIC03	5		SB-BK-06	BORE	SAIC02	1
	SB-33B-48	BORE	SAIC04	10		SB-BK-06	BORE	SAIC03	5
	SB-33B-49	BORE	SAIC02	1		SB-BK-06	BORE	SAIC04	10
	SB-33B-49	BORE	SAIC03	5		SB-BK-07	BORE	SAIC02	1
	SB-33B-49	BORE	SAIC04	10		SB-BK-07	BORE	SAIC03	5
	SB-33B-50	BORE	SAIC02	1		SB-BK-07	BORE	SAIC04	10
	SB-33B-50	BORE	SAIC03	5		SB-BK-08	BORE	SAIC02	1
	SB-33B-50	BORE	SAIC04	10		SB-BK-08	BORE	SAIC03	5
	SB-33B-51	BORE	SAIC02	1		SB-BK-09	BORE	SAIC02	1
	SB-33B-51	BORE	SAIC03	5		SB-BK-09	BORE	SAIC03	5
	SB-33B-51	BORE	SAIC04	10		SB-BK-10	BORE	SAIC02	1
	SB-33B-52	BORE	SAIC02	1		SB-BK-10	BORE	SAIC03	5
	SB-33B-52	BORE	SAIC03	5		SB-BK-01	BORE	SAIC01	0
	SB-33B-52	BORE	SAIC04	10		SB-BK-02	BORE	SAIC01	0
	SB-33B-53	BORE	SAIC02	1		SB-BK-03	BORE	SAIC01	0
	SB-33B-53	BORE	SAIC03	5		SB-BK-04	BORE	SAIC01	0
	SB-33B-53	BORE	SAIC04	10		SB-BK-05	BORE	SAIC01	0
	SB-33B-54	BORE	SAIC02	1		SB-BK-06	BORE	SAIC01	0
	SB-33B-54	BORE	SAIC03	5		SB-BK-07	BORE	SAIC01	0
	SB-33B-54	BORE	SAIC04	10		SB-BK-08	BORE	SAIC01	0
	SB-33B-55	BORE	SAIC02	1		SB-BK-09	BORE	SAIC01	0
	SB-33B-55	BORE	SAIC03	5		SB-BK-10	BORE	SAIC01	0
	SB-33B-55	BORE	SAIC04	10					
	SB-33B-56	BORE	SAIC02	1					

**Table K-52. Samples Included in Data Set for Subsurface Soils at SWMU 33B - Outside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
	SB-33B-56	BORE	SAIC03	5					
	SB-33B-56	BORE	SAIC04	10					

**Table K-53. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 33B - Outside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	3 / 3	3 / 3	100%	--	--	13,000	19,200	15,767	3,153	Undetermined	--	19,200 #
Arsenic	ug/g	3 / 3	3 / 3	100%	--	--	6.8	22	12	8.5	Undetermined	--	22 #
Barium	ug/g	3 / 3	3 / 3	100%	--	--	125	178	160	30	Undetermined	--	178 #
Beryllium	ug/g	3 / 3	3 / 3	100%	--	--	0.95	1.4	1.2	0.21	Undetermined	--	1.4 #
Cadmium	ug/g	3 / 3	3 / 3	100%	--	--	1.3	6.7	3.5	2.8	Undetermined	--	6.7 #
Calcium	ug/g	3 / 3	3 / 3	100%	--	--	95,000	100,000	97,000	2,646	Undetermined	--	100,000 #
Chromium	ug/g	3 / 3	3 / 3	100%	--	--	20	26	22	-3.4	Undetermined	--	26 #
Cobalt	ug/g	3 / 3	3 / 3	100%	--	--	6.3	7.6	7.2	0.76	Undetermined	--	7.6 #
Copper	ug/g	3 / 3	3 / 3	100%	--	--	23	140	69	62	Undetermined	--	140 #
Iron	ug/g	3 / 3	3 / 3	100%	--	--	15,700	18,800	17,167	1,557	Undetermined	--	18,800 #
Lead	ug/g	3 / 3	3 / 3	100%	--	--	36	530	233	262	Undetermined	--	530 #
Magnesium	ug/g	3 / 3	3 / 3	100%	--	--	12,900	15,000	13,700	1,136	Undetermined	--	15,000 #
Manganese	ug/g	3 / 3	3 / 3	100%	--	--	550	765	651	108	Undetermined	--	765 #
Mercury	ug/g	23 / 74	23 / 74	31%	0.050	0.100	0.043	1.1	0.12	0.23	Lognormal	0.12	0.12
Nickel	ug/g	3 / 3	3 / 3	100%	--	--	24	28	26	1.9	Undetermined	--	28 #
Potassium	ug/g	3 / 3	3 / 3	100%	--	--	3,780	5,710	4,837	978	Undetermined	--	5,710 #
Silver	ug/g	2 / 3	2 / 3	67%	0.59	0.59	1.00	4.1	1.8	2.0	Undetermined	--	4.1 #
Sodium	ug/g	3 / 3	3 / 3	100%	--	--	570	709	660	78	Undetermined	--	709 #
Thallium	ug/g	2 / 3	2 / 3	67%	6.6	6.6	17	20	13	8.8	Undetermined	--	20 #
Vanadium	ug/g	3 / 3	3 / 3	100%	--	--	24	32	27	4.6	Undetermined	--	32 #
Zinc	ug/g	3 / 3	3 / 3	100%	--	--	115	424	242	162	Undetermined	--	424 #

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-54. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 33B - Outside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:13:46 PM							Probability of			Poisson	Test: Max	Proportion of	
Run Date: 11/20/00							Accepting/			Upper	Greater Than	Than Poisson	
Exposure Unit: 33B_SS1		Frequency	Site	Background	Background	Result of	Rejecting/	Site	Background	Tolerance	Poisson	UTL <sup>f</sup>	UTL <sup>f</sup>
Parameter	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	19,200	25,200	Compare Maxima	--	--	15,767	14,545	--	--	-- / --	Not Site Related
Arsenic	ug/g	100%	22	53	Compare Maxima	--	--	12	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	178	423	Compare Maxima	--	--	160	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	100%	1.4	1.2	Compare Maxima	--	--	1.2	0.65	--	--	-- / --	Site Related
Cadmium	ug/g	100%	6.7	21	Compare Maxima	--	--	3.5	1.1	--	--	-- / --	Not Site Related
Calcium	ug/g	100%	100,000	250,000	Compare Maxima	--	--	97,000	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	26	56	Compare Maxima	--	--	22	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	7.6	11	Compare Maxima	--	--	7.2	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	140	162	Compare Maxima	--	--	69	17	--	--	-- / --	Not Site Related
Iron	ug/g	100%	18,800	24,300	Compare Maxima	--	--	17,167	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	530	401	Compare Maxima	--	--	233	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	15,000	35,700	Compare Maxima	--	--	13,700	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	765	739	Compare Maxima	--	--	651	365	--	--	-- / --	Site Related
Mercury	ug/g	31%	1.1	0.36	Nonparametric	--	0.00036	0.12	0.043	--	--	-- / --	Site Related
Nickel	ug/g	100%	28	36	Compare Maxima	--	--	26	15	--	--	-- / --	Not Site Related
Potassium	ug/g	100%	5,710	7,500	Compare Maxima	--	--	4,837	3,619	--	--	-- / --	Not Site Related
Silver	ug/g	67%	4.1	3.7	Compare Maxima	--	--	1.8	0.62	--	--	-- / --	Site Related
Sodium	ug/g	100%	709	5,610	Compare Maxima	--	--	660	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	67%	20	34	Compare Maxima	--	--	13	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	32	63	Compare Maxima	--	--	27	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	424	385	Compare Maxima	--	--	242	77	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup>For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

**Table K-54. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 33B - Outside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:13:46 PM											Probability of	Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00											Accepting/	Upper	Greater Than	Detects Greater	Background
Exposure Unit: 33B_SS1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Than Poisson	Background		
Parameter	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>	Null Hypothesis <sup>c</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>		

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-55. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 33B - Outside Building (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:13:46 PM		Proportion of Detects		Maximum	Standard		UTL	95% UTL of	Test : Max	Proportion of
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Mean	Deviation	Comparison <sup>d</sup>	Background	Detected Result	Detected Results
Exposure Unit: SD			Samples <sup>b</sup>	Result <sup>c</sup>				Data Set <sup>e</sup>	Greater Than	Greater Than
Parameter	Units								Background UTL <sup>f</sup>	Background UTL <sup>g</sup>
Aluminum	ug/g	3 / 3	3 / 3	19,200	15,767	3,153	Normal UTL	24,256	N	0 / 3
Arsenic	ug/g	3 / 3	3 / 3	3.1	12	8.5	Lognormal UTL	3.4	N	0 / 3
Barium	ug/g	3 / 3	3 / 3	178	160	30	Nonparametric UTL	423	N	0 / 3
Beryllium	ug/g	3 / 3	3 / 3	1.4	1.2	0.21	Nonparametric UTL	1.2	Y	1 / 3
Cadmium	ug/g	3 / 3	3 / 3	6.7	3.5	2.8	Nonparametric UTL	21	N	0 / 3
Calcium	ug/g	3 / 3	3 / 3	100,000	97,000	2,646	Nonparametric UTL	250,000	N	0 / 3
Chromium	ug/g	3 / 3	3 / 3	26	22	3.4	Nonparametric UTL	56	N	0 / 3
Cobalt	ug/g	3 / 3	3 / 3	7.6	7.2	0.76	Normal UTL	10	N	0 / 3
Copper	ug/g	3 / 3	3 / 3	140	69	62	Nonparametric UTL	162	N	0 / 3
Iron	ug/g	3 / 3	3 / 3	18,800	17,167	1,557	Normal UTL	21,340	N	0 / 3
Lead	ug/g	3 / 3	3 / 3	530	233	262	Nonparametric UTL	401	Y	1 / 3
Magnesium	ug/g	3 / 3	3 / 3	15,000	13,700	1,136	Nonparametric UTL	35,700	N	0 / 3
Manganese	ug/g	3 / 3	3 / 3	765	651	108	Normal UTL	649	Y	1 / 3
Mercury	ug/g	23 / 74	23 / 74	1.1	0.12	0.23	Nonparametric UTL	0.36	Y	8 / 23
Nickel	ug/g	3 / 3	3 / 3	28	26	1.9	Nonparametric UTL	33	N	0 / 3
Potassium	ug/g	3 / 3	3 / 3	5,710	4,837	978	Normal UTL	6,751	N	0 / 3
Silver	ug/g	2 / 3	2 / 3	1.4	1.8	2.0	Lognormal UTL	0.47	Y	1 / 2
Sodium	ug/g	3 / 3	3 / 3	709	660	78	Nonparametric UTL	5,610	N	0 / 3
Thallium	ug/g	2 / 3	2 / 3	20	13	8.8	Nonparametric UTL	34	N	0 / 2
Vanadium	ug/g	3 / 3	3 / 3	32	27	4.6	Normal UTL	55	N	0 / 3
Zinc	ug/g	3 / 3	3 / 3	424	242	162	Nonparametric UTL	385	Y	1 / 3

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

- 1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-56. Inorganics Greater than Background UTL for SWMU 33B - Outside Building Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Beryllium	1.21	1.37	SB-33-001C	BORE	SAIC03	1.00		Nonparametric UTL
Lead	401	530	SB-33-001C	BORE	SAIC03	1.00		Nonparametric UTL
Manganese	648.7565583	765	SB-33-002C	BORE	SAIC03	1.00		Normal UTL
Mercury	0.359	0.446	SB-33B-53	BORE	SAIC02	1.00		Nonparametric UTL
Mercury	0.359	0.571	SB-33B-45	BORE	SAIC02	1.00		Nonparametric UTL
Mercury	0.359	0.661	SB-33-001C	BORE	SAIC03	1.00		Nonparametric UTL
Mercury	0.359	0.678	SB-33B-47	BORE	SAIC02	1.00		Nonparametric UTL
Mercury	0.359	0.681	SB-33B-37	BORE	SAIC03	5.00		Nonparametric UTL
Mercury	0.359	0.735	SB-33B-52	BORE	SAIC02	1.00		Nonparametric UTL
Mercury	0.359	0.94	SB-33-002C	BORE	SAIC03	1.00		Nonparametric UTL
Mercury	0.359	1.12	SB-33B-46	BORE	SAIC02	1.00		Nonparametric UTL
Silver	0.467452072	4.06	SB-33-001C	BORE	SAIC03	1.00		Lognormal UTL
Zinc	385	424	SB-33-001C	BORE	SAIC03	1.00		Nonparametric UTL

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-57. Samples Included in Data Set for Surface Soils at SWMU 33C - Drainage Swale (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	TP-33-001A	BORE	SAIC01	0.5	SAIC	3-BK-1	BORE	S1055	2
	TP-33-002A	BORE	SAIC01	0.5		3-BK-2	BORE	S1057	2
	TP-33-003A	BORE	SAIC01	0.5		31-BK-1	BORE	S1019	2
	TP-33-004A	BORE	SAIC01	0.5		31-BK-2	BORE	S1021	2
	TP-33-005A	BORE	SAIC01	0.5		5-BK-1	BORE	S0136	2
	TP-33-006A	BORE	SAIC01	0.5		5-BK-2	BORE	S0138	2
	TP-33-007A	BORE	SAIC01	0.5		8-BK-1	BORE	S0773	2
	TP-33-008A	BORE	SAIC01	0.5		8-BK-2	BORE	S0775	2
						9-BK-1	BORE	S0333	2
						9-BK-2	BORE	S0335	2
						S-SS-05-BK	BORE	SSS-05BK	1.5
						S-SS-05-BK	BORE	SSS05-BK	1.5
						S-SS-05-BK	BORE	SSS05BK	1.5
						S-SS-08-BK	BORE	SSS-08BK	1.5
						S-SS-08-BK	BORE	SSS08-BK	1.5
						S-SS-08-BK	BORE	SSS08BK	3
						S-SS-10-BK	BORE	SSS-10BK	1.5
						S-SS-10-BK	BORE	SSS10-BK	1.5
						S-SS-14-BK	BORE	SSS-14BK	1.5
						S-SS-14-BK	BORE	SSS14BK	1.5
						S-SS-19-BK	BORE	SSS-19BK	1.5
						S-SS-19-BK	BORE	SSS19BK	1.5
						S-SS-22-BK	BORE	SSS-22BK	1.5
						S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC03	1
						SB-BK-01	BORE	SAIC02	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-58. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 33C - Drainage Swale (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>e</sup>		Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum				Arith. Mean <sup>c</sup>	Concentration <sup>e</sup>	
Aluminum	ug/g	8 / 8	8 / 8	100%	--	--	4,150	15,400	10,629	3,862	Normal	13,215	13,215	
Arsenic	ug/g	8 / 8	8 / 8	100%	--	--	6.4	22	13	4.8	Lognormal	18	18	
Barium	ug/g	8 / 8	8 / 8	100%	--	--	101	172	144	28	Normal	162	162	
Beryllium	ug/g	6 / 8	6 / 8	75%	0.50	0.50	0.66	0.91	0.64	0.25	Normal	0.81	0.81	
Cadmium	ug/g	8 / 8	8 / 8	100%	--	--	1.00	4.1	2.8	0.98	Normal	3.4	3.4	
Calcium	ug/g	8 / 8	8 / 8	100%	--	--	75,000	150,000	99,250	25,839	Normal	116,558	116,558	
Chromium	ug/g	8 / 8	8 / 8	100%	--	--	16	27	21	4.5	Normal	24	24	
Cobalt	ug/g	8 / 8	8 / 8	100%	--	--	3.0	6.0	4.8	1.2	Normal	5.6	5.6	
Copper	ug/g	8 / 8	8 / 8	100%	--	--	21	68	46	16	Normal	56	56	
Iron	ug/g	8 / 8	8 / 8	100%	--	--	8,540	15,700	12,355	2,844	Normal	14,260	14,260	
Lead	ug/g	8 / 8	8 / 8	100%	--	--	41	283	154	72	Normal	202	202	
Magnesium	ug/g	8 / 8	8 / 8	100%	--	--	7,750	12,500	10,553	1,513	Normal	11,566	11,566	
Manganese	ug/g	8 / 8	8 / 8	100%	--	--	215	506	393	109	Normal	466	466	
Nickel	ug/g	8 / 8	8 / 8	100%	--	--	14	24	19	4.3	Normal	22	22	
Potassium	ug/g	8 / 8	8 / 8	100%	--	--	2,050	4,930	3,548	955	Normal	4,187	4,187	
Silver	ug/g	5 / 8	5 / 8	63%	0.59	0.59	0.69	1.2	0.73	0.39	Lognormal	1.4	1.2	#
Sodium	ug/g	8 / 8	8 / 8	100%	--	--	496	725	610	76	Normal	660	660	
Vanadium	ug/g	8 / 8	8 / 8	100%	--	--	12	27	20	5.2	Normal	23	23	
Zinc	ug/g	8 / 8	8 / 8	100%	--	--	82	229	159	50	Normal	192	192	
Naphthalene	ug/g	1 / 8	1 / 8	13%	0.037	0.70	0.052	0.052	0.064	0.12	Lognormal	0.22	0.052	#
Trichlorofluoromethane	ug/g	3 / 8	3 / 8	38%	0.0059	0.0059	0.011	0.015	0.0067	0.0053	Lognormal	0.016	0.015	#

