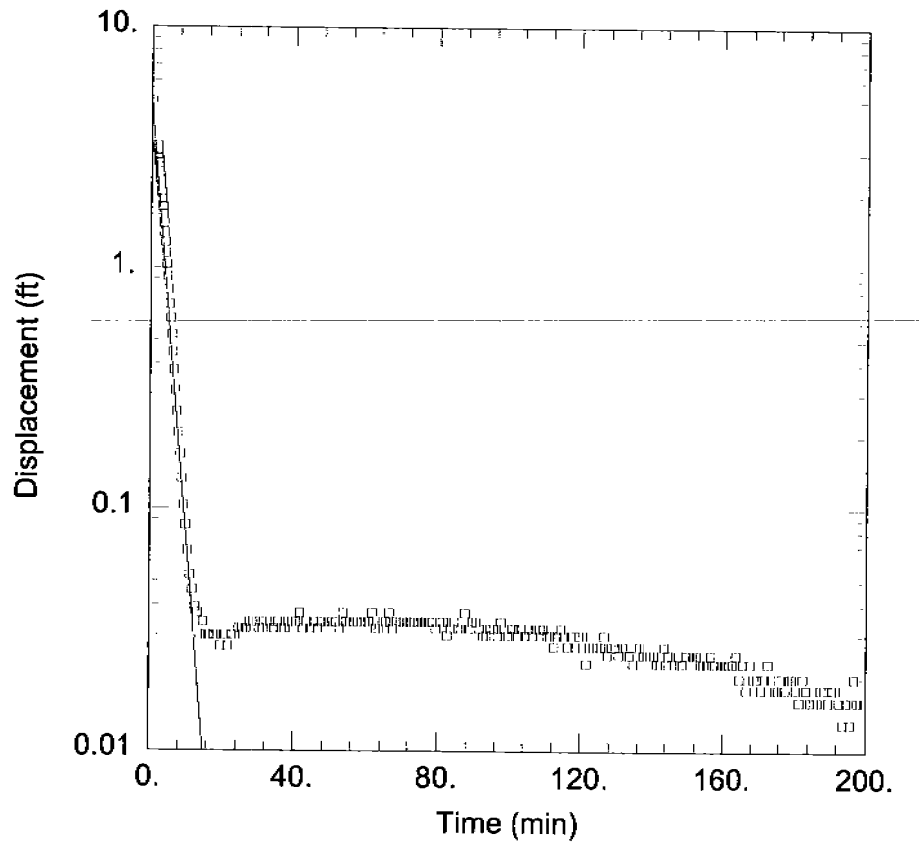

WELL TEST ANALYSIS

Data Set: C:\NATE\MW11_BR.AQT
Date: 09/06/00 Time: 11:42:21

PROJECT INFORMATION

Company: Earth Tech
Client: Granite
Project: 39901
Test Location: Tourtelot Property
Test Well: MW-11
Test Date: 8/23/00

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.572 ft/day
y0 = 4.927 ft

AQUIFER DATA

Saturated Thickness: 10. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 4.927 ft
Casing Radius: 0.083 ft
Screen Length: 10. ft

Water Column Height: 12.25 ft
Wellbore Radius: 0.25 ft
Gravel Pack Porosity: 0.2

APPENDIX E

STATISTICAL INFORMATION

Attachment E-1: **Wilcoxon Rank Sum Test Results**

Attachment E-2: **Scatter Plots and Isocentrations Plots for Inorganic Parameters**

Attachment E-3: **Upper Tolerance Limits (UTLs)**

Attachment E-4: **Cumulative Probability Plots**

Attachment E-5: **Soil Heterogeneity Evaluations for Arsenic, Iron, and Manganese**

ATTACHMENT E-1

Wilcoxon Rank Sum Test Results Summarized in Table 6-3 of Chapter 6

Attachment E-1
Wilcoxon Rank Sum Test Results

This attachment presents the computer-generated calculation sheets for the Wilcoxon Rank Sum test (also known as the Mann-Whitney U test) used to compare pooled data from specific areas of interest to pooled data from the ambient soil data set, as presented on Table 6-3 of Chapter 6.

The Wilcoxon Rank Sum test is a non-parametric procedure that tests for a difference between the medians of two data sets. All non-detected values were assigned a value of zero for ranking purposes. Since the Wilcoxon Rank Sum test is a statistical hypothesis test, it requires that both a "null hypothesis" and an "alternative hypothesis" be defined prior to calculation. The null hypothesis for this test is that the median of the pooled chemical concentration data from a particular area of interest is equal to the median of the pooled chemical concentration data from the ambient data set. The alternative hypothesis is that the median of the pooled data from a particular area of interest is higher than the median of the pooled data from the ambient data set. For purposes of the evaluation presented in Chapter 6, we are only interested in knowing if the median concentrations of chemicals from areas of interest are higher than their respective median ambient concentrations (as opposed to higher or lower); therefore, a "one-tailed" calculation is used.

As is the basis of all statistical hypothesis tests, the null hypothesis can never be proven; that is, it cannot be proven that any particular median chemical concentration from any particular area of interest and the ambient data set are equal. Instead, the null hypothesis is rejected only if the calculation returns a result that is inconsistent with what would be expected if the null hypothesis was true. In this context, the "proof" that the medians are equal lies simply in the demonstration that they are not extremely different. Extreme difference must be defined in terms of probability and statistical significance. For purposes of this evaluation, a result that returns a probability of less that 0.05 causes the null hypothesis to be rejected and an extreme concentration difference to be concluded (accepting that this conclusion will be incorrect 5% of the time). This, in turn, results in the conclusion that the median concentration from the area of interest is higher than the median concentration from the ambient data set. Specific cases where the null hypothesis is rejected at the <0.05 level, and where it is, therefore, concluded that the median concentration of a particular chemical in a particular area of interest is higher than its median concentration in the ambient data set, are shown in boldface on Table 6-3 in Chapter 6.

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

ALUMINUM	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	462.0	18.48	363.0
Ambient	20	573.0	28.65	137.0

Difference between medians	-2500.000	
95.2% CI	-4400.000 to +∞	(normal approximation)

Mann-Whitney U statistic	363	
1-tailed p	0.9951	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

ARSENIC	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	448.5	17.94	376.5
Ambient	20	586.5	29.33	123.5

Difference between medians	-2.500	
95.2% CI	-3.900 to +∞	(normal approximation)

Mann-Whitney U statistic	376.5	
1-tailed p	0.9981	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n 45

BARIUM	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	516.5	20.66	308.5
Ambient	20	518.5	25.93	191.5

Difference between medians -46.000

95.2% CI -98.000 to +∞ (normal approximation)

Mann-Whitney U statistic 308.5

1-tailed p 0.9093 (normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

CHROMIUM (total)	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	592.0	23.68	233.0
Ambient	20	443.0	22.15	267.0

Difference between medians	1.650	
95.2% CI	-2.900 to +∞	(normal approximation)

Mann-Whitney U statistic	233	
1-tailed p	0.3489	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

COBALT	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	648.5	25.94	176.5
Ambient	20	386.5	19.33	323.5

Difference between medians	1.900	
95.2% CI	0.000 to +∞	(normal approximation)

Mann-Whitney U statistic	176.5	
1-tailed p	0.0466	(normal approximation, corrected for ties)

analysed with: Analyse-it - General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

COPPER	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	680.0	27.20	145.0
Ambient	20	355.0	17.75	355.0

Difference between medians	7.800	
95.2% CI	2.500 to +∞	(normal approximation)

Mann-Whitney U statistic	145	
1-tailed p	0.0082	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

IRON	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	654.0	26.16	171.0
Ambient	20	381.0	19.05	329.0

Difference between medians	2050.000	
95.2% CI	200.000 to +∞	(normal approximation)

Mann-Whitney U statistic	171	
1-tailed p	0.0355	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

LEAD	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	389.5	15.58	435.5
Ambient	20	645.5	32.28	64.5

Difference between medians	-19.050	
95.2% CI	-27.200 to +∞	(normal approximation)

Mann-Whitney U statistic	435.5	
1-tailed p	1.0000	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n 45

MANGANESE	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	525.5	21.02	299.5
Ambient	20	509.5	25.48	200.5

Difference between medians -144.000
95.2% CI -382.000 to +∞ (normal approximation)

Mann-Whitney U statistic 299.5
1-tailed p 0.8709 (normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	45

NICKEL	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	723.5	28.94	101.5
Ambient	20	311.5	15.58	398.5

Difference between medians	14.500	
95.2% CI	7.700 to +∞	(normal approximation)

Mann-Whitney U statistic	101.5	
1-tailed p	0.0003	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n 45

ZINC	n	Rank sum	Mean rank	U
Ammunition Renovation Area	25	595.5	23.82	229.5
Ambient	20	439.5	21.98	270.5

Difference between medians	1.800	
95.2% CI	-4.900 to +∞	(normal approximation)

Mann-Whitney U statistic	229.5	
1-tailed p	0.3197	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	29

COPPER	n	Rank sum	Mean rank	U
Demolition Site 1	9	200.0	22.22	25.0
Ambient	20	235.0	11.75	155.0

Difference between medians	17.850	
95.1% CI	6.900 to +∞	(normal approximation)

Mann-Whitney U statistic	25	
1-tailed p	0.0011	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	29

IRON	n	Rank sum	Mean rank	U
Demolition Site 1	9	198.5	22.06	26.5
Ambient	20	236.5	11.83	153.5

Difference between medians	5250.000	
95.1% CI	2700.000 to +∞	(normal approximation)

Mann-Whitney U statistic	26.5	
1-tailed p	0.0014	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	29

ZINC	n	Rank sum	Mean rank	U
Demolition Site 1	9	166.0	18.44	59.0
Ambient	20	269.0	13.45	121.0

Difference between medians	10.000	
95.1% CI	-1.300 to +∞	(normal approximation)

Mann-Whitney U statistic	59	
1-tailed p	0.0719	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	28

ARSENIC	n	Rank sum	Mean rank	U
Demolition Site 2	8	116.0	14.50	80.0
Ambient	20	290.0	14.50	80.0

Difference between medians	0.000	
95.3% CI	-1.400 to +∞	(normal approximation)

Mann-Whitney U statistic	80	
1-tailed p	0.5000	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	28

COBALT	n	Rank sum	Mean rank	U
Demolition Site 2	8	121.5	15.19	74.5
Ambient	20	284.5	14.23	85.5

Difference between medians	0.700	
95.3% CI	-1.300 to +∞	(normal approximation)

Mann-Whitney U statistic	74.5	
1-tailed p	0.3897	(normal approximation, corrected for ties)

Test	Mann-Whitney test (Wilcoxon Rank Sum test)
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n | 28

IRON	n	Rank sum	Mean rank	U
Demolition Site 2	8	174.0	21.75	22.0
Ambient	20	232.0	11.60	138.0

Difference between medians	5150.000	
95.3% CI	2400.000 to +∞	(normal approximation)

Mann-Whitney U statistic	22	
1-tailed p	0.0016	(normal approximation)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	28

NICKEL	n	Rank sum	Mean rank	U
Demolition Site 2	8	163.0	20.38	33.0
Ambient	20	243.0	12.15	127.0

Difference between medians	9.300	
95.3% CI	2.800 to +∞	(normal approximation)

Mann-Whitney U statistic	33	
1-tailed p	0.0084	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	28

ZINC	n	Rank sum	Mean rank	U
Demolition Site 2	8	113.0	14.13	83.0
Ambient	20	293.0	14.65	77.0

Difference between medians	-0.550	
95.3% CI	-11.300 to +∞	(normal approximation)

Mann-Whitney U statistic	83	
1-tailed p	0.5607	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	36

ARSENIC	n	Rank sum	Mean rank	U
Demolition Site 3	16	207.0	12.94	249.0
Ambient	20	459.0	22.95	71.0

Difference between medians	-2.500	
95.1% CI	-4.200 to +∞	(normal approximation)

Mann-Whitney U statistic	249	
1-tailed p	0.9977	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n 36

COBALT	n	Rank sum	Mean rank	U
Demolition Site 3	16	298.0	18.63	158.0
Ambient	20	368.0	18.40	162.0

Difference between medians 0.100
95.1% CI -2.300 to +∞ (normal approximation)

Mann-Whitney U statistic 158
1-tailed p 0.4746 (normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	36

COPPER	n	Rank sum	Mean rank	U
Demolition Site 3	16	272.0	17.00	184.0
Ambient	20	394.0	19.70	136.0

Difference between medians	-5.700	
95.1% CI	-14.600 to +∞	(normal approximation)

Mann-Whitney U statistic	184	
1-tailed p	0.7776	(normal approximation, corrected for ties)

Test	Mann-Whitney test (Wilcoxon Rank Sum test)
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	36

IRON	n	Rank sum	Mean rank	U
Demolition Site 3	16	396.5	24.78	59.5
Ambient	20	269.5	13.48	260.5

Difference between medians	4700.000	
95.1% CI	2600.000 to +∞	(normal approximation)

Mann-Whitney U statistic	59.5	
1-tailed p	0.0007	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	36

MANGANESE	n	Rank sum	Mean rank	U
Demolition Site 3	16	186.0	11.63	270.0
Ambient	20	480.0	24.00	50.0

Difference between medians	-570.500	
95.1% CI	-783.000 to +∞	(normal approximation)

Mann-Whitney U statistic	270	
1-tailed p	0.9998	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	36

MERCURY	n	Rank sum	Mean rank	U
Demolition Site 3	16	265.5	16.59	190.5
Ambient	20	400.5	20.03	129.5

Difference between medians	-0.037	
95.1% CI	-0.079 to +∞	(normal approximation)

Mann-Whitney U statistic	190.5	
1-tailed p	0.8344	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	36

VANADIUM	n	Rank sum	Mean rank	U
Demolition Site 3	16	365.5	22.84	90.5
Ambient	20	300.5	15.03	229.5

Difference between medians	8.050	
95.1% CI	2.100 to +∞	(normal approximation)

Mann-Whitney U statistic	90.5	
1-tailed p	0.0134	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	36

ZINC	n	Rank sum	Mean rank	U
Demolition Site 3	16	241.0	15.06	215.0
Ambient	20	425.0	21.25	105.0

Difference between medians	-14.500	
95.1% CI	-25.300 to +∞	(normal approximation)

Mann-Whitney U statistic	215	
1-tailed p	0.9601	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

ALUMINUM	n	Rank sum	Mean rank	U
Flare Site	20	283.0	14.15	327.0
Ambient	20	537.0	26.85	73.0

Difference between medians	-4000.000	
95.1% CI	-6000.000 to +∞	(normal approximation)

Mann-Whitney U statistic	327	
1-tailed p	0.9997	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n 40

ANTIMONY	n	Rank sum	Mean rank	U
Flare Site	20	287.5	14.38	322.5
Ambient	20	532.5	26.63	77.5

Difference between medians -1.060

95.1% CI -1.300 to +∞ (normal approximation)

Mann-Whitney U statistic 322.5

1-tailed p 0.9996 (normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

ARSENIC	n	Rank sum	Mean rank	U
Flare Site	20	337.5	16.88	272.5
Ambient	20	482.5	24.13	127.5

Difference between medians	-2.550	
95.1% CI	-4.600 to +∞	(normal approximation)

Mann-Whitney U statistic	272.5	
1-tailed p	0.9751	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

BARIUM	n	Rank sum	Mean rank	U
Flare Site	20	413.5	20.68	196.5
Ambient	20	406.5	20.33	203.5

Difference between medians	3.000	
95.1% CI	-56.000 to +∞	(normal approximation)

Mann-Whitney U statistic	196.5	
1-tailed p	0.4623	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

CADMIUM	n	Rank sum	Mean rank	U
Flare Site	20	330.0	16.50	280.0
Ambient	20	490.0	24.50	120.0

Difference between medians	-0.500	
95.1% CI	-0.830 to +∞	(normal approximation)

Mann-Whitney U statistic	280	
1-tailed p	0.9936	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

CHROMIUM (total)	n	Rank sum	Mean rank	U
Flare Site	20	393.5	19.68	216.5
Ambient	20	426.5	21.33	183.5

Difference between medians	-1.250	
95.1% CI	-6.800 to +∞	(normal approximation)

Mann-Whitney U statistic	216.5	
1-tailed p	0.6723	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

COBALT	n	Rank sum	Mean rank	U
Flare Site	20	407.5	20.38	202.5
Ambient	20	412.5	20.63	197.5

Difference between medians	-0.100	
95.1% CI	-1.700 to +∞	(normal approximation)

Mann-Whitney U statistic	202.5	
1-tailed p	0.5270	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

COPPER	n	Rank sum	Mean rank	U
Flare Site	20	549.0	27.45	61.0
Ambient	20	271.0	13.55	339.0

Difference between medians	21.000	
95.1% CI	12.600 to +∞	(normal approximation)

Mann-Whitney U statistic	61	
1-tailed p	<0.0001	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

IRON	n	Rank sum	Mean rank	U
Flare Site	20	481.0	24.05	129.0
Ambient	20	339.0	16.95	271.0

Difference between medians	3300.000	
95.1% CI	600.000 to +∞	(normal approximation)

Mann-Whitney U statistic	129	
1-tailed p	0.0274	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n 40

LEAD	n	Rank sum	Mean rank	U
Flare Site	20	414.5	20.73	195.5
Ambient	20	405.5	20.28	204.5

Difference between medians	2.050	
95.1% CI	-11.700 to +∞	(normal approximation)

Mann-Whitney U statistic	195.5	
1-tailed p	0.4516	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

MANGANESE	n	Rank sum	Mean rank	U
Flare Site	20	317.5	15.88	292.5
Ambient	20	502.5	25.13	107.5

Difference between medians	-290.000	
95.1% CI	-483.000 to +∞	(normal approximation)

Mann-Whitney U statistic	292.5	
1-tailed p	0.9938	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

MERCURY	n	Rank sum	Mean rank	U
Flare Site	20	389.5	19.48	220.5
Ambient	20	430.5	21.53	179.5

Difference between medians	-0.010	
95.1% CI	-0.050 to +∞	(normal approximation)

Mann-Whitney U statistic	220.5	
1-tailed p	0.7104	(normal approximation, corrected for ties)

Test	Mann-Whitney test (Wilcoxon Rank Sum test)
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

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NICKEL	n	Rank sum	Mean rank	U
Flare Site	20	494.0	24.70	116.0
Ambient	20	326.0	16.30	284.0

Difference between medians	10.850	
95.1% CI	3.000 to +∞	(normal approximation)

Mann-Whitney U statistic	116	
1-tailed p	0.0115	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	34

PHOSPHORUS	n	Rank sum	Mean rank	U
Flare Site	14	218.5	15.61	166.5
Ambient	20	376.5	18.83	113.5

Difference between medians	-20.000	
95.3% CI	-70.000 to +∞	(normal approximation)

Mann-Whitney U statistic	166.5	
1-tailed p	0.8232	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	40

ZINC	n	Rank sum	Mean rank	U
Flare Site	20	509.0	25.45	101.0
Ambient	20	311.0	15.55	299.0

Difference between medians	18.050	
95.1% CI	8.400 to +∞	(normal approximation)

Mann-Whitney U statistic	101	
1-tailed p	0.0037	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

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ALUMINUM	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	460.5	20.02	275.5
Ambient	20	485.5	24.28	184.5

Difference between medians	-1400.000	
95.1% CI	-3500.000 to +∞	(normal approximation)

Mann-Whitney U statistic	275.5	
1-tailed p	0.8661	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

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ARSENIC	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	399.0	17.35	337.0
Ambient	20	547.0	27.35	123.0

Difference between medians	-1.900	
95.1% CI	-3.300 to +∞	(normal approximation)

Mann-Whitney U statistic	337	
1-tailed p	0.9954	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

BARIUM	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	505.5	21.98	230.5
Ambient	20	440.5	22.03	229.5

Difference between medians	-0.500	
95.1% CI	-46.000 to +∞	(normal approximation)

Mann-Whitney U statistic	230.5	
1-tailed p	0.5049	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

BERYLLIUM	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	526.5	22.89	209.5
Ambient	20	419.5	20.98	250.5

Difference between medians	0.030	
95.1% CI	-0.060 to +∞	(normal approximation)

Mann-Whitney U statistic	209.5	
1-tailed p	0.3087	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

COBALT	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	558.5	24.28	177.5
Ambient	20	387.5	19.38	282.5

Difference between medians	1.700	
95.1% CI	-0.500 to +∞	(normal approximation)

Mann-Whitney U statistic	177.5	
1-tailed p	0.1005	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

COPPER	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	621.0	27.00	115.0
Ambient	20	325.0	16.25	345.0

Difference between medians	10.000	
95.1% CI	4.900 to +∞	(normal approximation)

Mann-Whitney U statistic	115	
1-tailed p	0.0025	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

IRON	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	627.0	27.26	109.0
Ambient	20	319.0	15.95	351.0

Difference between medians	4400.000	
95.1% CI	2100.000 to +∞	(normal approximation)

Mann-Whitney U statistic	109	
1-tailed p	0.0016	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

LEAD	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	349.0	15.17	387.0
Ambient	20	597.0	29.85	73.0

Difference between medians	-20.250	
95.1% CI	-26.800 to +∞	(normal approximation)

Mann-Whitney U statistic	387	
1-tailed p	0.9999	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

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MANGANESE	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	493.5	21.46	242.5
Ambient	20	452.5	22.63	217.5

Difference between medians	-87.000	
95.1% CI	-340.000 to +∞	(normal approximation)

Mann-Whitney U statistic	242.5	
1-tailed p	0.6196	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

NICKEL	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	665.0	28.91	71.0
Ambient	20	281.0	14.05	389.0

Difference between medians	17.400	
95.1% CI	11.200 to +∞	(normal approximation)

Mann-Whitney U statistic	71	
1-tailed p	<0.0001	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	38

PHOSPHORUS	n	Rank sum	Mean rank	U
Howitzer Test Facility	18	294.5	16.36	236.5
Ambient	20	446.5	22.33	123.5

Difference between medians	-40.000	
95.2% CI	-67.000 to +∞	(normal approximation)

Mann-Whitney U statistic	236.5	
1-tailed p	0.9507	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

VANADIUM	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	341.5	14.85	394.5
Ambient	20	604.5	30.23	65.5

Difference between medians	-17.600	
95.1% CI	-22.000 to +∞	(normal approximation)

Mann-Whitney U statistic	394.5	
1-tailed p	1.0000	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	43

ZINC	n	Rank sum	Mean rank	U
Howitzer Test Facility	23	577.0	25.09	159.0
Ambient	20	369.0	18.45	301.0

Difference between medians	8.750	
95.1% CI	0.400 to +∞	(normal approximation)

Mann-Whitney U statistic	159	
1-tailed p	0.0419	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

ALUMINUM	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	805.5	27.78	209.5
Ambient	20	419.5	20.98	370.5

Difference between medians	2400.000	
95.0% CI	0.000 to +∞	(normal approximation)

Mann-Whitney U statistic	209.5	
1-tailed p	0.0507	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

ARSENIC	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	539.0	18.59	476.0
Ambient	20	686.0	34.30	104.0

Difference between medians	-3.500	
95.0% CI	-4.800 to +∞	(normal approximation)

Mann-Whitney U statistic	476	
1-tailed p	0.9999	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

BARIUM	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	670.5	23.12	344.5
Ambient	20	554.5	27.73	235.5

Difference between medians	-34.000	
95.0% CI	-83.000 to +∞	(normal approximation)

Mann-Whitney U statistic	344.5	
1-tailed p	0.8662	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

BERYLLIUM	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	824.0	28.41	191.0
Ambient	20	401.0	20.05	389.0

Difference between medians	0.090	
95.0% CI	0.020 to +∞	(normal approximation)

Mann-Whitney U statistic	191	
1-tailed p	0.0219	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

CHROMIUM (total)	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	778.0	26.83	237.0
Ambient	20	447.0	22.35	343.0

Difference between medians	2.800	
95.0% CI	-1.200 to +∞	(normal approximation)

Mann-Whitney U statistic	237	
1-tailed p	0.1405	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

COBALT	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	766.0	26.41	249.0
Ambient	20	459.0	22.95	331.0

Difference between medians	0.900	
95.0% CI	-0.800 to +∞	(normal approximation)

Mann-Whitney U statistic	249	
1-tailed p	0.2021	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

COPPER	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	797.0	27.48	218.0
Ambient	20	428.0	21.40	362.0

Difference between medians	5.250	
95.0% CI	-1.000 to +∞	(normal approximation)

Mann-Whitney U statistic	218	
1-tailed p	0.0715	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

IRON	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	863.0	29.76	152.0
Ambient	20	362.0	18.10	428.0

Difference between medians	4150.000	
95.0% CI	1600.000 to +∞	(normal approximation)

Mann-Whitney U statistic	152	
1-tailed p	0.0025	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

MANGANESE	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	686.0	23.66	329.0
Ambient	20	539.0	26.95	251.0

Difference between medians	-139.000	
95.0% CI	-376.000 to +∞	(normal approximation)

Mann-Whitney U statistic	329	
1-tailed p	0.7862	(normal approximation, corrected for ties)

Test	Mann-Whitney test (Wilcoxon Rank Sum test)
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

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NICKEL	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	854.0	29.45	161.0
Ambient	20	371.0	18.55	419.0

Difference between medians	9.650	
95.0% CI	3.900 to +∞	(normal approximation)

Mann-Whitney U statistic	161	
1-tailed p	0.0043	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

VANADIUM	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	621.0	21.41	394.0
Ambient	20	604.0	30.20	186.0

Difference between medians	-12.050	
95.0% CI	-18.700 to +∞	(normal approximation)

Mann-Whitney U statistic	394	
1-tailed p	0.9828	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	49

ZINC	n	Rank sum	Mean rank	U
N. Valley Non-Specific	29	768.5	26.50	246.5
Ambient	20	456.5	22.83	333.5

Difference between medians	3.450	
95.0% CI	-3.500 to +∞	(normal approximation)

Mann-Whitney U statistic	246.5	
1-tailed p	0.1881	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

ALUMINUM	n	Rank sum	Mean rank	U
NVML	34	1153.0	33.91	122.0
Ambient	20	332.0	16.60	558.0

Difference between medians	5900.000	
95.0% CI	3900.000 to +∞	(normal approximation)

Mann-Whitney U statistic	122	
1-tailed p	<0.0001	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

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ARSENIC	n	Rank sum	Mean rank	U
NVML	34	686.5	20.19	588.5
Ambient	20	798.5	39.93	91.5

Difference between medians -3.000
95.0% CI -3.900 to +∞ (normal approximation)

Mann-Whitney U statistic 588.5
1-tailed p 1.0000 (normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

BARIUM	n	Rank sum	Mean rank	U
NVML	34	870.5	25.60	404.5
Ambient	20	614.5	30.73	275.5

Difference between medians	-27.500	
95.0% CI	-70.000 to +∞	(normal approximation)

Mann-Whitney U statistic	404.5	
1-tailed p	0.8760	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

BERYLLIUM	n	Rank sum	Mean rank	U
NVML	34	1114.5	32.78	160.5
Ambient	20	370.5	18.53	519.5

Difference between medians	0.130	
95.0% CI	0.070 to +∞	(normal approximation)

Mann-Whitney U statistic	160.5	
1-tailed p	0.0006	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

CHROMIUM (total)	n	Rank sum	Mean rank	U
NVML	34	1109.0	32.62	166.0
Ambient	20	376.0	18.80	514.0

Difference between medians	9.900	
95.0% CI	4.700 to +∞	(normal approximation)

Mann-Whitney U statistic	166	
1-tailed p	0.0009	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

COBALT	n	Rank sum	Mean rank	U
NVML	34	1001.0	29.44	274.0
Ambient	20	484.0	24.20	406.0

Difference between medians	1.400	
95.0% CI	-0.600 to +∞	(normal approximation)

Mann-Whitney U statistic	274	
1-tailed p	0.1185	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

COPPER	n	Rank sum	Mean rank	U
NVML	34	1033.5	30.40	241.5
Ambient	20	451.5	22.58	438.5

Difference between medians	5.850	
95.0% CI	0.800 to +∞	(normal approximation)

Mann-Whitney U statistic	241.5	
1-tailed p	0.0388	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

IRON	n	Rank sum	Mean rank	U
NVML	34	1170.5	34.43	104.5
Ambient	20	314.5	15.73	575.5

Difference between medians	6200.000	
95.0% CI	4300.000 to +∞	(normal approximation)

Mann-Whitney U statistic	104.5	
1-tailed p	<0.0001	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

MANGANESE	n	Rank sum	Mean rank	U
NVML	34	923.0	27.15	352.0
Ambient	20	562.0	28.10	328.0

Difference between medians	-26.500	
95.0% CI	-227.000 to +∞	(normal approximation)

Mann-Whitney U statistic	352	
1-tailed p	0.5851	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

NICKEL	n	Rank sum	Mean rank	U
NVML	34	1034.0	30.41	241.0
Ambient	20	451.0	22.55	439.0

Difference between medians	7.650	
95.0% CI	0.700 to +∞	(normal approximation)

Mann-Whitney U statistic	241	
1-tailed p	0.0381	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

VANADIUM	n	Rank sum	Mean rank	U
NVML	34	1035.0	30.44	240.0
Ambient	20	450.0	22.50	440.0

Difference between medians	10.000	
95.0% CI	0.800 to +∞	(normal approximation)

Mann-Whitney U statistic	240	
1-tailed p	0.0366	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	54

ZINC	n	Rank sum	Mean rank	U
NVML	34	920.0	27.06	355.0
Ambient	20	565.0	28.25	325.0

Difference between medians	-1.000	
95.0% CI	-7.700 to +∞	(normal approximation)

Mann-Whitney U statistic	355	
1-tailed p	0.6059	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	30

BERYLLIUM	n	Rank sum	Mean rank	U
Ridge Stockpiles	10	188.0	18.80	67.0
Ambient	20	277.0	13.85	133.0

Difference between medians	0.080	
95.3% CI	-0.020 to +∞	(normal approximation)

Mann-Whitney U statistic	67	
1-tailed p	0.0731	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n 30

COBALT	n	Rank sum	Mean rank	U
Ridge Stockpiles	10	145.5	14.55	109.5
Ambient	20	319.5	15.98	90.5

Difference between medians -0.450

95.3% CI -2.600 to +∞ (normal approximation)

Mann-Whitney U statistic 109.5

1-tailed p 0.6621 (normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	30

IRON	n	Rank sum	Mean rank	U
Ridge Stockpiles	10	166.0	16.60	89.0
Ambient	20	299.0	14.95	111.0

Difference between medians	1100.000	
95.3% CI	-2800.000 to +∞	(normal approximation)

Mann-Whitney U statistic	89	
1-tailed p	0.3142	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	30

MANGANESE	n	Rank sum	Mean rank	U
Ridge Stockpiles	10	96.0	9.60	159.0
Ambient	20	369.0	18.45	41.0

Difference between medians	-438.500	
95.3% CI	-654.000 to +∞	(normal approximation)

Mann-Whitney U statistic	159	
1-tailed p	0.9953	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	30 May 2001

n	30

PHOSPHORUS	n	Rank sum	Mean rank	U
Ridge Stockpiles	10	157.0	15.70	98.0
Ambient	20	308.0	15.40	102.0

Difference between medians	1.000	
95.3% CI	-52.000 to +∞	(normal approximation)

Mann-Whitney U statistic	98	
1-tailed p	0.4649	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n 88

ALUMINUM	n	Rank sum	Mean rank	U
TNT Strips	68	2700.5	39.71	1005.5
Ambient	20	1215.5	60.78	354.5

Difference between medians	-3150.000	
95.1% CI	-4600.000 to +∞	(normal approximation)

Mann-Whitney U statistic	1005.5	
1-tailed p	0.9994	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

ANTIMONY	n	Rank sum	Mean rank	U
TNT Strips	68	2466.5	36.27	1239.5
Ambient	20	1449.5	72.48	120.5

Difference between medians	-1.200	
95.1% CI	-1.300 to +∞	(normal approximation)

Mann-Whitney U statistic	1239.5	
1-tailed p	1.0000	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

ARSENIC	n	Rank sum	Mean rank	U
TNT Strips	68	2741.0	40.31	965.0
Ambient	20	1175.0	58.75	395.0

Difference between medians	-1.500	
95.1% CI	-2.500 to +∞	(normal approximation)

Mann-Whitney U statistic	965	
1-tailed p	0.9978	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

BERYLLIUM	n	Rank sum	Mean rank	U
TNT Strips	68	3000.5	44.13	705.5
Ambient	20	915.5	45.78	654.5

Difference between medians	-0.010	
95.1% CI	-0.080 to +∞	(normal approximation)

Mann-Whitney U statistic	705.5	
1-tailed p	0.6003	(normal approximation, corrected for ties)

Test	Mann-Whitney test (Wilcoxon Rank Sum test)
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

CHROMIUM (total)	n	Rank sum	Mean rank	U
TNT Strips	68	3257.0	47.90	449.0
Ambient	20	659.0	32.95	911.0

Difference between medians	5.000	
95.1% CI	1.800 to +∞	(normal approximation)

Mann-Whitney U statistic	449	
1-tailed p	0.0107	(normal approximation, corrected for ties)

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

COBALT	n	Rank sum	Mean rank	U
TNT Strips	68	3223.0	47.40	483.0
Ambient	20	693.0	34.65	877.0

Difference between medians	1.700	
95.1% CI	0.200 to +∞	(normal approximation)

Mann-Whitney U statistic	483	
1-tailed p	0.0245	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

COPPER	n	Rank sum	Mean rank	U
TNT Strips	68	3264.5	48.01	441.5
Ambient	20	651.5	32.58	918.5

Difference between medians	7.000	
95.1% CI	2.000 to +∞	(normal approximation)

Mann-Whitney U statistic	441.5	
1-tailed p	0.0088	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n | 88

IRON	n	Rank sum	Mean rank	U
TNT Strips	68	3386.5	49.80	319.5
Ambient	20	529.5	26.48	1040.5

Difference between medians	3900.000	
95.1% CI	2200.000 to +∞	(normal approximation)

Mann-Whitney U statistic	319.5	
1-tailed p	0.0002	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

MANGANESE	n	Rank sum	Mean rank	U
TNT Strips	68	3101.0	45.60	605.0
Ambient	20	815.0	40.75	755.0

Difference between medians	70.000	
95.1% CI	-110.000 to +∞	(normal approximation)

Mann-Whitney U statistic	605	
1-tailed p	0.2273	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

NICKEL	n	Rank sum	Mean rank	U
TNT Strips	68	3469.5	51.02	236.5
Ambient	20	446.5	22.33	1123.5

Difference between medians	14.550	
95.1% CI	10.300 to +∞	(normal approximation)

Mann-Whitney U statistic	236.5	
1-tailed p	<0.0001	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

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PHOSPHORUS	n	Rank sum	Mean rank	U
TNT Strips	18	298.5	16.58	232.5
Ambient	20	442.5	22.13	127.5

Difference between medians	-37.500	
95.2% CI	-80.000 to +∞	(normal approximation)

Mann-Whitney U statistic	232.5	
1-tailed p	0.9376	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n	88

VANADIUM	n	Rank sum	Mean rank	U
TNT Strips	68	2793.5	41.08	912.5
Ambient	20	1122.5	56.13	447.5

Difference between medians	-6.050	
95.1% CI	-10.400 to +∞	(normal approximation)

Mann-Whitney U statistic	912.5	
1-tailed p	0.9897	(normal approximation, corrected for ties)

analysed with: Analyse-It + General v1.50

Test	**Mann-Whitney test (Wilcoxon Rank Sum test)**
Null Hypothesis	Area of Interest = Ambient
Alternative Hypothesis	Area of Interest > Ambient
Project	Tourtelot
Date	29 May 2001

n 88

ZINC	n	Rank sum	Mean rank	U
TNT Strips	68	2803.5	41.23	902.5
Ambient	20	1112.5	55.63	457.5

Difference between medians	-8.800	
95.1% CI	-13.900 to +∞	(normal approximation)

Mann-Whitney U statistic	902.5	
1-tailed p	0.9867	(normal approximation, corrected for ties)

ATTACHMENT E-2

Scatter Plots and Isoconcentration Plots for Inorganic Parameters

Attachment E-2
Scatter Plots for Inorganic Parameters

This attachment presents concentration vs. depth scatter plots for inorganic parameters (i.e., metals, nitrate, and phosphorus). The scatter plots include only in-situ soil samples (243 sample results for metals, 165 sample results for phosphorus, and 112 sample results for nitrate) in order to appropriately represent depth. This excludes stockpile samples and sediment samples. The scatter plots show the 95th percentile of the ambient soil data set* and labels all or some of the samples that exceed the 95th percentile, depending on the space available on the plot. The percentage of in-situ soil samples exceeding the 95th percentile of the ambient soil data set are as follows:

Al:	16.0%
Sb:	1.2%
As:	7.8%
Ba:	7.8%
Be:	11.5%
Cd:	0.4%
Cr	7.4%
Co:	18.9%
Cu:	17.7%
Fe:	42.4%
Pb:	3.7%
Mn:	13.2%
Hg:	3.3%
Ni:	22.6%
P:	4.2%
V:	14.0%
Zn:	15.6%

The scatter plots are a useful visual aid to assessing whether the results exceeding the 95th percentile are highly anomalous and/or exhibit some sort of pattern indicative of potential soil impact, or whether the results appear random, suggesting no soil impact. The scatter plots should be viewed in conjunction with all other tabular, graphical, and statistical information presented in the report. For metals where the percentage of values far exceed the predicted 5% failure rate and yet appear on the scatter plots to be randomly distributed both with respect to area and depth, the applicability of the 95th percentile is called into question; this issue is addressed in further detail in Attachments E-4 and E-5 to this appendix. Mercury is an example of a systematic pattern suggestive of soil (in Demolition Site #3). Iron is an example of apparent randomness but with a high rate of values exceeding the 95th percentile.