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

Table K-59. Analysis of Variance Background Comparison for Surface Soils at SWMU 33C - Drainage Swale (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah

Run Time: 5:06:06 PM						Probability of			Poisson	Test: Max	Proportion of		
Run Date: 11/20/00						Accepting/			Upper	Greater Than	Detects Greater	Result of	
Exposure Unit: 33_SS1		Frequency	Site	Background	Background	Result of	Null Hypothesis <sup>f</sup>	Site	Background	Tolerance	Poisson	Than Poisson	
Parameter	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>		Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Background
Aluminum	ug/g	100%	15,400	25,200	t-Test (N)	Equal	0.069	10,629	14,545	--	--	-- / --	Not Site Related
Arsenic	ug/g	100%	22	53	t-Test (L)	Equal	0.95	13	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	172	423	Nonparametric	--	0.55	144	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	75%	0.91	1.2	Nonparametric	--	0.67	0.64	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	100%	4.1	21	Nonparametric	--	2.40E-05	2.8	1.1	--	--	-- / --	Site Related
Calcium	ug/g	100%	150,000	250,000	Nonparametric	--	0.35	99,250	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	27	56	Nonparametric	--	0.53	21	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	6.0	11	t-Test (N)	Equal	0.066	4.8	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	68	162	Nonparametric	--	1.91E-05	46	17	--	--	-- / --	Site Related
Iron	ug/g	100%	15,700	24,300	t-Test (N)	Equal	0.47	12,355	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	283	401	Nonparametric	--	4.03E-05	154	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	12,500	35,700	Nonparametric	--	0.92	10,553	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	506	739	t-Test (N)	Equal	0.65	393	365	--	--	-- / --	Not Site Related
Nickel	ug/g	100%	24	36	Nonparametric	--	0.075	19	15	--	--	-- / --	Not Site Related
Potassium	ug/g	100%	4,930	7,500	t-Test (N)	Equal	0.92	3,548	3,619	--	--	-- / --	Not Site Related
Silver	ug/g	63%	1.2	3.7	t-Test (L)	Equal	0.59	0.73	0.62	--	--	-- / --	Not Site Related
Sodium	ug/g	100%	725	5,610	Nonparametric	--	0.93	610	1,680	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	27	63	Nonparametric	Unequal	1.00	20	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	229	385	Nonparametric	--	0.00011	159	77	--	--	-- / --	Site Related
Naphthalene	ug/g	13%	0.35	--	Site Related	--	--	0.064	--	--	--	-- / --	Site Related
Trichlorofluoromethane	ug/g	38%	0.015	--	Site Related	--	--	0.0067	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

\*For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

**Table K-59. Analysis of Variance Background Comparison for Surface Soils at SWMU 33C - Drainage Swale (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
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Run Time: 5:06:06 PM

Run Date: 11/20/00

Exposure Unit: 33\_SS1

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-60. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 33C - Drainage Swale (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects	Proportion of Detects	Maximum	Mean	Standard	UTL	95% UTL of	Test : Max	Proportion of
		All Samples <sup>a</sup>	Temporal	Detected					Detected Result	
Exposure Unit: SS			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Background	Greater Than	Background UTL <sup>f</sup>	Greater Than
							Data Set <sup>e</sup>			Background UTL <sup>g</sup>
Aluminum	ug/g	8 / 8	8 / 8	15,400	10,629	3,862	Normal UTL	24,256	N	0 / 8
Arsenic	ug/g	8 / 8	8 / 8	3.1	13	4.8	Lognormal UTL	3.4	N	0 / 8
Barium	ug/g	8 / 8	8 / 8	172	144	28	Nonparametric UTL	423	N	0 / 8
Beryllium	ug/g	6 / 8	6 / 8	0.91	0.64	0.25	Nonparametric UTL	1.2	N	0 / 6
Cadmium	ug/g	8 / 8	8 / 8	4.1	2.8	0.98	Nonparametric UTL	21	N	0 / 8
Calcium	ug/g	8 / 8	8 / 8	150,000	99,250	25,839	Nonparametric UTL	250,000	N	0 / 8
Chromium	ug/g	8 / 8	8 / 8	27	21	4.5	Nonparametric UTL	56	N	0 / 8
Cobalt	ug/g	8 / 8	8 / 8	6.0	4.8	1.2	Normal UTL	10	N	0 / 8
Copper	ug/g	8 / 8	8 / 8	68	46	16	Nonparametric UTL	162	N	0 / 8
Iron	ug/g	8 / 8	8 / 8	15,700	12,355	2,844	Normal UTL	21,340	N	0 / 8
Lead	ug/g	8 / 8	8 / 8	283	154	72	Nonparametric UTL	401	N	0 / 8
Magnesium	ug/g	8 / 8	8 / 8	12,500	10,553	1,513	Nonparametric UTL	35,700	N	0 / 8
Manganese	ug/g	8 / 8	8 / 8	506	393	109	Normal UTL	649	N	0 / 8
Nickel	ug/g	8 / 8	8 / 8	24	19	4.3	Nonparametric UTL	33	N	0 / 8
Potassium	ug/g	8 / 8	8 / 8	4,930	3,548	955	Normal UTL	6,751	N	0 / 8
Silver	ug/g	5 / 8	5 / 8	0.17	0.73	0.39	Lognormal UTL	0.47	N	0 / 5
Sodium	ug/g	8 / 8	8 / 8	725	610	76	Nonparametric UTL	5,610	N	0 / 8
Vanadium	ug/g	8 / 8	8 / 8	27	20	5.2	Normal UTL	55	N	0 / 8
Zinc	ug/g	8 / 8	8 / 8	229	159	50	Nonparametric UTL	385	N	0 / 8
Naphthalene	ug/g	1 / 8	1 / 8	0.35	0.064	0.12	Site Related	0.0	Y	1 / 1
Trichlorofluoromethane	ug/g	3 / 8	3 / 8	0.015	0.0067	0.0053	Site Related	0.0	Y	3 / 3

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal,

"Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases,

"Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-61. Samples Included in Data Set for Subsurface Soils at SWMU 33C - Drainage Swale (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	TP-33-001B	BORE	SAIC02	3	SAIC	3-BK-1	BORE	S1055	2
	TP-33-001C	BORE	SAIC03	5		3-BK-2	BORE	S1057	2
	TP-33-001D	BORE	SAIC04	10		31-BK-1	BORE	S1019	2
	TP-33-002B	BORE	SAIC02	3		31-BK-2	BORE	S1021	2
	TP-33-002C	BORE	SAIC03	6		5-BK-1	BORE	S0136	2
	TP-33-002D	BORE	SAIC04	10		5-BK-2	BORE	S0138	2
	TP-33-003B	BORE	SAIC02	3.5		8-BK-1	BORE	S0773	2
	TP-33-003C	BORE	SAIC03	6		8-BK-2	BORE	S0775	2
	TP-33-003D	BORE	SAIC04	10		9-BK-1	BORE	S0333	2
	TP-33-004B	BORE	SAIC02	3.75		9-BK-2	BORE	S0335	2
	TP-33-004C	BORE	SAIC03	6.75		S-SS-05-BK	BORE	SSS-05BK	1.5
	TP-33-004D	BORE	SAIC04	10		S-SS-05-BK	BORE	SSS05-BK	1.5
	TP-33-005B	BORE	SAIC02	3		S-SS-05-BK	BORE	SSS05BK	1.5
	TP-33-005C	BORE	SAIC03	6		S-SS-08-BK	BORE	SSS-08BK	1.5
	TP-33-005D	BORE	SAIC04	10		S-SS-08-BK	BORE	SSS08-BK	1.5
	TP-33-006B	BORE	SAIC02	3		S-SS-08-BK	BORE	SSS08BK	3
	TP-33-006C	BORE	SAIC03	6		S-SS-10-BK	BORE	SSS-10BK	1.5
	TP-33-006D	BORE	SAIC04	10		S-SS-10-BK	BORE	SSS10-BK	1.5
	TP-33-007B	BORE	SAIC02	3		S-SS-14-BK	BORE	SSS-14BK	1.5
	TP-33-007C	BORE	SAIC03	6.5		S-SS-14-BK	BORE	SSS14BK	1.5
	TP-33-007D	BORE	SAIC04	10		S-SS-19-BK	BORE	SSS-19BK	1.5
	TP-33-008B	BORE	SAIC02	3.8		S-SS-19-BK	BORE	SSS19BK	1.5
	TP-33-008C	BORE	SAIC03	6.3		S-SS-22-BK	BORE	SSS-22BK	1.5
	TP-33-008D	BORE	SAIC04	10		S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-62. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 33C - Drainage Swale (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	24 / 24	24 / 24	100%	--	--	2,750	13,500	8,367	3,433	Normal	9,568	9,568
Arsenic	ug/g	24 / 24	24 / 24	100%	--	--	5.6	19	10	3.4	Lognormal	11	11
Barium	ug/g	24 / 24	24 / 24	100%	--	--	35	348	125	78	Lognormal	169	169
Beryllium	ug/g	10 / 24	10 / 24	42%	0.50	0.50	0.58	0.91	0.44	0.24	Lognormal	0.56	0.56
Cadmium	ug/g	20 / 24	20 / 24	83%	0.70	0.70	0.87	41	3.5	8.1	Lognormal	5.1	5.1
Calcium	ug/g	24 / 24	24 / 24	100%	--	--	60,000	140,000	102,292	18,541	Normal	108,778	108,778
Chromium	ug/g	24 / 24	24 / 24	100%	--	--	8.1	40	20	8.9	Lognormal	24	24
Cobalt	ug/g	24 / 24	24 / 24	100%	--	--	1.8	6.3	4.2	1.3	Normal	4.6	4.6
Copper	ug/g	24 / 24	24 / 24	100%	--	--	7.4	576	55	113	Lognormal	78	78
Iron	ug/g	24 / 24	24 / 24	100%	--	--	5,800	20,500	11,428	3,609	Normal	12,690	12,690
Lead	ug/g	24 / 24	24 / 24	100%	--	--	16	644	162	182	Lognormal	322	322
Magnesium	ug/g	24 / 24	24 / 24	100%	--	--	7,860	19,500	10,984	2,337	Lognormal	11,773	11,773
Manganese	ug/g	24 / 24	24 / 24	100%	--	--	199	474	340	84	Normal	370	370
Mercury	ug/g	4 / 24	4 / 24	17%	0.050	0.40	0.055	0.51	0.11	0.11	Lognormal	0.18	0.18
Nickel	ug/g	24 / 24	24 / 24	100%	--	--	11	28	18	4.3	Normal	20	20
Potassium	ug/g	24 / 24	24 / 24	100%	--	--	581	4,650	2,554	1,326	Normal	3,018	3,018
Silver	ug/g	9 / 24	9 / 24	38%	0.59	0.59	0.65	1.3	0.51	0.31	Lognormal	0.63	0.63
Sodium	ug/g	24 / 24	24 / 24	100%	--	--	298	766	505	111	Normal	544	544
Thallium	ug/g	3 / 24	3 / 24	13%	6.6	6.6	9.0	13	4.2	2.5	Lognormal	4.8	4.8
Vanadium	ug/g	24 / 24	24 / 24	100%	--	--	11	24	18	4.5	Normal	20	20
Zinc	ug/g	24 / 24	24 / 24	100%	--	--	43	392	145	98	Lognormal	196	196
2-Methylnaphthalene	ug/g	3 / 24	3 / 24	13%	0.049	2.0	0.11	0.40	0.11	0.22	Lognormal	0.16	0.16
Benzene	ug/g	1 / 24	1 / 24	4%	0.0015	0.0015	0.0032	0.0032	0.00085	0.00050	Lognormal	0.00093	0.00093
Chloroform	ug/g	1 / 24	1 / 24	4%	0.00087	0.00087	0.0011	0.0011	0.00046	0.00014	Lognormal	0.00049	0.00049
Naphthalene	ug/g	2 / 24	2 / 24	8%	0.037	2.0	0.093	0.12	0.087	0.21	Lognormal	0.11	0.11
Phenanthrene	ug/g	2 / 24	2 / 24	8%	0.033	2.0	0.047	0.068	0.082	0.21	Lognormal	0.099	0.068 #
Toluene	ug/g	5 / 24	5 / 24	21%	0.00078	0.00078	0.00082	0.0020	0.00057	0.00041	Lognormal	0.00067	0.00067
Trichlorofluoromethane	ug/g	13 / 24	13 / 24	54%	0.0059	0.0059	0.0088	0.039	0.011	0.011	Lognormal	0.018	0.018
di-N-Butyl Phthalate	ug/g	1 / 24	1 / 24	4%	0.061	3.0	0.97	0.97	0.16	0.35	Lognormal	0.22	0.22

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

**Table K-62. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 33C - Drainage Swale (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:06:06 PM	Proportion	Proportion									Exposure	
Run Date: 11/20/00	of Detects	of Detects	Frequency	NonDetects	Detects		Arithmetic	Standard	95% UCL of		Point	
Exposure Unit: 33__SS1	All Samples <sup>a</sup>	Temporal	of Detection	Min CRL	Max CRL	Minimum	Maximum	Mean <sup>c</sup>	Deviation <sup>c</sup>	Distribution <sup>d</sup>	Arith. Mean <sup>c</sup>	Concentration <sup>e</sup>
Parameter	Units	Samples <sup>b</sup>										

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

\*The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "\*" next to the EPC).

Table K-63. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 33C - Drainage Swale (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	13,500	25,200	Nonparametric	Unequal	1.00	8,367	14,545	--	--	-- / --	Not Site Related
Arsenic	ug/g	100%	19	53	Nonparametric	Unequal	0.77	10	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	348	423	Nonparametric	--	0.93	125	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	42%	0.91	1.2	Nonparametric	--	1.00	0.44	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	83%	41	21	Nonparametric	--	8.16E-06	3.5	1.1	--	--	-- / --	Site Related
Calcium	ug/g	100%	140,000	250,000	Nonparametric	--	0.064	102,292	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	40	56	Nonparametric	--	0.91	20	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	6.3	11	Nonparametric	Unequal	1.00	4.2	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	576	162	Nonparametric	--	0.00065	55	17	--	--	-- / --	Site Related
Iron	ug/g	100%	20,500	24,300	t-Test (N)	Equal	0.051	11,428	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	644	401	Nonparametric	--	4.44E-09	162	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	19,500	35,700	Nonparametric	--	0.96	10,984	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	474	739	Nonparametric	Unequal	0.64	340	365	--	--	-- / --	Not Site Related
Mercury	ug/g	17%	0.51	0.36	Nonparametric	--	5.83E-06	0.11	0.043	--	--	-- / --	Site Related
Nickel	ug/g	100%	28	36	Nonparametric	--	0.044	18	15	--	--	-- / --	Site Related
Potassium	ug/g	100%	4,650	7,500	t-Test (N)	Equal	0.015	2,554	3,619	--	--	-- / --	Not Site Related
Silver	ug/g	38%	1.3	3.7	Nonparametric	--	0.83	0.51	0.62	--	--	-- / --	Not Site Related
Sodium	ug/g	100%	766	5,610	Nonparametric	--	1.00	505	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	13%	13	34	Nonparametric	--	0.015	4.2	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	24	63	Nonparametric	Unequal	1.00	18	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	392	385	Nonparametric	--	0.00056	145	77	--	--	-- / --	Site Related
2-Methylnaphthalene	ug/g	13%	1.00	--	Site Related	--	--	0.11	--	--	--	-- / --	Site Related
Benzene	ug/g	4%	0.0032	--	Site Related	--	--	0.00085	--	--	--	-- / --	Site Related
Chloroform	ug/g	4%	0.0011	--	Site Related	--	--	0.00046	--	--	--	-- / --	Site Related
Naphthalene	ug/g	8%	1.00	--	Site Related	--	--	0.087	--	--	--	-- / --	Site Related
Phenanthrene	ug/g	8%	1.00	--	Site Related	--	--	0.082	--	--	--	-- / --	Site Related
Toluene	ug/g	21%	0.0020	--	Site Related	--	--	0.00057	--	--	--	-- / --	Site Related
Trichlorofluoromethane	ug/g	54%	0.039	--	Site Related	--	--	0.011	--	--	--	-- / --	Site Related
di-N-Butyl Phthalate	ug/g	4%	1.5	--	Site Related	--	--	0.16	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is

**Table K-63. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 33C - Drainage Swale (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:06:06 PM											Probability of	Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00											Accepting/	Upper	Greater Than	Detects Greater	Background
Exposure Unit: 33_SS1	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Than Poisson	Comparison <sup>8</sup>		
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>	Null Hypothesis <sup>f</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>e</sup>	UTL <sup>e</sup>	Comparison <sup>8</sup>		

compared to the maximum detected concentration in the background data set.

4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):

a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.

b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.

c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>f</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>c</sup> Counts are based on the unaveraged data set.

<sup>8</sup> Result of Background Comparison:

1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.

2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.

3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-64. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 33C - Drainage Swale (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:06:06 PM Run Date: 11/20/00 Exposure Unit: SD		Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Maximum Detected Result <sup>c</sup>	Mean	Standard Deviation	UTL Comparison <sup>d</sup>	95% UTL of Background Data Set <sup>e</sup>	Test : Max Detected Result Greater Than Background UTL <sup>f</sup>	Proportion of Detected Results Greater Than Background UTL <sup>g</sup>
Parameter	Units									
Aluminum	ug/g	24 / 24	24 / 24	13,500	8,367	3,433	Normal UTL	24,256	N	0 / 24
Arsenic	ug/g	24 / 24	24 / 24	2.9	10	3.4	Lognormal UTL	3.4	N	0 / 24
Barium	ug/g	24 / 24	24 / 24	348	125	78	Nonparametric UTL	423	N	0 / 24
Beryllium	ug/g	10 / 24	10 / 24	0.91	0.44	0.24	Nonparametric UTL	1.2	N	0 / 10
Cadmium	ug/g	20 / 24	20 / 24	41	3.5	8.1	Nonparametric UTL	21	Y	1 / 20
Calcium	ug/g	24 / 24	24 / 24	140,000	102,292	18,541	Nonparametric UTL	250,000	N	0 / 24
Chromium	ug/g	24 / 24	24 / 24	40	20	8.9	Nonparametric UTL	56	N	0 / 24
Cobalt	ug/g	24 / 24	24 / 24	6.3	4.2	1.3	Normal UTL	10	N	0 / 24
Copper	ug/g	24 / 24	24 / 24	576	55	113	Nonparametric UTL	162	Y	1 / 24
Iron	ug/g	24 / 24	24 / 24	20,500	11,428	3,609	Normal UTL	21,340	N	0 / 24
Lead	ug/g	24 / 24	24 / 24	644	162	182	Nonparametric UTL	401	Y	3 / 24
Magnesium	ug/g	24 / 24	24 / 24	19,500	10,984	2,337	Nonparametric UTL	35,700	N	0 / 24
Manganese	ug/g	24 / 24	24 / 24	474	340	84	Normal UTL	649	N	0 / 24
Mercury	ug/g	4 / 24	4 / 24	0.51	0.11	0.11	Nonparametric UTL	0.36	Y	1 / 4
Nickel	ug/g	24 / 24	24 / 24	28	18	4.3	Nonparametric UTL	33	N	0 / 24
Potassium	ug/g	24 / 24	24 / 24	4,650	2,554	1,326	Normal UTL	6,751	N	0 / 24
Silver	ug/g	9 / 24	9 / 24	0.29	0.51	0.31	Lognormal UTL	0.47	N	0 / 9
Sodium	ug/g	24 / 24	24 / 24	766	505	111	Nonparametric UTL	5,610	N	0 / 24
Thallium	ug/g	3 / 24	3 / 24	13	4.2	2.5	Nonparametric UTL	34	N	0 / 3
Vanadium	ug/g	24 / 24	24 / 24	24	18	4.5	Normal UTL	55	N	0 / 24
Zinc	ug/g	24 / 24	24 / 24	392	145	98	Nonparametric UTL	385	Y	1 / 24
2-Methylnaphthalene	ug/g	3 / 24	3 / 24	1.00	0.11	0.22	Site Related	0.0	Y	3 / 3
Benzene	ug/g	1 / 24	1 / 24	0.0032	0.00085	0.00050	Site Related	0.0	Y	1 / 1
Chloroform	ug/g	1 / 24	1 / 24	0.0011	0.00046	0.00014	Site Related	0.0	Y	1 / 1
Naphthalene	ug/g	2 / 24	2 / 24	1.00	0.087	0.21	Site Related	0.0	Y	2 / 2
Phenanthrene	ug/g	2 / 24	2 / 24	1.00	0.082	0.21	Site Related	0.0	Y	2 / 2
Toluene	ug/g	5 / 24	5 / 24	0.0020	0.00057	0.00041	Site Related	0.0	Y	5 / 5
Trichlorofluoromethane	ug/g	13 / 24	13 / 24	0.039	0.011	0.011	Site Related	0.0	Y	13 / 13
di-N-Butyl Phthalate	ug/g	1 / 24	1 / 24	1.5	0.16	0.35	Site Related	0.0	Y	1 / 1

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

**Table K-64. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 33C - Drainage Swale (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:06:06 PM	Proportion of Detects		Maximum				Test : Max	Proportion of
Run Date: 11/20/00	All Samples <sup>a</sup>	Temporal	Detected	Mean	Standard	UTL	Detected Result	Detected Results
Exposure Unit: SD		Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Greater Than	Greater Than
Parameter	Units						Background UTL <sup>f</sup>	Background UTL <sup>g</sup>

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-65. Inorganics Greater than Background UTL for SWMU 33C - Drainage Swale Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>	Value <sup>b</sup>						Comparison
Cadmium	21.1	41.1	TP-33-007B	BORE	SAIC02	3.00		Nonparametric UTL
Copper	162	576	TP-33-007C	BORE	SAIC03	6.50		Nonparametric UTL
Lead	401	535	TP-33-007C	BORE	SAIC03	6.50		Nonparametric UTL
Lead	401	546	TP-33-001D	BORE	SAIC04	10.00		Nonparametric UTL
Lead	401	644	TP-33-007B	BORE	SAIC02	3.00		Nonparametric UTL
Mercury	0.359	0.512	TP-33-001D	BORE	SAIC04	10.00		Nonparametric UTL
Zinc	385	392	TP-33-007C	BORE	SAIC03	6.50		Nonparametric UTL

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-66. Samples Included in Data Set for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-37-001A	BORE	SAIC01	0	SAIC	3-BK-1	BORE	S1055	2
	SB-37-002A	BORE	SAIC01	0		3-BK-2	BORE	S1057	2
	SB-37-003A	BORE	SAIC01	0		31-BK-1	BORE	S1019	2
	SB-37-004A	BORE	SAIC01	0		31-BK-2	BORE	S1021	2
	SB-37-005A	BORE	SAIC01	0		5-BK-1	BORE	S0136	2
	SB-37-006A	BORE	SAIC01	0		5-BK-2	BORE	S0138	2
	SB-37-007A	BORE	SAIC01	0		8-BK-1	BORE	S0773	2
	SB-37-008A	BORE	SAIC01	0		8-BK-2	BORE	S0775	2
	SB-37-009A	BORE	SAIC01	0		9-BK-1	BORE	S0333	2
	SB-37-010A	BORE	SAIC01	0		9-BK-2	BORE	S0335	2
						S-SS-05-BK	BORE	SSS-05BK	1.5
						S-SS-05-BK	BORE	SSS05-BK	1.5
						S-SS-05-BK	BORE	SSS05BK	1.5
						S-SS-08-BK	BORE	SSS-08BK	1.5
						S-SS-08-BK	BORE	SSS08-BK	1.5
						S-SS-08-BK	BORE	SSS08BK	3
						S-SS-10-BK	BORE	SSS-10BK	1.5
						S-SS-10-BK	BORE	SSS10-BK	1.5
						S-SS-14-BK	BORE	SSS-14BK	1.5
						S-SS-14-BK	BORE	SSS14BK	1.5
						S-SS-19-BK	BORE	SSS-19BK	1.5
						S-SS-19-BK	BORE	SSS19BK	1.5
						S-SS-22-BK	BORE	SSS-22BK	1.5
						S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0

**Table K-66. Samples Included in Data Set for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-67. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	Exposure Point Concentration <sup>e</sup>	
					Min CRL	Max CRL	Minimum	Maximum				Arith. Mean <sup>c</sup>	95% UCL of
Aluminum	ug/g	8 / 10	8 / 10	80%	1,770	3,550	4,270	19,800	7,708	6,019	Normal	11,197	11,197
Arsenic	ug/g	10 / 10	10 / 10	100%	--	--	3.4	12	7.9	3.0	Lognormal	11	11
Barium	ug/g	10 / 10	10 / 10	100%	--	--	44	181	137	45	Normal	163	163
Beryllium	ug/g	4 / 10	4 / 10	40%	0.50	0.50	0.57	1.0	0.50	0.34	Lognormal	0.86	0.86
Cadmium	ug/g	4 / 10	4 / 10	40%	0.70	0.70	1.1	1.4	0.71	0.47	Lognormal	1.2	1.2
Calcium	ug/g	6 / 10	6 / 10	60%	8,640	140,000	49,900	120,000	67,622	34,771	Normal	87,778	87,778
Chromium	ug/g	6 / 10	6 / 10	60%	5.0	29	6.8	23	10	5.9	Normal	13	13
Cobalt	ug/g	10 / 10	10 / 10	100%	--	--	1.8	6.5	4.5	1.5	Normal	5.4	5.4
Copper	ug/g	10 / 10	10 / 10	100%	--	--	9.2	30	18	7.6	Normal	22	22
Iron	ug/g	9 / 10	9 / 10	90%	4,130	4,130	6,420	18,200	9,284	4,904	Normal	12,126	12,126
Lead	ug/g	10 / 10	10 / 10	100%	--	--	11	34	21	8.6	Normal	26	26
Magnesium	ug/g	6 / 10	6 / 10	60%	6,510	17,500	8,300	14,000	9,161	3,313	Normal	11,081	11,081
Manganese	ug/g	10 / 10	10 / 10	100%	--	--	220	532	392	100	Normal	450	450
Nickel	ug/g	10 / 10	10 / 10	100%	--	--	7.9	23	16	6.1	Normal	19	19
Potassium	ug/g	6 / 10	6 / 10	60%	413	4,360	1,320	5,780	2,132	1,619	Normal	3,070	3,070
Sodium	ug/g	6 / 10	6 / 10	60%	406	563	461	789	425	194	Normal	538	538
Thallium	ug/g	4 / 10	4 / 10	40%	6.6	6.6	10	13	6.4	4.0	Lognormal	11	11
Vanadium	ug/g	10 / 10	10 / 10	100%	--	--	8.4	28	17	6.9	Normal	21	21
Zinc	ug/g	10 / 10	10 / 10	100%	--	--	32	100	57	25	Normal	71	71
Acenaphthene	ug/g	1 / 10	1 / 10	10%	0.036	0.20	0.22	0.22	0.046	0.066	Lognormal	0.10	0.10
Anthracene	ug/g	1 / 10	1 / 10	10%	0.033	0.20	0.24	0.24	0.047	0.073	Lognormal	0.11	0.11
Benzo(a)anthracene	ug/g	1 / 10	1 / 10	10%	0.17	0.80	0.70	0.70	0.18	0.21	Lognormal	0.33	0.33
Benzo(a)pyrene	ug/g	1 / 10	1 / 10	10%	0.25	1.00	0.59	0.59	0.21	0.18	Lognormal	0.33	0.33
Benzo(b)fluoranthene	ug/g	1 / 10	1 / 10	10%	0.21	1.00	0.65	0.65	0.20	0.20	Lognormal	0.35	0.35
Benzo(g,h,i)perylene	ug/g	1 / 10	1 / 10	10%	0.25	1.00	0.32	0.32	0.18	0.13	Lognormal	0.26	0.26
Benzo(k)fluoranthene	ug/g	1 / 10	1 / 10	10%	0.066	0.30	0.42	0.42	0.083	0.12	Lognormal	0.17	0.17
Chrysene	ug/g	1 / 10	1 / 10	10%	0.12	0.60	0.96	0.96	0.17	0.29	Lognormal	0.39	0.39
Dibenzofuran	ug/g	1 / 10	1 / 10	10%	0.035	0.20	0.064	0.064	0.030	0.028	Lognormal	0.050	0.050
Fluoranthene	ug/g	1 / 10	1 / 10	10%	0.068	0.30	1.8	1.8	0.22	0.56	Lognormal	0.67	0.67
Fluorene	ug/g	1 / 10	1 / 10	10%	0.033	0.20	0.14	0.14	0.037	0.045	Lognormal	0.075	0.075
Indeno(1,2,3-cd)pyrene	ug/g	1 / 10	1 / 10	10%	0.29	1.00	0.31	0.31	0.20	0.12	Lognormal	0.27	0.27
Phenanthrene	ug/g	1 / 10	1 / 10	10%	0.033	0.20	1.00	1.00	0.12	0.31	Lognormal	0.44	0.44
Pyrene	ug/g	1 / 10	1 / 10	10%	0.033	0.20	1.6	1.6	0.18	0.50	Lognormal	0.77	0.77

-- Not applicable

**Table K-67. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:21:17 PM	Proportion	Proportion											
Run Date: 11/20/00	of Detects	of Detects											Exposure
Exposure Unit: 37_SS2	All Samples <sup>a</sup>	Temporal	Frequency	NonDetects	Detects	Arithmetic	Standard				95% UCL of		Point
Parameter	Units	Samples <sup>b</sup>	of Detection	Min CRL	Max CRL	Minimum	Maximum	Mean <sup>c</sup>	Deviation <sup>c</sup>	Distribution <sup>d</sup>	Arith. Mean <sup>c</sup>		Concentration <sup>e</sup>

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.