OBSERVATIONS

Inspection of the scatter plots indicates the following non-random and/or extreme anomalies that are interpreted as indicating soil impact:

1. Mercury in Demolition Site #3
2. Antimony in the Flare Site
3. Barium in the Flare Site
4. Copper in the Flare Site
5. Lead in the Flare Site
6. Zinc in the Flare Site

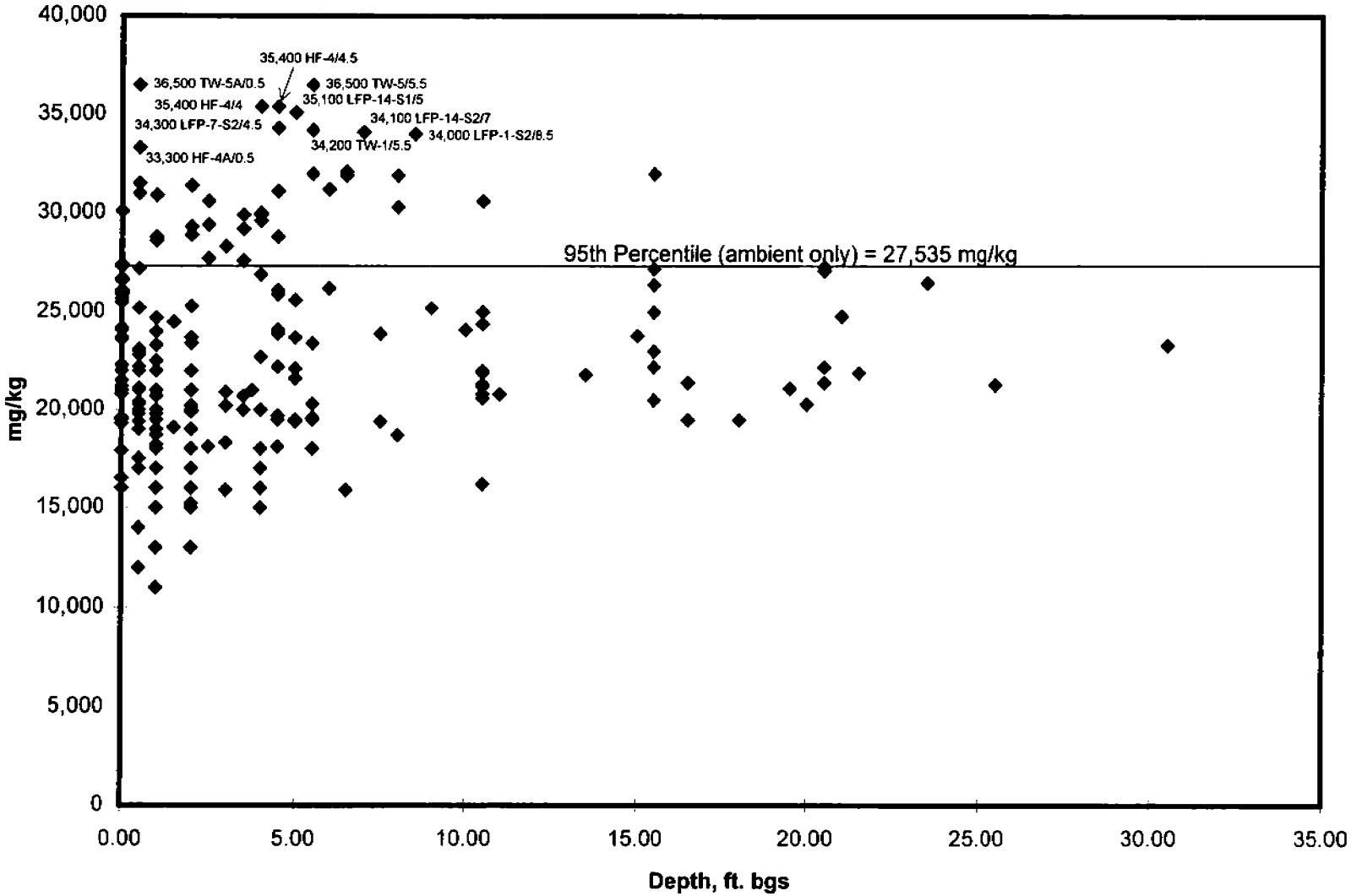
*except for Mo, Ag, Se, and Tl where no 95th percentile was calculated due to high rates of non-detected results in the ambient soil data set, and nitrate due to absence of nitrate data in ambient soil data set.

Notes to Scatter Plots

In the following scatter plots, many of the samples that exceed the 95th Percentile of the ambient data set are identified by (or labeled with) their concentration followed by the sample identification number. For an example, on the Aluminum Concentration vs. Depth scatter plot "35,400 HF-4/4.5" represents a concentration of 35,400 milligrams per kilogram (mg/kg) from a sample collected at the Howitzer Test Facility (sample location HF-4) from a depth of 4.5 feet below ground surface (bgs). The following alpha characters represent the sites at the Tourtelot Project Site:

AR = Ammunition Renovation Area
DA1 = Demolition Area #1
DA2 = Demolition Area #2
DA3 = Demolition Area #3
FA = Flare Site
HF = Howitzer Test Facility
LFP/LFM = North Valley Military Landfill
TNT = TNT Strip Area
TW = Temporary Well location
# = Ambient sample location
WET = Sediment sample from the South Valley wetland

Aluminum Concentration vs. Depth



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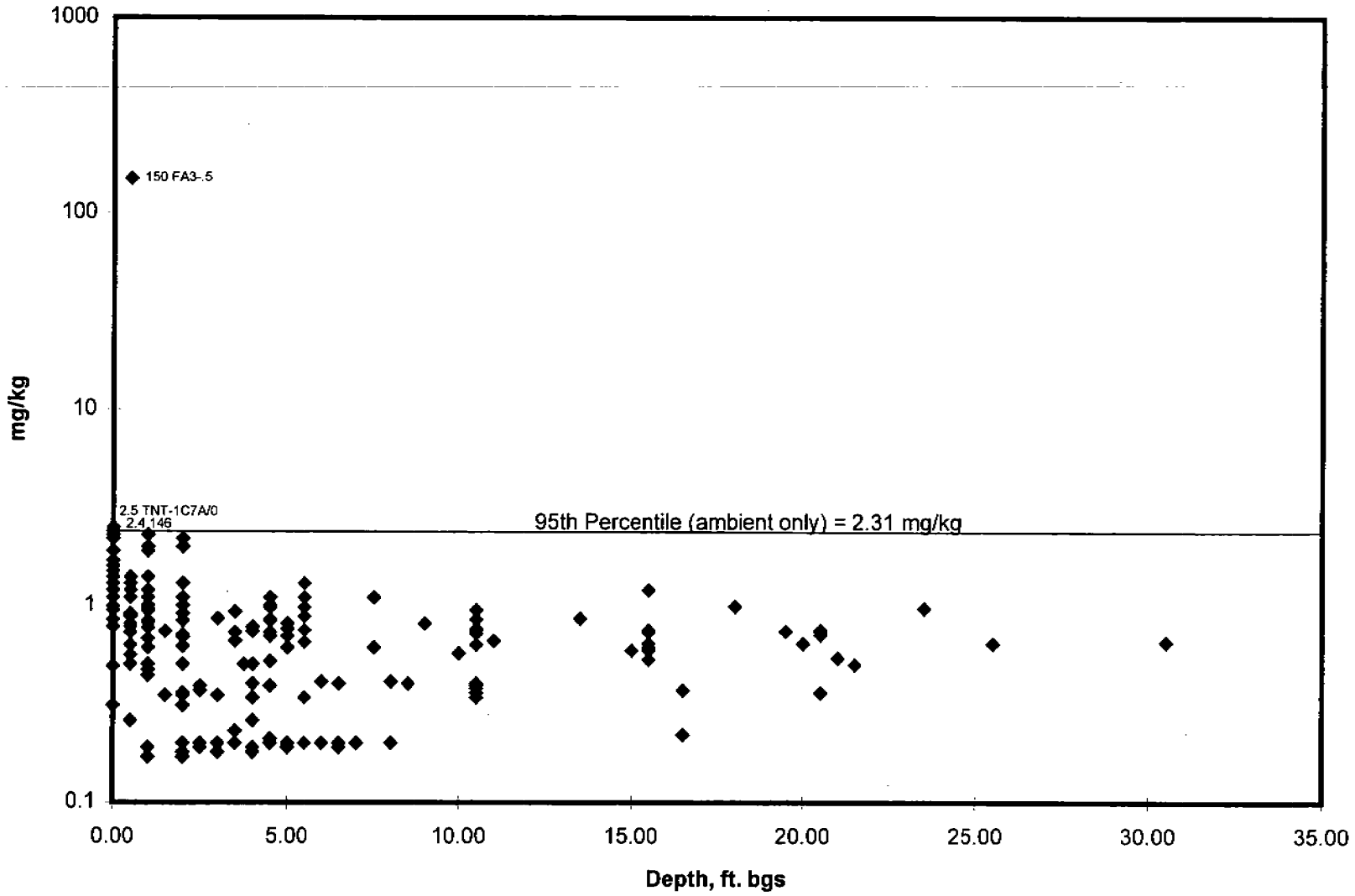
Antimony Concentration vs. Depth



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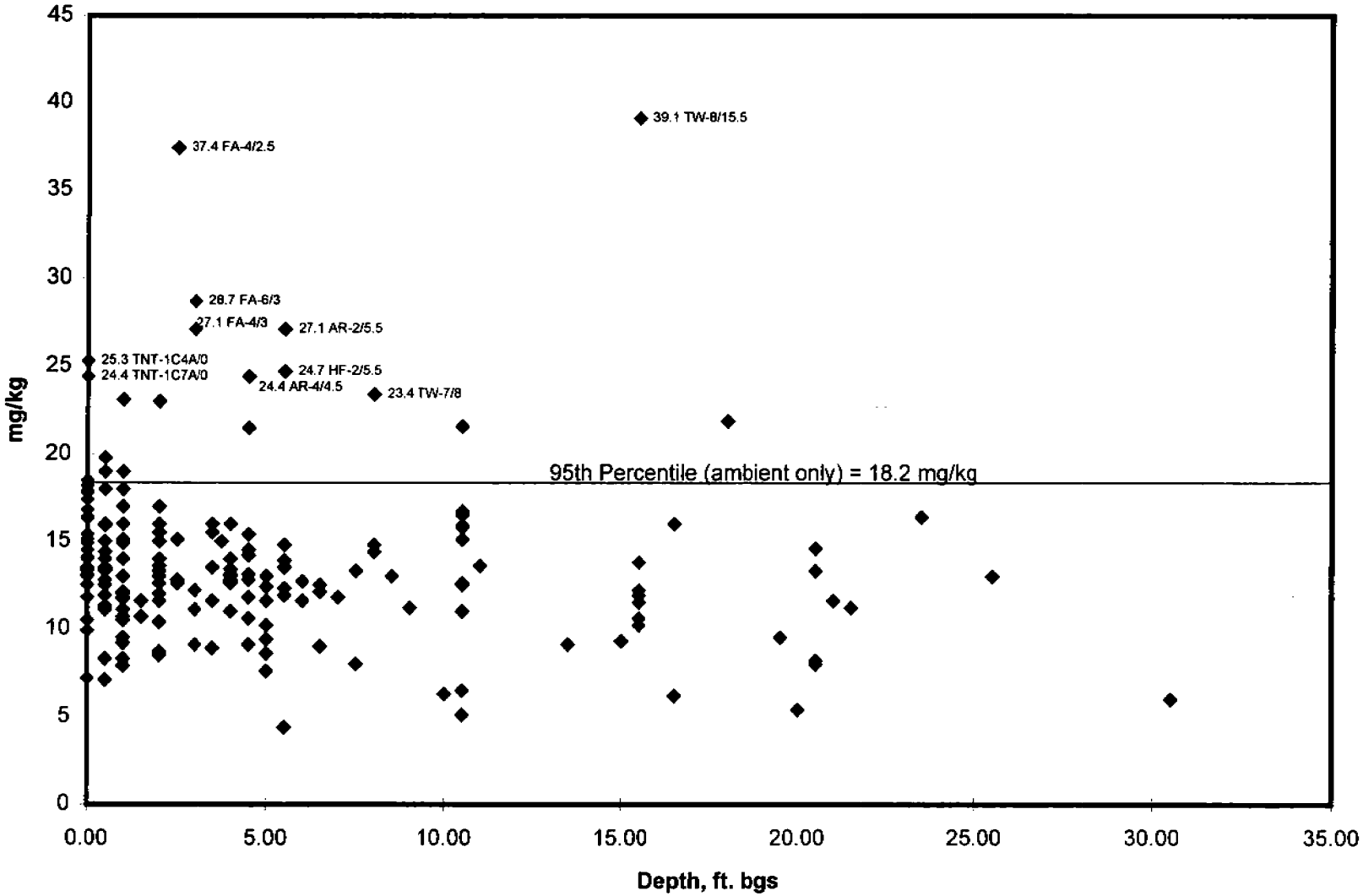
Arsenic Concentration vs. Depth



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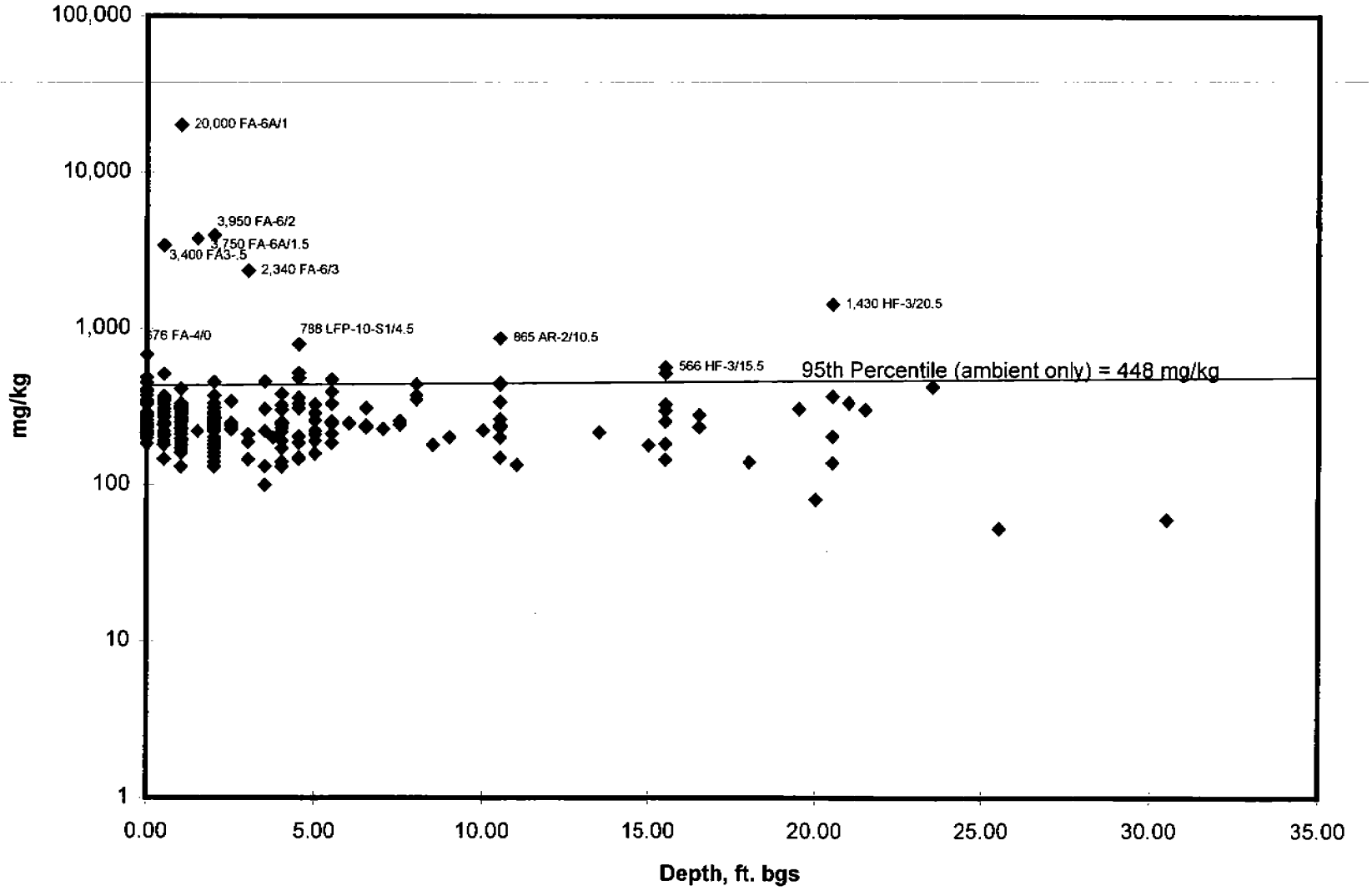
Barium Concentration vs. Depth



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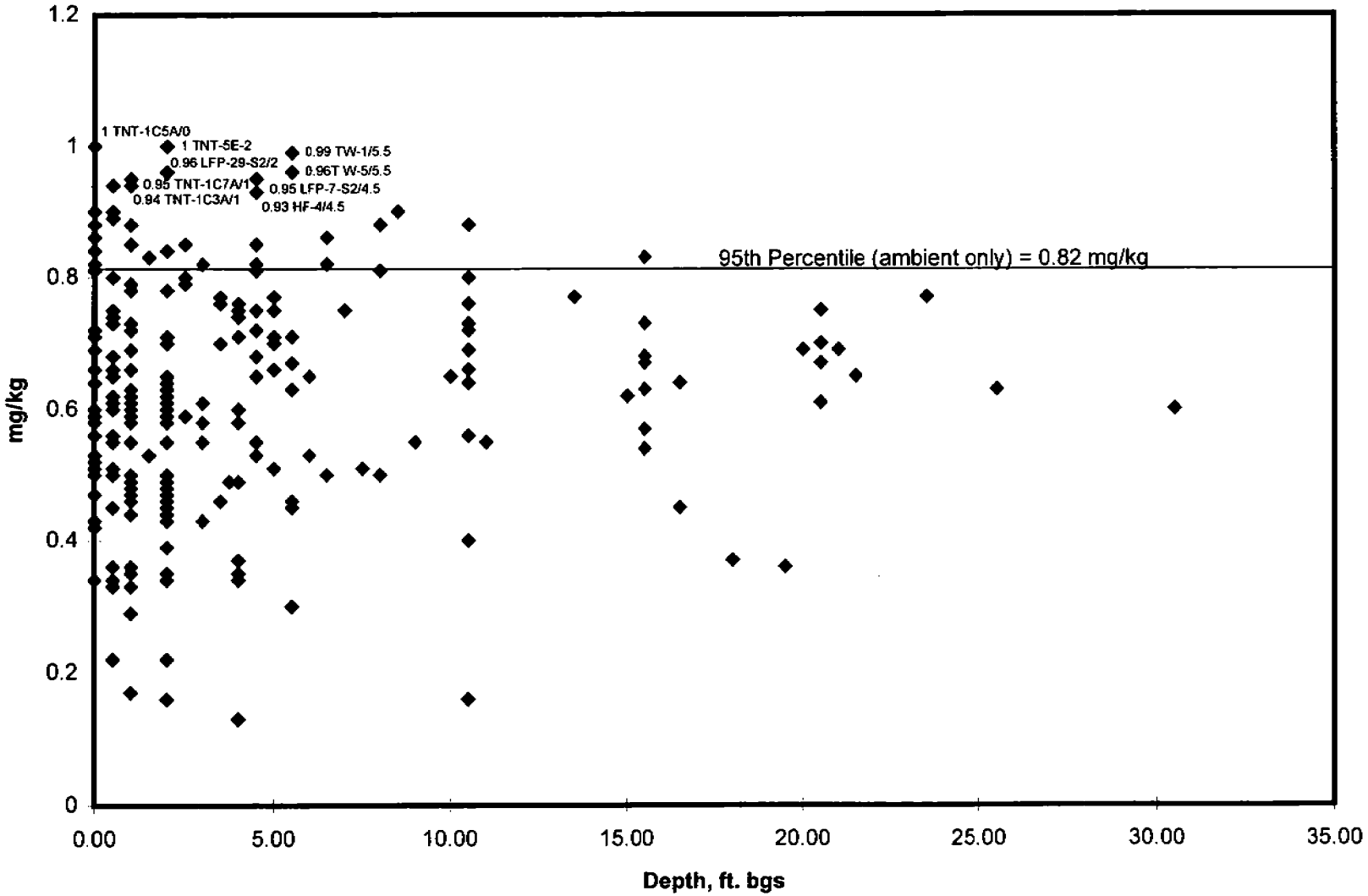
Beryllium Concentration vs. Depth



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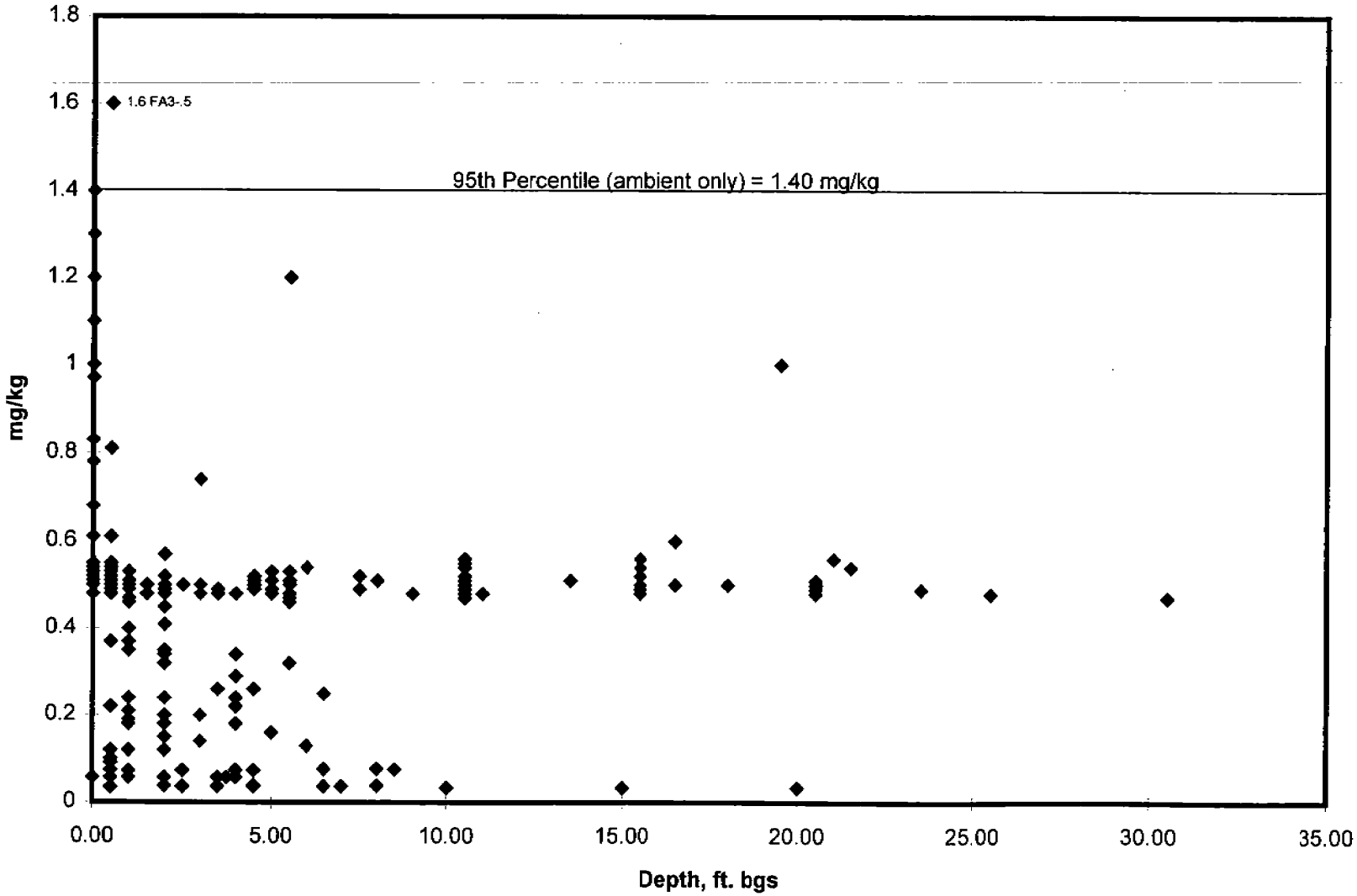
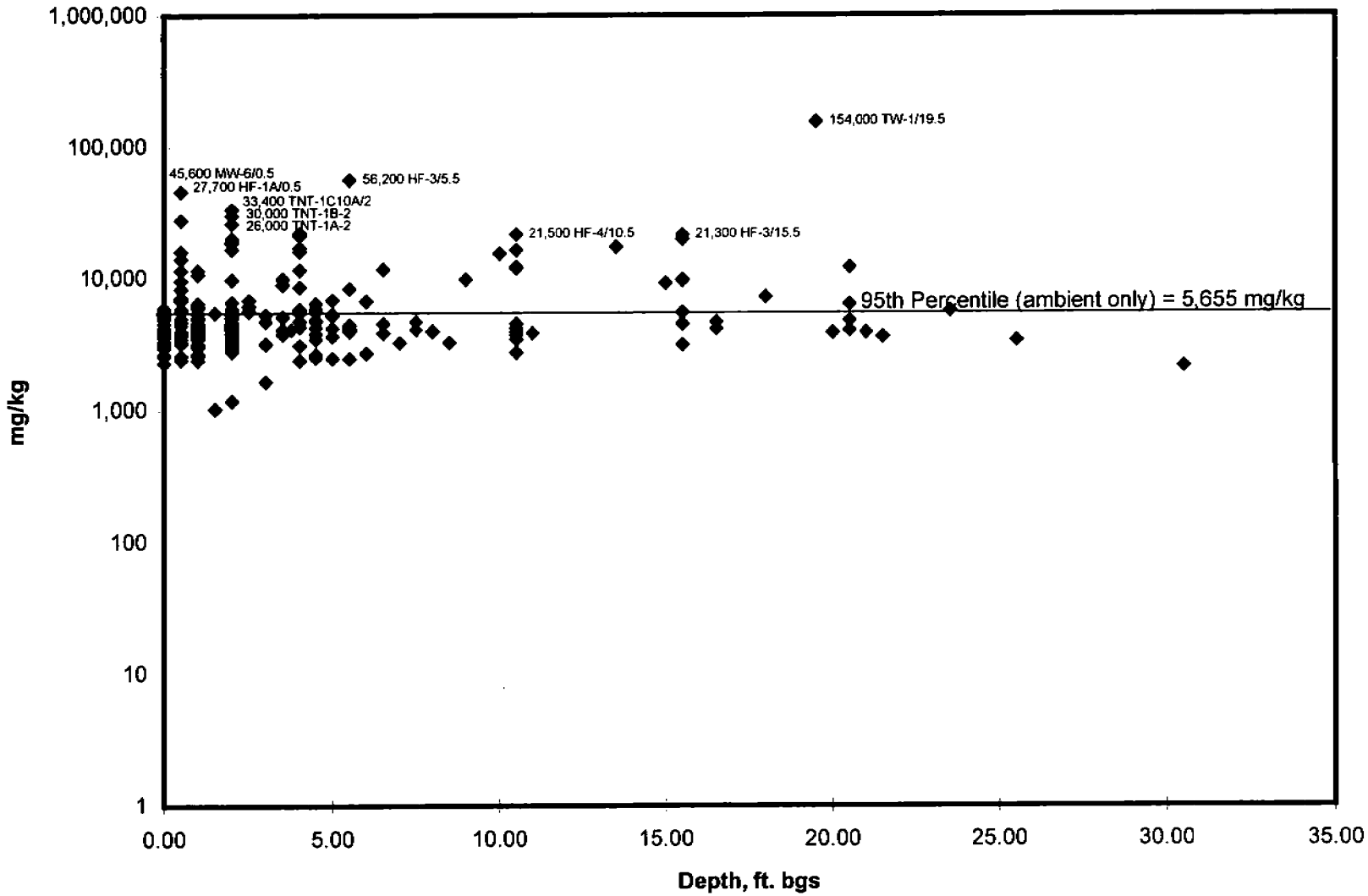
Cadmium Concentration vs. Depth



Calcium Concentration vs. Depth



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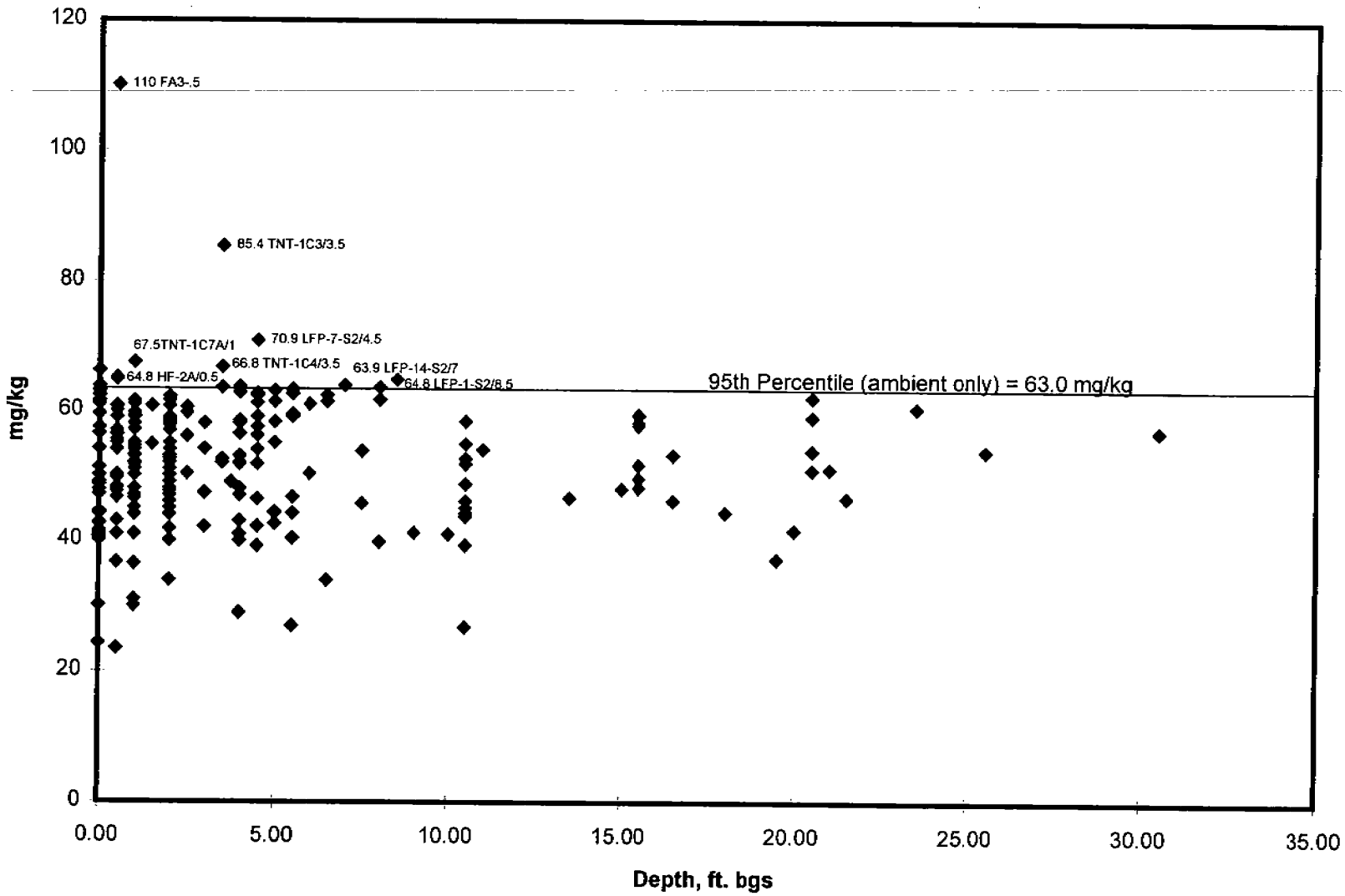
Chromium (total) Concentration vs. Depth