3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-68. Analysis of Variance Background Comparison for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:21:17 PM							Probability of			Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00							Accepting/			Upper	Greater Than	Detects Greater	Background
Exposure Unit: 37_SS2		Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson	Comparison <sup>g</sup>
Parameter	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>	Null Hypothesis <sup>f</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>i</sup>	
Aluminum	ug/g	80%	19,800	25,200	t-Test (N)	Equal	0.0013	7,708	14,545	--	--	-- / --	Not Site Related
Arsenic	ug/g	100%	12	53	Nonparametric	Unequal	0.97	7.9	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	181	423	Nonparametric	--	0.57	137	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	40%	1.0	1.2	Nonparametric	--	0.94	0.50	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	40%	1.4	21	Nonparametric	--	0.64	0.71	1.1	--	--	-- / --	Not Site Related
Calcium	ug/g	60%	120,000	250,000	Nonparametric	--	0.97	67,622	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	60%	23	56	Nonparametric	--	1.00	10	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	6.5	11	t-Test (N)	Equal	0.019	4.5	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	30	162	Nonparametric	--	0.11	18	17	--	--	-- / --	Not Site Related
Iron	ug/g	90%	18,200	24,300	t-Test (N)	Equal	0.011	9,284	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	34	401	Nonparametric	--	0.066	21	32	--	--	-- / --	Not Site Related
Magnesium	ug/g	60%	14,000	35,700	Nonparametric	--	0.99	9,161	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	532	739	t-Test (N)	Equal	0.62	392	365	--	--	-- / --	Not Site Related
Nickel	ug/g	100%	23	36	Nonparametric	--	0.50	16	15	--	--	-- / --	Not Site Related
Potassium	ug/g	60%	5,780	7,500	t-Test (N)	Equal	0.022	2,132	3,619	--	--	-- / --	Not Site Related
Sodium	ug/g	60%	789	5,610	Nonparametric	--	1.00	425	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	40%	13	34	Nonparametric	--	0.049	6.4	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	28	63	t-Test (N)	Equal	8.99E-05	17	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	100	385	Nonparametric	--	0.93	57	77	--	--	-- / --	Not Site Related
Acenaphthene	ug/g	10%	0.22	--	Site Related	--	--	0.046	--	--	--	-- / --	Site Related
Anthracene	ug/g	10%	0.24	--	Site Related	--	--	0.047	--	--	--	-- / --	Site Related
Benzo(a)anthracene	ug/g	10%	0.70	--	Site Related	--	--	0.18	--	--	--	-- / --	Site Related
Benzo(a)pyrene	ug/g	10%	0.59	--	Site Related	--	--	0.21	--	--	--	-- / --	Site Related
Benzo(b)fluoranthene	ug/g	10%	0.65	--	Site Related	--	--	0.20	--	--	--	-- / --	Site Related
Benzo(g,h,i)perylene	ug/g	10%	0.50	--	Site Related	--	--	0.18	--	--	--	-- / --	Site Related
Benzo(k)fluoranthene	ug/g	10%	0.42	--	Site Related	--	--	0.083	--	--	--	-- / --	Site Related
Chrysene	ug/g	10%	0.96	--	Site Related	--	--	0.17	--	--	--	-- / --	Site Related
Dibenzofuran	ug/g	10%	0.100	--	Site Related	--	--	0.030	--	--	--	-- / --	Site Related
Fluoranthene	ug/g	10%	1.8	--	Site Related	--	--	0.22	--	--	--	-- / --	Site Related
Fluorene	ug/g	10%	0.14	--	Site Related	--	--	0.037	--	--	--	-- / --	Site Related
Indeno(1,2,3-cd)pyrene	ug/g	10%	0.50	--	Site Related	--	--	0.20	--	--	--	-- / --	Site Related
Phenanthrene	ug/g	10%	1.00	--	Site Related	--	--	0.12	--	--	--	-- / --	Site Related
Pyrene	ug/g	10%	1.6	--	Site Related	--	--	0.18	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

**Table K-68. Analysis of Variance Background Comparison for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:21:17 PM						Probability of			Poisson	Test: Max	Proportion of	Result of
Run Date: 11/20/00						Accepting/ Rejecting	Site	Background	Upper	Greater Than	Detected Greater	Background
Exposure Unit: 37_SS2	Frequency	Site	Background	Background	Result of	Null Hypothesis <sup>f</sup>	Mean	Mean	Tolerance	Poisson	Than Poisson	Comparison <sup>g</sup>
Parameter	Units	of Detect	Maximum	Maximum	F-Test <sup>b</sup>				Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	

<sup>a</sup>For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.
- 5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.
- 6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup>The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup>The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup>The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup>Y - yes; N - no

<sup>f</sup>Counts are based on the unaveraged data set.

<sup>g</sup>Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-69. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:21:17 PM		Proportion of Detects		Maximum				95% UTL of	Test : Max	Proportion of
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Mean	Standard	UTL	Background	Detected Result	Detected Results
Exposure Unit: SS			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Greater Than	Background UTL <sup>f</sup>	Greater Than
Parameter	Units							Background UTL <sup>g</sup>	Background UTL <sup>h</sup>	Background UTL <sup>h</sup>
Aluminum	ug/g	8 / 10	8 / 10	19,800	7,708	6,019	Normal UTL	24,256	N	0 / 8
Arsenic	ug/g	10 / 10	10 / 10	2.5	7.9	3.0	Lognormal UTL	3.4	N	0 / 10
Barium	ug/g	10 / 10	10 / 10	181	137	45	Nonparametric UTL	423	N	0 / 10
Beryllium	ug/g	4 / 10	4 / 10	1.0	0.50	0.34	Nonparametric UTL	1.2	N	0 / 4
Cadmium	ug/g	4 / 10	4 / 10	1.4	0.71	0.47	Nonparametric UTL	21	N	0 / 4
Calcium	ug/g	6 / 10	6 / 10	120,000	67,622	34,771	Nonparametric UTL	250,000	N	0 / 6
Chromium	ug/g	6 / 10	6 / 10	23	10	5.9	Nonparametric UTL	56	N	0 / 6
Cobalt	ug/g	10 / 10	10 / 10	6.5	4.5	1.5	Normal UTL	10	N	0 / 10
Copper	ug/g	10 / 10	10 / 10	30	18	7.6	Nonparametric UTL	162	N	0 / 10
Iron	ug/g	9 / 10	9 / 10	18,200	9,284	4,904	Normal UTL	21,340	N	0 / 9
Lead	ug/g	10 / 10	10 / 10	34	21	8.6	Nonparametric UTL	401	N	0 / 10
Magnesium	ug/g	6 / 10	6 / 10	14,000	9,161	3,313	Nonparametric UTL	35,700	N	0 / 6
Manganese	ug/g	10 / 10	10 / 10	532	392	100	Normal UTL	649	N	0 / 10
Nickel	ug/g	10 / 10	10 / 10	23	16	6.1	Nonparametric UTL	33	N	0 / 10
Potassium	ug/g	6 / 10	6 / 10	5,780	2,132	1,619	Normal UTL	6,751	N	0 / 6
Sodium	ug/g	6 / 10	6 / 10	789	425	194	Nonparametric UTL	5,610	N	0 / 6
Thallium	ug/g	4 / 10	4 / 10	13	6.4	4.0	Nonparametric UTL	34	N	0 / 4
Vanadium	ug/g	10 / 10	10 / 10	28	17	6.9	Normal UTL	55	N	0 / 10
Zinc	ug/g	10 / 10	10 / 10	100	57	25	Nonparametric UTL	385	N	0 / 10
Acenaphthene	ug/g	1 / 10	1 / 10	0.22	0.046	0.066	Site Related	0.0	Y	1 / 1
Anthracene	ug/g	1 / 10	1 / 10	0.24	0.047	0.073	Site Related	0.0	Y	1 / 1
Benzo(a)anthracene	ug/g	1 / 10	1 / 10	0.70	0.18	0.21	Site Related	0.0	Y	1 / 1
Benzo(a)pyrene	ug/g	1 / 10	1 / 10	0.59	0.21	0.18	Site Related	0.0	Y	1 / 1
Benzo(b)fluoranthene	ug/g	1 / 10	1 / 10	0.65	0.20	0.20	Site Related	0.0	Y	1 / 1
Benzo(g,h,i)perylene	ug/g	1 / 10	1 / 10	0.50	0.18	0.13	Site Related	0.0	Y	1 / 1
Benzo(k)fluoranthene	ug/g	1 / 10	1 / 10	0.42	0.083	0.12	Site Related	0.0	Y	1 / 1
Chrysene	ug/g	1 / 10	1 / 10	0.96	0.17	0.29	Site Related	0.0	Y	1 / 1
Dibenzofuran	ug/g	1 / 10	1 / 10	0.100	0.030	0.028	Site Related	0.0	Y	1 / 1
Fluoranthene	ug/g	1 / 10	1 / 10	1.8	0.22	0.56	Site Related	0.0	Y	1 / 1
Fluorene	ug/g	1 / 10	1 / 10	0.14	0.037	0.045	Site Related	0.0	Y	1 / 1
Indeno(1,2,3-cd)pyrene	ug/g	1 / 10	1 / 10	0.50	0.20	0.12	Site Related	0.0	Y	1 / 1
Phenanthrene	ug/g	1 / 10	1 / 10	1.00	0.12	0.31	Site Related	0.0	Y	1 / 1
Pyrene	ug/g	1 / 10	1 / 10	1.6	0.18	0.50	Site Related	0.0	Y	1 / 1

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

**Table K-69. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 37 - Pit Floor (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Maximum Detected Result <sup>c</sup>	Mean	Standard Deviation	UTL Comparison <sup>d</sup>	95% UTL of Background Data Set <sup>e</sup>	Test : Max Detected Result Greater Than Background UTL <sup>f</sup>	Proportion of Detected Results Greater Than Background UTL <sup>g</sup>
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Run Time: 5:21:17 PM

Run Date: 11/20/00

Exposure Unit: SS

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-70. Samples Included in Data Set for Subsurface Soils at SWMU 37 - Pit Floor (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-37-001B	BORE	SAIC02	3	SAIC	3-BK-1	BORE	S1055	2
	SB-37-002B	BORE	SAIC02	3		3-BK-2	BORE	S1057	2
	SB-37-003B	BORE	SAIC02	3		31-BK-1	BORE	S1019	2
	SB-37-004B	BORE	SAIC02	3		31-BK-2	BORE	S1021	2
	SB-37-005B	BORE	SAIC02	3		5-BK-1	BORE	S0136	2
	SB-37-006B	BORE	SAIC02	3		5-BK-2	BORE	S0138	2
	SB-37-007B	BORE	SAIC02	3		8-BK-1	BORE	S0773	2
	SB-37-008B	BORE	SAIC02	3		8-BK-2	BORE	S0775	2
	SB-37-009B	BORE	SAIC02	3		9-BK-1	BORE	S0333	2
	SB-37-010B	BORE	SAIC02	3		9-BK-2	BORE	S0335	2
	TP-37-001B	BORE	SAIC02	1.5		S-SS-05-BK	BORE	SSS-05BK	1.5
	TP-37-001D	BORE	SAIC04	1.2		S-SS-05-BK	BORE	SSS05-BK	1.5
	TP-37-002B	BORE	SAIC02	1		S-SS-05-BK	BORE	SSS05BK	1.5
	TP-37-002D	BORE	SAIC04	1		S-SS-08-BK	BORE	SSS-08BK	1.5
						S-SS-08-BK	BORE	SSS08-BK	1.5
						S-SS-08-BK	BORE	SSS08BK	3
						S-SS-10-BK	BORE	SSS-10BK	1.5
						S-SS-10-BK	BORE	SSS10-BK	1.5
						S-SS-14-BK	BORE	SSS-14BK	1.5
						S-SS-14-BK	BORE	SSS14BK	1.5
						S-SS-19-BK	BORE	SSS-19BK	1.5
						S-SS-19-BK	BORE	SSS19BK	1.5
						S-SS-22-BK	BORE	SSS-22BK	1.5
						S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-71. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 37 - Pit Floor (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:21:17 PM		Proportion	Proportion										Exposure
Run Date: 11/20/00		of Detects	of Detects	Frequency	NonDetects	Detects	Arithmetic	Standard			95% UCL of		Point
Exposure Unit: 37_SS2		All Samples <sup>a</sup>	Temporal	of Detection	Min CRL	Maximum	Mean <sup>c</sup>	Deviation <sup>c</sup>	Distribution <sup>d</sup>	Arith. Mean <sup>c</sup>	Concentration <sup>e</sup>		
Parameter	Units		Samples <sup>b</sup>										
Aluminum	ug/g	14 / 14	14 / 14	100%	--	--	2,530	22,300	8,747	5,381	Lognormal	12,589	12,589
Arsenic	ug/g	14 / 14	14 / 14	100%	--	--	8.1	49	16	11	Lognormal	21	21
Barium	ug/g	14 / 14	14 / 14	100%	--	--	43	319	140	91	Lognormal	203	203
Beryllium	ug/g	2 / 14	2 / 14	14%	0.50	0.50	0.63	0.81	0.32	0.17	Lognormal	0.39	0.39
Cadmium	ug/g	2 / 14	2 / 14	14%	0.70	0.70	1.4	1.6	0.52	0.42	Lognormal	0.68	0.68
Calcium	ug/g	14 / 14	14 / 14	100%	--	--	65,000	550,000	144,429	120,889	Lognormal	188,900	188,900
Chromium	ug/g	14 / 14	14 / 14	100%	--	--	6.5	43	17	12	Lognormal	25	25
Cobalt	ug/g	14 / 14	14 / 14	100%	--	--	1.8	13	4.4	2.6	Lognormal	5.7	5.7
Copper	ug/g	14 / 14	14 / 14	100%	--	--	6.0	38	16	11	Lognormal	23	23
Iron	ug/g	14 / 14	14 / 14	100%	--	--	4,710	33,500	11,151	6,843	Lognormal	14,078	14,078
Lead	ug/g	14 / 14	14 / 14	100%	--	--	4.8	21	13	4.7	Normal	16	16
Magnesium	ug/g	14 / 14	14 / 14	100%	--	--	3,110	34,100	12,645	7,401	Lognormal	17,993	17,993
Manganese	ug/g	14 / 14	14 / 14	100%	--	--	100	1,020	352	218	Lognormal	473	473
Nickel	ug/g	14 / 14	14 / 14	100%	--	--	8.4	51	17	10	Lognormal	20	20
Potassium	ug/g	14 / 14	14 / 14	100%	--	--	496	4,550	1,911	1,226	Lognormal	2,844	2,844
Selenium	ug/g	2 / 14	2 / 14	14%	0.25	0.25	0.44	0.64	0.18	0.16	Lognormal	0.24	0.24
Sodium	ug/g	14 / 14	14 / 14	100%	--	--	415	1,800	784	472	Lognormal	1,036	1,036
Thallium	ug/g	4 / 14	4 / 14	29%	6.6	6.6	8.9	11	5.3	3.3	Lognormal	7.2	7.2
Vanadium	ug/g	14 / 14	14 / 14	100%	--	--	9.5	58	20	11	Lognormal	24	24
Zinc	ug/g	14 / 14	14 / 14	100%	--	--	22	145	51	29	Lognormal	64	64
Pyrene	ug/g	1 / 14	1 / 14	7%	0.033	0.033	0.050	0.050	0.019	0.0090	Lognormal	0.022	0.022
di-N-Butyl Phthalate	ug/g	1 / 14	1 / 14	7%	0.061	0.061	0.083	0.083	0.034	0.014	Lognormal	0.039	0.039

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

- 1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.
- 3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "\*" next to the EPC).