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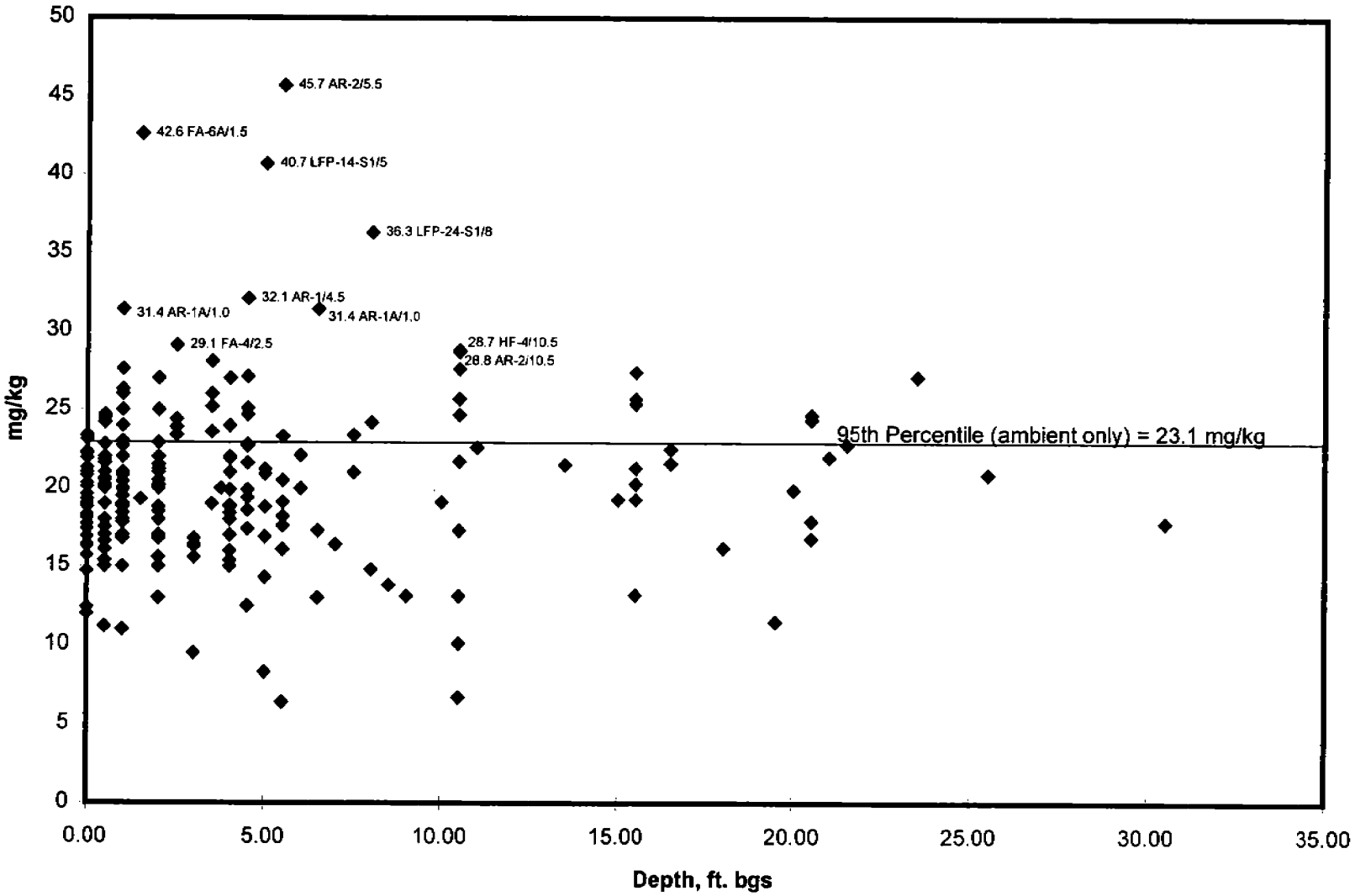
Cobalt Concentration vs. Depth



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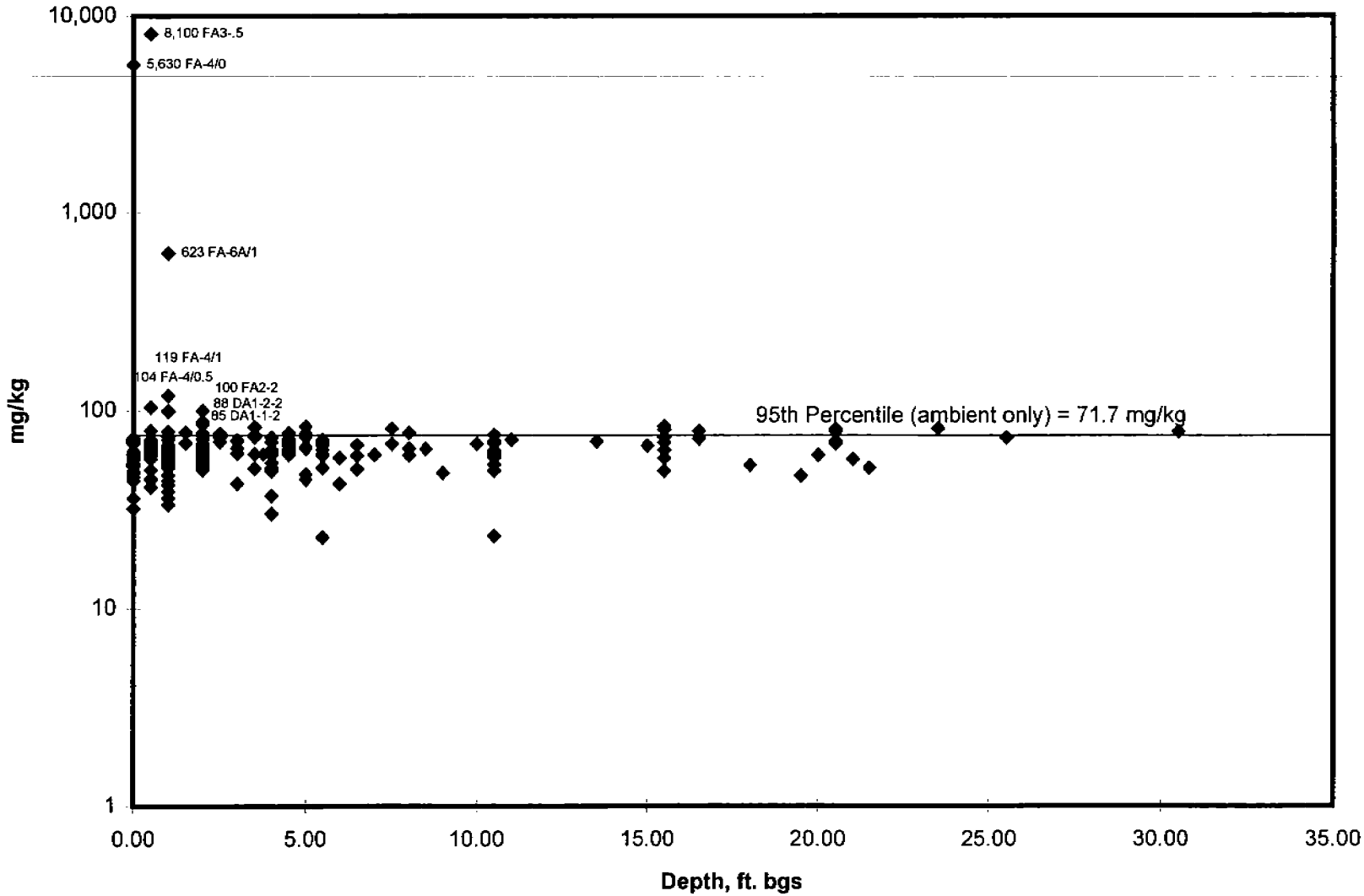
Copper Concentration vs. Depth



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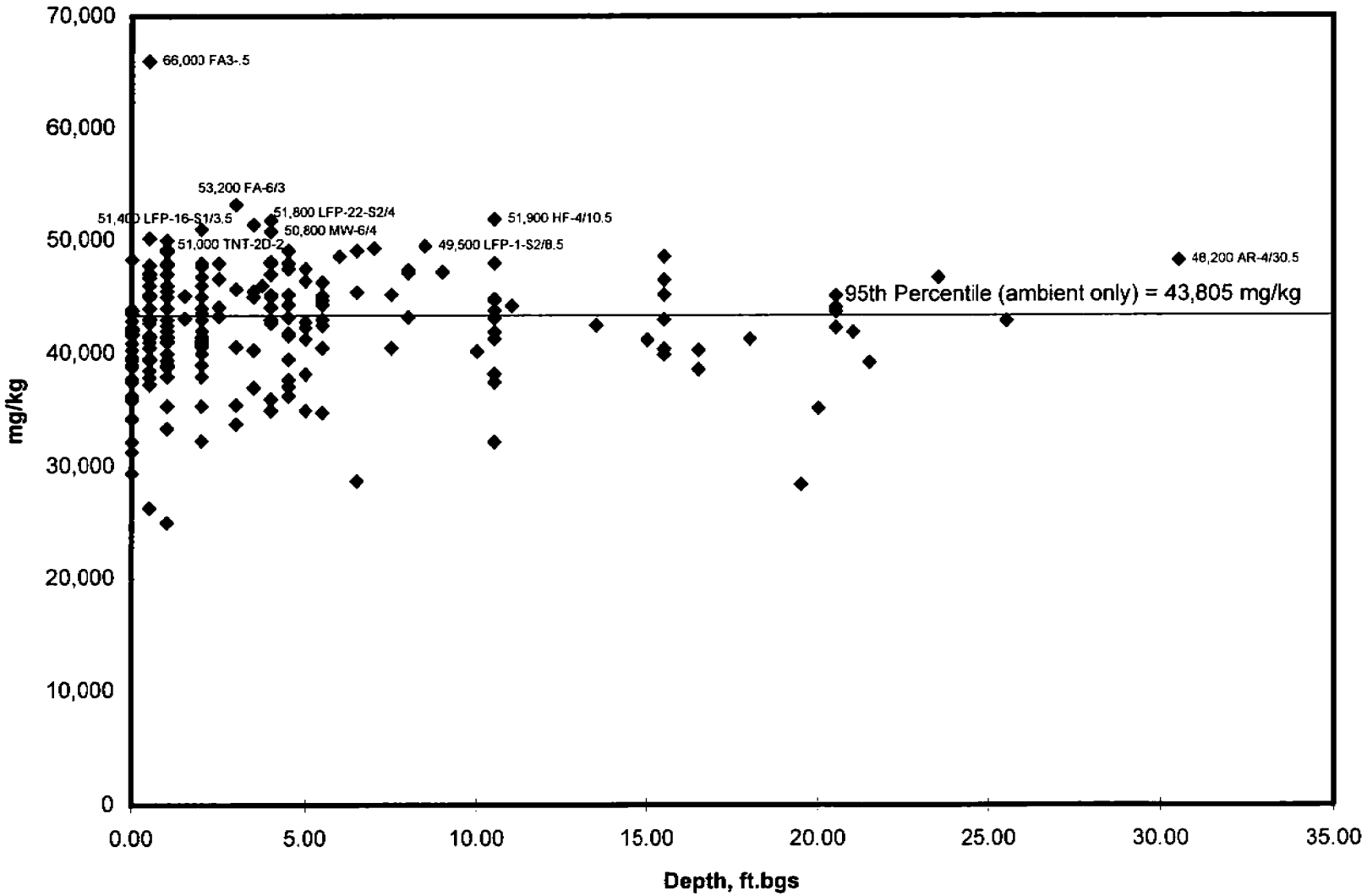
Iron Concentration vs. Depth



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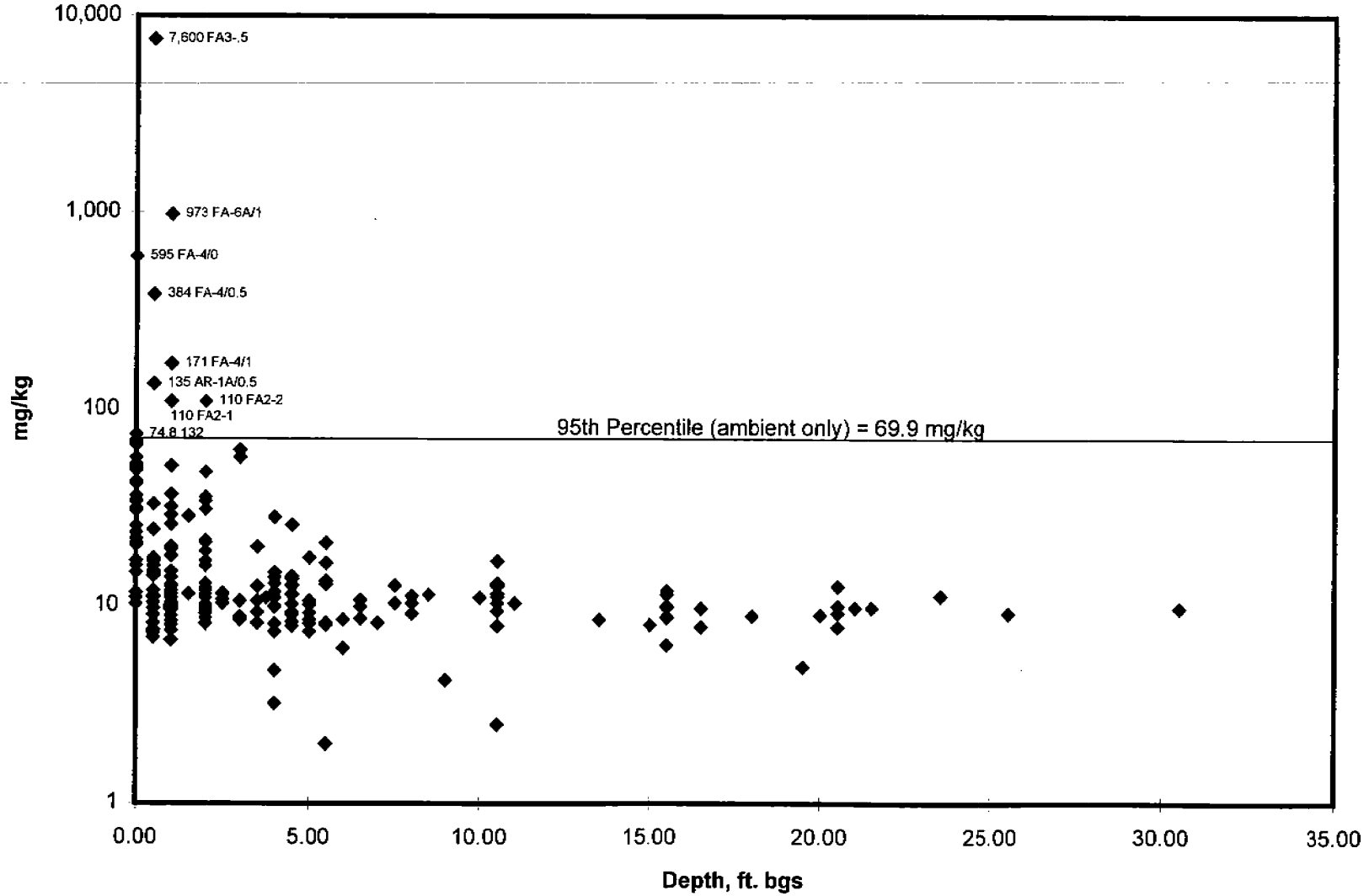
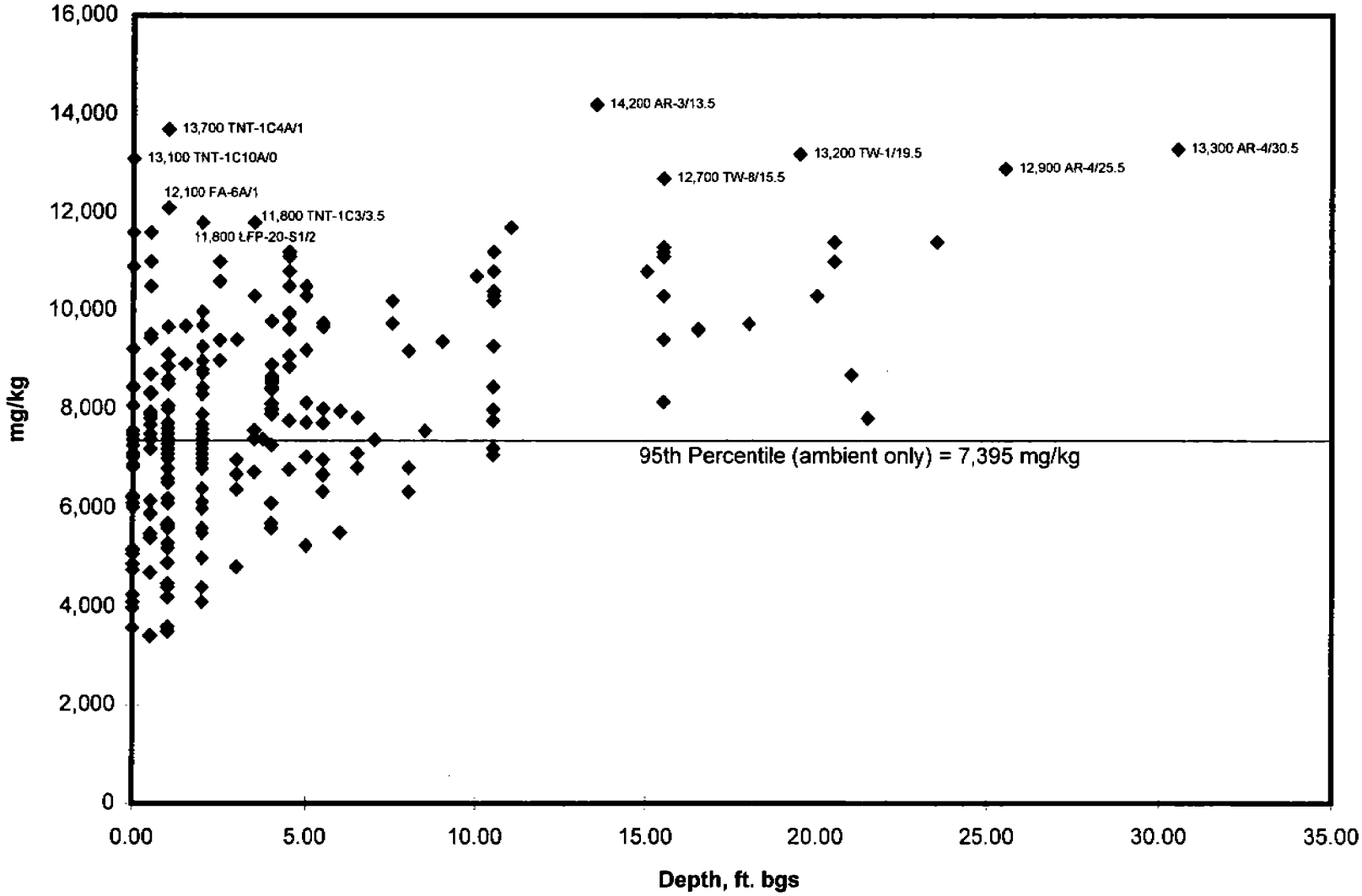
Lead Concentration vs. Depth



Magnesium Concentration vs. Depth



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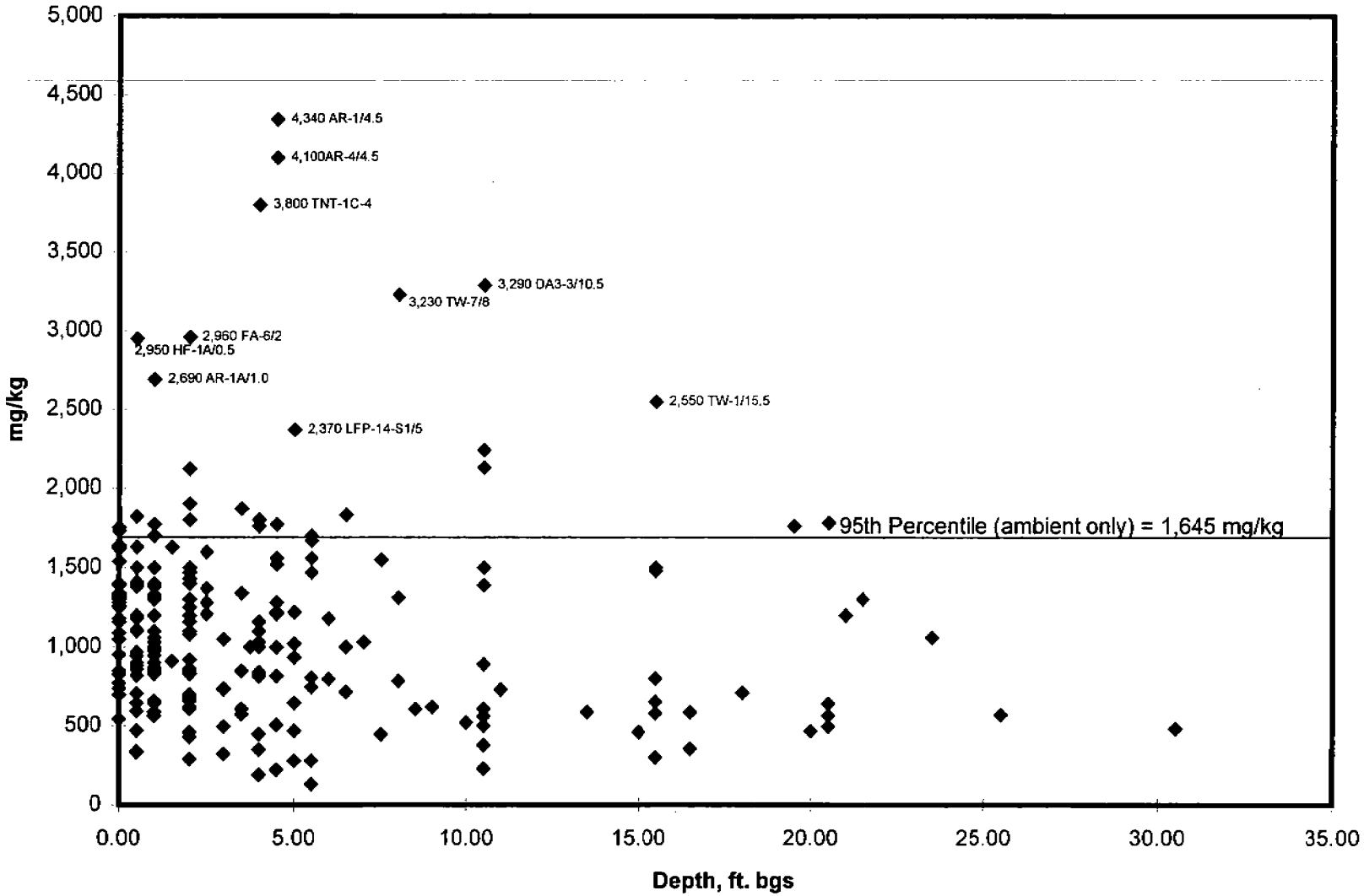
Manganese Concentration vs. Depth



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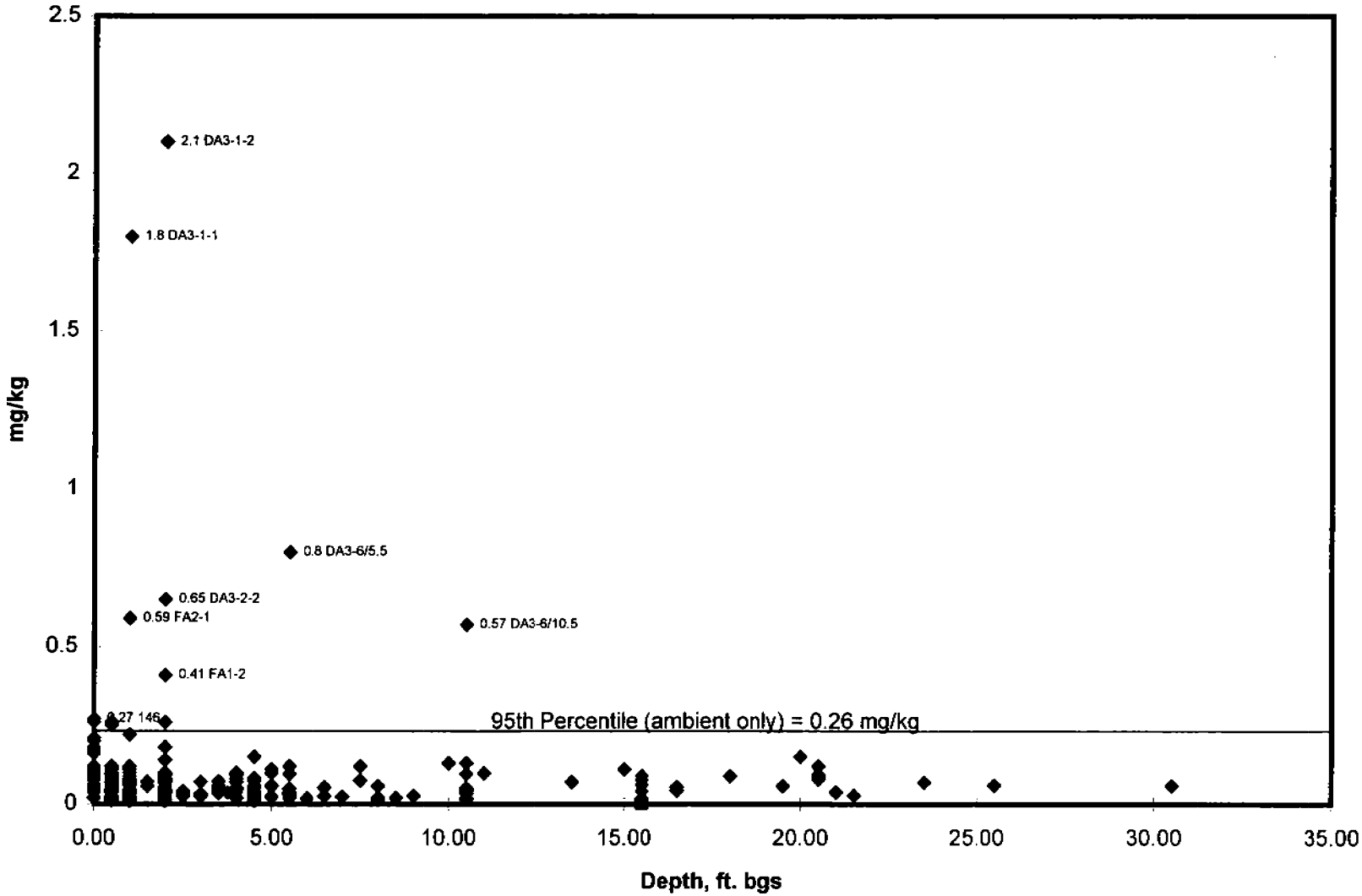
Mercury Concentration vs. Depth



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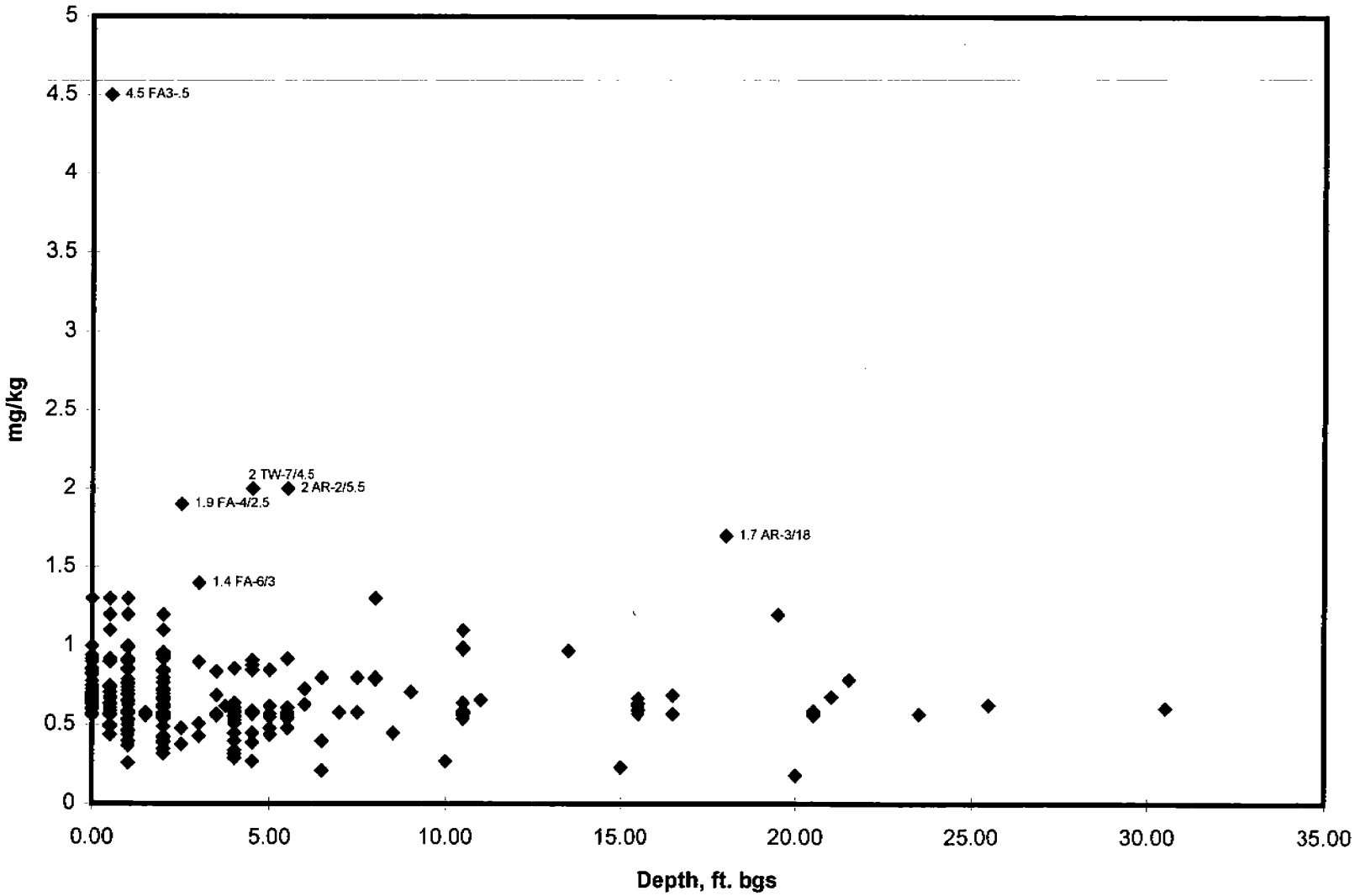
Molybdenum Concentration vs. Depth



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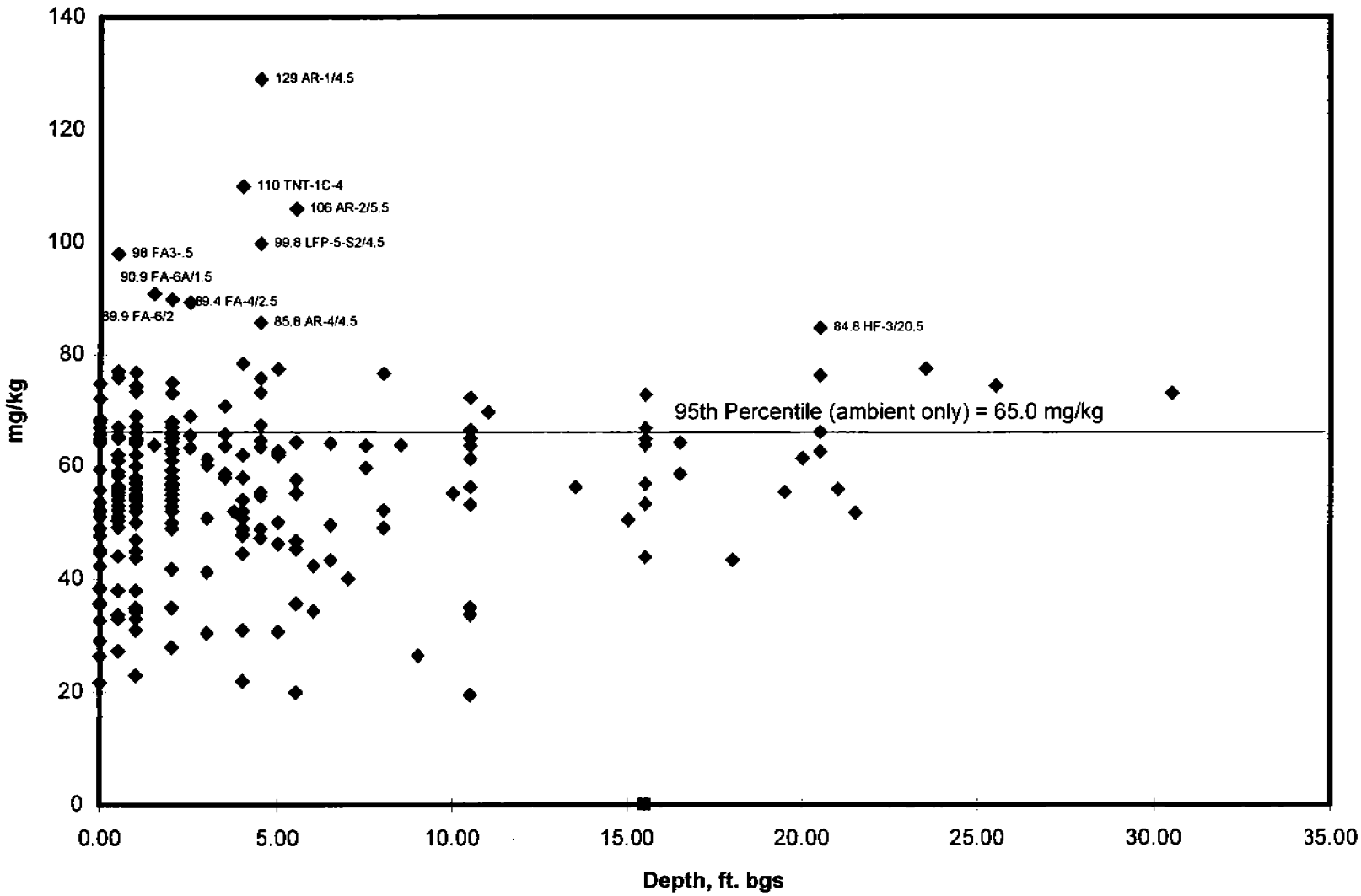
Nickel Concentration vs. Depth