**Table K-72. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 37 - Pit Floor (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/ Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	22,300	25,200	Nonparametric	--	1.00	8,747	14,545	--	--	-- / --	Not Site Related
Arsenic	ug/g	100%	49	53	Nonparametric	--	0.037	16	13	--	--	-- / --	Site Related
Barium	ug/g	100%	319	423	Nonparametric	--	0.89	140	147	--	--	-- / --	Not Site Related
Beryllium	ug/g	14%	0.81	1.2	Nonparametric	--	1.00	0.32	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	14%	1.6	21	Nonparametric	--	0.99	0.52	1.1	--	--	-- / --	Not Site Related
Calcium	ug/g	100%	550,000	250,000	Nonparametric	--	0.048	144,429	103,597	--	--	-- / --	Site Related
Chromium	ug/g	100%	43	56	Nonparametric	--	1.00	17	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	100%	13	11	Nonparametric	--	1.00	4.4	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	38	162	Nonparametric	--	0.63	16	17	--	--	-- / --	Not Site Related
Iron	ug/g	100%	33,500	24,300	Nonparametric	--	1.00	11,151	13,571	--	--	-- / --	Not Site Related
Lead	ug/g	100%	21	401	Nonparametric	--	0.73	13	32	--	--	-- / --	Not Site Related
Magnesium	ug/g	100%	34,100	35,700	Nonparametric	--	0.62	12,645	12,213	--	--	-- / --	Not Site Related
Manganese	ug/g	100%	1,020	739	Nonparametric	--	0.77	352	365	--	--	-- / --	Not Site Related
Nickel	ug/g	100%	51	36	Nonparametric	--	0.70	17	15	--	--	-- / --	Not Site Related
Potassium	ug/g	100%	4,550	7,500	Nonparametric	--	1.00	1,911	3,619	--	--	-- / --	Not Site Related
Selenium	ug/g	14%	0.64	2.9	Nonparametric	--	1.00	0.18	0.72	--	--	-- / --	Not Site Related
Sodium	ug/g	100%	1,800	5,610	Nonparametric	--	0.95	784	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	29%	11	34	Nonparametric	--	0.033	5.3	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	100%	58	63	Nonparametric	--	1.00	20	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	145	385	Nonparametric	--	1.00	51	77	--	--	-- / --	Not Site Related
Pyrene	ug/g	7%	0.050	--	Site Related	--	--	0.019	--	--	--	-- / --	Site Related
di-N-Butyl Phthalate	ug/g	7%	0.083	--	Site Related	--	--	0.034	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.
  - c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

**Table K-72. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 37 - Pit Floor (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Toeel, Utah**

Run Time: 5:21:17 PM						Probability of			Poisson	Test: Max	Proportion of	
Run Date: 11/20/00						Accepting/ Rejecting	Site	Background	Upper	Greater Than	Detects Greater	Result of
Exposure Unit: 37_SS2	Frequency	Site	Background	Background	Result of	Null Hypothesis <sup>c</sup>	Mean	Mean	Tolerance	Poisson	Than Poisson	Background
Parameter	Units	Maximum	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>				Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.

2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.

3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-73. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 37 - Pit Floor (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:21:17 PM		Proportion of Detects		Maximum				Test : Max	Proportion of	
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Mean	Standard	UTL	95% UTL of	Detected Result	Detected Results
Exposure Unit: SD			Samples <sup>b</sup>	Result <sup>c</sup>		Deviation	Comparison <sup>d</sup>	Background	Greater Than	Greater Than
Parameter	Units							Data Set <sup>e</sup>	Background UTL <sup>f</sup>	Background UTL <sup>g</sup>
Aluminum	ug/g	14 / 14	14 / 14	22,300	8,747	5,381	Normal UTL	24,256	N	0 / 14
Arsenic	ug/g	14 / 14	14 / 14	3.9	16	11	Lognormal UTL	3.4	Y	1 / 14
Barium	ug/g	14 / 14	14 / 14	319	140	91	Nonparametric UTL	423	N	0 / 14
Beryllium	ug/g	2 / 14	2 / 14	0.81	0.32	0.17	Nonparametric UTL	1.2	N	0 / 2
Cadmium	ug/g	2 / 14	2 / 14	1.6	0.52	0.42	Nonparametric UTL	21	N	0 / 2
Calcium	ug/g	14 / 14	14 / 14	550,000	144,429	120,889	Nonparametric UTL	250,000	Y	1 / 14
Chromium	ug/g	14 / 14	14 / 14	43	17	12	Nonparametric UTL	56	N	0 / 14
Cobalt	ug/g	14 / 14	14 / 14	13	4.4	2.6	Normal UTL	10	Y	1 / 14
Copper	ug/g	14 / 14	14 / 14	38	16	11	Nonparametric UTL	162	N	0 / 14
Iron	ug/g	14 / 14	14 / 14	33,500	11,151	6,843	Normal UTL	21,340	Y	1 / 14
Lead	ug/g	14 / 14	14 / 14	21	13	4.7	Nonparametric UTL	401	N	0 / 14
Magnesium	ug/g	14 / 14	14 / 14	34,100	12,645	7,401	Nonparametric UTL	35,700	N	0 / 14
Manganese	ug/g	14 / 14	14 / 14	1,020	352	218	Normal UTL	649	Y	1 / 14
Nickel	ug/g	14 / 14	14 / 14	51	17	10	Nonparametric UTL	33	Y	1 / 14
Potassium	ug/g	14 / 14	14 / 14	4,550	1,911	1,226	Normal UTL	6,751	N	0 / 14
Selenium	ug/g	2 / 14	2 / 14	0.64	0.18	0.16	Nonparametric UTL	2.9	N	0 / 2
Sodium	ug/g	14 / 14	14 / 14	1,800	784	472	Nonparametric UTL	5,610	N	0 / 14
Thallium	ug/g	4 / 14	4 / 14	11	5.3	3.3	Nonparametric UTL	34	N	0 / 4
Vanadium	ug/g	14 / 14	14 / 14	58	20	11	Normal UTL	55	Y	1 / 14
Zinc	ug/g	14 / 14	14 / 14	145	51	29	Nonparametric UTL	385	N	0 / 14
Pyrene	ug/g	1 / 14	1 / 14	0.050	0.019	0.0090	Site Related	0.0	Y	1 / 1
di-N-Butyl Phthalate	ug/g	1 / 14	1 / 14	0.083	0.034	0.014	Site Related	0.0	Y	1 / 1

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

- 1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated.
- 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL".
- 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated.
- 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-74. Inorganics Greater than Background UTL for SWMU 37 - Pit Floor Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Arsenic	3.37044058	49	SB-37-006B	BORE	SAIC02	3.00		Lognormal UTL
Calcium	250000	550000	SB-37-006B	BORE	SAIC02	3.00		Nonparametric UTL
Cobalt	10.22734583	12.5	SB-37-006B	BORE	SAIC02	3.00		Normal UTL
Iron	21339.95549	33500	SB-37-006B	BORE	SAIC02	3.00		Normal UTL
Manganese	648.7565583	1020	SB-37-006B	BORE	SAIC02	3.00		Normal UTL
Nickel	33.35	51.1	SB-37-006B	BORE	SAIC02	3.00		Nonparametric UTL
Vanadium	55.28143391	57.6	SB-37-006B	BORE	SAIC02	3.00		Normal UTL

<sup>a</sup>The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup>The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-75. Samples Included in Data Set for Surface Soils at SWMU 37 - Slope (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-37-11	BORE	SAIC01	0	SAIC	3-BK-1	BORE	S1055	2
	SB-37-12	BORE	SAIC01	0		3-BK-2	BORE	S1057	2
	SB-37-13	BORE	SAIC01	0		31-BK-1	BORE	S1019	2
	SB-37-14	BORE	SAIC01	0		31-BK-2	BORE	S1021	2
	SB-37-15	BORE	SAIC01	0		5-BK-1	BORE	S0136	2
	SB-37-16	BORE	SAIC01	0		5-BK-2	BORE	S0138	2
	SB-37-17	BORE	SAIC01	0		8-BK-1	BORE	S0773	2
	SB-37-18	BORE	SAIC01	0		8-BK-2	BORE	S0775	2
	SB-37-19	BORE	SAIC01	0		9-BK-1	BORE	S0333	2
	SB-37-20	BORE	SAIC01	0		9-BK-2	BORE	S0335	2
	SB-37-21	BORE	SAIC01	0		S-SS-05-BK	BORE	SSS-05BK	1.5
						S-SS-05-BK	BORE	SSS05-BK	1.5
						S-SS-05-BK	BORE	SSS05BK	1.5
						S-SS-08-BK	BORE	SSS-08BK	1.5
						S-SS-08-BK	BORE	SSS08-BK	1.5
						S-SS-08-BK	BORE	SSS08BK	3
						S-SS-10-BK	BORE	SSS-10BK	1.5
						S-SS-10-BK	BORE	SSS10-BK	1.5
						S-SS-14-BK	BORE	SSS-14BK	1.5
						S-SS-14-BK	BORE	SSS14BK	1.5
						S-SS-19-BK	BORE	SSS-19BK	1.5
						S-SS-19-BK	BORE	SSS19BK	1.5
						S-SS-22-BK	BORE	SSS-22BK	1.5
						S-SS-22-BK	BORE	SSS22BK	1.5
						S-SS-26-BK	BORE	SSS-26BK	1.5
						S-SS-26-BK	BORE	SSS26-BK	1.5
						S-SS-27-BK	BORE	SSS-27BK	1.5
						S-SS-27-BK	BORE	SSS27-BK	1.5
						S-SS-29-BK	BORE	SSS-29BK	1.5
						S-SS-29-BK	BORE	SSS29-BK	1.5
						S-SS-36-BK	BORE	SSS-36BK	1.5
						S-SS-36-BK	BORE	SSS36-BK	1.5
						S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0

**Table K-75. Samples Included in Data Set for Surface Soils at SWMU 37 - Slope (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-76. Summary Statistics and Exposure Point Concentrations for Surface Soils at SWMU 37 - Slope (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	Exposure Point Concentration <sup>e</sup>	
					Min CRL	Max CRL	Minimum	Maximum				95% UCL of Arith. Mean <sup>c</sup>	Point Concentration <sup>e</sup>
Aluminum	ug/g	11 / 11	11 / 11	100%	--	--	12,400	35,400	19,836	6,129	Lognormal	23,502	23,502
Antimony	ug/g	3 / 9	3 / 9	33%	6.0	6.0	8.3	16	5.7	4.7	Lognormal	10	10
Arsenic	ug/g	11 / 11	11 / 11	100%	--	--	6.3	19	13	3.1	Normal	15	15
Barium	ug/g	11 / 11	11 / 11	100%	--	--	294	6,800	1,811	2,118	Lognormal	5,572	5,572
Beryllium	ug/g	8 / 11	8 / 11	73%	0.50	0.50	0.57	0.83	0.58	0.22	Lognormal	0.83	0.83 #
Cadmium	ug/g	11 / 11	11 / 11	100%	--	--	0.46	12	3.3	3.8	Lognormal	9.6	9.6
Calcium	ug/g	11 / 11	11 / 11	100%	--	--	39,600	87,400	64,709	14,847	Normal	72,823	72,823
Chromium	ug/g	11 / 11	11 / 11	100%	--	--	19	109	37	26	Lognormal	51	51
Cobalt	ug/g	10 / 11	10 / 11	91%	5.0	5.0	6.0	37	16	10	Normal	21	21
Copper	ug/g	11 / 11	11 / 11	100%	--	--	120	2,690	617	817	Lognormal	1,549	1,549
Iron	ug/g	11 / 11	11 / 11	100%	--	--	24,300	158,000	58,627	44,067	Lognormal	90,113	90,113
Lead	ug/g	11 / 11	11 / 11	100%	--	--	26	748	202	269	Lognormal	651	651
Magnesium	ug/g	11 / 11	11 / 11	100%	--	--	7,410	55,100	21,474	14,647	Lognormal	32,320	32,320
Manganese	ug/g	11 / 11	11 / 11	100%	--	--	395	958	569	163	Normal	658	658
Mercury	ug/g	1 / 11	1 / 11	9%	0.050	0.050	0.056	0.056	0.028	0.0092	Lognormal	0.032	0.032
Nickel	ug/g	11 / 11	11 / 11	100%	--	--	23	153	52	44	Lognormal	83	83
Potassium	ug/g	11 / 11	11 / 11	100%	--	--	1,810	6,130	4,096	1,371	Normal	4,846	4,846
Silver	ug/g	4 / 11	4 / 11	36%	10.0	10.0	2.2	82	13	23	Lognormal	26	26
Sodium	ug/g	11 / 11	11 / 11	100%	--	--	146	419	307	86	Normal	354	354
Thallium	ug/g	3 / 11	3 / 11	27%	1.00	1.00	1.4	3.2	1.0	0.96	Lognormal	1.7	1.7
Vanadium	ug/g	10 / 11	10 / 11	91%	5.0	5.0	9.6	42	22	11	Normal	28	28
Zinc	ug/g	11 / 11	11 / 11	100%	--	--	90	651	208	190	Lognormal	335	335
2,4,6-Trinitrotoluene	ug/g	1 / 11	1 / 11	9%	0.20	0.20	0.53	0.53	0.14	0.13	Lognormal	0.19	0.19

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

- 1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated. 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.
- 3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-77. Analysis of Variance Background Comparison for Surface Soils at SWMU 37 - Slope (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	35,400	25,200	Nonparametric	--	0.013	19,836	14,545	--	--	-- / --	Site Related
Antimony	ug/g	33%	16	12	Poisson UTL	--	0.96	5.7	4.5	8.5	Y	2 / 3	Site Related
Arsenic	ug/g	100%	19	53	Nonparametric	--	0.12	13	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	6,800	423	Nonparametric	--	3.01E-07	1,811	147	--	--	-- / --	Site Related
Beryllium	ug/g	73%	0.83	1.2	Nonparametric	--	0.89	0.58	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	100%	12	21	Nonparametric	--	5.64E-05	3.3	1.1	--	--	-- / --	Site Related
Calcium	ug/g	100%	87,400	250,000	Nonparametric	--	1.00	64,709	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	109	56	Nonparametric	--	0.00071	37	22	--	--	-- / --	Site Related
Cobalt	ug/g	91%	37	11	Nonparametric	Unequal	0.00017	16	6.4	--	--	-- / --	Site Related
Copper	ug/g	100%	2,690	162	Nonparametric	--	1.22E-07	617	17	--	--	-- / --	Site Related
Iron	ug/g	100%	158,000	24,300	Nonparametric	--	1.85E-07	58,627	13,571	--	--	-- / --	Site Related
Lead	ug/g	100%	748	401	Nonparametric	--	4.34E-06	202	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	55,100	35,700	Nonparametric	--	0.00060	21,474	12,213	--	--	-- / --	Site Related
Manganese	ug/g	100%	958	739	t-Test (N)	Equal	0.00059	569	365	--	--	-- / --	Site Related
Mercury	ug/g	9%	0.056	0.36	Nonparametric	--	0.63	0.028	0.043	--	--	-- / --	Not Site Related
Nickel	ug/g	100%	153	36	Nonparametric	--	9.02E-07	52	15	--	--	-- / --	Site Related
Potassium	ug/g	100%	6,130	7,500	t-Test (N)	Equal	0.42	4,096	3,619	--	--	-- / --	Not Site Related
Silver	ug/g	36%	82	3.7	Nonparametric	--	1.01E-07	13	0.62	--	--	-- / --	Site Related
Sodium	ug/g	100%	419	5,610	Nonparametric	--	1.00	307	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	27%	3.2	34	Nonparametric	--	0.98	1.0	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	91%	42	63	t-Test (N)	Equal	0.0042	22	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	651	385	Nonparametric	--	1.07E-05	208	77	--	--	-- / --	Site Related
2,4,6-Trinitrotoluene	ug/g	9%	0.53	--	Site Related	--	--	0.14	--	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.