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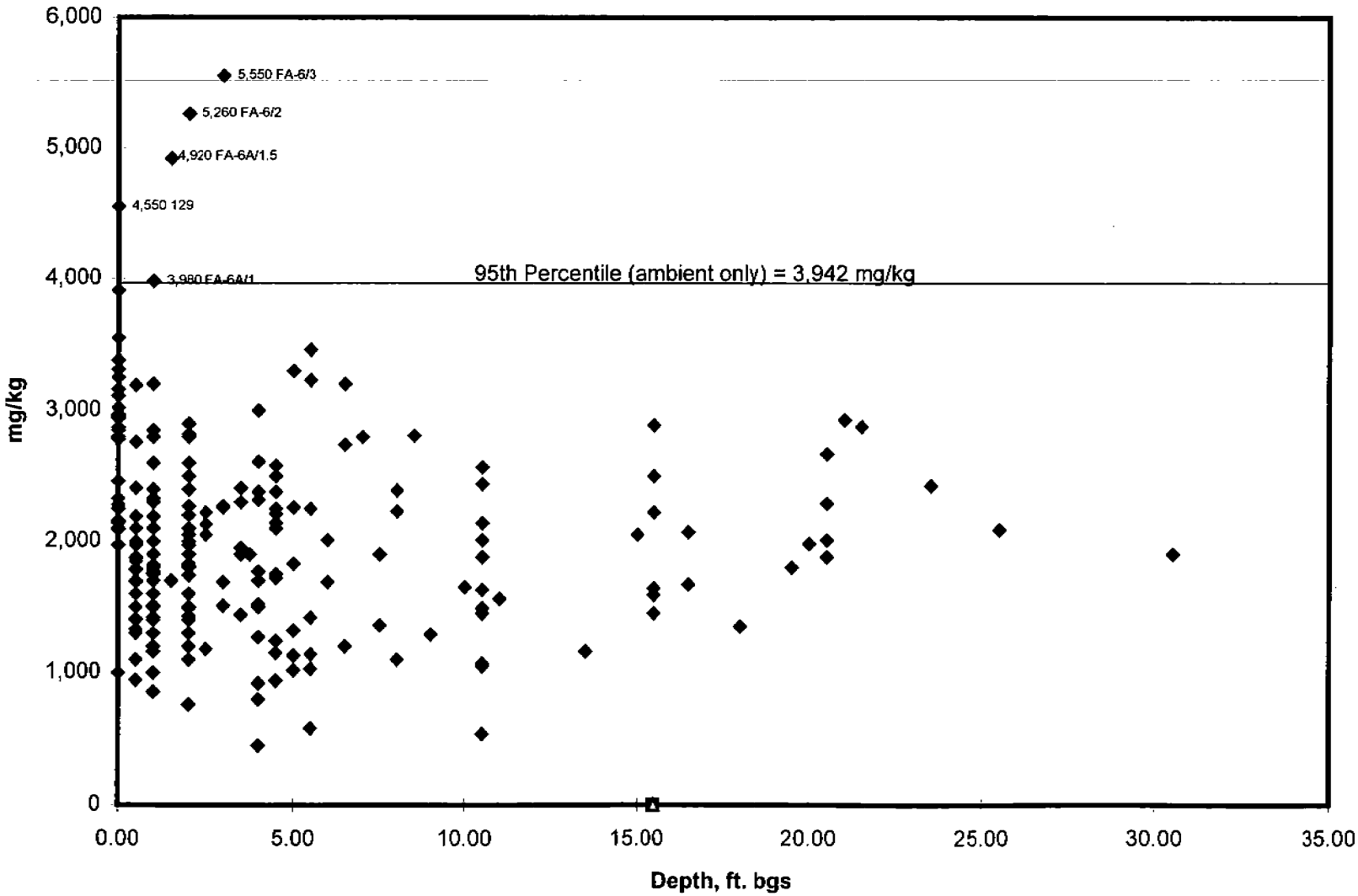
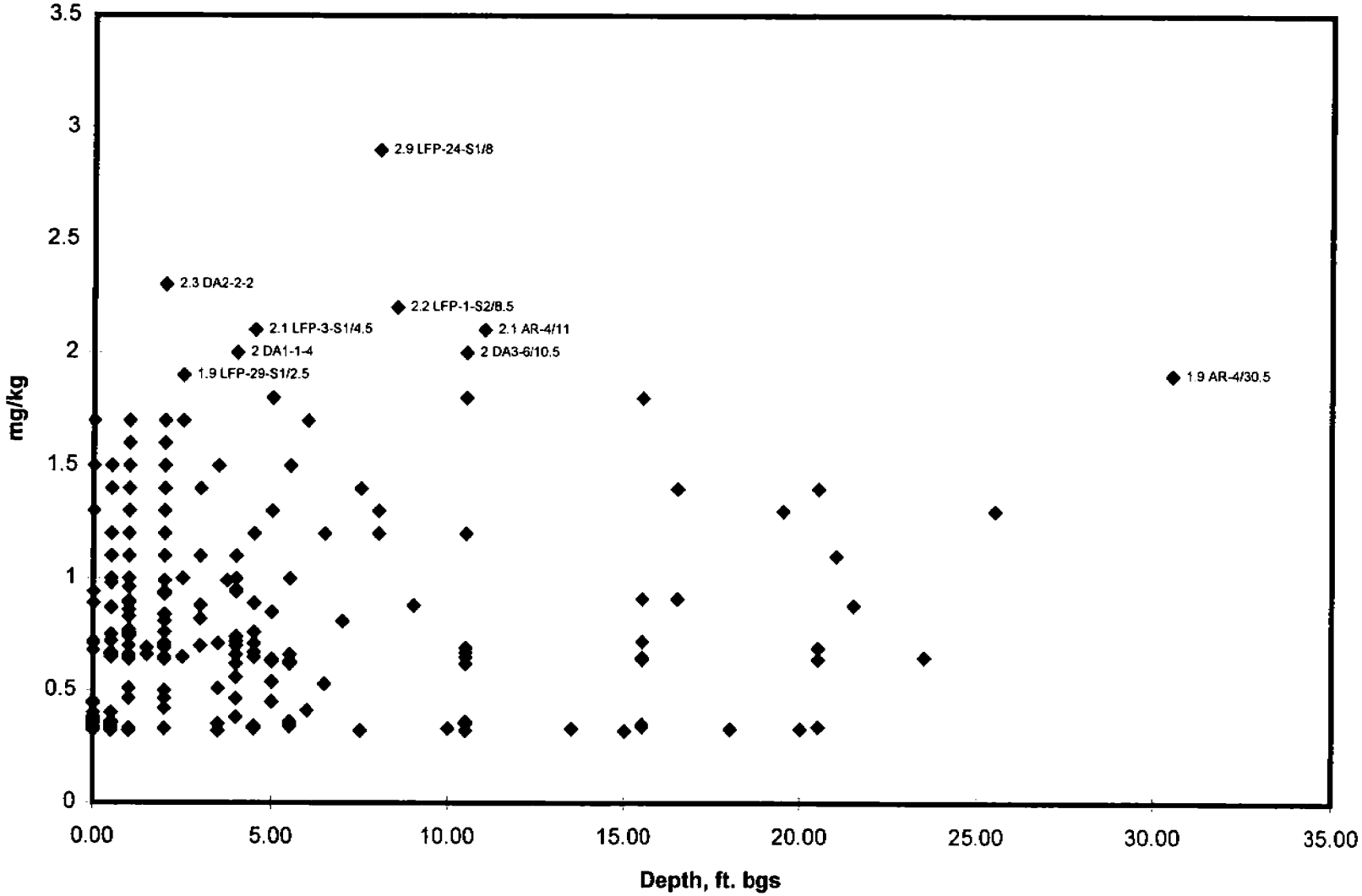
Potassium Concentration vs. Depth



Selenium Concentration vs. Depth



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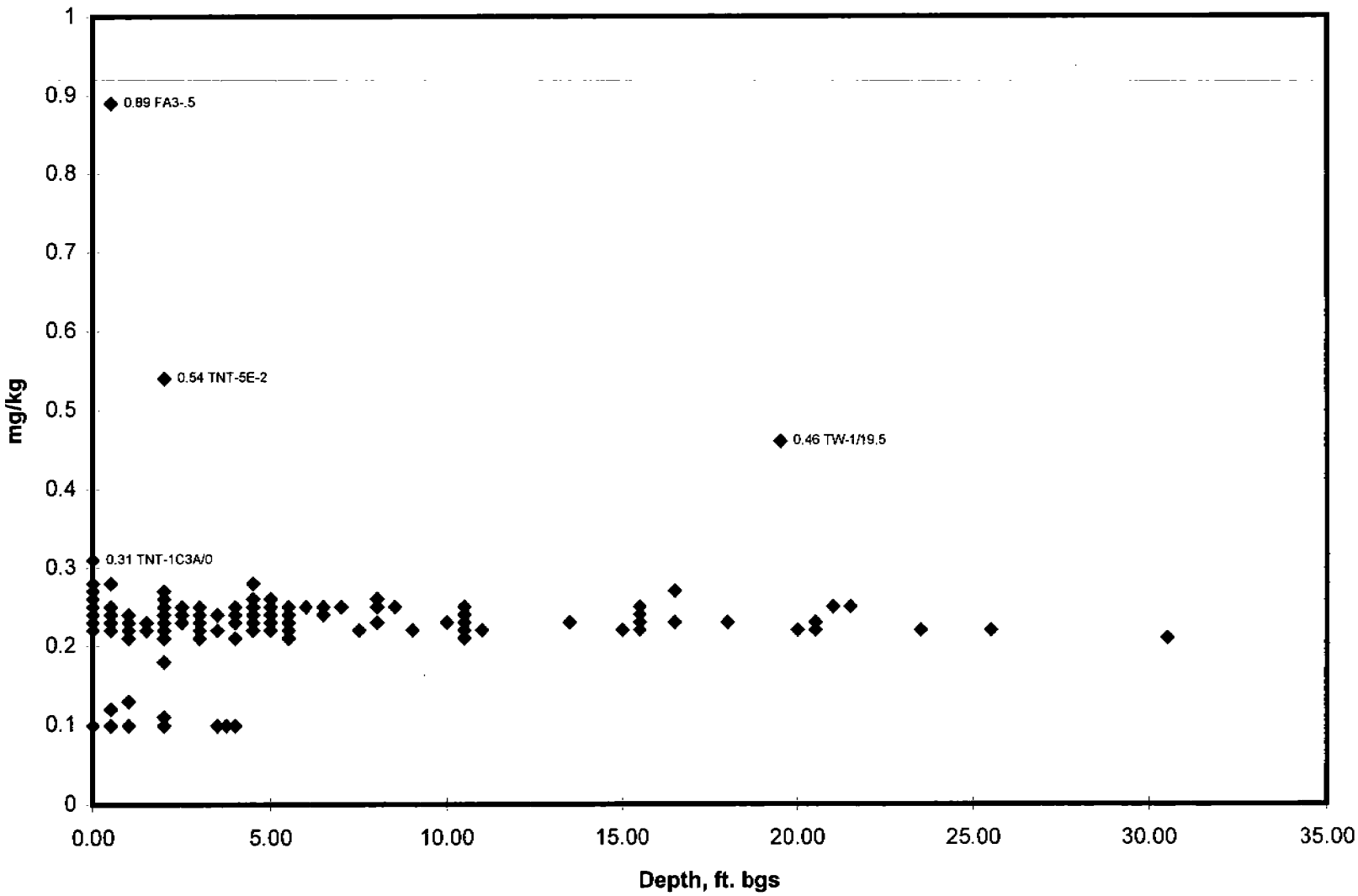
Silver Concentration vs. Depth



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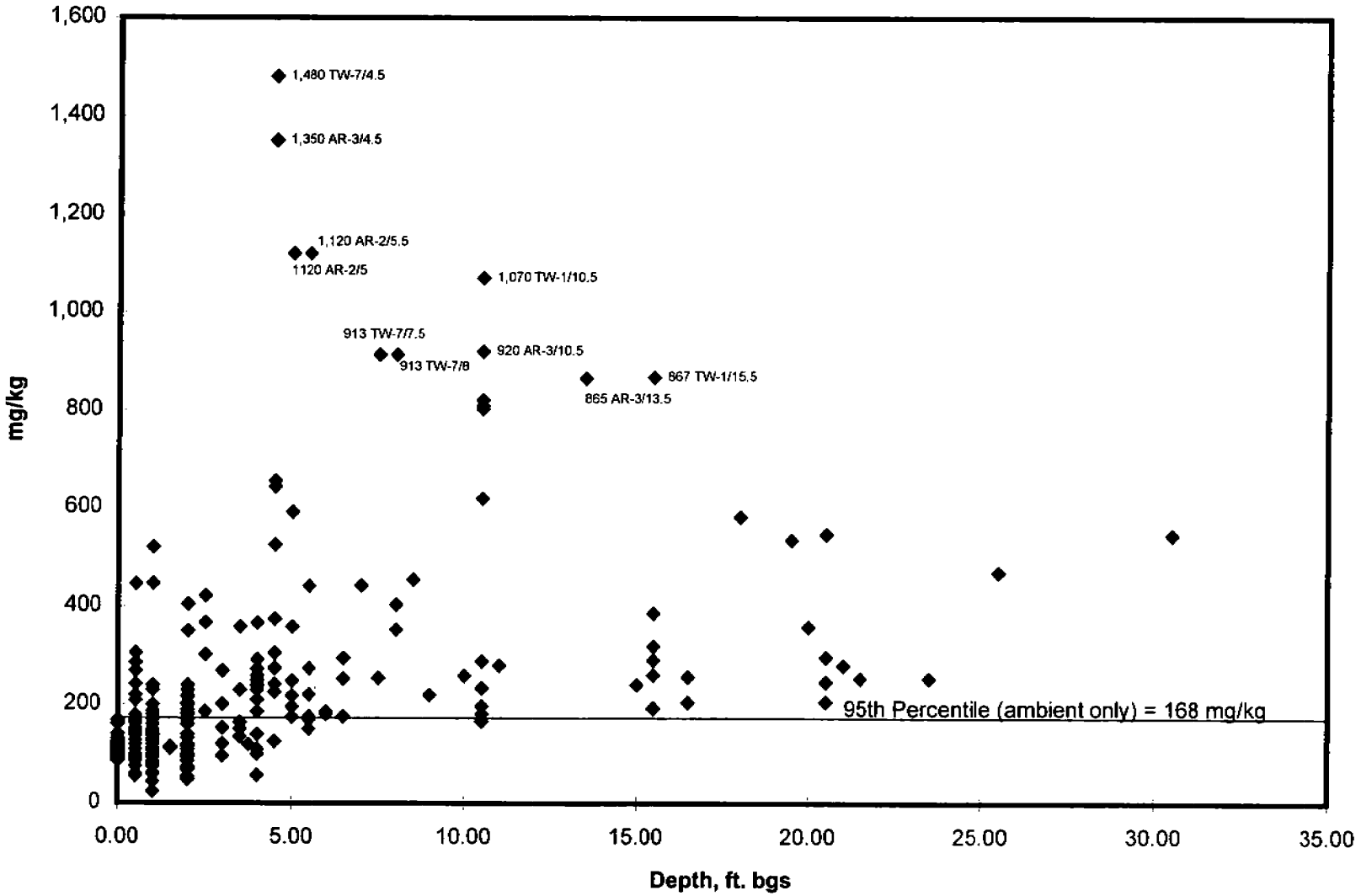
Sodium Concentration vs. Depth



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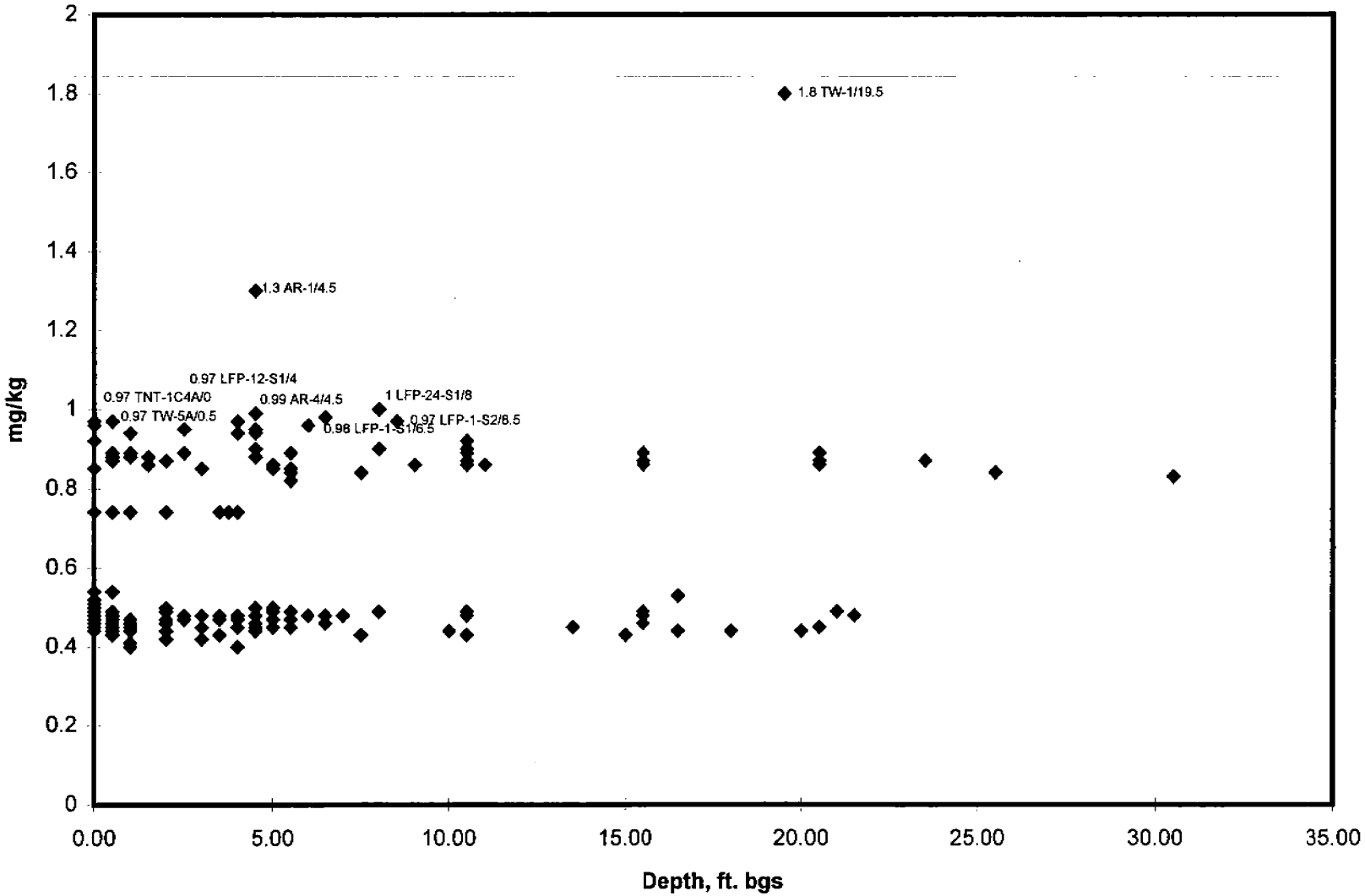
Thallium Concentration vs. Depth



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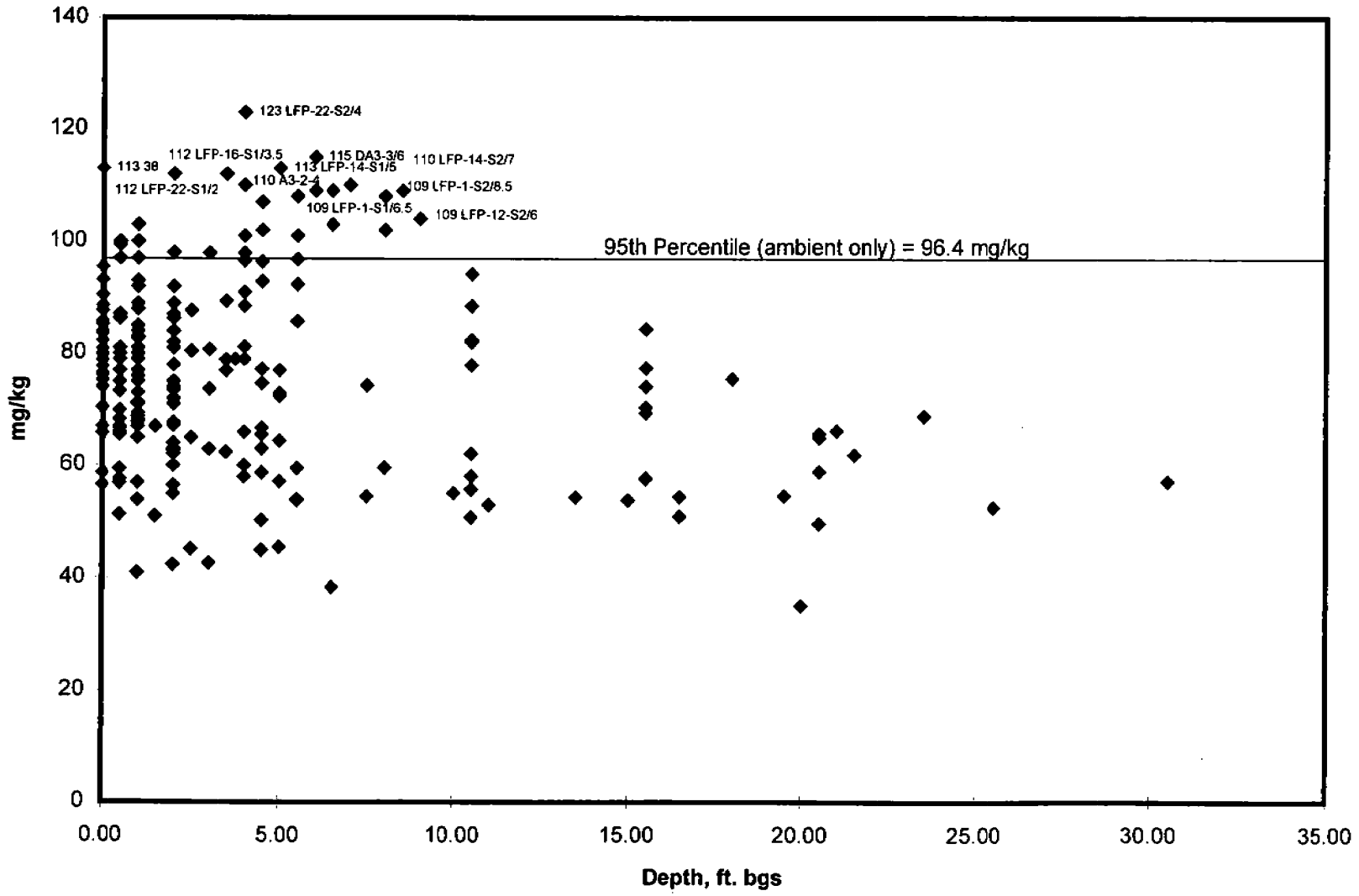
Vanadium Concentration vs. Depth



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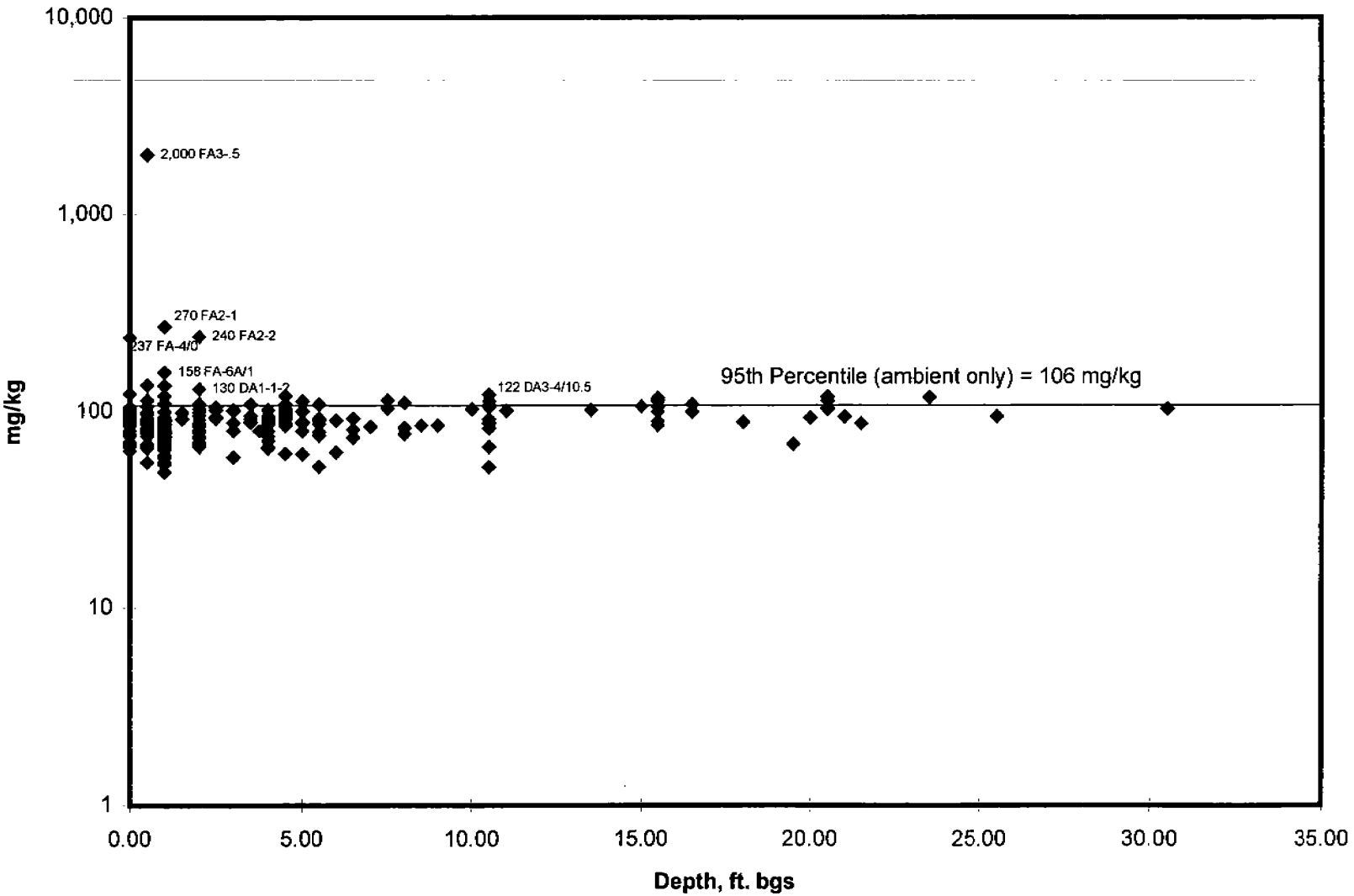
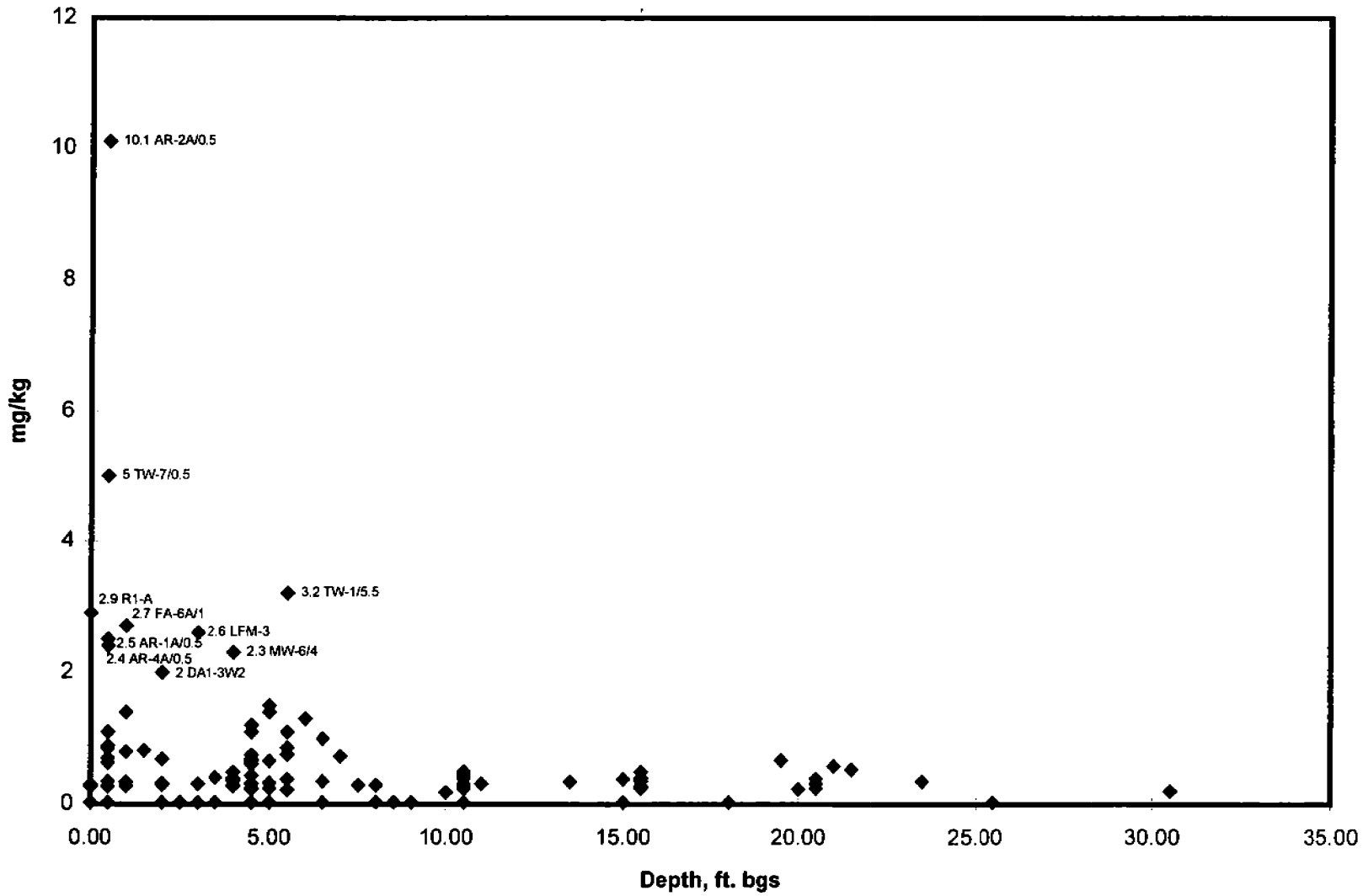
Zinc Concentration vs. Depth

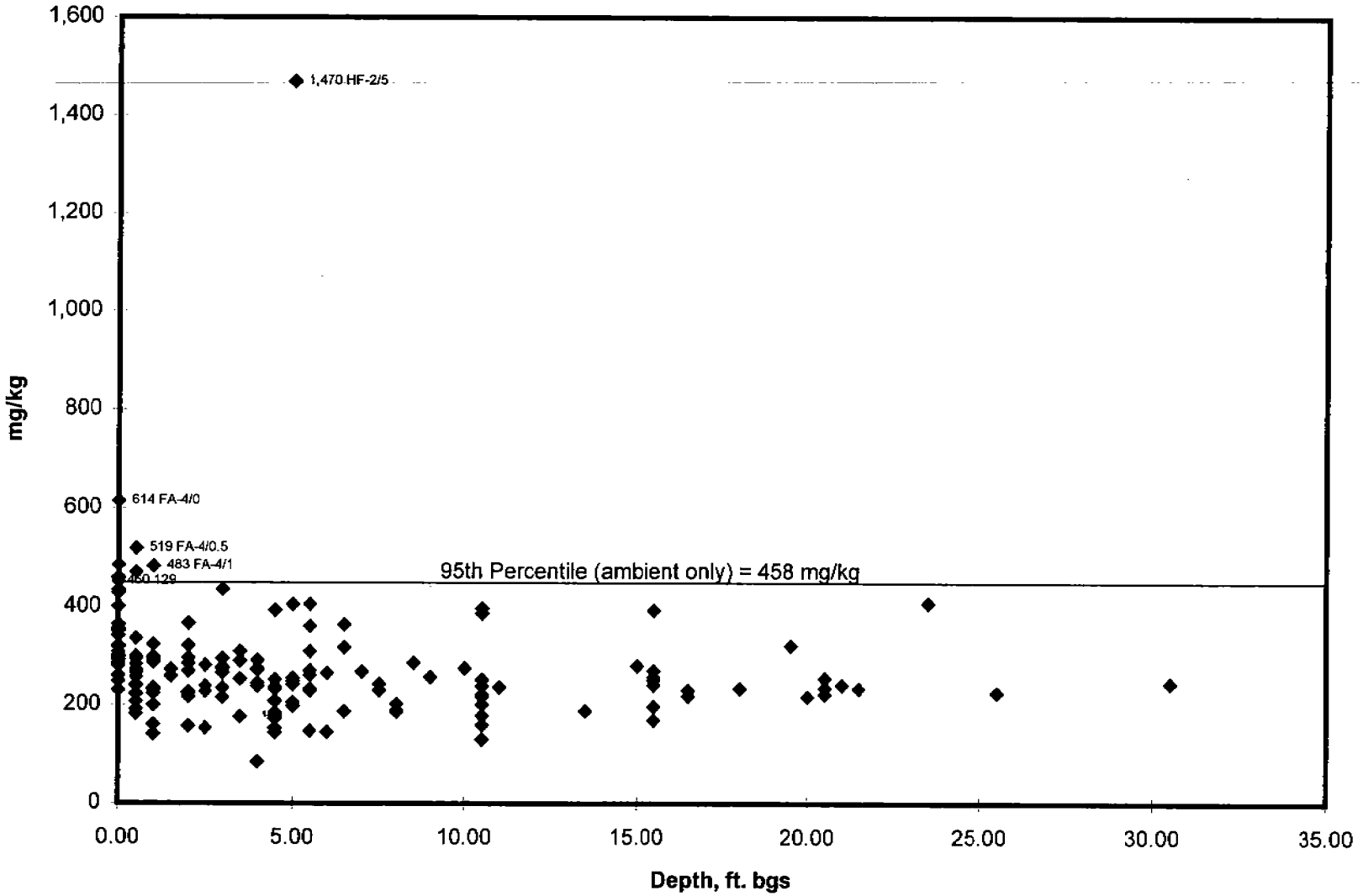


Nitrate-N Concentration vs.Depth



insituFIN.xls

Phosphorus as P Concentration vs. Depth



Attachment E-2
Isoconcentration Plots for Metals

A commercial-off-the-shelf (COTS) software program (Spatial Analyst for ArcView) was used to develop the isoconcentration plots for metal constituents. Because COTS software development includes QA/QC testing, no independent statistical or mathematical evaluation of the algorithms to test the validity of the software was performed for this application. With limited exceptions, a grid cell size of 5 feet and default values (nearest neighbor weighting) for the Inverse Distance Weighted (IDW) model were used.

The Spatial Analyst for ArcView software was used because of its integration with the project geographic information system (GIS) and because this model was judged to be the best option readily available for use with the data from the site (professional judgment). The process used to select the most appropriate contouring software included several tests with various metal constituent data sets. A number of the metal isoconcentration plots were prepared using IDW algorithms with various combinations of non-default values. Several metals were also analyzed using the Spline model, which is generally more applicable for contouring chemical concentrations. Because there are localized highs in some metal concentrations (i.e., samples with very high concentrations of a given metal very near other samples with much lower values of the same metal), the IDW method was deemed more appropriate than Spline, which is not recommended for data where there are large changes in a surface over short horizontal distances (ESRI, 1996). Also, because of the distribution of the data at the Tourtelot Project Site, the Spline model was deemed inappropriate for this application. The results from these models were compared and reviewed by project geologists familiar both with general metals distributions in soils and with this project. The IDW model was selected based on the reasonableness of the outputs and the distribution of the data.

The isoconcentration information presented on these maps are based on a data set with concentrated sample locations at several areas suspected of possible contamination, with only a limited data set between these locations. This spatial clustering of samples limits the confidence in the quality of the modeling outputs. Although the plots represent the best estimate of the distribution of various metals at the project site, they still should be considered as one evaluation tool among several. These isoconcentration plots must be used in conjunction with the detailed statistical analysis presented in this appendix and professional judgment to determine whether a specific portion of the site has been impacted by site activities for a given metal.

A final, significant consideration to note is that the project boundary was used to limit the interpolation of data. No metal data was collected outside the property boundary. Therefore, extension of the model outputs beyond the site boundary is not possible. Even with the plot cut off at the project boundary, the reader is cautioned that the modeling software has extrapolated data to the project boundary, and therefore represents a best approximation of metals values at this boundary. This is why the maps should be used in conjunction with all available data to determine whether a site has been impacted by former arsenal activities.

The following figures show projected concentrations of 21 different metals in soils at the Project Site. For each metal, analytical results from Earth Tech sampling and Secor sampling (where available) were entered into the project Geographic Information System. The maps show the sample locations color-coded by concentration of the metal being displayed; the color gradients are based on whether the sample falls above or below the 95th percentile, the UTL, or the PRG. The sampling results were then used in a modeling software to build a grid surface in which

concentrations of metals were predicted across the entire project site. The surfaces were built using an Inverse Distance Weighted interpolation function and are color-coded based on the same characteristics as the point concentrations. In a few cases, very high point concentrations were found in localized areas (such as the Flare Site). These anomalous concentrations are shown only in the point data because they are expected to be localized features that are not representative of the entire site.

The following provides an interpretation of the isoconcentration plots without the assistance of the statistical data.

Aluminum: No significant "bullseye" anomalies are present within "areas of interest" with the exception of the area around the Howitzer Test Facility. One other anomaly is isolated near the eastern end of the Project Site boundary that is not associated with any "areas of interest".

Antimony: There are no significant "bullseye" anomalies represented on the map. However, one elevated result above the PRG is present at the Flare Site.

Arsenic: No significant "bullseye" anomalies are present within the "areas of interest". Several anomalies across the northeastern end of the Project Site are not related to any known "areas of interest" and likely represent high concentrations of arsenic in the underlying bedrock (parent soil material).

Barium: One elevated result above the PRG is present at the Flare Site. No other significant "bullseye" anomalies are present at "areas of interest". One elevated sample result (SS-11) appears in an area not considered an "area of interest" in the eastern portion of the site.

Beryllium: No significant "bullseye" anomalies are observed at the "areas of interest". Several anomalies are present in areas not associated with any "areas of interest". This may suggest that beryllium is widespread throughout the site.

Cadmium: No significant "bullseye" anomalies are observed at "areas of interest". One sample location near the northeastern border of the Project Site is not related to any known "areas of interest".

Chromium: One anomaly is present around the Flare Site, created by a single slightly elevated sample not indicative of significant chromium impact. No other anomalies are present.

Cobalt: Two areas (Ammunition Renovation Area and the Flare Site) show anomalies with results above PRGs. One other minor anomaly is present near the TNT Strip Area (sample TNT-4C).

Copper: The Flare Site and possibly near Demolition Site #1 show possible anomalies. The Flare Site has concentrations that exceed PRGs.

Iron: No "bullseye" anomalies are present in "areas of interest." Instead, there appears to be a widespread zone of elevated iron that extends through the "areas of interest" in the South Valley continuing through the Howitzer Test Facility and north through the TNT strips. This is likely a result of the bedrock material containing high iron content (typical of shale bedrock).

Lead: No significant "bullseye" anomalies are present in "areas of interest". The high concentrations of lead at the Flare Site are shown but the impact area appears to be restricted to the Flare Site.

Manganese: No significant "bullseye" anomalies are present in "areas of interest" with the exception of the Ammunition Renovation Area and near the TNT strips. Several background samples also show elevated concentrations, which supports the concept that manganese is naturally occurring.

Mercury: Mercury appears elevated near Demolition Site #3 and along the northeastern border of the Project Site. The anomaly at Demolition Site #3 appears to reflect impact from the site but the anomaly along the northeastern edge of the Project Site is not associated with any known "areas of interest".

Molybdenum: No "bullseye" anomalies are represented by the plots.

Nickel: Some minor anomalies are present near the Howitzer Test Facility and the southern end of the TNT Strip Area. However, the pattern of anomalies are not consistent with patterns that usually indicate impact. No other anomalies are present at "areas of interest".

Phosphorous: Two significant anomalies are represented by the plots. One anomaly located on the ridge along the northwestern edge of the Project Site is not associated with any known "areas of interest". A minor anomaly near the Flare Site is represented by sample FA-4 and WET-2.

Selenium: No "bullseye" anomalies are represented by the plots.

Silver: No "bullseye" anomalies are represented by the plots.

Thallium: No "bullseye" anomalies are represented by the plots.

Vanadium: No significant "bullseye" anomalies are represented by the plots. One minor anomaly in background sample NO-38 is present on the ridge near the northwest end of the Project Site.

Zinc: Two significant anomalies area represented in the plot. The Flare Site is impacted by zinc and one anomaly west of Demolition Site #1 does not appear to be related to any known "area of interest."

EXPLANATION

Aluminum Sample Locations (mg/kg)
- 10000 - 27535
- 27535 - 32996
- 32996 - 76000
- 76000 - 100000
- Property Boundary
- Sites
- Buildings
- Roads/Concrete
- 25 Foot Topographic Contours

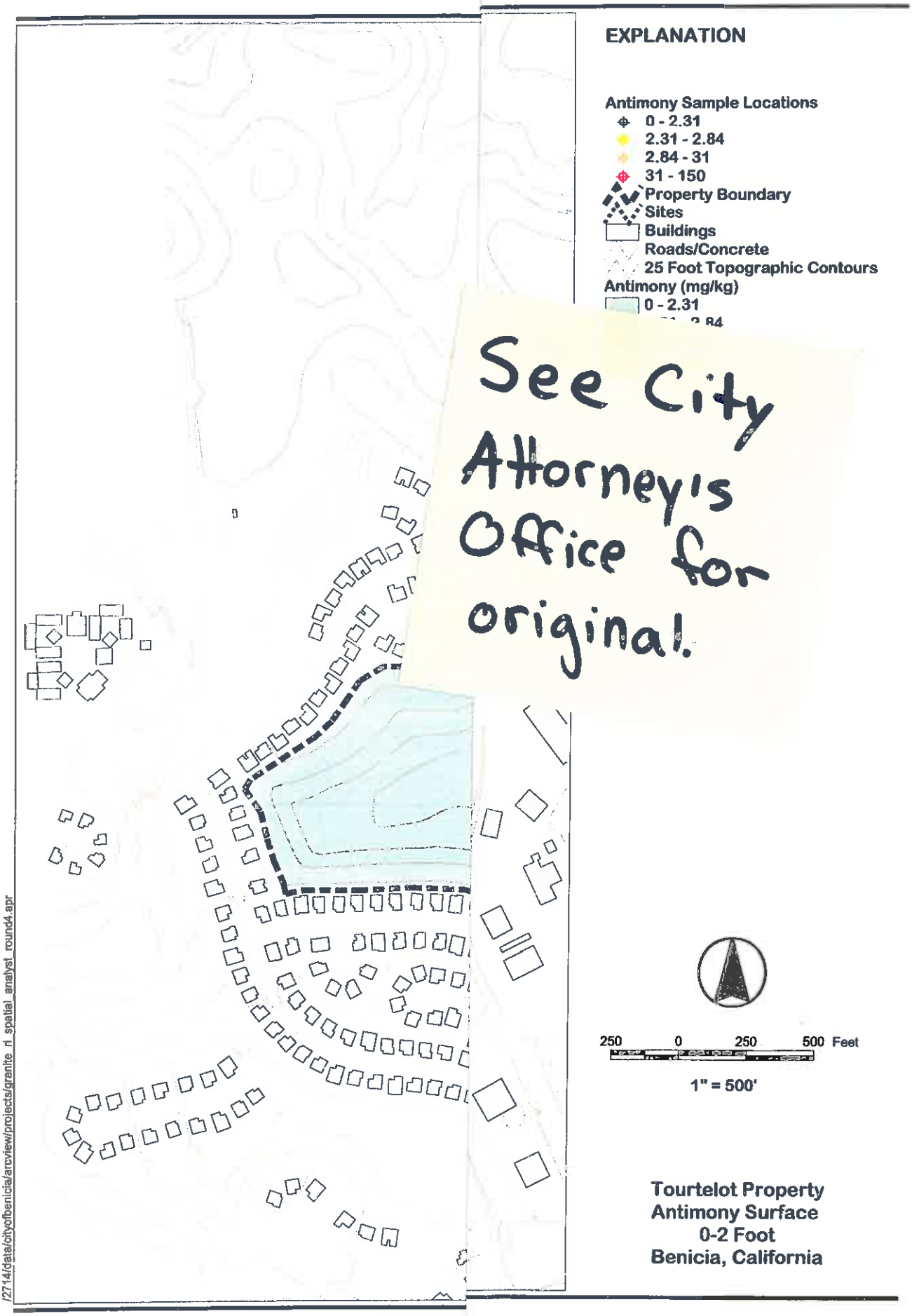
See City Attorney's Office for original.

250 0 250 500 Feet

1" = 500'

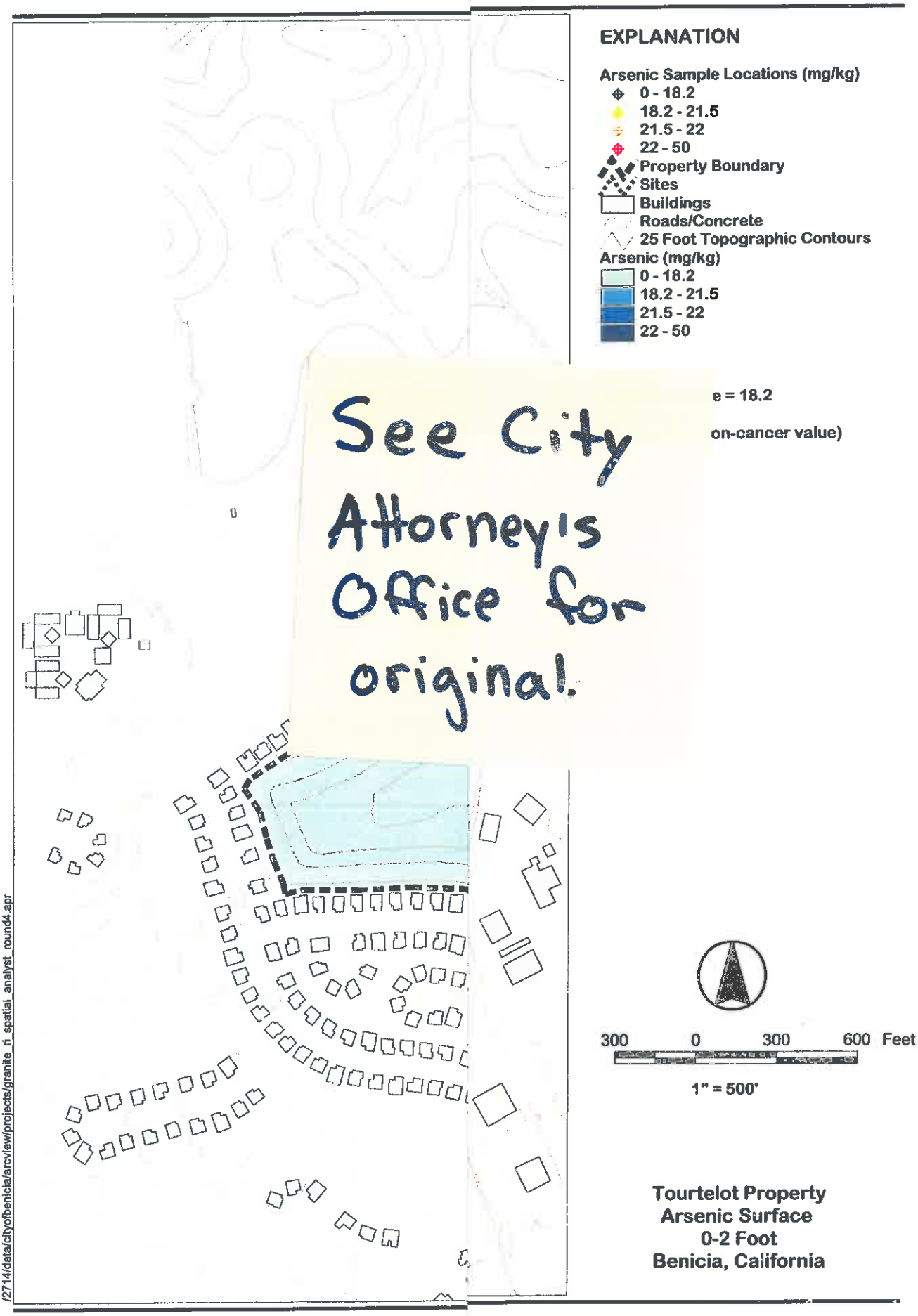
Tourtelot Property
Aluminum Surface
0-2 Foot
Benicia, California

/2714/data/cityofbenicia/arcview/projects/granite_ri_spatial_analyst_round4.apr



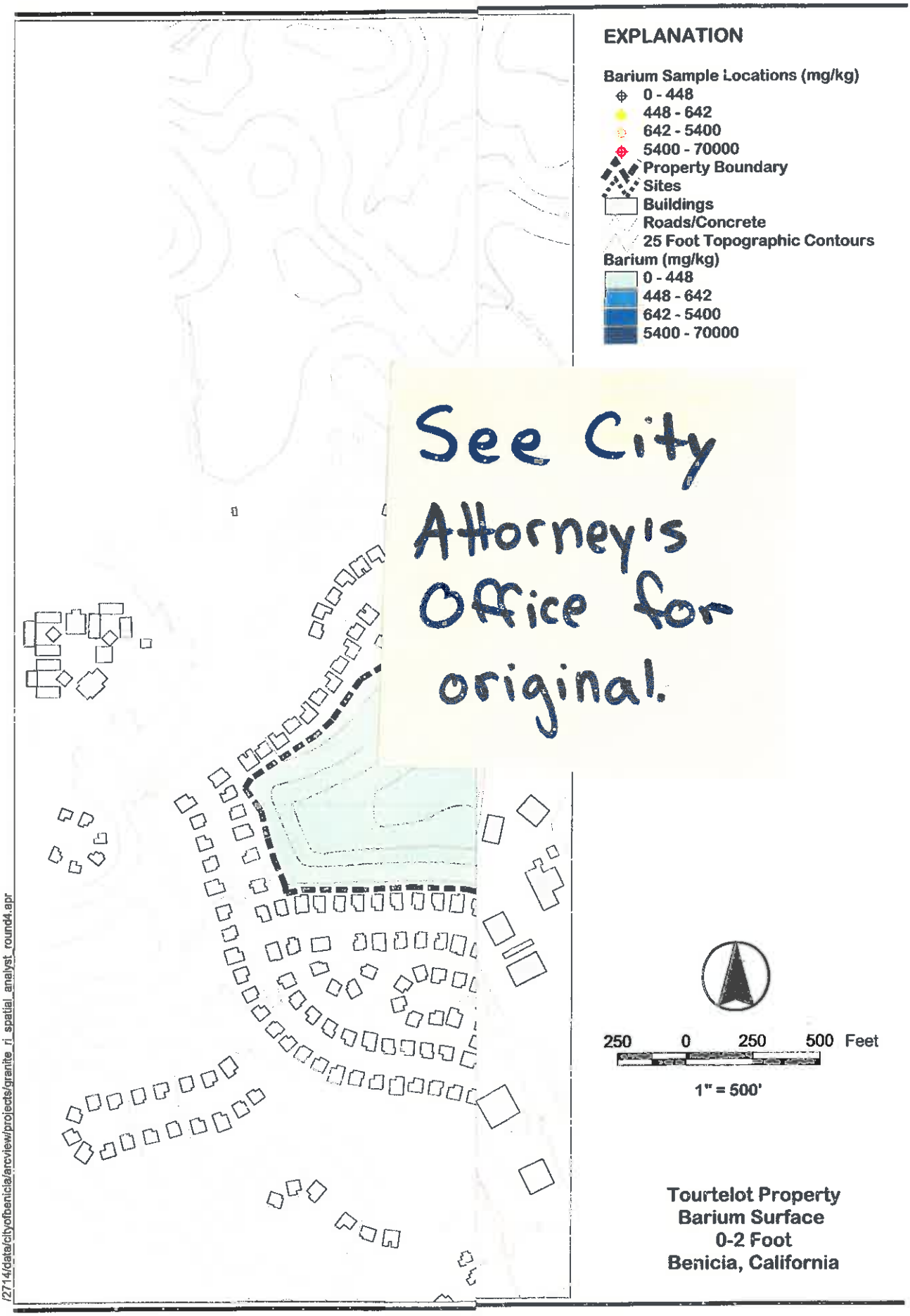
See City Attorney's Office for original.

Tourtelot Property
Antimony Surface
0-2 Foot
Benicia, California

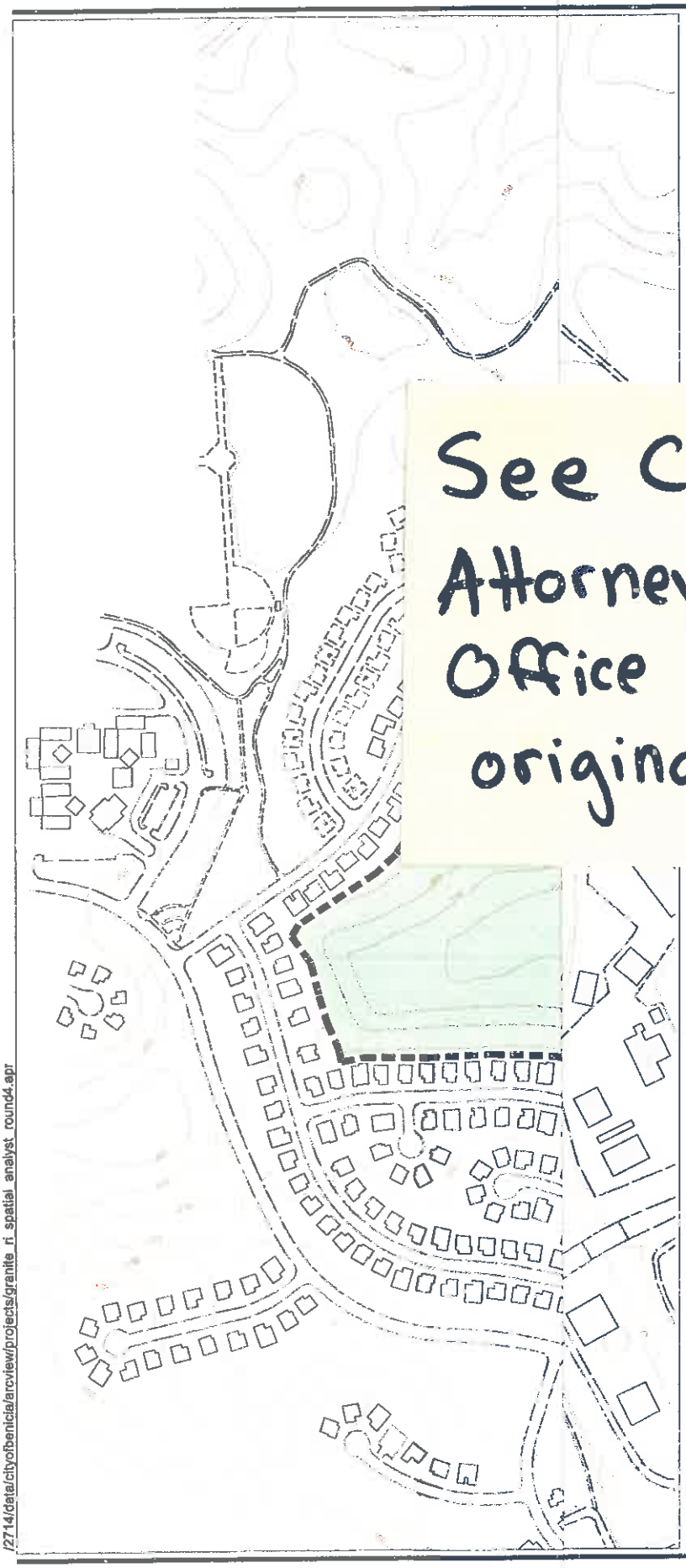


See City Attorney's Office for original.

Tourtelot Property
Arsenic Surface
0-2 Foot
Benicia, California



See City Attorney's Office for original.



EXPLANATION

Beryllium Sample Locations (mg/kg)
- 0 - 0.82
- 0.82 - 0.99
- 0.99 - 150
- 150 - 200

Property Boundary
Sites
Roads/Concrete
Buildings
25 Foot Topographic Contours

Beryllium (mg/kg)
- 0 - 0.82
- 0.82 - 0.99

.82

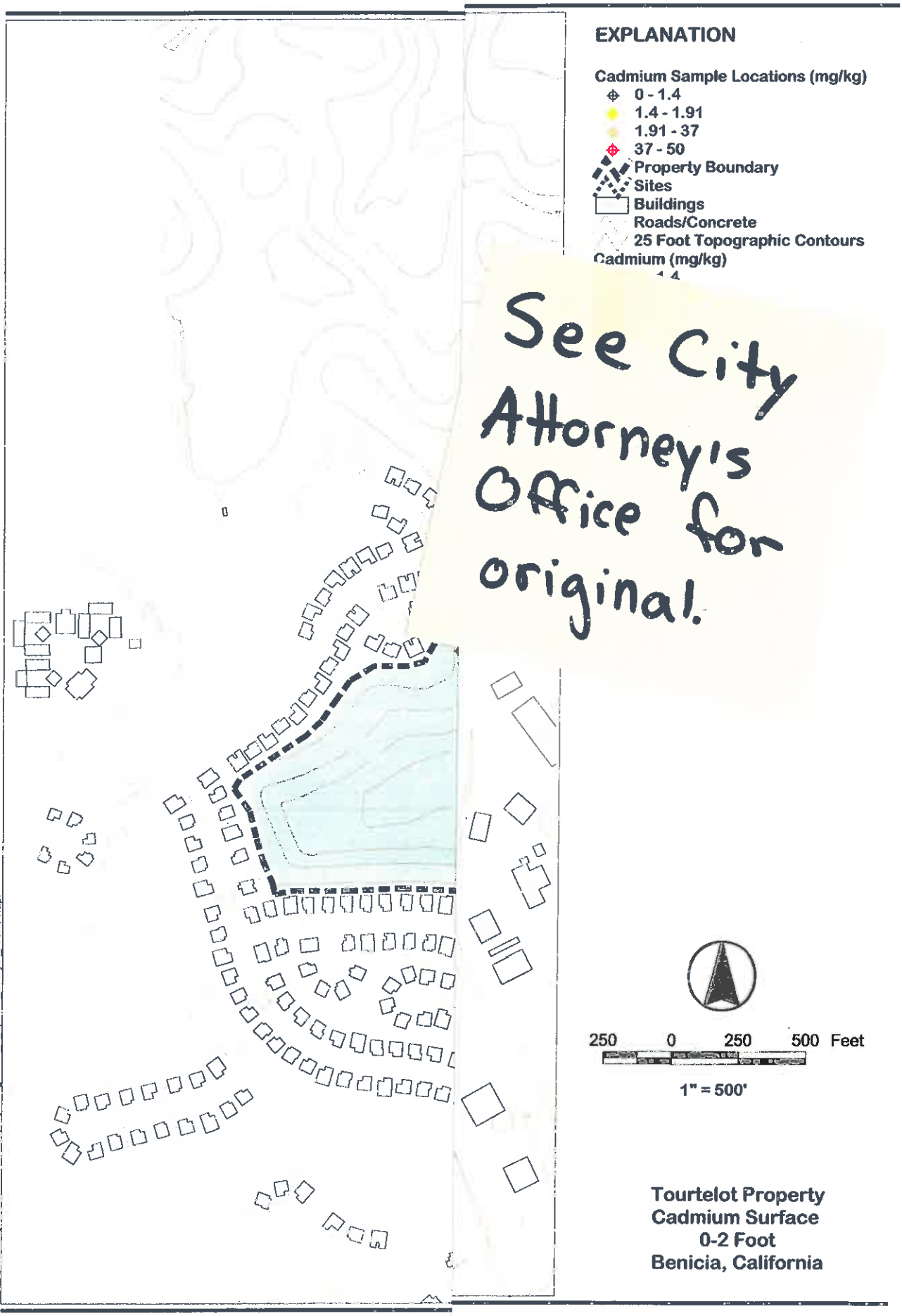
See City Attorney's Office for original.

250 0 250 500 Feet

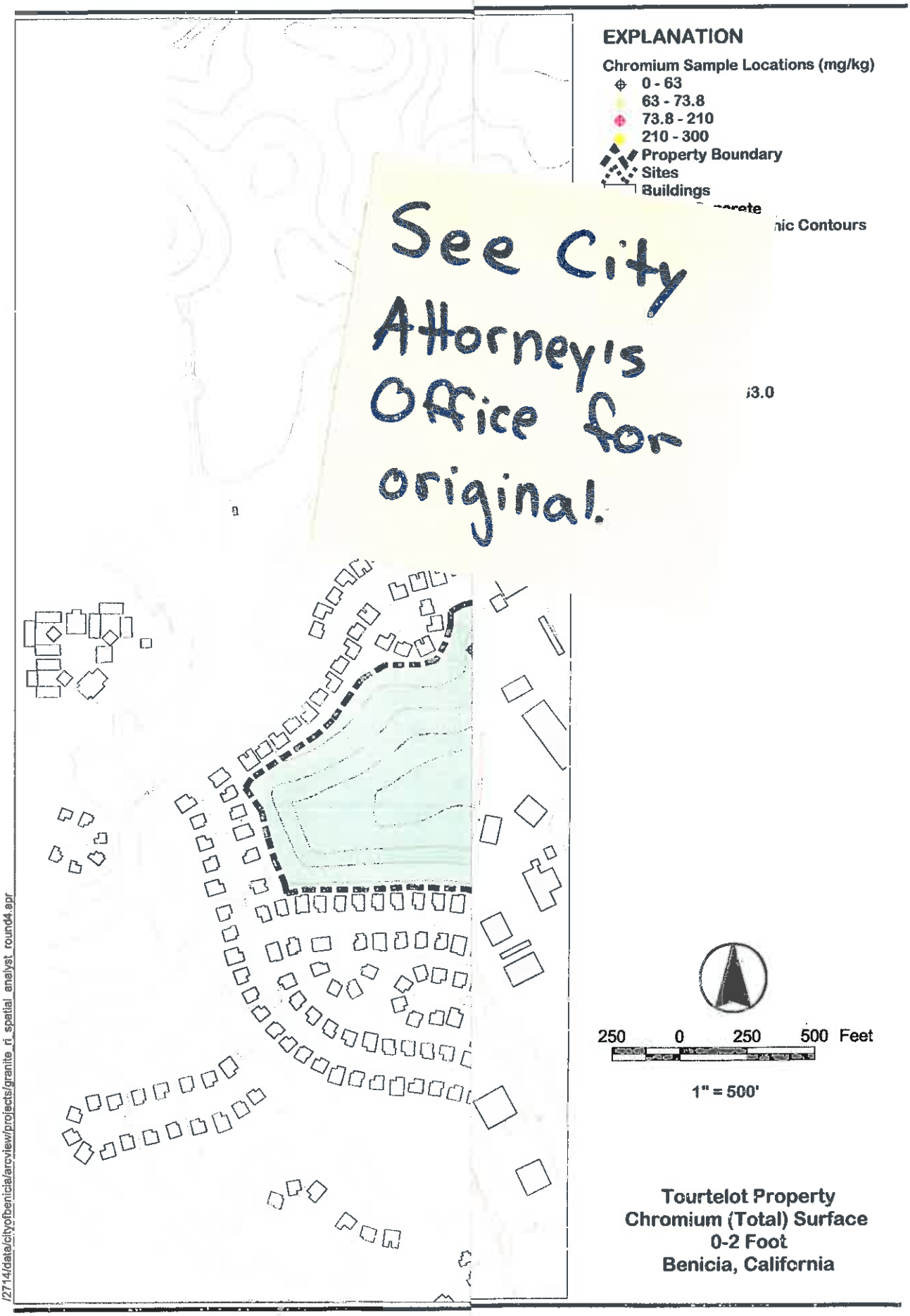
1" = 500'

Tourtelot Property
Beryllium Surface
0-2 Foot
Benicia, California

/2714/data/cityofbenicia/arcview/projects/granite_ri_spatial_analyst_round4.apr

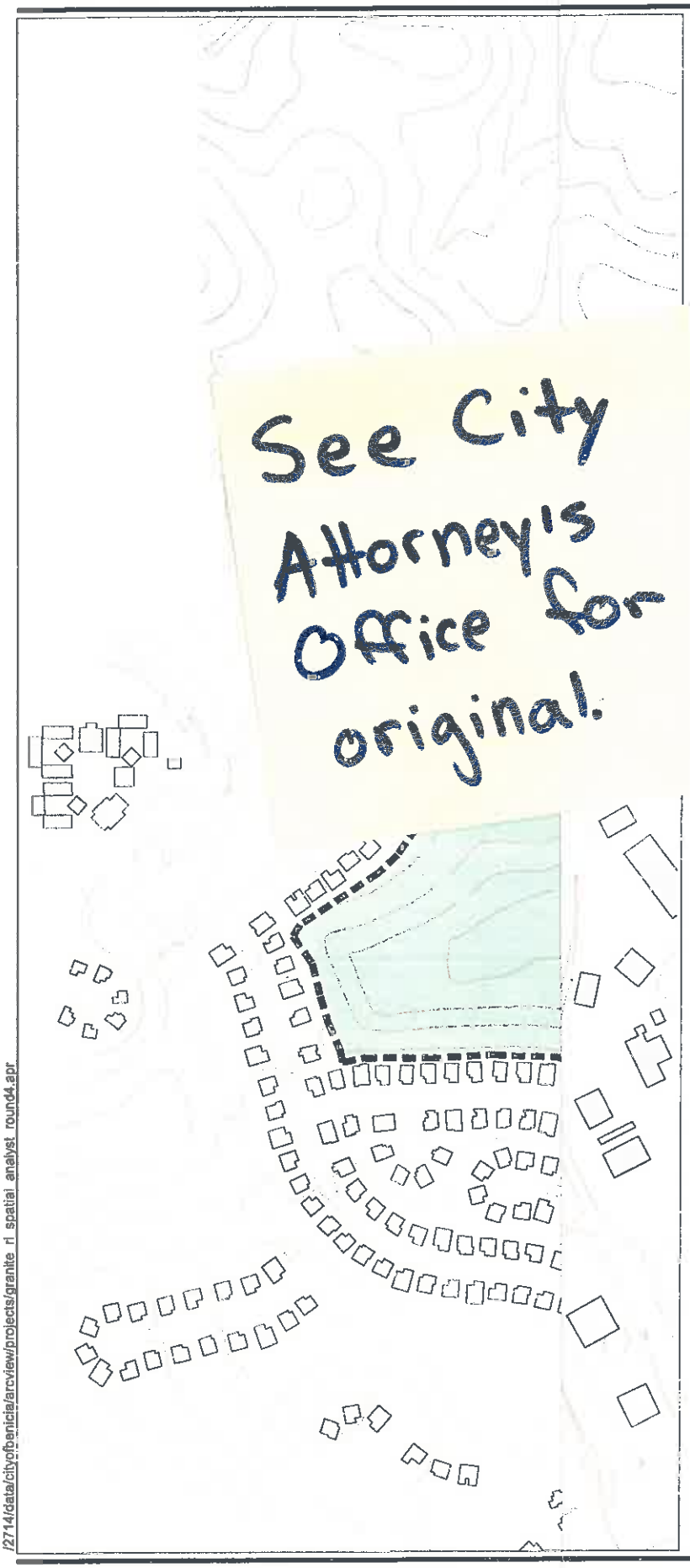


See City Attorney's Office for original.