**Table K-77. Analysis of Variance Background Comparison for Surface Soils at SWMU 37 - Slope (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:24:55 PM						Probability of			Poisson	Test: Max	Proportion of		
Run Date: 11/20/00						Accepting/			Upper	Greater Than	Detects Greater		
Exposure Unit: 37__S63	Frequency	Site	Background	Background	Result of	Rejecting	Site	Background	Tolerance	Poisson	Than Poisson		
Parameter	Units	of Detect	Maximum	Maximum	Comparison <sup>a</sup>	F-Test <sup>b</sup>	Mean	Mean	Limit <sup>d</sup>	UTL <sup>e</sup>	UTL <sup>f</sup>	Comparison <sup>g</sup>	

c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.

2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.

3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-78. Comparison with Background Upper Tolerance Limit for Surface Soils at SWMU 37 - Slope (0-0.5 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:24:55 PM Run Date: 11/20/00 Exposure Unit: SS		Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Maximum Detected Result <sup>c</sup>	Mean	Standard Deviation	UTL Comparison <sup>d</sup>	95% UTL of Background Data Set <sup>e</sup>	Test : Max Detected Result Greater Than Background UTL <sup>f</sup>	Proportion of Detected Results Greater Than Background UTL <sup>g</sup>
Parameter	Units									
Aluminum	ug/g	11 / 11	11 / 11	35,400	19,836	6,129	Normal UTL	24,256	Y	1 / 11
Antimony	ug/g	3 / 9	3 / 9	16	5.7	4.7	Poisson UTL	12	Y	1 / 3
Arsenic	ug/g	11 / 11	11 / 11	2.9	13	3.1	Lognormal UTL	3.4	N	0 / 11
Barium	ug/g	11 / 11	11 / 11	6,800	1,811	2,118	Nonparametric UTL	423	Y	8 / 11
Beryllium	ug/g	8 / 11	8 / 11	0.83	0.58	0.22	Nonparametric UTL	1.2	N	0 / 8
Cadmium	ug/g	11 / 11	11 / 11	12	3.3	3.8	Nonparametric UTL	21	N	0 / 11
Calcium	ug/g	11 / 11	11 / 11	87,400	64,709	14,847	Nonparametric UTL	250,000	N	0 / 11
Chromium	ug/g	11 / 11	11 / 11	109	37	26	Nonparametric UTL	56	Y	2 / 11
Cobalt	ug/g	10 / 11	10 / 11	37	16	10	Normal UTL	10	Y	8 / 10
Copper	ug/g	11 / 11	11 / 11	2,690	617	817	Nonparametric UTL	162	Y	9 / 11
Iron	ug/g	11 / 11	11 / 11	158,000	58,627	44,067	Normal UTL	21,340	Y	11 / 11
Lead	ug/g	11 / 11	11 / 11	748	202	269	Nonparametric UTL	401	Y	2 / 11
Magnesium	ug/g	11 / 11	11 / 11	55,100	21,474	14,647	Nonparametric UTL	35,700	Y	2 / 11
Manganese	ug/g	11 / 11	11 / 11	958	569	163	Normal UTL	649	Y	2 / 11
Mercury	ug/g	1 / 11	1 / 11	0.056	0.028	0.0092	Nonparametric UTL	0.36	N	0 / 1
Nickel	ug/g	11 / 11	11 / 11	153	52	44	Nonparametric UTL	33	Y	5 / 11
Potassium	ug/g	11 / 11	11 / 11	6,130	4,096	1,371	Normal UTL	6,751	N	0 / 11
Silver	ug/g	4 / 11	4 / 11	4.4	13	23	Lognormal UTL	0.47	Y	4 / 4
Sodium	ug/g	11 / 11	11 / 11	419	307	86	Nonparametric UTL	5,610	N	0 / 11
Thallium	ug/g	3 / 11	3 / 11	3.2	1.0	0.96	Nonparametric UTL	34	N	0 / 3
Vanadium	ug/g	10 / 11	10 / 11	42	22	11	Normal UTL	55	N	0 / 10
Zinc	ug/g	11 / 11	11 / 11	651	208	190	Nonparametric UTL	385	Y	2 / 11
2,4,6-Trinitrotoluene	ug/g	1 / 11	1 / 11	0.53	0.14	0.13	Site Related	0.0	Y	1 / 1

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-79. Inorganics Greater than Background UTL for SWMU 37 - Slope Surface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background	Value <sup>b</sup>	Site ID	Site Type	Field Sample	Depth	Flagging Code	Background
	Data Set <sup>a</sup>							Comparison
Aluminum	24255.75146	35400	SB-37-11	BORE	SAIC01	0.00		Normal UTL
Antimony	11.9	16.4	SB-37-11	BORE	SAIC01	0.00		Poisson UTL
Barium	423	464	SB-37-15	BORE	SAIC01	0.00		Nonparametric UTL
Barium	423	647	SB-37-17	BORE	SAIC01	0.00		Nonparametric UTL
Barium	423	680	SB-37-12	BORE	SAIC01	0.00		Nonparametric UTL
Barium	423	1100	SB-37-21	BORE	SAIC01	0.00		Nonparametric UTL
Barium	423	1460	SB-37-18	BORE	SAIC01	0.00		Nonparametric UTL
Barium	423	3850	SB-37-19	BORE	SAIC01	0.00		Nonparametric UTL
Barium	423	3880	SB-37-11	BORE	SAIC01	0.00		Nonparametric UTL
Barium	423	6800	SB-37-20	BORE	SAIC01	0.00		Nonparametric UTL
Chromium	56.2	58.5	SB-37-11	BORE	SAIC01	0.00		Nonparametric UTL
Chromium	56.2	109	SB-37-20	BORE	SAIC01	0.00		Nonparametric UTL
Cobalt	10.22734583	12.1	SB-37-14	BORE	SAIC01	0.00		Normal UTL
Cobalt	10.22734583	12.5	SB-37-15	BORE	SAIC01	0.00		Normal UTL
Cobalt	10.22734583	13.7	SB-37-18	BORE	SAIC01	0.00		Normal UTL
Cobalt	10.22734583	13.8	SB-37-12	BORE	SAIC01	0.00		Normal UTL
Cobalt	10.22734583	17.1	SB-37-19	BORE	SAIC01	0.00		Normal UTL
Cobalt	10.22734583	20.2	SB-37-16	BORE	SAIC01	0.00		Normal UTL
Cobalt	10.22734583	29.7	SB-37-20	BORE	SAIC01	0.00		Normal UTL
Cobalt	10.22734583	37	SB-37-11	BORE	SAIC01	0.00		Normal UTL
Copper	162	177	SB-37-17	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	190	SB-37-16	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	198	SB-37-13	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	225	SB-37-12	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	306	SB-37-18	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	316	SB-37-21	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	787	SB-37-19	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	1620	SB-37-20	BORE	SAIC01	0.00		Nonparametric UTL
Copper	162	2690	SB-37-11	BORE	SAIC01	0.00		Nonparametric UTL
Iron	21339.95549	24300	SB-37-13	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	27300	SB-37-21	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	34700	SB-37-14	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	35800	SB-37-17	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	37800	SB-37-15	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	38100	SB-37-18	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	41200	SB-37-12	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	54500	SB-37-19	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	63200	SB-37-16	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	130000	SB-37-20	BORE	SAIC01	0.00		Normal UTL
Iron	21339.95549	158000	SB-37-11	BORE	SAIC01	0.00		Normal UTL
Lead	401	715	SB-37-20	BORE	SAIC01	0.00		Nonparametric UTL
Lead	401	748	SB-37-18	BORE	SAIC01	0.00		Nonparametric UTL

**Table K-79. Inorganics Greater than Background UTL for SWMU 37 - Slope Surface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Magnesium	35700	44000	SB-37-19	BORE	SAIC01	0.00		Nonparametric UTL
Magnesium	35700	55100	SB-37-20	BORE	SAIC01	0.00		Nonparametric UTL
Manganese	648.7565583	749	SB-37-20	BORE	SAIC01	0.00		Normal UTL
Manganese	648.7565583	958	SB-37-11	BORE	SAIC01	0.00		Normal UTL
Nickel	33.35	34	SB-37-18	BORE	SAIC01	0.00		Nonparametric UTL
Nickel	33.35	41.5	SB-37-16	BORE	SAIC01	0.00		Nonparametric UTL
Nickel	33.35	54.1	SB-37-19	BORE	SAIC01	0.00		Nonparametric UTL
Nickel	33.35	126	SB-37-20	BORE	SAIC01	0.00		Nonparametric UTL
Nickel	33.35	153	SB-37-11	BORE	SAIC01	0.00		Nonparametric UTL
Silver	0.467452072	2.18	SB-37-17	BORE	SAIC01	0.00		Lognormal UTL
Silver	0.467452072	11.9	SB-37-19	BORE	SAIC01	0.00		Lognormal UTL
Silver	0.467452072	13.6	SB-37-21	BORE	SAIC01	0.00		Lognormal UTL
Silver	0.467452072	82.1	SB-37-11	BORE	SAIC01	0.00		Lognormal UTL
Zinc	385	515	SB-37-19	BORE	SAIC01	0.00		Nonparametric UTL
Zinc	385	651	SB-37-20	BORE	SAIC01	0.00		Nonparametric UTL

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.

**Table K-80. Samples Included in Data Set for Subsurface Soils at SWMU 37 - Slope (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
SAIC	SB-37-11	BORE	SAIC02	1	SAIC	3-BK-1	BORE	S1055	2
	SB-37-11	BORE	SAIC03	5		3-BK-2	BORE	S1057	2
	SB-37-12	BORE	SAIC02	1		31-BK-1	BORE	S1019	2
	SB-37-12	BORE	SAIC03	5		31-BK-2	BORE	S1021	2
	SB-37-12	BORE	SAIC04	10		5-BK-1	BORE	S0136	2
	SB-37-12	BORE	SAIC05	15		5-BK-2	BORE	S0138	2
	SB-37-13	BORE	SAIC02	1		8-BK-1	BORE	S0773	2
	SB-37-13	BORE	SAIC03	5		8-BK-2	BORE	S0775	2
	SB-37-14	BORE	SAIC02	1		9-BK-1	BORE	S0333	2
	SB-37-14	BORE	SAIC03	5		9-BK-2	BORE	S0335	2
	SB-37-15	BORE	SAIC02	1		S-SS-05-BK	BORE	SSS-05BK	1.5
	SB-37-15	BORE	SAIC03	6.5		S-SS-05-BK	BORE	SSS05-BK	1.5
	SB-37-16	BORE	SAIC02	1		S-SS-05-BK	BORE	SSS05BK	1.5
	SB-37-16	BORE	SAIC03	5		S-SS-08-BK	BORE	SSS-08BK	1.5
	SB-37-17	BORE	SAIC02	1		S-SS-08-BK	BORE	SSS08-BK	1.5
	SB-37-17	BORE	SAIC03	5		S-SS-08-BK	BORE	SSS08BK	3
	SB-37-17	BORE	SAIC04	10		S-SS-10-BK	BORE	SSS-10BK	1.5
	SB-37-17	BORE	SAIC05	15		S-SS-10-BK	BORE	SSS10-BK	1.5
	SB-37-18	BORE	SAIC02	1		S-SS-14-BK	BORE	SSS-14BK	1.5
	SB-37-18	BORE	SAIC03	5		S-SS-14-BK	BORE	SSS14BK	1.5
	SB-37-18	BORE	SAIC04	10		S-SS-19-BK	BORE	SSS-19BK	1.5
	SB-37-18	BORE	SAIC05	15		S-SS-19-BK	BORE	SSS19BK	1.5
	SB-37-19	BORE	SAIC02	1		S-SS-22-BK	BORE	SSS-22BK	1.5
	SB-37-19	BORE	SAIC03	5		S-SS-22-BK	BORE	SSS22BK	1.5
	SB-37-19	BORE	SAIC04	10		S-SS-26-BK	BORE	SSS-26BK	1.5
	SB-37-20	BORE	SAIC02	1		S-SS-26-BK	BORE	SSS26-BK	1.5
	SB-37-20	BORE	SAIC03	5		S-SS-27-BK	BORE	SSS-27BK	1.5
	SB-37-21	BORE	SAIC02	1		S-SS-27-BK	BORE	SSS27-BK	1.5
	SB-37-21	BORE	SAIC03	5		S-SS-29-BK	BORE	SSS-29BK	1.5
	SB-37-15	BORE	SAIC04	10		S-SS-29-BK	BORE	SSS29-BK	1.5
	SB-37-15	BORE	SAIC05	15		S-SS-36-BK	BORE	SSS-36BK	1.5
	SB-37-16	BORE	SAIC04	10		S-SS-36-BK	BORE	SSS36-BK	1.5
	SB-37-16	BORE	SAIC05	16		S-SS-36-BK	BORE	SSS36BK	1.5
						SB-BK-01	BORE	SAIC02	1
						SB-BK-01	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC02	1
						SB-BK-02	BORE	SAIC03	5
						SB-BK-02	BORE	SAIC03D	5
						SB-BK-02	BORE	SAIC04	10
						SB-BK-03	BORE	SAIC02	1
						SB-BK-03	BORE	SAIC03	5
						SB-BK-03	BORE	SAIC03D	5
						SB-BK-03	BORE	SAIC04	10
						SB-BK-04	BORE	SAIC02	1
						SB-BK-04	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC02	1
						SB-BK-05	BORE	SAIC03	5
						SB-BK-05	BORE	SAIC04	10
						SB-BK-06	BORE	SAIC02	1
						SB-BK-06	BORE	SAIC03	5
						SB-BK-06	BORE	SAIC04	10
						SB-BK-07	BORE	SAIC02	1
						SB-BK-07	BORE	SAIC03	5
						SB-BK-07	BORE	SAIC04	10
						SB-BK-08	BORE	SAIC02	1
						SB-BK-08	BORE	SAIC03	5
						SB-BK-09	BORE	SAIC02	1
						SB-BK-09	BORE	SAIC03	5
						SB-BK-10	BORE	SAIC02	1
						SB-BK-10	BORE	SAIC03	5
						SB-BK-01	BORE	SAIC01	0
						SB-BK-02	BORE	SAIC01	0
						SB-BK-03	BORE	SAIC01	0

**Table K-80. Samples Included in Data Set for Subsurface Soils at SWMU 37 - Slope (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Site Data					Background Data				
Data Source	Site ID	Site Type	Field Sample	Depth	Data Source	Site ID	Site Type	Field Sample	Depth
						SB-BK-04	BORE	SAIC01	0
						SB-BK-05	BORE	SAIC01	0
						SB-BK-06	BORE	SAIC01	0
						SB-BK-07	BORE	SAIC01	0
						SB-BK-08	BORE	SAIC01	0
						SB-BK-09	BORE	SAIC01	0
						SB-BK-10	BORE	SAIC01	0