See City Attorney's Office for original.

Tourtelot Property
Chromium (Total) Surface
0-2 Foot
Benicia, California



EXPLANATION

Cobalt Sample Locations (mg/kg)
- 0 - 23.1
- 23.1 - 27.9
- 27.9 - 4700
- 4700 - 5000
- Property Boundary
- Sites
- Buildings
- Roads/Concrete
- 25 Foot Topographic Contours

Cobalt (mg/kg)
- 0 - 23.1
- 23.1 - 27.9
- 27.9 - 4700
- 4700 - 5000

NOTES:
95th Percentile = 23.1
UTL = 27.9
PRG = 4,700

250 0 250 500 Feet

1" = 500'

Tourtelot Property
Cobalt Surface
0-2 Foot
Benicia, California

f2714/data/cityofbenicia/arcview/projects/granite ri spatial analyst round4.apr

EXPLANATION

Copper Sample Locations (mg/kg)
- 0 - 71.7
- 71.7 - 87.7
- 87.7 - 2900
- 2900 - 90000
- Property Boundary
- Sites
- Buildings
- Roads/Concrete
- 25 Foot Topographic Contours

Copper (mg/kg)
- 0 - 71.7
- 71.7 - 87.7
- 87.7 - 2900

See City Attorney's Office for original.

300 0 300 600 Feet

1" = 500'

Tourtelot Property
Copper Surface
0-2 Foot
Benicia, California

/2714/data/cityofbenicia/arcview/projects/granite_ri_spatial_analyst_round4.apr

See City Attorney's Office for original.

EXPLANATION

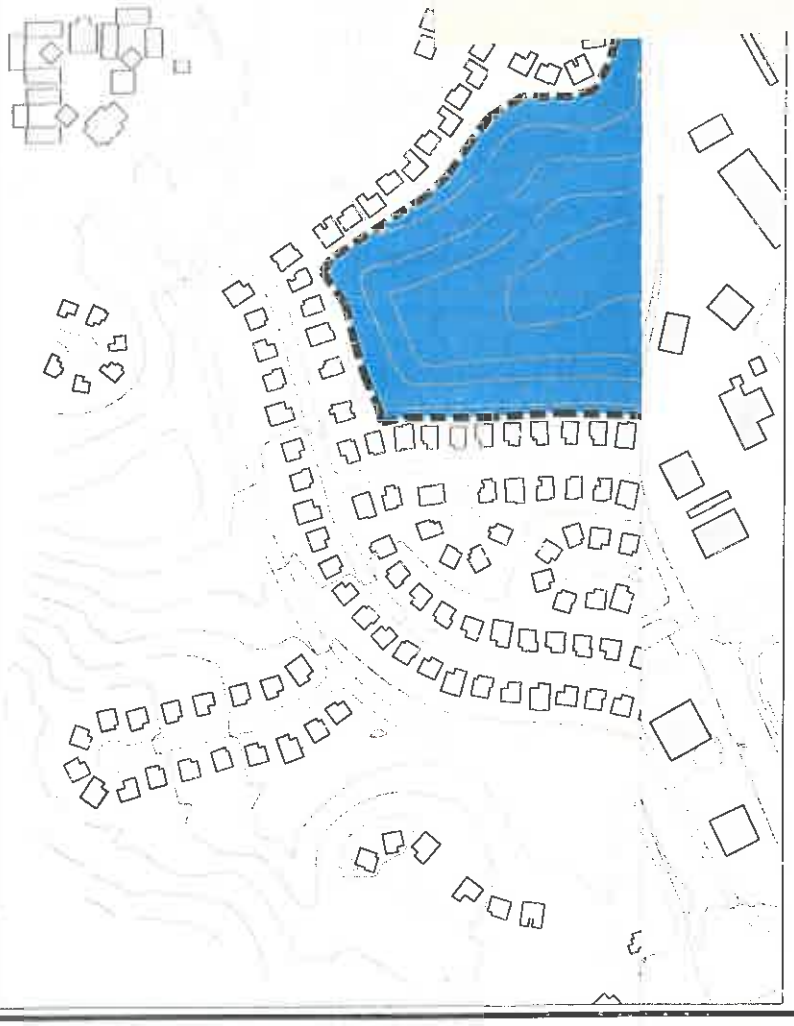
Iron Sample Locations (mg/kg)
- 0 - 23000
- 23000 - 43805
- 43805 - 50817
- 50817 - 67000

Property Boundary
Sites
ncrete

opographic Contours

805
817
'000

= 43805

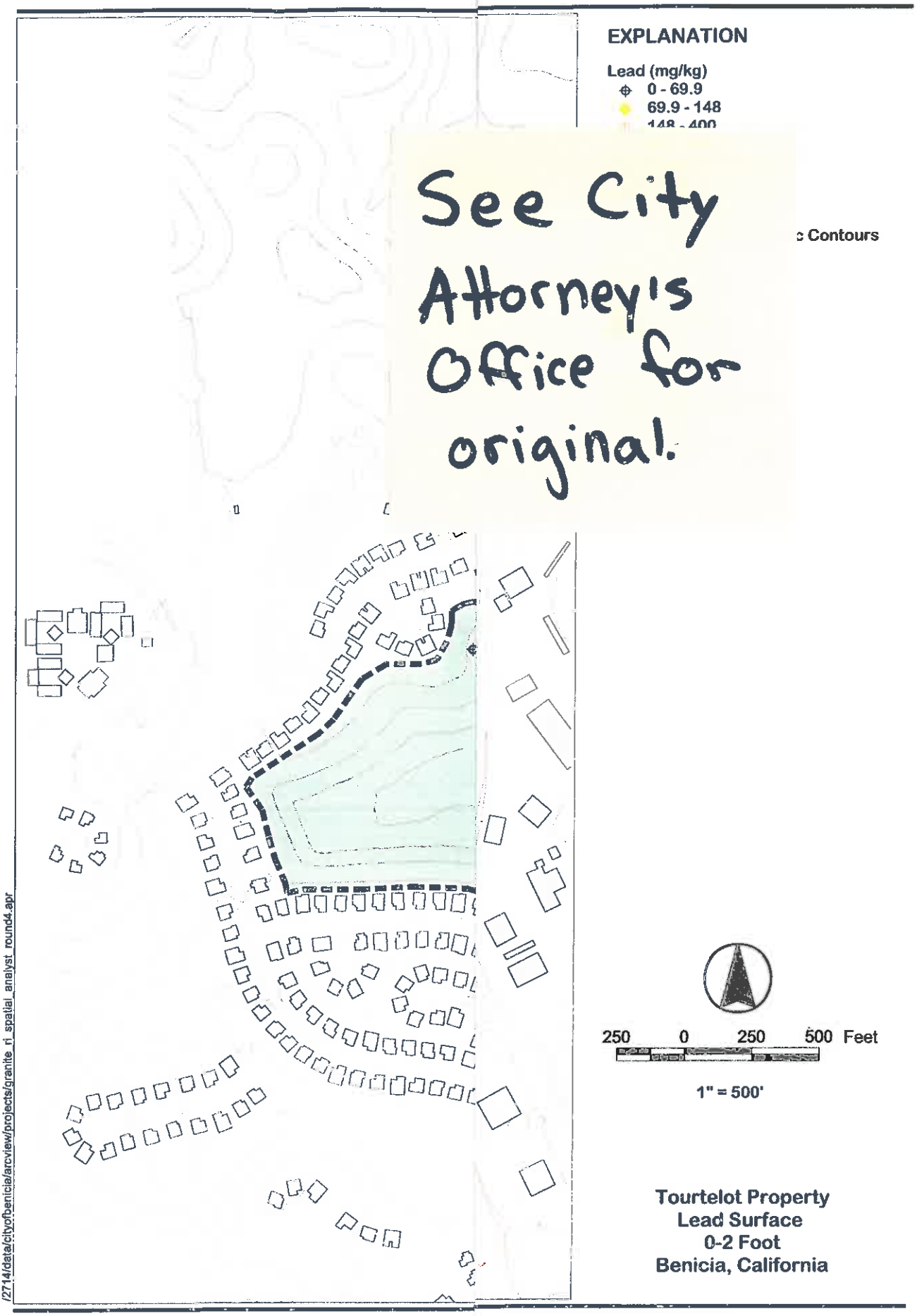


250 0 250 500 Feet

1" = 500'

Tourtelot Property
Iron Surface
0-2 Foot
Benicia, California

/2714/data/cityofbenicia/arcview/projects/granite_ri_spatial_analyst_round4.apr



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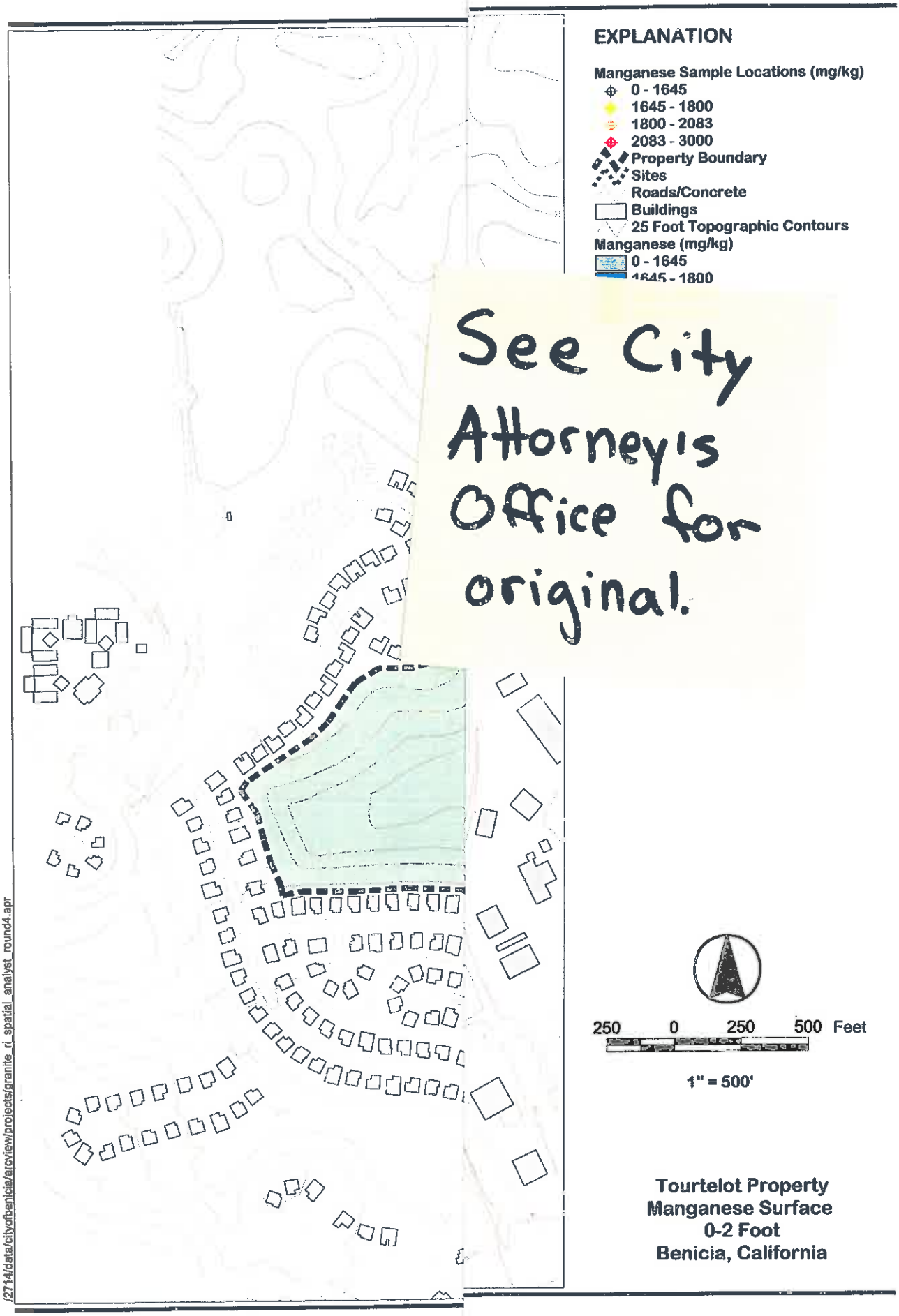
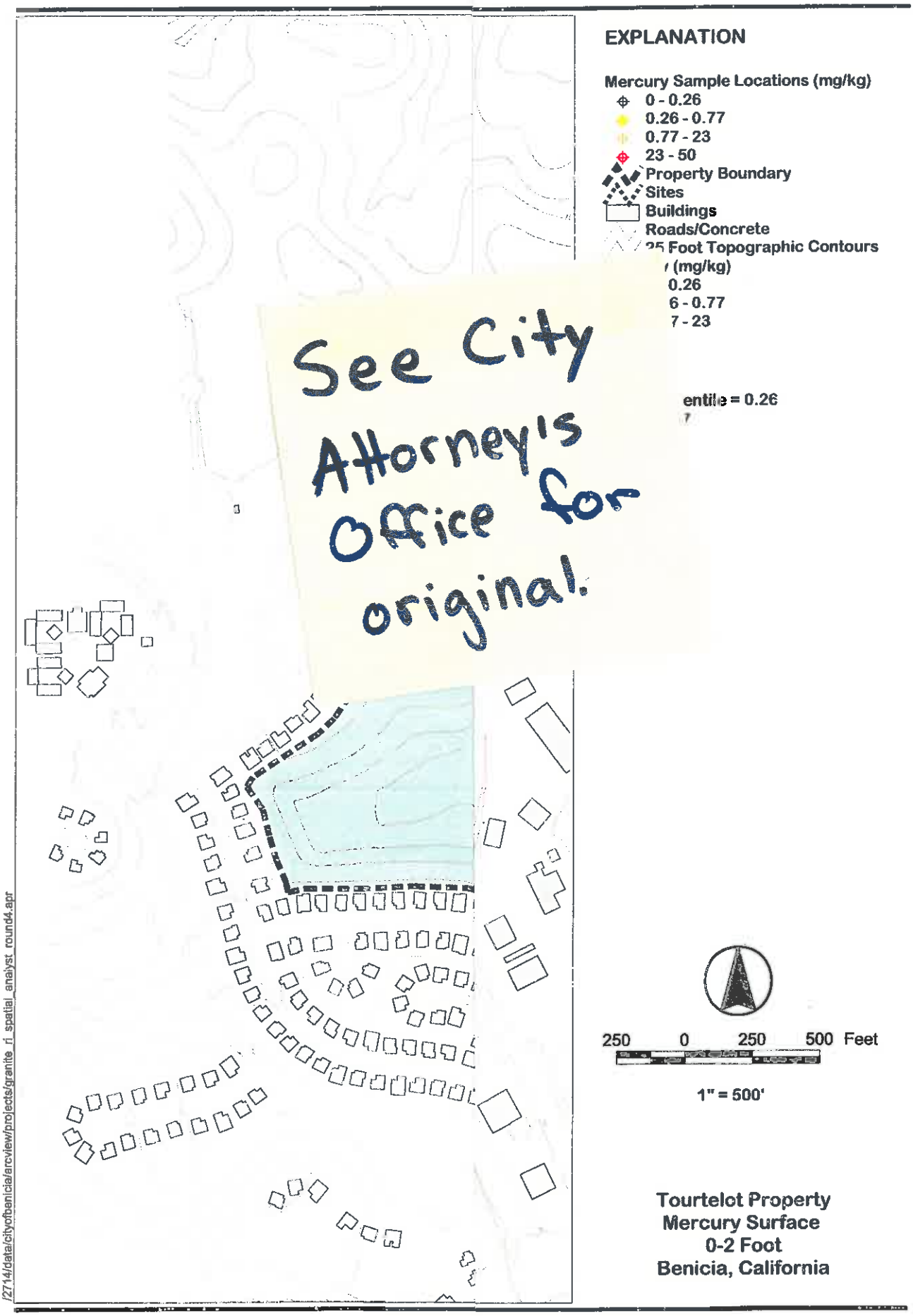


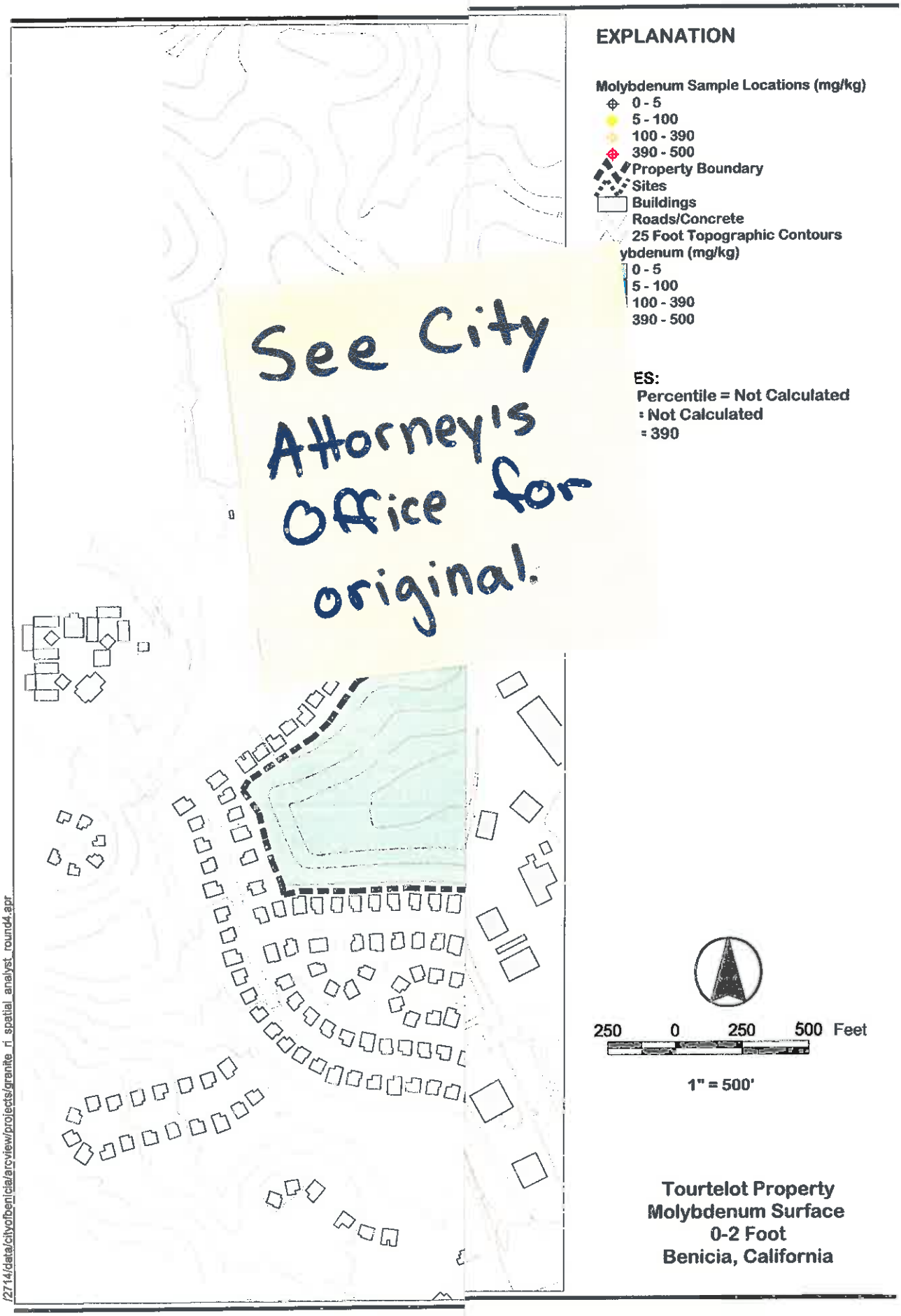
See City Attorney's Office for original.

Tourtelot Property
Manganese Surface
0-2 Foot
Benicia, California



See City Attorney's Office for original.

Tourtelot Property
Mercury Surface
0-2 Foot
Benicia, California



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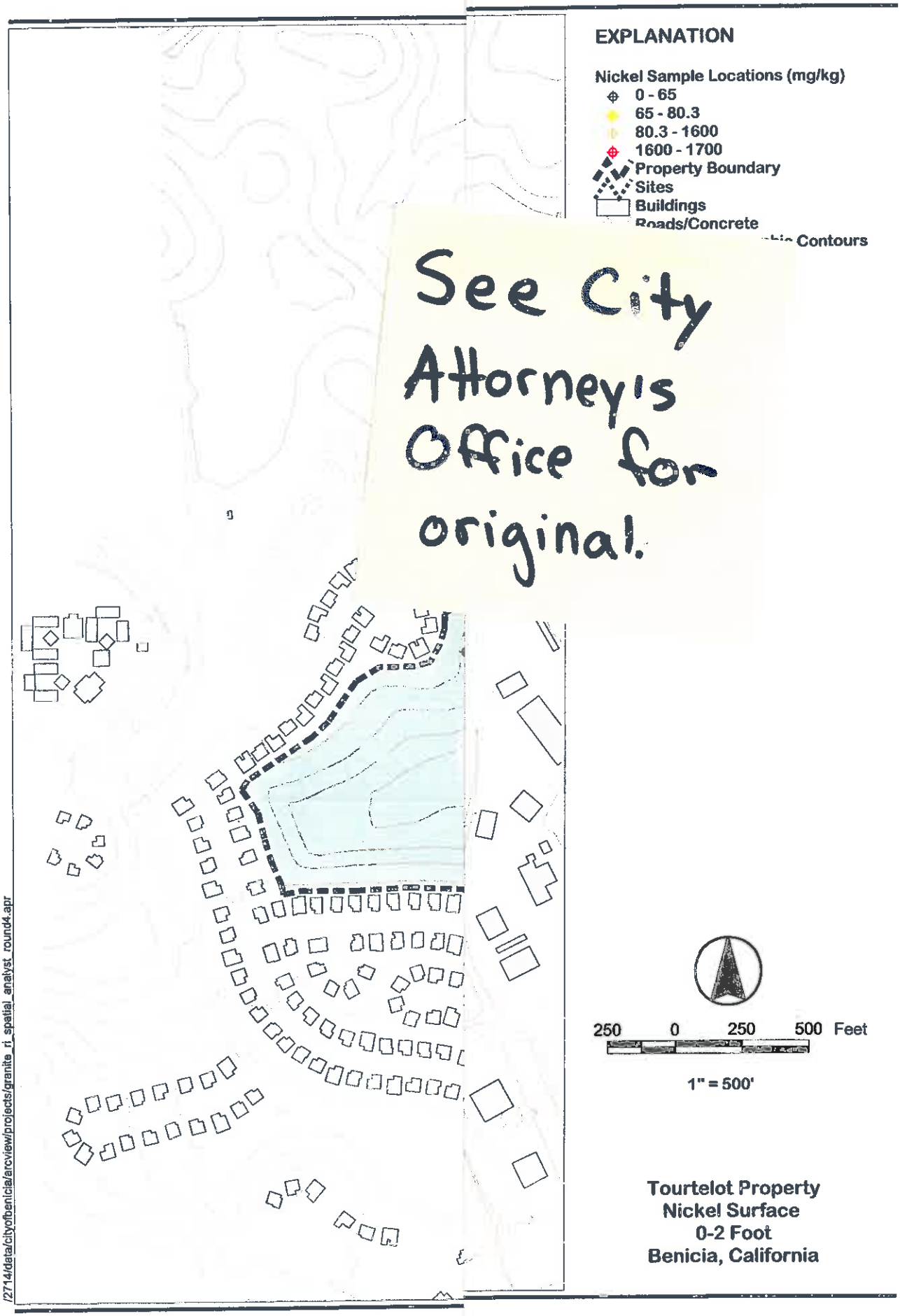
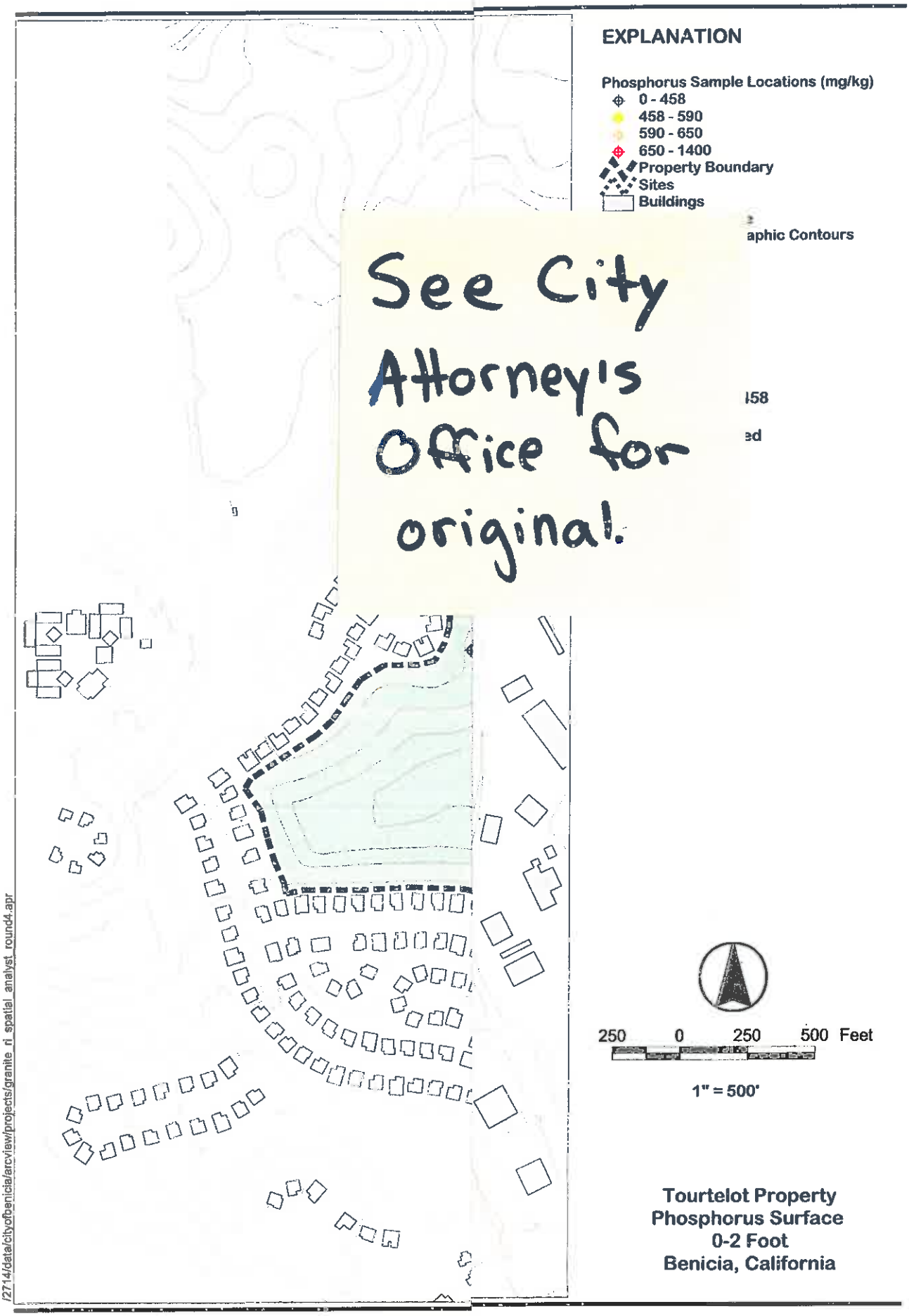


See City Attorney's Office for original.

Tourtelot Property
Nickel Surface
0-2 Foot
Benicia, California



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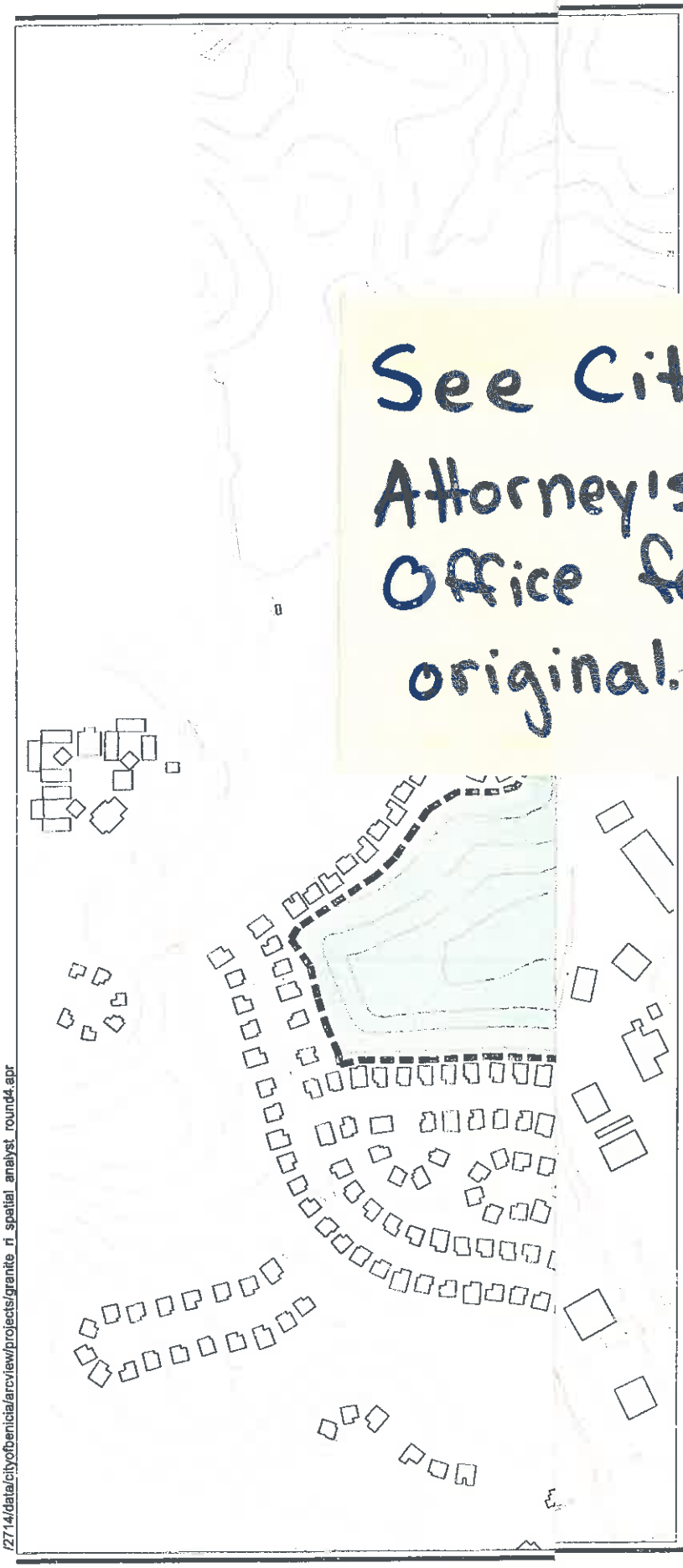


EXPLANATION

Selenium Sample Locations (mg/kg)

- 0 - 2
- 2 - 5
- 5 - 390
- 390 And Above
- Property Boundary
- Sites
- Buildings
- Roads/Concrete
- 25 Foot Topographic Contours

Selenium Sample Locations (mg/kg)

d Above

ntile = Not Calculated
Calculated

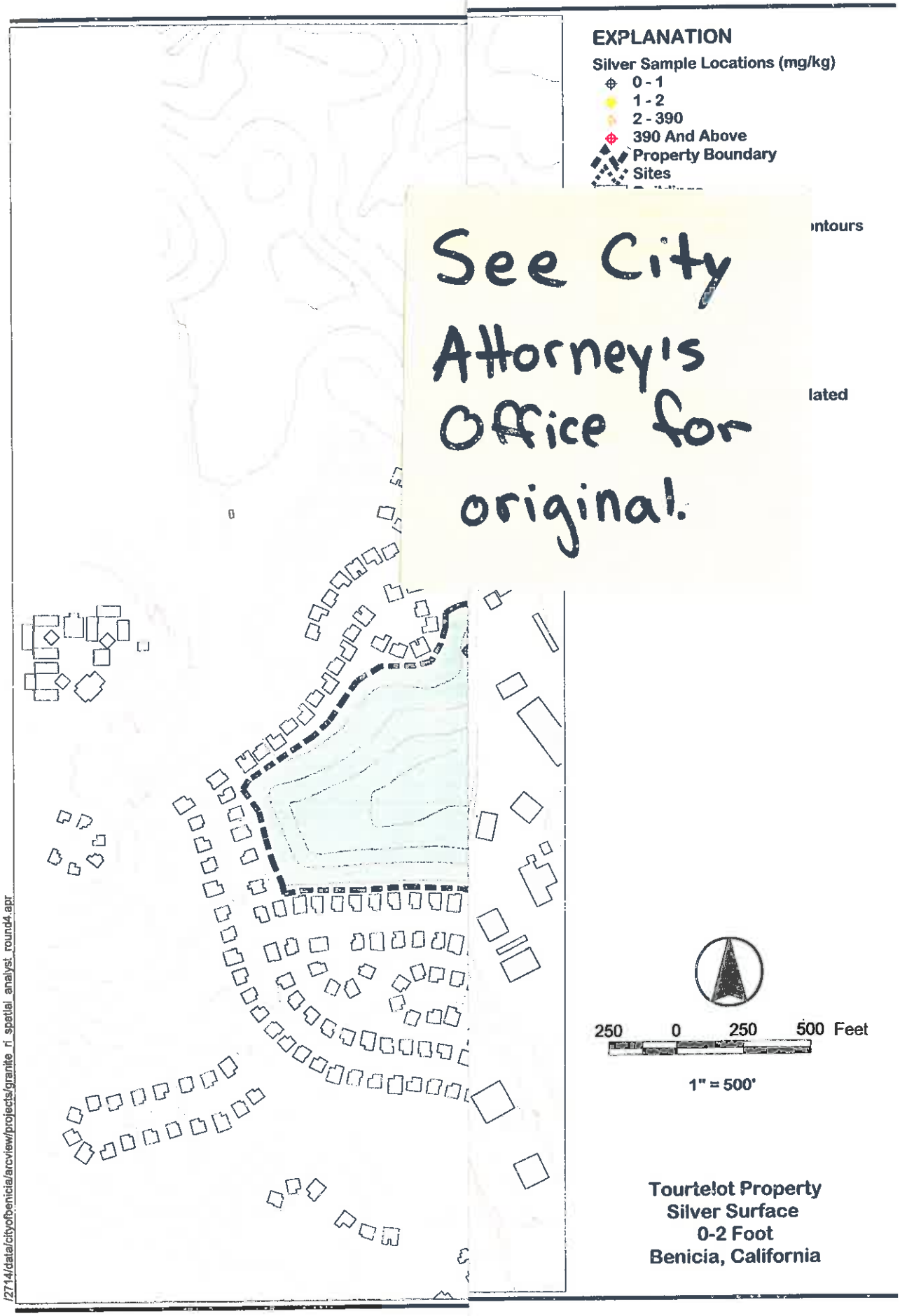
See City Attorney's Office for original.