**Table K-81. Summary Statistics and Exposure Point Concentrations for Subsurface Soils at SWMU 37 - Slope (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Proportion of Detects All Samples <sup>a</sup>	Proportion of Detects Temporal Samples <sup>b</sup>	Frequency of Detection	NonDetects		Detects		Arithmetic Mean <sup>c</sup>	Standard Deviation <sup>c</sup>	Distribution <sup>d</sup>	95% UCL of Arith. Mean <sup>c</sup>	Exposure Point Concentration <sup>e</sup>
					Min CRL	Max CRL	Minimum	Maximum					
Aluminum	ug/g	33 / 33	33 / 33	100%	--	--	4,170	99,200	23,812	25,875	Lognormal	34,312	34,312
Antimony	ug/g	5 / 19	5 / 19	26%	6.0	7.0	6.9	13	5.1	3.1	Lognormal	6.4	6.4
Arsenic	ug/g	33 / 33	33 / 33	100%	--	--	1.3	58	16	13	Lognormal	22	22
Barium	ug/g	33 / 33	33 / 33	100%	--	--	41	23,100	3,807	5,792	Lognormal	15,459	15,459
Beryllium	ug/g	16 / 33	16 / 33	48%	0.50	0.50	0.057	0.78	0.33	0.16	Lognormal	0.39	0.39
Cadmium	ug/g	32 / 33	32 / 33	97%	0.20	0.20	0.36	37	4.8	8.1	Lognormal	9.7	9.7
Calcium	ug/g	33 / 33	33 / 33	100%	--	--	318	198,000	91,565	65,298	Lognormal	338,446	198,000 #
Chromium	ug/g	33 / 33	33 / 33	100%	--	--	4.8	234	52	60	Lognormal	80	80
Cobalt	ug/g	25 / 33	25 / 33	76%	5.0	5.0	1.6	63	13	15	Lognormal	22	22
Copper	ug/g	33 / 33	33 / 33	100%	--	--	6.5	12,500	1,691	2,937	Lognormal	11,635	11,635
Iron	ug/g	33 / 33	33 / 33	100%	--	--	1,610	391,000	94,537	113,618	Lognormal	254,397	254,397
Lead	ug/g	33 / 33	33 / 33	100%	--	--	8.9	963	157	250	Lognormal	315	315
Magnesium	ug/g	33 / 33	33 / 33	100%	--	--	3,050	268,000	35,928	51,097	Lognormal	51,398	51,398
Manganese	ug/g	33 / 33	33 / 33	100%	--	--	180	2,290	670	548	Lognormal	910	910
Mercury	ug/g	8 / 33	8 / 33	24%	0.050	0.050	0.051	0.11	0.035	0.020	Lognormal	0.040	0.040
Nickel	ug/g	33 / 33	33 / 33	100%	--	--	8.5	374	97	117	Lognormal	184	184
Potassium	ug/g	30 / 33	30 / 33	91%	300	300	401	4,800	1,600	1,326	Lognormal	2,532	2,532
Selenium	ug/g	1 / 33	1 / 33	3%	0.50	2.5	1.5	1.5	0.66	0.50	Lognormal	0.90	0.90
Silver	ug/g	24 / 33	24 / 33	73%	1.00	10.0	1.4	310	27	62	Lognormal	85	85
Sodium	ug/g	32 / 33	32 / 33	97%	20	20	29	873	369	234	Normal	438	438
Thallium	ug/g	20 / 33	20 / 33	61%	1.00	5.0	0.46	23	4.8	6.6	Lognormal	11	11
Vanadium	ug/g	28 / 33	28 / 33	85%	5.0	5.0	9.3	43	17	10	Lognormal	26	26
Zinc	ug/g	33 / 33	33 / 33	100%	--	--	38	1,770	251	450	Lognormal	325	325

-- Not applicable

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Duplicate & Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged; duplicate samples were averaged).

<sup>c</sup> Nondetects were treated at one-half the detection limit in the calculation of the arithmetic mean, standard deviation, and 95% UCL.

<sup>d</sup> For the calculation of exposure point concentrations (EPCs):

- 1) If fewer than 4 samples are available in the data set, "Undetermined" is indicated.
- 2) If the normal probability plot correlation coefficient > critical value, a Normal distribution was assumed for the calculation of EPCs.
- 3) In all other cases, the distribution for the calculation of EPCs was assumed to be Lognormal.

<sup>e</sup> The exposure point concentration (EPC) is the 95% upper confidence (UCL) of the arithmetic mean, unless the 95% UCL exceeds the maximum detected value.

If the latter is true, the maximum detected value is substituted as the EPC (denoted by a "#" next to the EPC).

**Table K-82. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 37 - Slope (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
Aluminum	ug/g	100%	99,200	25,200	Nonparametric	--	0.43	23,812	14,545	--	--	-- / --	Not Site Related
Antimony	ug/g	26%	13	12	Poisson UTL	--	0.84	5.1	4.5	8.5	Y	-- / --	Site Related
Arsenic	ug/g	100%	58	53	Nonparametric	--	0.078	16	13	--	--	-- / --	Not Site Related
Barium	ug/g	100%	23,100	423	Nonparametric	--	2.57E-08	3,807	147	--	--	-- / --	Site Related
Beryllium	ug/g	48%	0.78	1.2	Nonparametric	--	1.00	0.33	0.65	--	--	-- / --	Not Site Related
Cadmium	ug/g	97%	37	21	Nonparametric	--	4.46E-06	4.8	1.1	--	--	-- / --	Site Related
Calcium	ug/g	100%	198,000	250,000	Nonparametric	--	0.79	91,565	103,597	--	--	-- / --	Not Site Related
Chromium	ug/g	100%	234	56	Nonparametric	--	0.092	52	22	--	--	-- / --	Not Site Related
Cobalt	ug/g	76%	63	11	Nonparametric	--	0.45	13	6.4	--	--	-- / --	Not Site Related
Copper	ug/g	100%	12,500	162	Nonparametric	--	1.47E-12	1,691	17	--	--	-- / --	Site Related
Iron	ug/g	100%	391,000	24,300	Nonparametric	--	0.00057	94,537	13,571	--	--	-- / --	Site Related
Lead	ug/g	100%	963	401	Nonparametric	--	1.70E-06	157	32	--	--	-- / --	Site Related
Magnesium	ug/g	100%	268,000	35,700	Nonparametric	--	0.0057	35,928	12,213	--	--	-- / --	Site Related
Manganese	ug/g	100%	2,290	739	Nonparametric	--	0.032	670	365	--	--	-- / --	Site Related
Mercury	ug/g	24%	0.11	0.36	Nonparametric	--	0.22	0.035	0.043	--	--	-- / --	Not Site Related
Nickel	ug/g	100%	374	36	Nonparametric	--	3.31E-05	97	15	--	--	-- / --	Site Related
Potassium	ug/g	91%	4,800	7,500	Nonparametric	--	1.00	1,600	3,619	--	--	-- / --	Not Site Related
Selenium	ug/g	3%	1.5	2.9	Nonparametric	--	0.012	0.66	0.72	--	--	-- / --	Not Site Related
Silver	ug/g	73%	310	3.7	Nonparametric	Unequal	3.17E-10	27	0.62	--	--	-- / --	Site Related
Sodium	ug/g	97%	873	5,610	Nonparametric	--	1.00	369	1,680	--	--	-- / --	Not Site Related
Thallium	ug/g	61%	23	34	Nonparametric	--	0.82	4.8	6.7	--	--	-- / --	Not Site Related
Vanadium	ug/g	85%	43	63	Nonparametric	--	1.00	17	34	--	--	-- / --	Not Site Related
Zinc	ug/g	100%	1,770	385	Nonparametric	--	0.025	251	77	--	--	-- / --	Site Related

-- Not applicable (e.g., background comparison not conducted for organic compounds)

<sup>a</sup> For the Background Comparison:

- 1) All detected organic compounds are assumed to be Site Related (i.e., above background) and a background comparison is not conducted.
- 2) If the analyte is detected in only the site data set (i.e., not detected in background), "Site Related" is indicated.
- 3) If fewer than 4 samples are available in either the site or background data sets, "Compare Maxima" indicates that the maximum detected concentration in the site data set is compared to the maximum detected concentration in the background data set.
- 4) If both the site and background data detection frequencies are > 50%, an effort is made to match the site and background distributions (in order to perform a parametric analysis):
  - a) If the variances in the site and background data sets using the F-test are equal and the distributions are both Normal, the Student's "t-Test (N)" is used to conduct the background comparison on the untransformed data.
  - b) If the variances in the site and background data sets using the F-test are equal and the distributions are both Lognormal, the Student's "t-Test (L)" is used to conduct the background comparison on the logtransformed data.

**Table K-82. Analysis of Variance Background Comparison for Subsurface Soils at SWMU 37 - Slope (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	Units	Frequency of Detect	Site Maximum	Background Maximum	Background Comparison <sup>a</sup>	Result of F-Test <sup>b</sup>	Probability of Accepting/Rejecting Null Hypothesis <sup>c</sup>	Site Mean	Background Mean	Poisson Upper Tolerance Limit <sup>d</sup>	Test: Max Greater Than Poisson UTL <sup>e</sup>	Proportion of Detects Greater Than Poisson UTL <sup>f</sup>	Result of Background Comparison <sup>g</sup>
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c) If the variances are unequal or the distributions are not the same, "Nonparametric" is indicated.

5) If the background data detection frequency is <10%, a Poisson UTL is calculated from the background data and each site concentration is compared to the Poisson UTL.

6) In all other cases, "Nonparametric" is indicated and the Mann-Whitney test is used to conduct the background comparison.

<sup>b</sup> The F-test is conducted only if the distributions of the site and background data sets are both normal or both lognormal. If the result of the F-test (one-tailed probability that the variances in the site and background data sets are not significantly different) is < than 0.05, the result is Unequal. In all other cases the result is Equal.

<sup>c</sup> The Null Hypothesis assumes that site and background data are from the same population.

<sup>d</sup> The Poisson UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance*, February 1989, and the *Addendum to Interim Final Guidance*, July 1992.

<sup>e</sup> Y - yes; N - no

<sup>f</sup> Counts are based on the unaveraged data set.

<sup>g</sup> Result of Background Comparison:

- 1) If fewer than 4 samples are available, the background comparison is "Compare Maxima", and the site max > the background max, the constituent is Site Related.
- 2) If the background comparison is "t-Test (N)", "t-Test (L)", or "Nonparametric", the probability of accepting/rejecting the null hypothesis is < 0.05, and the site mean > background mean, the constituent is Site Related. In all other cases the result is Not Site Related.
- 3) Poisson UTL - if one or more of the detected concentrations exceeds the Poisson UTL, the contaminant is Site Related. In all other cases involving the Poisson UTL, the contaminant is Not Site Related.

**Table K-83. Comparison with Background Upper Tolerance Limit for Subsurface Soils at SWMU 37 - Slope (>0.5-15 ft BLS)  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Run Time: 5:24:55 PM		Proportion of Detects		Maximum				Test : Max	Proportion of	
Run Date: 11/20/00		All Samples <sup>a</sup>	Temporal	Detected	Mean	Standard	UTL	95% UTL of	Detected Result	Detected Results
Exposure Unit: SD			Samples <sup>b</sup>	Result <sup>c</sup>	Deviation	Comparison <sup>d</sup>	Data Set <sup>e</sup>	Background	Greater Than	Greater Than
Parameter	Units							Background UTL <sup>f</sup>	Background UTL <sup>f</sup>	Background UTL <sup>g</sup>
Aluminum	ug/g	33 / 33	33 / 33	99,200	23,812	25,875	Normal UTL	24,256	Y	9 / 33
Antimony	ug/g	5 / 19	5 / 19	13	5.1	3.1	Poisson UTL	12	Y	1 / 5
Arsenic	ug/g	33 / 33	33 / 33	4.1	16	13	Lognormal UTL	3.4	Y	4 / 33
Barium	ug/g	33 / 33	33 / 33	23,100	3,807	5,792	Nonparametric UTL	423	Y	20 / 33
Beryllium	ug/g	16 / 33	16 / 33	0.78	0.33	0.16	Nonparametric UTL	1.2	N	0 / 16
Cadmium	ug/g	32 / 33	32 / 33	37	4.8	8.1	Nonparametric UTL	21	Y	2 / 32
Calcium	ug/g	33 / 33	33 / 33	198,000	91,565	65,298	Nonparametric UTL	250,000	N	0 / 33
Chromium	ug/g	33 / 33	33 / 33	234	52	60	Nonparametric UTL	56	Y	9 / 33
Cobalt	ug/g	25 / 33	25 / 33	63	13	15	Normal UTL	10	Y	13 / 25
Copper	ug/g	33 / 33	33 / 33	12,500	1,691	2,937	Nonparametric UTL	162	Y	18 / 33
Iron	ug/g	33 / 33	33 / 33	391,000	94,537	113,618	Normal UTL	21,340	Y	17 / 33
Lead	ug/g	33 / 33	33 / 33	963	157	250	Nonparametric UTL	401	Y	5 / 33
Magnesium	ug/g	33 / 33	33 / 33	268,000	35,928	51,097	Nonparametric UTL	35,700	Y	9 / 33
Manganese	ug/g	33 / 33	33 / 33	2,290	670	548	Normal UTL	649	Y	13 / 33
Mercury	ug/g	8 / 33	8 / 33	0.11	0.035	0.020	Nonparametric UTL	0.36	N	0 / 8
Nickel	ug/g	33 / 33	33 / 33	374	97	117	Nonparametric UTL	33	Y	17 / 33
Potassium	ug/g	30 / 33	30 / 33	4,800	1,600	1,326	Normal UTL	6,751	N	0 / 30
Selenium	ug/g	1 / 33	1 / 33	1.5	0.66	0.50	Nonparametric UTL	2.9	N	0 / 1
Silver	ug/g	24 / 33	24 / 33	5.7	27	62	Lognormal UTL	0.47	Y	20 / 24
Sodium	ug/g	32 / 33	32 / 33	873	369	234	Nonparametric UTL	5,610	N	0 / 32
Thallium	ug/g	20 / 33	20 / 33	23	4.8	6.6	Nonparametric UTL	34	N	0 / 20
Vanadium	ug/g	28 / 33	28 / 33	43	17	10	Normal UTL	55	N	0 / 28
Zinc	ug/g	33 / 33	33 / 33	1,770	251	450	Nonparametric UTL	385	Y	4 / 33

-- Not applicable (critical value or correlation coefficient not needed; background comparison not conducted for organic compounds)

<sup>a</sup> For the Proportion of Detects - All Samples, counts were based on the unaveraged data set.

<sup>b</sup> For the Proportion of Detects - Temporal Samples and the Frequency of Detection, counts were based on the averaged data set (i.e. - temporal samples were averaged).

<sup>c</sup> If the 95% UTL is Lognormal, the maximum detected result is presented in log-space.

<sup>d</sup> For the UTL comparison (not conducted for organic compounds):

1) If fewer than 4 samples are available in the background data set, "Compare Maxima" is indicated. 2) If the frequency of detection in the background data set is > 50%: a) If the background distribution is normal, "Normal UTL". b) if the background distribution is lognormal, "Lognormal UTL". 3) If the frequency of detection in the background data set is < 10%, "Poisson UTL" is indicated. 4) In all other cases, "Nonparametric UTL" is indicated.

<sup>e</sup> The 95% UTLs were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*.

<sup>f</sup> Y - yes; N - no.

<sup>g</sup> Counts are based on the unaveraged data set.

**Table K-84. Inorganics Greater than Background UTL for SWMU 37 - Slope Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Aluminum	24255.75146	27800	SB-37-15	BORE	SAIC04	10.00		Normal UTL
Aluminum	24255.75146	28500	SB-37-19	BORE	SAIC04	10.00		Normal UTL
Aluminum	24255.75146	33700	SB-37-20	BORE	SAIC02	1.00		Normal UTL
Aluminum	24255.75146	39400	SB-37-16	BORE	SAIC03	5.00		Normal UTL
Aluminum	24255.75146	57100	SB-37-11	BORE	SAIC03	5.00		Normal UTL
Aluminum	24255.75146	63400	SB-37-11	BORE	SAIC02	1.00		Normal UTL
Aluminum	24255.75146	78800	SB-37-19	BORE	SAIC03	5.00		Normal UTL
Aluminum	24255.75146	94200	SB-37-15	BORE	SAIC03	6.50		Normal UTL
Aluminum	24255.75146	99200	SB-37-17	BORE	SAIC03	5.00		Normal UTL
Antimony	11.9	12.5	SB-37-15	BORE	SAIC03	6.50		Poisson UTL
Arsenic	3.37044058	31.7	SB-37-18	BORE	SAIC05	15.00		Lognormal UTL
Arsenic	3.37044058	47.3	SB-37-16	BORE	SAIC03	5.00		Lognormal UTL
Arsenic	3.37044058	54.4	SB-37-18	BORE	SAIC03	5.00		Lognormal UTL
Arsenic	3.37044058	57.5	SB-37-19	BORE	SAIC02	1.00		Lognormal UTL
Barium	423	450	SB-37-18	BORE	SAIC05	15.00		Nonparametric UTL
Barium	423	460	SB-37-16	BORE	SAIC02	1.00		Nonparametric UTL
Barium	423	502	SB-37-15	BORE	SAIC02	1.00		Nonparametric UTL
Barium	423	716	SB-37-21	BORE	SAIC02	1.00		Nonparametric UTL
Barium	423	878	SB-37-20	BORE	SAIC03	5.00		Nonparametric UTL
Barium	423	1340	SB-37-18	BORE	SAIC02	1.00		Nonparametric UTL
Barium	423	1550	SB-37-16	BORE	SAIC04	10.00	J	Nonparametric UTL
Barium	423	1950	SB-37-19	BORE	SAIC02	1.00		Nonparametric UTL
Barium	423	2300	SB-37-12	BORE	SAIC02	1.00		Nonparametric UTL
Barium	423	2430	SB-37-12	BORE	SAIC03	5.00		Nonparametric UTL
Barium	423	3770	SB-37-11	BORE	SAIC03	5.00		Nonparametric UTL
Barium	423	6710	SB-37-15	BORE	SAIC04	10.00	J	Nonparametric UTL
Barium	423	6780	SB-37-19	BORE	SAIC04	10.00		Nonparametric UTL
Barium	423	6910	SB-37-11	BORE	SAIC02	1.00		Nonparametric UTL
Barium	423	8400	SB-37-17	BORE	SAIC03	5.00		Nonparametric UTL
Barium	423	9400	SB-37-18	BORE	SAIC03	5.00		Nonparametric UTL
Barium	423	14000	SB-37-15	BORE	SAIC03	6.50		Nonparametric UTL
Barium	423	14000	SB-37-19	BORE	SAIC03	5.00		Nonparametric UTL
Barium	423	17100	SB-37-16	BORE	SAIC03	5.00		Nonparametric UTL
Barium	423	23100	SB-37-20	BORE	SAIC02	1.00		Nonparametric UTL
Cadmium	21.1	21.4	SB-37-19	BORE	SAIC02	1.00		Nonparametric UTL
Cadmium	21.1	37.4	SB-37-12	BORE	SAIC02	1.00		Nonparametric UTL
Chromium	56.2	58.9	SB-37-11	BORE	SAIC03	5.00		Nonparametric UTL
Chromium	56.2	84.3	SB-37-18	BORE	SAIC03	5.00		Nonparametric UTL
Chromium	56.2	102	SB-37-17	BORE	SAIC03	5.00		Nonparametric UTL
Chromium	56.2	103	SB-37-11	BORE	SAIC02	1.00		Nonparametric UTL
Chromium	56.2	119	SB-37-15	BORE	SAIC03	6.50		Nonparametric UTL
Chromium	56.2	153	SB-37-19	BORE	SAIC03	5.00		Nonparametric UTL

**Table K-84. Inorganics Greater than Background UTL for SWMU 37 - Slope Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Chromium	56.2	162	SB-37-16	BORE	SAIC03	5.00		Nonparametric UTL
Chromium	56.2	207	SB-37-20	BORE	SAIC02	1.00		Nonparametric UTL
Chromium	56.2	234	SB-37-19	BORE	SAIC02	1.00		Nonparametric UTL
Cobalt	10.22734583	11.2	SB-37-19	BORE	SAIC04	10.00		Normal UTL
Cobalt	10.22734583	13.7	SB-37-15	BORE	SAIC04	10.00		Normal UTL
Cobalt	10.22734583	14.1	SB-37-17	BORE	SAIC03	5.00		Normal UTL
Cobalt	10.22734583	15.4	SB-37-14	BORE	SAIC02	1.00		Normal UTL
Cobalt	10.22734583	15.8	SB-37-19	BORE	SAIC02	1.00		Normal UTL
Cobalt	10.22734583	19.3	SB-37-15	BORE	SAIC03	6.50		Normal UTL
Cobalt	10.22734583	23.2	SB-37-18	BORE	SAIC03	5.00		Normal UTL
Cobalt	10.22734583	28.3	SB-37-20	BORE	SAIC02	1.00		Normal UTL
Cobalt	10.22734583	32.6	SB-37-11	BORE	SAIC03	5.00		Normal UTL
Cobalt	10.22734583	34	SB-37-19	BORE	SAIC03	5.00		Normal UTL
Cobalt	10.22734583	43.2	SB-37-12	BORE	SAIC02	1.00		Normal UTL
Cobalt	10.22734583	46.2	SB-37-16	BORE	SAIC03	5.00		Normal UTL
Cobalt	10.22734583	63.1	SB-37-11	BORE	SAIC02	1.00		Normal UTL
Copper	162	209	SB-37-18	BORE	SAIC04	10.00		Nonparametric UTL
Copper	162	231	SB-37-14	BORE	SAIC02	1.00		Nonparametric UTL
Copper	162	383	SB-37-15	BORE	SAIC02	1.00		Nonparametric UTL
Copper	162	402	SB-37-18	BORE	SAIC02	1.00		Nonparametric UTL
Copper	162	535	SB-37-16	BORE	SAIC04	10.00	J	Nonparametric UTL
Copper	162	1080	SB-37-19	BORE	SAIC04	10.00		Nonparametric UTL
Copper	162	1140	SB-37-12	BORE	SAIC03	5.00		Nonparametric UTL
Copper	162	1280	SB-37-12	BORE	SAIC02	1.00		Nonparametric UTL
Copper	162	1480	SB-37-18	BORE	SAIC03	5.00		Nonparametric UTL
Copper	162	1770	SB-37-20	BORE	SAIC02	1.00		Nonparametric UTL
Copper	162	2250	SB-37-19	BORE	SAIC03	5.00		Nonparametric UTL
Copper	162	2280	SB-37-15	BORE	SAIC04	10.00	J	Nonparametric UTL
Copper	162	3180	SB-37-16	BORE	SAIC03	5.00		Nonparametric UTL
Copper	162	3850	SB-37-11	BORE	SAIC03	5.00		Nonparametric UTL
Copper	162	6010	SB-37-17	BORE	SAIC03	5.00		Nonparametric UTL
Copper	162	7190	SB-37-11	BORE	SAIC02	1.00		Nonparametric UTL
Copper	162	9000	SB-37-15	BORE	SAIC03	6.50		Nonparametric UTL
Copper	162	12500	SB-37-19	BORE	SAIC02	1.00		Nonparametric UTL
Iron	21339.95549	33100	SB-37-17	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	34400	SB-37-19	BORE	SAIC04	10.00		Normal UTL
Iron	21339.95549	43300	SB-37-16	BORE	SAIC04	10.00	J	Normal UTL
Iron	21339.95549	44500	SB-37-14	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	88700	SB-37-16	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	131000	SB-37-15	BORE	SAIC04	10.00	J	Normal UTL
Iron	21339.95549	144000	SB-37-11	BORE	SAIC03	5.00		Normal UTL
Iron	21339.95549	151000	SB-37-15	BORE	SAIC03	6.50		Normal UTL

**Table K-84. Inorganics Greater than Background UTL for SWMU 37 - Slope Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background Data Set <sup>a</sup>	Value <sup>b</sup>	Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
Iron	21339.95549	157000	SB-37-19	BORE	SAIC03	5.00		Normal UTL
Iron	21339.95549	166000	SB-37-15	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	168000	SB-37-20	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	197000	SB-37-12	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	227000	SB-37-17	BORE	SAIC03	5.00		Normal UTL
Iron	21339.95549	291000	SB-37-16	BORE	SAIC03	5.00		Normal UTL
Iron	21339.95549	296000	SB-37-11	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	367000	SB-37-19	BORE	SAIC02	1.00		Normal UTL
Iron	21339.95549	391000	SB-37-18	BORE	SAIC03	5.00		Normal UTL
Lead	401	421	SB-37-12	BORE	SAIC02	1.00		Nonparametric UTL
Lead	401	441	SB-37-11	BORE	SAIC02	1.00		Nonparametric UTL
Lead	401	788	SB-37-19	BORE	SAIC02	1.00		Nonparametric UTL
Lead	401	808	SB-37-14	BORE	SAIC02	1.00		Nonparametric UTL
Lead	401	963	SB-37-12	BORE	SAIC03	5.00		Nonparametric UTL
Magnesium	35700	50800	SB-37-15	BORE	SAIC04	10.00		Nonparametric UTL
Magnesium	35700	53600	SB-37-18	BORE	SAIC03	5.00		Nonparametric UTL
Magnesium	35700	58800	SB-37-17	BORE	SAIC03	5.00		Nonparametric UTL
Magnesium	35700	60400	SB-37-20	BORE	SAIC02	1.00		Nonparametric UTL
Magnesium	35700	76600	SB-37-19	BORE	SAIC04	10.00		Nonparametric UTL
Magnesium	35700	86300	SB-37-16	BORE	SAIC03	5.00		Nonparametric UTL
Magnesium	35700	90600	SB-37-15	BORE	SAIC03	6.50		Nonparametric UTL
Magnesium	35700	123000	SB-37-19	BORE	SAIC03	5.00		Nonparametric UTL
Magnesium	35700	268000	SB-37-12	BORE	SAIC03	5.00		Nonparametric UTL
Manganese	648.7565583	664	SB-37-16	BORE	SAIC02	1.00		Normal UTL
Manganese	648.7565583	878	SB-37-15	BORE	SAIC02	1.00		Normal UTL
Manganese	648.7565583	889	SB-37-11	BORE	SAIC03	5.00		Normal UTL
Manganese	648.7565583	889	SB-37-15	BORE	SAIC04	10.00	J	Normal UTL
Manganese	648.7565583	1040	SB-37-12	BORE	SAIC02	1.00		Normal UTL
Manganese	648.7565583	1220	SB-37-20	BORE	SAIC02	1.00		Normal UTL
Manganese	648.7565583	1260	SB-37-19	BORE	SAIC03	5.00		Normal UTL
Manganese	648.7565583	1380	SB-37-19	BORE	SAIC02	1.00		Normal UTL
Manganese	648.7565583	1410	SB-37-18	BORE	SAIC03	5.00		Normal UTL
Manganese	648.7565583	1430	SB-37-11	BORE	SAIC02	1.00		Normal UTL
Manganese	648.7565583	1450	SB-37-17	BORE	SAIC03	5.00		Normal UTL
Manganese	648.7565583	1540	SB-37-16	BORE	SAIC03	5.00		Normal UTL
Manganese	648.7565583	2290	SB-37-15	BORE	SAIC03	6.50		Normal UTL
Nickel	33.35	35.1	SB-37-18	BORE	SAIC02	1.00		Nonparametric UTL
Nickel	33.35	38.5	SB-37-16	BORE	SAIC02	1.00		Nonparametric UTL
Nickel	33.35	41	SB-37-16	BORE	SAIC04	10.00	J	Nonparametric UTL
Nickel	33.35	54.1	SB-37-19	BORE	SAIC04	10.00		Nonparametric UTL
Nickel	33.35	58.8	SB-37-15	BORE	SAIC02	1.00		Nonparametric UTL
Nickel	33.35	67.7	SB-37-14	BORE	SAIC02	1.00		Nonparametric UTL

**Table K-84. Inorganics Greater than Background UTL for SWMU 37 - Slope Subsurface Soils  
Group 3 Phase II RFI, DCD, Tooele, Utah**

Parameter	95% UTL of Background		Site ID	Site Type	Field Sample	Depth	Flagging Code	Background Comparison
	Data Set <sup>a</sup>	Value <sup>b</sup>						
Nickel	33.35	87.3	SB-37-12	BORE	SAIC02	1.00		Nonparametric UTL
Nickel	33.35	121	SB-37-15	BORE	SAIC04	10.00	J	Nonparametric UTL
Nickel	33.35	166	SB-37-18	BORE	SAIC03	5.00		Nonparametric UTL
Nickel	33.35	175	SB-37-20	BORE	SAIC02	1.00		Nonparametric UTL
Nickel	33.35	208	SB-37-11	BORE	SAIC03	5.00		Nonparametric UTL
Nickel	33.35	254	SB-37-17	BORE	SAIC03	5.00		Nonparametric UTL
Nickel	33.35	283	SB-37-15	BORE	SAIC03	6.50		Nonparametric UTL
Nickel	33.35	308	SB-37-16	BORE	SAIC03	5.00		Nonparametric UTL
Nickel	33.35	310	SB-37-19	BORE	SAIC02	1.00		Nonparametric UTL
Nickel	33.35	355	SB-37-19	BORE	SAIC03	5.00		Nonparametric UTL
Nickel	33.35	374	SB-37-11	BORE	SAIC02	1.00		Nonparametric UTL
Silver	0.467452072	1.61	SB-37-14	BORE	SAIC03	5.00		Lognormal UTL
Silver	0.467452072	1.68	SB-37-18	BORE	SAIC02	1.00		Lognormal UTL
Silver	0.467452072	2.06	SB-37-16	BORE	SAIC02	1.00		Lognormal UTL
Silver	0.467452072	2.66	SB-37-15	BORE	SAIC02	1.00		Lognormal UTL
Silver	0.467452072	2.82	SB-37-18	BORE	SAIC03	5.00		Lognormal UTL
Silver	0.467452072	4.06	SB-37-15	BORE	SAIC05	15.00	J	Lognormal UTL
Silver	0.467452072	4.65	SB-37-20	BORE	SAIC02	1.00		Lognormal UTL
Silver	0.467452072	4.8	SB-37-19	BORE	SAIC03	5.00		Lognormal UTL
Silver	0.467452072	6.66	SB-37-17	BORE	SAIC02	1.00		Lognormal UTL
Silver	0.467452072	7.1	SB-37-18	BORE	SAIC04	10.00	JP	Lognormal UTL
Silver	0.467452072	12.9	SB-37-16	BORE	SAIC04	10.00	J	Lognormal UTL
Silver	0.467452072	21.4	SB-37-19	BORE	SAIC04	10.00		Lognormal UTL
Silver	0.467452072	21.8	SB-37-19	BORE	SAIC02	1.00		Lognormal UTL
Silver	0.467452072	25.8	SB-37-12	BORE	SAIC03	5.00		Lognormal UTL
Silver	0.467452072	32.8	SB-37-15	BORE	SAIC03	6.50		Lognormal UTL
Silver	0.467452072	73.4	SB-37-15	BORE	SAIC04	10.00	J	Lognormal UTL
Silver	0.467452072	90.3	SB-37-16	BORE	SAIC03	5.00		Lognormal UTL
Silver	0.467452072	104	SB-37-17	BORE	SAIC03	5.00		Lognormal UTL
Silver	0.467452072	153	SB-37-11	BORE	SAIC03	5.00		Lognormal UTL
Silver	0.467452072	310	SB-37-11	BORE	SAIC02	1.00		Lognormal UTL
Zinc	385	700	SB-37-11	BORE	SAIC02	1.00		Nonparametric UTL
Zinc	385	1360	SB-37-14	BORE	SAIC02	1.00		Nonparametric UTL
Zinc	385	1650	SB-37-19	BORE	SAIC02	1.00		Nonparametric UTL
Zinc	385	1770	SB-37-12	BORE	SAIC02	1.00		Nonparametric UTL

<sup>a</sup> The 95% Upper Tolerance Limits (UTLs) were calculated as described in EPA's *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Interim Final Guidance, February 1989*, and the *Addendum to Interim Final Guidance, July 1992*. Note: if the UTL is Lognormal, the UTL is presented in log-space.

<sup>b</sup> The value shown in this column does not reflect the averaging of field duplicates or temporal samples. Values in this column have not been log-transformed.