250 0 250 500 Feet

1" = 500'

Tourtelot Property
Selenium Surface
0-2 Foot
Benicia, California

f2714/data/cityofbenicia/arcview/projects/granite_ri_spatial_analyst_round4.apr



See City Attorney's Office for original.

See City Attorney's Office for original.

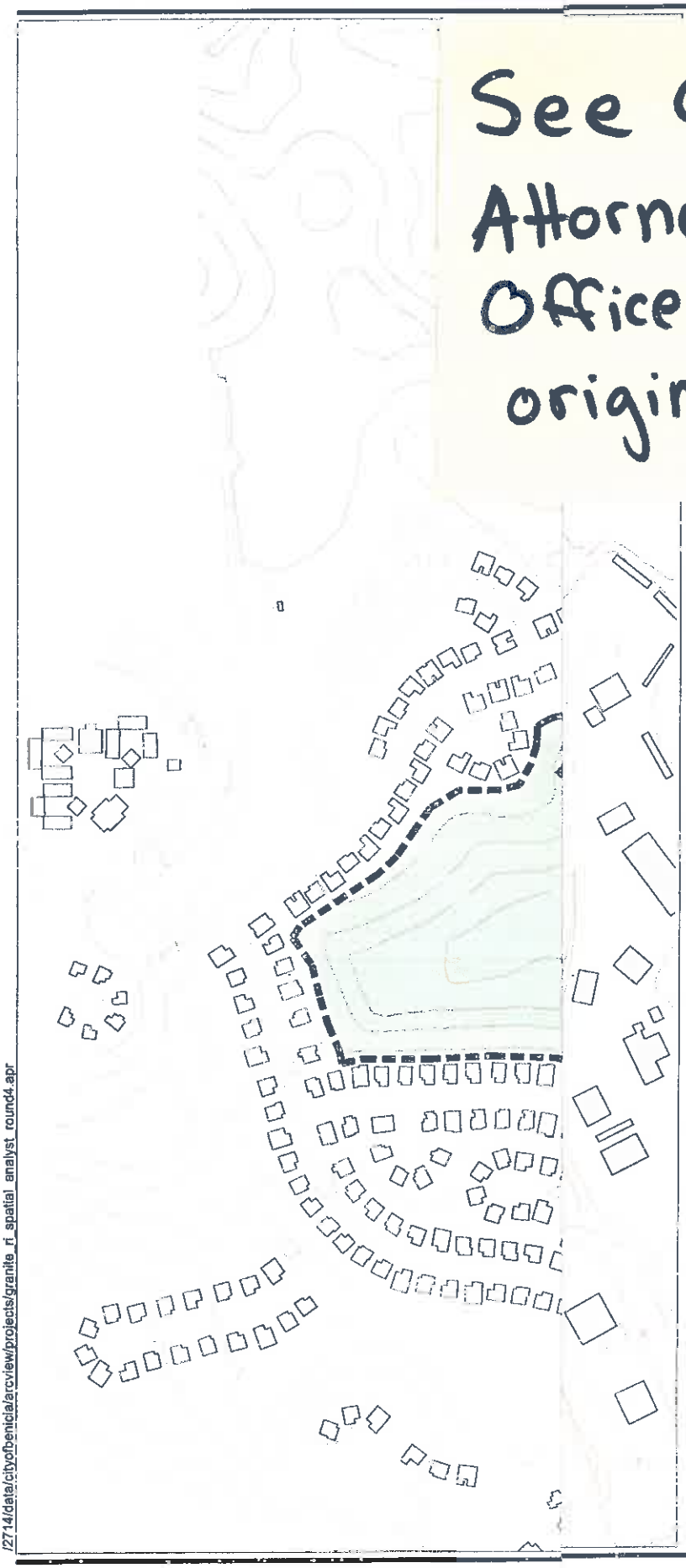
ions (mg/kg)

y

hic Contours

Calculated

PRG = 5.2

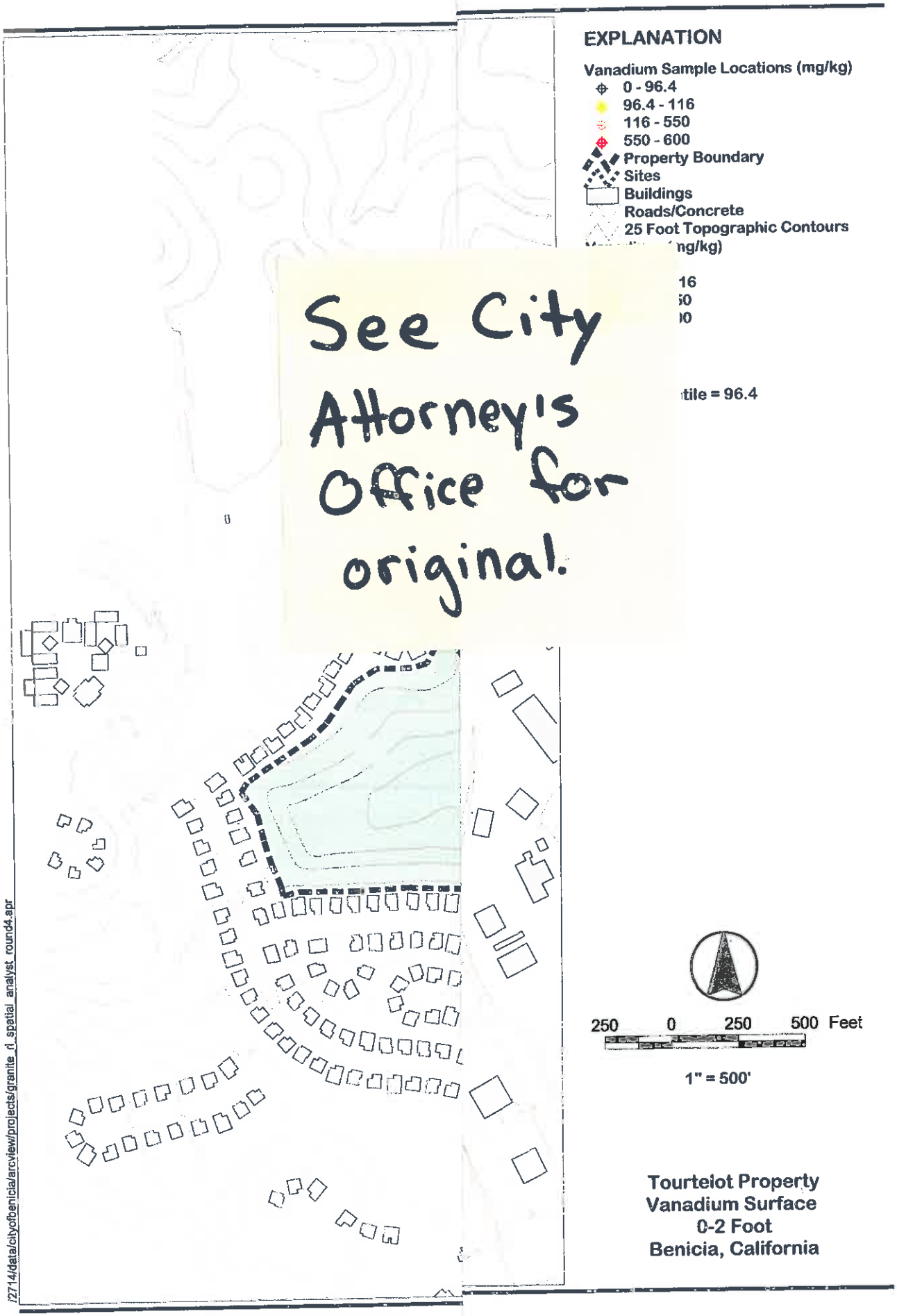


250 0 250 500 Feet

1" = 500'

Tourtelot Property
Thallium Surface
0-2 Foot
Benicia, California

/2714/data/cityofbenicia/arcview/projects/granite_ri_spatial_analyst_round4.apr



See City Attorney's Office for original.

See City Attorney's Office for original.

EXPLANATION

Zinc Sample Locations (mg/kg)

- 0 - 106
- 106 - 142
- 142 - 23000

000

oundary

crete

pographic Contours

0

= 106

250 0 250 500 Feet

1" = 500'

Tourtelot Property
Zinc Surface
0-2 Foot
Benicia, California

/2714/data/cityofbenicia/arcview/projects/granite_ri_spatial_analyst_round4.apr

ATTACHMENT E-3

Upper Tolerance Limits (UTLs)

Attachment E-3
Upper Tolerance Limits (UTLs)

This attachment presents the upper tolerance limits (UTLs) for inorganics. UTLs are presented for those inorganics where 95th percentiles could be calculated and compares each UTL value to each 95th percentile value; this shows the difference between the value used to represent ambient concentrations (95th percentile) and the value used to establish remediation goals (the UTL).

Because UTLs are most representative when they are calculated from a normal distribution (or a data set that can be transformed to a normal distribution), a distributional analysis was performed on the 20-sample ambient soil data set using the Shapiro-Wilk test on both untransformed and log-transformed data. If untransformed data produced a higher Shapiro-Wilk coefficient, then a normal distribution was assumed for the UTL calculation and the UTL was calculated using untransformed data. If log-transformed data produced a higher Shapiro-Wilk coefficient, then a log-normal distribution was assumed and the UTL was calculated using log-transformed data.

Calculation of the UTL used a one-sided procedure with 99 percent coverage and a 95 percent confidence level. The following equation was used:

UTL = x + ks, where
x = mean
k = tolerance limit k factor for n samples
s = standard deviation

Table 1 of this attachment summarizes the results of the distributional analysis and specifies whether a normal or log-normal distribution is assumed. The computer-generated calculations for each Shapiro-Wilk calculation, which also present basic statistical data and histograms, are included at the end of this attachment.

Table 2 of this attachment shows the spreadsheet used to calculate the UTLs for each inorganic parameter.

Table 3 of this attachment presents a side-by-side comparison of UTLs to 95th percentiles.

Table 4 of this attachment presents a compilation of the metals that exceed the 95th percentile and the UTL.

OBSERVATIONS

1. The ambient soil data set exhibits both normal and log-normal distributions, depending on the particular inorganic constituent. These distributions may not be consistent with the evaluations that incorporate all site data (shown in Attachment E-4).
2. UTL values are consistently higher than 95th percentiles. This is not unusual as the UTL is a predictive value designed to predict an upper limit (at a specified coverage level and confidence level) for a data set based on its statistical characteristics and uncertainties related to the number of data points used, whereas the 95th percentile is drawn from the actual data set, which may or may not contain values representative of the possible upper concentrations. In some cases, the UTL may be more representative of ambient concentrations than the 95th percentile; however, for purposes of this investigation, they are used solely for remediation goals.

TABLE 1
Shapiro-Wilk Test Results for Untransformed and Log-Transformed Tourtelot Ambient Soil Data Set

Element	Untransformed		Log-transformed		Distributional Assumption
	Shapiro-Wilk Coefficient	Probability	Shapiro-Wilk Coefficient	Probability	
Al	0.9846	0.9789	0.9797	0.9304	Normal
Sb	0.9535	0.4227	0.8373	0.0033	Normal
As	0.9446	0.2920	0.9021	0.0452	Normal
Ba	0.9603	0.5493	0.9741	0.8385	Log-Normal
Be	0.9778	0.9027	0.9696	0.7469	Normal
Cd	0.8356	0.0031	0.8209	0.0018	Normal
Cr	0.9528	0.4122	0.9483	0.3419	Normal
Co	0.9527	0.4098	0.9193	0.0960	Normal
Cu	0.9532	0.4181	0.9290	0.1478	Normal
Fe	0.9299	0.1535	0.9154	0.0807	Normal
Pb	0.9085	0.0597	0.9436	0.2796	Log-Normal
Mn	0.9500	0.3675	0.9330	0.1767	Normal
Hg	0.9384	0.2232	0.9541	0.4331	Log-Normal
Mo	N/A	N/A	N/A	N/A	N/A
Ni	0.9823	0.9605	0.9586	0.5167	Normal
P	0.9053	0.0518	0.9261	0.1300	Log-Normal
Se	N/A	N/A	N/A	N/A	N/A
Ag	N/A	N/A	N/A	N/A	N/A
Tl	N/A	N/A	N/A	N/A	N/A
V	0.9382	0.2216	0.9697	0.7490	Log-Normal
Zn	0.9720	0.7970	0.9751	0.8571	Log-Normal

Notes:
Non-detected values were assigned a value of 1/2 of the method detection limit (MDL); applies to Cd only
N/A: not applicable as all results were below the MDL (for Mo, Ag, and Tl) or >50% of results below the MDL (for Se)

TABLE 2

Upper Tolerance Limit (UTL) Calculations for Untransformed and Log-Transformed Ambient Soil Data

Ambient Sample Location	Al Tourtelot	Log Al Tourtelot	Sb Tourtelot	Log Sb Tourtelot	As Tourtelot	Log As Tourtelot	Ba Tourtelot	Log Ba Tourtelot
NO-19	22300	4.348304863	1.9	0.278753601	16.3	1.212187604	279	2.445604203
NO-27	27400	4.437750563	1.6	0.204119983	14.5	1.161368002	290	2.462397998
NO-38	25700	4.409933123	2.2	0.342422681	18.2	1.260071388	482	2.683047038
NO-44	22000	4.342422681	2.3	0.361727836	16.4	1.214843848	260	2.414973348
NO-50	19500	4.290034611	2.4	0.380211242	17.4	1.240549248	206	2.31386722
NO-68	21200	4.326335861	1.3	0.113943352	15.4	1.187520721	213	2.328379603
NO-89	30100	4.478566496	0.31	-0.508638306	17.8	1.250420002	446	2.649334859
NO-99	26600	4.424881637	1.5	0.176091259	17.9	1.252853031	335	2.525044807
NO-100	25500	4.40654018	1.3	0.113943352	14	1.146128036	371	2.56937391
NO-118	23600	4.372912003	0.99	-0.004364805	13.1	1.117271296	394	2.595496222
NO-129	19600	4.292256071	1.5	0.176091259	16.4	1.214843848	276	2.440909082
NO-132	26000	4.414973348	1.2	0.079181246	16.3	1.212187604	405	2.607455023
NO-146	24200	4.383815366	1.2	0.079181246	13.4	1.127104798	327	2.514547753
NO-170	16500	4.217483944	0.95	-0.022276395	13.5	1.130333768	223	2.348304863
NO-173	21000	4.322219295	1.3	0.113943352	16.8	1.225309282	346	2.539076099
NO-179	21500	4.33243846	1.1	0.041392685	14.1	1.149219113	237	2.374748346
NO-184	24100	4.382017043	1.4	0.146128036	15.1	1.178976947	324	2.51054501
NO-210	20800	4.318063335	0.99	-0.004364805	9.9	0.995635195	198	2.29666519
NO-238	17900	4.252853031	1.5	0.176091259	14.9	1.173186268	183	2.26245109
NO-241	27300	4.436162647	1.7	0.230448921	18.5	1.267171728	287	2.457881897
N	20	20	20	20	20	20	20	20
NDs	0	0	0	0	0	0	0	0
%Detected	100%	100%	100%	100%	100%	100%	100%	100%
Mean	23140	4.359498228	1.432	0.12370135	15.495	1.185859086	304.1	2.467005178
Std. Dev.	3511.394984	0.067203121	0.500858211	0.190003143	2.137503463	0.064704015	84.8942996	0.121271928
Tolerance Factor	2.807	2.807	2.807	2.807	2.807	2.807	2.807	2.807
distributional assumption*	Normal		Normal		Normal			Log-Normal
UTL (normal)	**32996**		**2.84**		**21.5**		542	
UTL (lognormal)		35329		4.54		23.3		**642**

NOTES:

1. * = from Table 1
2. UTL value in BOLD is the applicable UTL value based on distributional assumption

TABLE 2
Upper Tolerance Limit (UTL)

Ambient Sample Location	Be Tourtelot	Log Be Tourtelot	Cd Tourtelot	Log Cd Tourtelot	Ca Tourtelot	Log Ca Tourtelot	Cr Tourtelot	Log Cr Tourtelot
NO-19	0.72	-0.142667504	1	0	2640	3.421603927	49	1.69019608
NO-27	0.71	-0.148741651	***0.305***	**-0.515700161**	3340	3.523746467	57.4	1.758911892
NO-38	0.69	-0.161150909	1.4	0.146128036	3710	3.56937391	63	1.799340549
NO-44	0.58	-0.236572006	1.4	0.146128036	3030	3.481442629	42.7	1.630427875
NO-50	0.43	-0.366531544	1.3	0.113943352	3200	3.505149978	40.1	1.603144373
NO-68	0.56	-0.251811973	***0.25***	**-0.602059991**	3220	3.507855872	42.6	1.629409599
NO-89	0.86	-0.065501549	0.78	-0.107905397	3850	3.58546073	63.8	1.804820679
NO-99	0.82	-0.086186148	1.2	0.079181246	3270	3.514547753	59.5	1.774516966
NO-100	0.64	-0.193820026	***0.27***	**-0.568636236**	3880	3.588831726	47.1	1.673020907
NO-118	0.6	-0.22184875	***0.27***	**-0.568636236**	3110	3.492760389	49	1.69019608
NO-129	0.52	-0.283996656	0.97	-0.013228266	3860	3.586587305	41.5	1.618048097
NO-132	0.69	-0.161150909	***0.265***	**-0.576754126**	5640	3.751279104	54.1	1.733197265
NO-146	0.53	-0.27572413	***0.26***	**-0.585026652**	5930	3.773054693	48.6	1.686636269
NO-170	0.34	-0.468521083	***0.275***	**-0.560667306**	3590	3.555094449	30.1	1.478566496
NO-173	0.47	-0.327902142	***0.275***	**-0.560667306**	3950	3.596597096	44.1	1.644438589
NO-179	0.56	-0.251811973	0.5	-0.301029996	4940	3.693726949	47.8	1.679427897
NO-184	0.66	-0.180456064	0.68	-0.167491087	3120	3.494154594	51.2	1.709269961
NO-210	0.5	-0.301029996	***0.255***	**-0.59345982**	5120	3.709269961	40.9	1.611723308
NO-238	0.53	-0.27572413	1.1	0.041392685	2290	3.359835482	40.6	1.608526034
NO-241	0.82	-0.086186148	0.83	-0.080921908	2570	3.409933123	61.5	1.788875116
N	20	20	20	20	20	20	20	20
NDs	0	0	9	9	0	0	0	0
%Detected	100%	100%	55%	55%	100%	100%	100%	100%
Mean	0.6115	-0.224366765	0.67925	-0.263770557	3713	3.556015307	48.73	1.680634702
Std. Dev.	0.136276615	0.100939075	0.437601943	0.30263083	993.6434815	0.110343894	8.944866214	0.081817588
Tolerance Factor	2.807	2.807	2.807	2.807	2.807	2.807	2.807	2.807
distributional assumption*	Normal		Normal			Log-Normal	Normal	
UTL (normal)	**0.99**		**1.91**		6502		**73.8**	
UTL (lognormal)		1.15		3.85		**7341**		81.3

NOTES:
1. * = from Table 1
2. UTL value in BOLD is the a

TABLE 2
Upper Tolerance Limit (UTL)

Ambient Sample Location	Co Tourtelot	Log Co Tourtelot	Cu Tourtelot	Log Cu Tourtelot	Fe Tourtelot	Log Fe Tourtelot	Pb Tourtelot	Log Pb Tourtelot
NO-19	20.8	1.318063335	56.4	1.751279104	34300	4.53529412	65.7	1.81756537
NO-27	23.3	1.367355921	70.1	1.845718018	40300	4.605305046	34	1.531478917
NO-38	23.1	1.36361198	72.1	1.857935265	43900	4.64246452	52.8	1.722633923
NO-44	20.3	1.307496038	56.9	1.755112266	35900	4.555094449	74.8	1.873901598
NO-50	12.4	1.093421685	52.1	1.716837723	32200	4.507855872	69.6	1.84260924
NO-68	15.7	1.195899652	48	1.681241237	39700	4.598790507	30.5	1.484299839
NO-89	21	1.322219295	70.1	1.845718018	43700	4.640481437	43.1	1.63447727
NO-99	22.3	1.348304863	68.5	1.835690571	40900	4.611723308	49.6	1.695481676
NO-100	17.4	1.240549248	54	1.73239376	36300	4.559906625	31.1	1.492760389
NO-118	20.1	1.303196057	53.6	1.72916479	41600	4.619093331	21	1.322219295
NO-129	16.9	1.227886705	49.2	1.691965103	37500	4.574031268	51.2	1.709269961
NO-132	19.3	1.285557309	60.2	1.779596491	43800	4.641474111	22	1.342422681
NO-146	19	1.278753601	56.4	1.751279104	41800	4.621176282	14.8	1.170261715
NO-170	12	1.079181246	31.9	1.503790683	31300	4.495544338	23.6	1.372912003
NO-173	17.7	1.247973266	35.9	1.555094449	42300	4.626340367	17	1.230448921
NO-179	18.1	1.257678575	52.9	1.723455672	38800	4.588831726	16.1	1.206825876
NO-184	21.9	1.340444115	62	1.792391689	39400	4.595496222	31.5	1.498310554
NO-210	14.7	1.167317335	46	1.662757832	34200	4.534026106	20.4	1.309630167
NO-238	16.4	1.214843848	44	1.643452676	29400	4.46834733	67.8	1.831229694
NO-241	21.3	1.328379603	71.7	1.855519156	42200	4.625312451	36.4	1.561101384
N	20	20	20	20	20	20	20	20
NDs	0	0	0	0	0	0	0	0
%Detected	100%	100%	100%	100%	100%	100%	100%	100%
Mean	18.685	1.264406684	55.6	1.73551968	38475	4.582329471	38.65	1.532492024
Std. Dev.	3.2951759	0.082694035	11.43581631	0.096019422	4396.873889	0.051783168	19.51945049	0.226817526
Tolerance Factor	2.807	2.807	2.807	2.807	2.807	2.807	2.807	2.807
distributional assumption*	Normal		Normal		Normal			Log-Normal
UTL (normal)	**27.9**		**87.7**		**50817**		93.4	
UTL (lognormal)		31.4		101		53418		**148**

NOTES:
1. * = from Table 1
2. UTL value in BOLD is the a

TABLE 2
Upper Tolerance Limit (UTL)

Ambient Sample Location	Mg Tourtelot	Log Mg Tourtelot	Mn Tourtelot	Log Mn Tourtelot	Hg Tourtelot	Log Hg Tourtelot	Mo Tourtelot	Log Mo Tourtelot
NO-19	6020	3.779596491	1730	3.238046103	0.18	-0.744727495	**0.425**	**-0.37161107**
NO-27	7030	3.846955325	1310	3.117271296	0.09	-1.045757491	**0.355**	**-0.449771647**
NO-38	6830	3.834420704	1640	3.214843848	0.2	-0.698970004	**0.41**	**-0.387216143**
NO-44	5160	3.712649702	1280	3.10720997	0.26	-0.585026652	**0.33**	**-0.48148606**
NO-50	4880	3.688419822	699	2.844477176	0.27	-0.568636236	**0.5**	**-0.301029996**
NO-68	4760	3.677606953	773	2.888179494	0.081	-1.091514981	**0.65**	**-0.187086643**
NO-89	7110	3.851869601	1320	3.120573931	0.12	-0.920818754	**0.335**	**-0.474955193**
NO-99	6250	3.795880017	1630	3.212187604	0.16	-0.795880017	**0.375**	**-0.425968732**
NO-100	5080	3.705863712	1160	3.064457989	0.1	-1	**0.365**	**-0.437707136**
NO-118	6100	3.785329835	1090	3.037426498	0.048	-1.318758763	**0.415**	**-0.381951903**
NO-129	5180	3.71432976	1090	3.037426498	0.17	-0.769551079	**0.43**	**-0.366531544**
NO-132	6210	3.7930916	1050	3.021189299	0.057	-1.244125144	**0.39**	**-0.408935393**
NO-146	6880	3.837588438	952	2.978636948	0.018	-1.744727495	**0.39**	**-0.408935393**
NO-170	3570	3.552668216	739	2.868644438	0.075	-1.124938737	**0.47**	**-0.327902142**
NO-173	4250	3.62838893	1260	3.100370545	0.062	-1.207608311	**0.35**	**-0.455931956**
NO-179	7480	3.873901598	850	2.929418926	0.038	-1.420216403	**0.285**	**-0.54515514**
NO-184	6100	3.785329835	1390	3.1430148	0.11	-0.958607315	**0.365**	**-0.437707136**
NO-210	7270	3.861534411	699	2.844477176	0.037	-1.431798276	**0.345**	**-0.462180905**
NO-238	3980	3.599883072	1330	3.123851641	0.17	-0.769551079	**0.325**	**-0.488116639**
NO-241	7390	3.868644438	1540	3.187520721	0.21	-0.677780705	**0.46**	**-0.337242168**
N	20	20	20	20	20	20	20	20
NDs	0	0	0	0	0	0	20	20
%Detected	100%	100%	100%	100%	100%	100%	0%	0%
Mean	5876.5	3.759697623	1176.6	3.053961245	0.1228	-1.005949747	0.3985	-0.406871147
Std. Dev.	1200.391493	0.095092801	323.0369703	0.125949573	0.075436694	0.317976651	0.080001645	0.07946445
Tolerance Factor	2.807	2.807	2.807	2.807	2.807	2.807	2.807	2.807
distributional assumption*	Normal		Normal			Log-Normal	NOT APPLICABL	NOT APPLICABL
UTL (normal)	**9246**		**2083**		0.33		0.62	
UTL (lognormal)		10632		2556		**0.77**		0.65

NOTES:
1. * = from Table 1
2. UTL value in BOLD is the a

TABLE 2
Upper Tolerance Limit (UTL)

Ambient Sample Location	Ni Tourtelot	Log Ni Tourtelot	P Tourtelot	Log P Tourtelot	K Tourtelot	Log K Tourtelot	Se Tourtelot	Log Se Tourtelot
NO-19	52.2	1.717670503	355	2.550228353	3160	3.499687083	**0.19**	**-0.721246399**
NO-27	55.8	1.746634199	341	2.532754379	3910	3.592176757	**0.2**	**-0.698970004**
NO-38	64.8	1.811575006	460	2.662757832	4550	3.658011397	**0.18**	**-0.744727495**
NO-44	42.3	1.626340367	401	2.603144373	2800	3.447158031	**0.19**	**-0.721246399**
NO-50	35.8	1.553883027	434	2.63748973	2970	3.472756449	**0.19**	**-0.721246399**
NO-68	32.7	1.514547753	261	2.416640507	2160	3.334453751	**0.165**	**-0.782516056**
NO-89	67.9	1.831869774	297	2.472756449	2940	3.46834733	0.89	-0.050609993
NO-99	53.6	1.72916479	260	2.414973348	3380	3.5289167	0.44	-0.356547324
NO-100	44.7	1.650307523	249	2.396199347	2280	3.357934847	**0.175**	**-0.756961951**
NO-118	45.2	1.655138435	292	2.465382851	2870	3.457881897	**0.18**	**-0.744727495**
NO-129	38.4	1.584331224	318	2.50242712	2850	3.45484486	**0.17**	**-0.769551079**
NO-132	52	1.716003344	280	2.447158031	3110	3.492760389	0.45	-0.346787486
NO-146	51	1.707570176	428	2.631443769	3310	3.519827994	**0.175**	**-0.756961951**
NO-170	21.7	1.336459734	458	2.660865478	2330	3.367355921	**0.18**	**-0.744727495**
NO-173	29.1	1.463892989	434	2.63748973	2780	3.444044796	**0.18**	**-0.744727495**
NO-179	47.7	1.678518379	319	2.503790683	2250	3.352182518	**0.16**	**-0.795880017**
NO-184	49	1.69019608	308	2.488550717	3020	3.480006943	**0.18**	**-0.744727495**
NO-210	35.5	1.550228353	301	2.478566496	2950	3.469822016	**0.17**	**-0.769551079**
NO-238	38.3	1.583198774	365	2.562292864	2090	3.320146286	**0.185**	**-0.732828272**
NO-241	64.1	1.80685803	286	2.456366033	3250	3.511883361	**0.185**	**-0.732828272**
N	20	20	20	20	20	20	20	20
NDs	0	0	0	0	0	0	17	17
%Detected	100%	100%	100%	100%	100%	100%	15%	15%
Mean	46.09	1.647719423	342.35	2.526063904	2948	3.461509966	0.24175	-0.671868508
Std. Dev.	12.19572401	0.124353568	70.06108237	0.087111814	594.5329879	0.085047403	0.173199573	0.191156855
Tolerance Factor	2.807	2.807	2.807	2.807	2.807	2.807	2.807	2.807
distributional assumption*	Normal			Log-Normal		Log-Normal	NOT APPLICABL	NOT APPLICABL
UTL (normal)	**80.3**		539		4617		0.73	
UTL (lognormal)		99.3		**590**		**5015**		0.73

NOTES:
1. * = from Table 1
2. UTL value in BOLD is the a

TABLE 2
Upper Tolerance Limit (UTL)

Ambient Sample Location	Ag Tourtelot	Log Ag Tourtelot	Na Tourtelot	Log Na Tourtelot	Tl Tourtelot	Log Tl Tourtelot	V Tourtelot	Log V Tourtelot
NO-19	**0.135**	**-0.869666232**	116	2.064457989	**0.26**	**-0.585026652**	70.5	1.848189117
NO-27	**0.14**	**-0.853871964**	122	2.086359831	**0.27**	**-0.568636236**	80.8	1.907411361
NO-38	**0.125**	**-0.903089987**	92.4	1.965671971	**0.24**	**-0.619788758**	87.7	1.942999593
NO-44	**0.13**	**-0.886056648**	87.5	1.942008053	**0.25**	**-0.602059991**	77.7	1.890421019
NO-50	**0.13**	**-0.886056648**	98.2	1.992111488	**0.255**	**-0.59345982**	70.4	1.847572659
NO-68	**0.115**	**-0.93930216**	108	2.033423755	**0.225**	**-0.647817482**	90.5	1.956648579
NO-89	**0.13**	**-0.886056648**	113	2.053078443	**0.255**	**-0.59345982**	93.2	1.969415912
NO-99	**0.125**	**-0.903089987**	112	2.049218023	**0.25**	**-0.602059991**	84	1.924279286
NO-100	**0.12**	**-0.920818754**	161	2.206825876	**0.24**	**-0.619788758**	85.2	1.930439595
NO-118	**0.125**	**-0.903089987**	95.3	1.979092901	**0.24**	**-0.619788758**	88.6	1.947433722
NO-129	**0.115**	**-0.93930216**	85.9	1.933993164	**0.225**	**-0.647817482**	85.8	1.933487288
NO-132	**0.12**	**-0.920818754**	121	2.08278537	**0.235**	**-0.628932138**	95.5	1.980003372
NO-146	**0.12**	**-0.920818754**	168	2.225309282	**0.23**	**-0.638272164**	79.9	1.902546779
NO-170	**0.125**	**-0.903089987**	109	2.037426498	**0.24**	**-0.619788758**	78.8	1.896526217
NO-173	**0.125**	**-0.903089987**	93.9	1.972665592	**0.245**	**-0.610833916**	113	2.053078443
NO-179	**0.11**	**-0.958607315**	162	2.209515015	**0.22**	**-0.657577319**	74	1.86923172
NO-184	**0.125**	**-0.903089987**	109	2.037426498	**0.24**	**-0.619788758**	82.3	1.915399835
NO-210	**0.115**	**-0.93930216**	169	2.227886705	**0.23**	**-0.638272164**	75.3	1.876794976
NO-238	**0.125**	**-0.903089987**	109	2.037426498	**0.25**	**-0.602059991**	67	1.826074803
NO-241	**0.125**	**-0.903089987**	99.4	1.997386384	**0.25**	**-0.602059991**	83.6	1.922206277
N	20	20	20	20	20	20	20	20
NDs	20	20	0	0	20	20	0	0
%Detected	0%	0%	100%	100%	0%	0%	100%	100%
Mean	0.124	-0.907269905	116.58	2.056703467	0.2425	-0.615864447	83.19	1.917008028
Std. Dev.	0.007181848	0.025151746	26.88062499	0.092974683	0.012824729	0.022949487	10.40060221	0.052360438
Tolerance Factor	2.807	2.807	2.807	2.807	2.807	2.807	2.807	2.807
distributional assumption*	NOT APPLICABL	NOT APPLICABLE		Log-Normal	NOT APPLICABL	NOT APPLICABLE		Log-Normal
UTL (normal)	0.14		192		0.28		112	
UTL (lognormal)		0.15		**208**		0.28		**116**

NOTES:
1. * = from Table 1
2. UTL value in BOLD is the a

TABLE 2
Upper Tolerance Limit (UTL)

Ambient Sample Location	Zn Tourtelot	Log Zn Tourtelot
NO-19	105	2.021189299
NO-27	91.3	1.960470778
NO-38	123	2.089905111
NO-44	103	2.012837225
NO-50	103	2.012837225
NO-68	77	1.886490725
NO-89	96.1	1.982723388
NO-99	102	2.008600172
NO-100	75.2	1.876217841
NO-118	79.9	1.902546779
NO-129	93.3	1.969881644
NO-132	86.8	1.938519725
NO-146	89.8	1.953276337
NO-170	63	1.799340549
NO-173	68.3	1.834420704
NO-179	84.9	1.92890769
NO-184	89.2	1.950364854
NO-210	70.2	1.846337112
NO-238	76.1	1.881384657
NO-241	103	2.012837225
N	20	20
NDs	0	0
%Detected	100%	100%
Mean	89.005	1.943454452
Std. Dev.	15.05622707	0.074150358
Tolerance Factor	2.807	2.807
distributional assumption*		Log-Normal
UTL (normal)	131	
UTL (lognormal)		**142**

NOTES:
1. * = from Table 1
2. UTL value in BOLD is the a

TABLE 3
Upper Tolerance Limits (UTLs) and 95th Percentiles for the Tourtelot Ambient Soil Data Set

	UTL	Distributional Assumption	95th Percentile
Al	32996	Normal	27535
Sb	2.84	Normal	2.31
As	21.5	Normal	18.2
Ba	642	Log-Normal	448
Be	0.99	Normal	0.82
Cd	1.91	Normal	1.40
Cr	73.8	Normal	63.0
Co	27.9	Normal	23.1
Cu	87.7	Normal	71.7
Fe	50817	Normal	43805
Pb	148	Log-Normal	69.9
Mn	2083	Normal	1645
Hg	0.77	Log-Normal	0.26
Mo	NC	NA	NC
Ni	80.3	Normal	65.0
P	590	Log-Normal	458
Se	NC	NA	NC
Ag	NC	NA	NC
Tl	NC	NA	NC
V	116	Log-Normal	96.4
Zn	142	Log-Normal	106

Notes:

N/A = not applicable
NC = not calculated due to the high percentage of non-detected values

TABLE 4
Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
aluminum	27,535	32996	Misc. NV	TW-5A/0.5	**36500**
aluminum	27,535	32996	Misc. NV	TW-5/5.5	**36500**
aluminum	27,535	32996	NVML	LFP-22-S2/4	**35400**
aluminum	27,535	32996	HTF	HF-4/4.5	**35400**
aluminum	27,535	32996	NVML	LFP-14-S1/5	**35100**
aluminum	27,535	32996	NVML	LFP-7-S2/4.5	**34300**
aluminum	27,535	32996	Misc. NV	TW-1/5.5	**34200**
aluminum	27,535	32996	NVML	LFP-14-S2/7	**34100**
aluminum	27,535	32996	NVML	LFP-1-S1/8.5	**34000**
aluminum	27,535	32996	HTF	HF-4A/0.5	**33300**
aluminum	27,535	32996	NVML	LFP-1-S1/6.5	32100
aluminum	27,535	32996	Misc. NV	TW-1/15.5	32000
aluminum	27,535	32996	NVML	LFP-16-S2/5.5	32000
aluminum	27,535	32996	NVML	LFP-3-S2/6.5	31900
aluminum	27,535	32996	NVML	LFP-24-S1/8	31900
aluminum	27,535	32996	Misc. NV	MW-6/0.5	31500
aluminum	27,535	32996	NVML	LFP-22-S1/2	31400
aluminum	27,535	32996	NVML	LFP-12-S2/6	31200
aluminum	27,535	32996	NVML	LFP-5-S2/4.5	31100
aluminum	27,535	32996	Flare Site	FA3-.5	31000
aluminum	27,535	32996	Misc. NV	MW-6/1	30900
aluminum	27,535	32996	Misc. NV	TW-1/10.5	30600
aluminum	27,535	32996	NVML	LFP-7-S1/2.5	30600
aluminum	27,535	32996	NVML	LFP-24-S1/8A	30300
aluminum	27,535	32996	NVML	LFP-12-S1/4	30000
aluminum	27,535	32996	Misc. NV	MW-6/4	29900
aluminum	27,535	32996	NVML	LFP-16-S1/3.5	29900
aluminum	27,535	32996	NVML	LFP-12-S1/4A	29600
aluminum	27,535	32996	NVML	LFP-29-S1/2.5	29400
aluminum	27,535	32996	NVML	LFP-20-S1/2	29300
aluminum	27,535	32996	TNT Strips	TNT-1C3/3.5	29200
aluminum	27,535	32996	NVML	LFP-29-S2/2	28900
aluminum	27,535	32996	Misc. NV	TW-6/4.5	28800
aluminum	27,535	32996	NVML	LFP-27-S1/1	28800
aluminum	27,535	32996	TNT Strips	TNT-1C7A/1	28600
aluminum	27,535	32996	NVML	LFP-27-S2/3	28300
aluminum	27,535	32996	AR/PD Site	SP2-C	28100
aluminum	27,535	32996	NVML	LFP-5-S1/2.5	27700
aluminum	27,535	32996	NVML	LFP-9-S1/3.5	27600
antimony	2.31	2.84	Flare Site	FA3-.5	**150**
antimony	2.31	2.84	TNT Strips	TNT-1C7A/0	2.5
antimony	2.31	2.84	Ambient	NO-146	2.4
arsenic	18.2	21.5	Misc. NV	TW-8/15.5	**39.1**
arsenic	18.2	21.5	Flare Site	FA-4/2.5	**37.4**
arsenic	18.2	21.5	Flare Site	FA-6/3	**28.7**
arsenic	18.2	21.5	Flare Site	FA-4/3	**27.1**
arsenic	18.2	21.5	AR/PD Site	AR-2/5.5	**27.1**
arsenic	18.2	21.5	TNT Strips	TNT-1C4A/0	**25.3**
arsenic	18.2	21.5	HTF	HF-2/5.5	**24.7**
arsenic	18.2	21.5	TNT Strips	TNT-1C7A/0	**24.4**
arsenic	18.2	21.5	AR/PD Site	AR-4/4.5	**24.4**
arsenic	18.2	21.5	Misc. NV	TW-7/8	**23.4**
arsenic	18.2	21.5	TNT Strips	TNT-1C4A/1	**23.1**
arsenic	18.2	21.5	TNT Strips	TNT-5B-2	**23**

TABLE 4

Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
arsenic	18.2	21.5	AR/PD Site	AR-3/18	**21.9**
arsenic	18.2	21.5	Demolition Site #3	DA3-6/10.5	**21.6**
arsenic	18.2	21.5	NVML	LFP-3-S1/4.5	21.5
arsenic	18.2	21.5	HTF	HF-2A/0.5	19.8
arsenic	18.2	21.5	TNT Strips	TNT-5B-.5	19
arsenic	18.2	21.5	Demolition Site #2	DA2-1-1	19
arsenic	18.2	21.5	Ambient	NO-99	18.5
barium	448	642	Flare Site	FA-6A/1	**20000**
barium	448	642	Flare Site	FA-6/2	**3950**
barium	448	642	Flare Site	FA-6A/1.5	**3750**
barium	448	642	Flare Site	FA3-.5	**3400**
barium	448	642	Flare Site	FA-6/3	**2340**
barium	448	642	HTF	HF-3/20.5	**1430**
barium	448	642	AR/PD Site	AR-2/10.5	**865**
barium	448	642	NVML	LFP-10-S1/4.5	**788**
barium	448	642	Flare Site	FA-4/0	**676**
barium	448	642	HTF	HF-3/15.5	566
barium	448	642	Misc. NV	TW-7/4.5	517
barium	448	642	AR/PD Site	AR-1/4.5	516
barium	448	642	Misc. NV	TW-1/15.5	514
barium	448	642	Misc. NV	MW-6/0.5	508
barium	448	642	Ambient	NO-129	482
barium	448	642	HTF	HF-4/4.5	477
barium	448	642	AR/PD Site	AR-2/5.5	467
barium	448	642	NVML	LFM-2	449
beryllium	0.82	0.99	TNT Strips	TNT-5E-2	**1**
beryllium	0.82	0.99	TNT Strips	TNT-1C5A/0	**1**
beryllium	0.82	0.99	Ridge Stockpiles	RSP8	**1**
beryllium	0.82	0.99	Ridge Stockpiles	RSP7	**1**
beryllium	0.82	0.99	Misc. NV	TW-1/5.5	0.99
beryllium	0.82	0.99	Misc. NV	TW-5/5.5	0.96
beryllium	0.82	0.99	NVML	LFP-29-S2/2	0.96
beryllium	0.82	0.99	TNT Strips	TNT-1C7A/1	0.95
beryllium	0.82	0.99	NVML	LFP-7-S2/4.5	0.95
beryllium	0.82	0.99	TNT Strips	TNT-1C3A/1	0.94
beryllium	0.82	0.99	HTF	HF-4A/0.5	0.94
beryllium	0.82	0.99	NVML	LFP-5-S2/4.5	0.93
beryllium	0.82	0.99	HTF	HF-4/4.5	0.93
beryllium	0.82	0.99	Misc. NV	TW-5A/0.5	0.9
beryllium	0.82	0.99	TNT Strips	TNT-1C6A/0	0.9
beryllium	0.82	0.99	NVML	LFP-1-S2/8.5	0.9
beryllium	0.82	0.99	TNT Strips	TNT-1C6A/0.5	0.89
beryllium	0.82	0.99	Misc. NV	TW-1/10.5	0.88
beryllium	0.82	0.99	TNT Strips	TNT-1C7A/0	0.88
beryllium	0.82	0.99	TNT Strips	TNT-1C6A/1	0.88
beryllium	0.82	0.99	NVML	LFP-24-S1/8	0.88
beryllium	0.82	0.99	Ambient	NO-173	0.86
beryllium	0.82	0.99	NVML	LFP-1-S1/6.5	0.86
beryllium	0.82	0.99	Misc. NV	TW-6/4.5	0.85
beryllium	0.82	0.99	NVML	LFP-5-S1/2.5	0.85
beryllium	0.82	0.99	NVML	LFP-27-S1/1	0.85
beryllium	0.82	0.99	TNT Strips	TNT-1C4A/0	0.84
beryllium	0.82	0.99	TNT Strips	TNT-1C3A/2	0.84
beryllium	0.82	0.99	Misc. NV	TW-1/15.5	0.83
beryllium	0.82	0.99	TNT Strips	TNT-1C7A/1.5	0.83

TABLE 4

Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
cadmium	1.40	1.91	Flare Site	FA3-.5	1.6
chromium, total	63	73.8	Flare Site	FA3-.5	**110**
chromium, total	63	73.8	TNT Strips	TNT-1C3/3.5	**85.4**
chromium, total	63	73.8	NVML	LFP-7-S2/4.5	70.9
chromium, total	63	73.8	TNT Strips	TNT-1C7A/1	67.5
chromium, total	63	73.8	TNT Strips	TNT-1C4/3.5	66.8
chromium, total	63	73.8	TNT Strips	TNT-1C5A/0	66.2
chromium, total	63	73.8	Misc. NV	TW-5A/0.5	65.1
chromium, total	63	73.8	NVML	LFP-1-S2/8.5	64.8
chromium, total	63	73.8	AR/PD Site	SP1-C	64.6
chromium, total	63	73.8	NVML	LFP-14-S2/7	63.9
chromium, total	63	73.8	TNT Strips	TNT-1C10A/0	63.8
chromium, total	63	73.8	Ambient	NO-173	63.8
chromium, total	63	73.8	NVML	LFP-22-S2/4	63.7
chromium, total	63	73.8	NVML	LFP-24-S1/8	63.6
chromium, total	63	73.8	NVML	LFP-16-S1/3.5	63.6
chromium, total	63	73.8	Misc. NV	TW-1/5.5	63.3
chromium, total	63	73.8	TNT Strips	TNT-1C4A/0	63.1
chromium, total	63	73.8	NVML	LFP-14-S1/5	63.1
cobalt	23.1	27.9	AR/PD Site	AR-2/5.5	**45.7**
cobalt	23.1	27.9	Flare Site	FA-6A/1.5	**42.6**
cobalt	23.1	27.9	NVML	LFP-14-S1/5	**40.7**
cobalt	23.1	27.9	NVML	LFP-24-S1/8	**36.3**
cobalt	23.1	27.9	AR/PD Site	AR-1/4.5	**32.1**
cobalt	23.1	27.9	NVML	LFP-1-S1/6.5	**31.4**
cobalt	23.1	27.9	AR/PD Site	AR-1A/1.0	**31.4**
cobalt	23.1	27.9	Flare Site	FA-4/2.5	**29.1**
cobalt	23.1	27.9	AR/PD Site	AR-2/10.5	**28.8**
cobalt	23.1	27.9	HTF	HF-4/10.5	**28.7**
cobalt	23.1	27.9	TNT Strips	TNT-1C4/3.5	**28.1**
cobalt	23.1	27.9	Misc. NV	TW-1/10.5	27.6
cobalt	23.1	27.9	Flare Site	FA-6A/1	27.6
cobalt	23.1	27.9	Demolition Site #3	DA3-3/15.5	27.4
cobalt	23.1	27.9	McAllister LB	LB-3A/4.5	27.1
cobalt	23.1	27.9	HTF	HF-4/23.5	27.1
cobalt	23.1	27.9	TNT Strips	TNT-4C-2	27
cobalt	23.1	27.9	TNT Strips	TNT-1C-4	27
cobalt	23.1	27.9	TNT Strips	TNT-1C3A/1	26.3
cobalt	23.1	27.9	NVML	LFP-9-S1/3.5	26
cobalt	23.1	27.9	Demolition Site #2	DA2-1-1	26
cobalt	23.1	27.9	Misc. NV	TW-1/15.5	25.7
cobalt	23.1	27.9	Demolition Site #3	DA3-4/10.5	25.7
cobalt	23.1	27.9	Misc. NV	TW-8/15.5	25.4
cobalt	23.1	27.9	TNT Strips	TNT-1C3/3.5	25.2
cobalt	23.1	27.9	NVML	LFP-3-S1/4.5	25.1
cobalt	23.1	27.9	TNT Strips	TNT-5D-2	25
cobalt	23.1	27.9	TNT Strips	TNT-4A-1	25
cobalt	23.1	27.9	HTF	HF-4/4.5	24.7
cobalt	23.1	27.9	HTF	HF-4/20.5	24.7
cobalt	23.1	27.9	HTF	HF-3/10.5	24.7
cobalt	23.1	27.9	AR/PD Site	AR-1A/0.5	24.7
cobalt	23.1	27.9	Ridge Stockpiles	RSP9	24.5
cobalt	23.1	27.9	HTF	HF-1A/0.5	24.5
cobalt	23.1	27.9	NVML	LFP-7-S1/2.5	24.4
cobalt	23.1	27.9	HTF	HF-3/20.5	24.4
cobalt	23.1	27.9	Misc. NV	TW-7/8	24.2

TABLE 4

Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
cobalt	23.1	27.9	HTF	HF-3A/0.5	24.2
cobalt	23.1	27.9	TNT Strips	TNT-5D-1	24
cobalt	23.1	27.9	Demolition Site #3	DA3-1-4	24
cobalt	23.1	27.9	NVML	LFP-29-S1/2.5	23.9
cobalt	23.1	27.9	NVML	LFP-16-S1/3.5	23.6
cobalt	23.1	27.9	TNT Strips	TNT-1C5A/0	23.4
cobalt	23.1	27.9	NVML	LFP-5-S1/2.5	23.4
cobalt	23.1	27.9	Demolition Site #3	DA3-5/7.5	23.4
cobalt	23.1	27.9	Misc. NV	TW-1/5.5	23.3
cobalt	23.1	27.9	Ambient	NO-118	23.3
copper	71.7	87.7	Flare Site	FA3-.5	**8100**
copper	71.7	87.7	Flare Site	FA-4/0	**5630**
copper	71.7	87.7	Flare Site	FA-6A/1	**623**
copper	71.7	87.7	Flare Site	FA-4/1	**119**
copper	71.7	87.7	Flare Site	FA-4/0.5	**104**
copper	71.7	87.7	Flare Site	FA2-2	**100**
copper	71.7	87.7	Flare Site	FA2-1	**100**
copper	71.7	87.7	Demolition Site #1	DA1-1-1	**99**
copper	71.7	87.7	Demolition Site #1	DA1-2-2	**88**
copper	71.7	87.7	Demolition Site #1	DA1-1-2	**85**
copper	71.7	87.7	Demolition Site #3	DA3-3/15.5	82.9
copper	71.7	87.7	HTF	HF-1/5	82.8
copper	71.7	87.7	TNT Strips	TNT-1C3/3.5	82.4
copper	71.7	87.7	HTF	HF-4/23.5	80.9
copper	71.7	87.7	Demolition Site #3	DA3-5/7.5	80.9
copper	71.7	87.7	HTF	HF-4/20.5	80.1
copper	71.7	87.7	HTF	HF-3/15.5	79.7
copper	71.7	87.7	HTF	HF-2A/0.5	78.8
copper	71.7	87.7	Demolition Site #3	DA3-6/16.5	78.4
copper	71.7	87.7	HTF	HF-3/20.5	78.2
copper	71.7	87.7	TNT Strips	TNT-1C7A/1	78
copper	71.7	87.7	AR/PD Site	AR-4/30.5	77.8
copper	71.7	87.7	Flare Site	FA-6A/1.5	77.4
copper	71.7	87.7	Misc. NV	TW-7/8	77
copper	71.7	87.7	Misc. NV	TW-6/4.5	77
copper	71.7	87.7	Flare Site	FA1-2	77
copper	71.7	87.7	AR/PD Site	AR-2/5	76.5
copper	71.7	87.7	NVML	LFP-7-S1/2.5	76.3
copper	71.7	87.7	HTF	HF-3/10.5	75
copper	71.7	87.7	Demolition Site #1	DA1-2-3.5	75
copper	71.7	87.7	Demolition Site #1	DA1-3W2	74.7
copper	71.7	87.7	TNT Strips	TNT-1A-1	74
copper	71.7	87.7	HTF	HF-1A/1	73.9
copper	71.7	87.7	NVML	LFP-29-S1/2.5	73.6
copper	71.7	87.7	TNT Strips	TNT-1C4/3.5	73.3
copper	71.7	87.7	HTF	HF-2/5	73.2
copper	71.7	87.7	TNT Strips	TNT-1C-4	73
copper	71.7	87.7	Flare Site	FA-4/2.5	73
copper	71.7	87.7	Misc. NV	TW-8/15.5	72.8
copper	71.7	87.7	AR/PD Site	AR-4/25.5	72.7
copper	71.7	87.7	Ambient	NO-129	72.1
copper	71.7	87.7	TNT Strips	TNT-1B-2	72
copper	71.7	87.7	TNT Strips	TNT-1C6/4.5	71.8
iron	43,805	50,817	Flare Site	FA3-.5	**66000**
iron	43,805	50,817	AR/PD Site	SP1-C	**55200**
iron	43,805	50,817	Flare Site	FA-6/3	**53200**

TABLE 4

Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
iron	43,805	50,817	HTF	HF-4/10.5	**51900**
iron	43,805	50,817	NVML	LFP-22-S2/4	**51800**
iron	43,805	50,817	NVML	LFP-16-S1/3.5	**51400**
iron	43,805	50,817	TNT Strips	TNT-2D-2	**51000**
iron	43,805	50,817	Misc. NV	MW-6/4	50800
iron	43,805	50,817	HTF	HF-2A/0.5	50200
iron	43,805	50,817	TNT Strips	TNT-1A-1	50000
iron	43,805	50,817	Ridge Stockpiles	RSP3	49700
iron	43,805	50,817	NVML	LFP-1-S2/8.5	49500
iron	43,805	50,817	NVML	LFP-7-S2/7	49300
iron	43,805	50,817	Misc. NV	MW-6/1	49200
iron	43,805	50,817	Misc. NV	TW-6/4.5	49100
iron	43,805	50,817	NVML	LFP-1-S1/6.5	49100
iron	43,805	50,817	TNT Strips	TNT-1B-1	49000
iron	43,805	50,817	Misc. NV	TW-8/15.5	48600
iron	43,805	50,817	NVML	LFP-12-S2/6	48600
iron	43,805	50,817	Demolition Site #3	DA3-3/6	48600
iron	43,805	50,817	TNT Strips	TNT-1C5A/0	48300
iron	43,805	50,817	AR/PD Site	AR-4/30.5	48200
iron	43,805	50,817	NVML	LFP-12-S1/4	48100
iron	43,805	50,817	TNT Strips	TNT-2A-1	48000
iron	43,805	50,817	NVML	LFP-29-S1/2.5	48000
iron	43,805	50,817	HTF	HF-4/4.5	48000
iron	43,805	50,817	Flare Site	FA2-1	48000
iron	43,805	50,817	Flare Site	FA1-2	48000
iron	43,805	50,817	Demolition Site #3	DA3-4/10.5	48000
iron	43,805	50,817	Demolition Site #3	DA3-2-4	48000
iron	43,805	50,817	Demolition Site #2	DA2-2-1	48000
iron	43,805	50,817	Demolition Site #1	DA1-1-1	48000
iron	43,805	50,817	Misc. NV	TW-5A/0.5	47800
iron	43,805	50,817	TNT Strips	TNT-1C7A/1	47800
iron	43,805	50,817	NVML	LFP-22-S1/2	47700
iron	43,805	50,817	NVML	LFP-7-S2/4.5	47500
iron	43,805	50,817	NVML	LFP-14-S1/5	47500
iron	43,805	50,817	NVML	LFP-24-S1/8	47400
iron	43,805	50,817	Misc. NV	TW-6/9	47200
iron	43,805	50,817	Misc. NV	TW-6/0.5	47100
iron	43,805	50,817	NVML	LFP-24-S1A/8	47100
iron	43,805	50,817	TNT Strips	TNT-5B-.5	47000
iron	43,805	50,817	HTF	SP3-2-B	47000
iron	43,805	50,817	Flare Site	FA1-.5	47000
iron	43,805	50,817	Demolition Site #2	DA2-2-1	47000
iron	43,805	50,817	Demolition Site #1	DA1-1-4	47000
iron	43,805	50,817	NVML	LFP-20-S1/2	46800
iron	43,805	50,817	HTF	HF-4A/0.5	46700
iron	43,805	50,817	HTF	HF-4/23.5	46700
iron	43,805	50,817	NVML	LFP-7-S1/2.5	46600
iron	43,805	50,817	Demolition Site #3	DA3-3/15.5	46500
iron	43,805	50,817	HTF	HF-1/5	46400
iron	43,805	50,817	Demolition Site #3	DA3-6/5.5	46300
iron	43,805	50,817	TNT Strips	TNT-5B-1	46000
iron	43,805	50,817	TNT Strips	TNT-4C-2	46000
iron	43,805	50,817	TNT Strips	TNT-4A-1	46000
iron	43,805	50,817	TNT Strips	TNT-3C-2	46000
iron	43,805	50,817	TNT Strips	TNT-3C-.5	46000
iron	43,805	50,817	TNT Strips	TNT-3B-2	46000
iron	43,805	50,817	TNT Strips	TNT-2E-2	46000
iron	43,805	50,817	TNT Strips	TNT-2B-1	46000

TABLE 4

Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
iron	43,805	50,817	TNT Strips	TNT-2A-2	46000
iron	43,805	50,817	TNT Strips	TNT-2A-2	46000
iron	43,805	50,817	Demolition Site #2	DA2-1-3.75	46000
iron	43,805	50,817	Demolition Site #1	DA1-2-2	46000
iron	43,805	50,817	Demolition Site #1	DA1-2-.5	46000
iron	43,805	50,817	NVML	LFP-27-S2/3	45700
iron	43,805	50,817	NVML	LFP-9-S1.3.5	45500
iron	43,805	50,817	NVML	LFP-27-S1/1	45500
iron	43,805	50,817	NVML	LFP-3-S2/6.5	45400
iron	43,805	50,817	Misc. NV	TW-1/15.5	45200
iron	43,805	50,817	Misc. NV	MW-6/0.5	45200
iron	43,805	50,817	NVML	LFP-3-S1/4.5	45200
iron	43,805	50,817	NVML	LFP-20-S2/4	45200
iron	43,805	50,817	HTF	HF-3/15.5	45200
iron	43,805	50,817	Demolition Site #3	DA3-5/7.5	45200
iron	43,805	50,817	Misc. NV	TW-5/20.5	45100
iron	43,805	50,817	TNT Strips	TNT-1C7A/1.5	45100
iron	43,805	50,817	NVML	LFP-16-S2/5.5	45100
iron	43,805	50,817	TNT Strips	TNT-5D-2	45000
iron	43,805	50,817	TNT Strips	TNT-5D-1	45000
iron	43,805	50,817	TNT Strips	TNT-5A-2	45000
iron	43,805	50,817	TNT Strips	TNT-4A-2	45000
iron	43,805	50,817	TNT Strips	TNT-3C-1	45000
iron	43,805	50,817	TNT Strips	TNT-2C-2	45000
iron	43,805	50,817	TNT Strips	TNT-2B-4	45000
iron	43,805	50,817	TNT Strips	TNT-1C-4	45000
iron	43,805	50,817	TNT Strips	TNT-1C-2	45000
iron	43,805	50,817	Demolition Site #3	DA3-2-.5	45000
iron	43,805	50,817	Demolition Site #2	DA2-1-1	45000
iron	43,805	50,817	Demolition Site #1	DA1-2-3.5	45000
iron	43,805	50,817	HTF	HF-3/10.5	44800
iron	43,805	50,817	Misc. NV	TW-5/5.5	44700
iron	43,805	50,817	Misc. NV	TW-1/10.5	44700
iron	43,805	50,817	Ridge Stockpiles	RSP6	44700
iron	43,805	50,817	Misc. NV	TW-1/5.5	44300
iron	43,805	50,817	AR/PD Site	AR-4/11	44200
iron	43,805	50,817	NVML	LFP-12-S1A/4	44100
iron	43,805	50,817	HTF	HF-4/20.5	44100
iron	43,805	50,817	Flare Site	FA-4/2.5	44100
iron	43,805	50,817	TNT Strips	TNT-3B-1	44000
iron	43,805	50,817	TNT Strips	TNT-2E-1	44000
iron	43,805	50,817	TNT Strips	TNT-2D-1	44000
iron	43,805	50,817	TNT Strips	TNT-2B-.5	44000
iron	43,805	50,817	AR/PD Site	SP1A1	44000
iron	43,805	50,817	Demolition Site #2	DA2-2-2	44000
iron	43,805	50,817	Ridge Stockpiles	RSP5	43900
iron	43,805	50,817	Ambient	NO-129	43900
iron	43,805	50,817	Demolition Site #3	DA3-6/10.5	43800
lead	69.9	148	Flare Site	FA3-.5	**7600**
lead	69.9	148	Flare Site	FA-6A/1	**973**
lead	69.9	148	Flare Site	FA-4/0	**595**
lead	69.9	148	Flare Site	FA-4/0.5	**384**
lead	69.9	148	Flare Site	FA-4/1	**171**
lead	69.9	148	AR/PD Site	AR-1A/0.5	135
lead	69.9	148	HTF	SP3-4-A	120
lead	69.9	148	Flare Site	FA2-2	110
lead	69.9	148	Flare Site	FA2-1	110

TABLE 4
Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
lead	69.9	148	HTF	SP3-3-A	89
lead	69.9	148	AR/PD Site	SP2B1	82
lead	69.9	148	Ambient	NO-132	74.8
lead	69.9	148	HTF	SP3-3A	70
manganese	1,645	2,083	AR/PD Site	AR-1/4.5	**4340**
manganese	1,645	2,083	AR/PD Site	AR-4/4.5	**4100**
manganese	1,645	2,083	TNT Strips	TNT-1C-4	**3800**
manganese	1,645	2,083	Demolition Site #3	DA3-3/10.5	**3290**
manganese	1,645	2,083	Misc. NV	TW-7/8	**3230**
manganese	1,645	2,083	Flare Site	FA-6/2	**2960**
manganese	1,645	2,083	HTF	HF-1A/0.5	**2950**
manganese	1,645	2,083	AR/PD Site	AR-1A/1.0	**2690**
manganese	1,645	2,083	Misc. NV	TW-1/15.5	**2550**
manganese	1,645	2,083	NVML	LFP-14-S1/5	**2370**
manganese	1,645	2,083	Misc. NV	TW-1/10.5	**2240**
manganese	1,645	2,083	Ridge Stockpiles	RSP9	**2150**
manganese	1,645	2,083	HTF	HF-4/10.5	**2130**
manganese	1,645	2,083	TNT Strips	TNT-1C10A/2	**2120**
manganese	1,645	2,083	TNT Strips	TNT-3B-2	1900
manganese	1,645	2,083	NVML	LFP-9-S1/3.5	1870
manganese	1,645	2,083	NVML	LFP-1-S1/6.5	1830
manganese	1,645	2,083	HTF	HF-3A/0.5	1820
manganese	1,645	2,083	TNT Strips	TNT-5D-2	1800
manganese	1,645	2,083	TNT Strips	TNT-2A-2	1800
manganese	1,645	2,083	TNT Strips	TNT-2A-2	1800
manganese	1,645	2,083	TNT Strips	TNT-1B-2	1800
manganese	1,645	2,083	NVML	LFP-20-S2/4	1800
manganese	1,645	2,083	HTF	HF-4/20.5	1780
manganese	1,645	2,083	HTF	HF-1A/1	1770
manganese	1,645	2,083	AR/PD Site	AR-3/4.5	1770
manganese	1,645	2,083	Misc. NV	TW-1/19.5	1760
manganese	1,645	2,083	NVML	LFP-12-S1A/4	1760
manganese	1,645	2,083	TNT Strips	TNT-1C5A/0	1750
manganese	1,645	2,083	Ambient	NO-100	1730
manganese	1,645	2,083	Misc. NV	TW-1/5.5	1700
manganese	1,645	2,083	TNT Strips	TNT-1B-1	1700
manganese	1,645	2,083	HTF	HF-3/5.5	1670
mercury	0.26	0.77	Demolition Site #3	DA3-1-2	**2.1**
mercury	0.26	0.77	Demolition Site #3	DA3-1-1	**1.8**
mercury	0.26	0.77	Demolition Site #3	DA3-6/5.5	**0.8**
mercury	0.26	0.77	Demolition Site #3	DA3-2-2	0.65
mercury	0.26	0.77	Flare Site	FA2-1	0.59
mercury	0.26	0.77	Demolition Site #3	DA3-6/10.5	0.57
mercury	0.26	0.77	Flare Site	FA1-2	0.41
mercury	0.26	0.77	Ambient	NO-146	0.27
nickel	65.0	80.3	AR/PD Site	AR-1/4.5	**129**
nickel	65.0	80.3	TNT Strips	TNT-1C-4	**110**
nickel	65.0	80.3	AR/PD Site	AR-2/5.5	**106**
nickel	65.0	80.3	NVML	LFP-5-S2/4.5	**99.8**
nickel	65.0	80.3	Flare Site	FA3-.5	**98**
nickel	65.0	80.3	Flare Site	FA-6A/1.5	**90.9**
nickel	65.0	80.3	Flare Site	FA-6/2	**89.9**
nickel	65.0	80.3	Flare Site	FA-4/2.5	**89.4**
nickel	65.0	80.3	AR/PD Site	AR-4/4.5	**85.8**
nickel	65.0	80.3	HTF	HF-3/20.5	**84.8**

TABLE 4

Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
nickel	65.0	80.3	NVML	LFP-1-S1/4	78.4
nickel	65.0	80.3	HTF	HF-4/23.5	77.4
nickel	65.0	80.3	HTF	HF-1/5	77.4
nickel	65.0	80.3	HTF	HF-2A/0.5	77
nickel	65.0	80.3	HTF	HF-1A/1	76.8
nickel	65.0	80.3	Misc. NV	TW-7/8	76.6
nickel	65.0	80.3	HTF	HF-4/20.5	76.2
nickel	65.0	80.3	HTF	HF-1A/0.5	75.9
nickel	65.0	80.3	NVML	LFP-7-S2/4.5	75.8
nickel	65.0	80.3	TNT Strips	TNT-4C-2	75
nickel	65.0	80.3	TNT Strips	TNT-1C5A/0	74.8
nickel	65.0	80.3	AR/PD Site	AR-4/25.5	74.4
nickel	65.0	80.3	AR/PD Site	AR-1A/1.0	74.4
nickel	65.0	80.3	TNT Strips	TNT-1C7A/1	73.4
nickel	65.0	80.3	McAllister LB	LB-3A/4.5	73.2
nickel	65.0	80.3	NVML	LFP-29-S2/2	73.1
nickel	65.0	80.3	AR/PD Site	AR-4/30.5	73
nickel	65.0	80.3	Misc. NV	TW-1/15.5	72.8
nickel	65.0	80.3	HTF	HF-3/10.5	72.3
nickel	65.0	80.3	TNT Strips	TNT-1C10A/0	72.1
nickel	65.0	80.3	TNT Strips	TNT-1C3/3.5	70.8
nickel	65.0	80.3	AR/PD Site	SP1-C	69.9
nickel	65.0	80.3	AR/PD Site	AR-4/11	69.7
nickel	65.0	80.3	NVML	LPF-5-S1/2.5	69
nickel	65.0	80.3	Demolition Site #2	DA2-1-1	69
nickel	65.0	80.3	TNT Strips	TNT-1C6A/0	68.4
nickel	65.0	80.3	TNT Strips	TNT-1C-2	68
nickel	65.0	80.3	TNT Strips	TNT-1C6A/2	67.9
nickel	65.0	80.3	Ambient	NO-173	67.9
nickel	65.0	80.3	NVML	LFP-10-S1/4.5	67.4
nickel	65.0	80.3	TNT Strips	TNT-1C3A/1	67.2
nickel	65.0	80.3	TNT Strips	TNT-5D-2	67
nickel	65.0	80.3	TNT Strips	TNT-3C-.5	67
nickel	65.0	80.3	TNT Strips	TNT-2E-2	67
nickel	65.0	80.3	TNT Strips	TNT-1C4A/0	66.9
nickel	65.0	80.3	Misc. NV	TW-8/15.5	66.8
nickel	65.0	80.3	Misc. NV	TW-1/10.5	66.5
nickel	65.0	80.3	AR/PD Site	AR-4/20.5	66.1
nickel	65.0	80.3	TNT Strips	TNT-3C-2	66
nickel	65.0	80.3	TNT Strips	TNT-1B-2	66
nickel	65.0	80.3	TNT Strips	TNT-1A-1	66
nickel	65.0	80.3	TNT Strips	TNT-1C7A/0	65.7
nickel	65.0	80.3	TNT Strips	TNT-1C3A/2	65.7
nickel	65.0	80.3	NVML	LFP-16-S1/3.5	65.7
nickel	65.0	80.3	NVML	LFP-7-S1/2.5	65.5
nickel	65.0	80.3	TNT Strips	TNT-1C6A/0.5	65.3
phosphorus, total (as P)	458	590	HTF	HF-2/5	**1470**
phosphorus, total (as P)	458	590	Ridge Stockpiles	RSP3	**1380**
phosphorus, total (as P)	458	590	Ridge Stockpiles	RSP1	**662**
phosphorus, total (as P)	458	590	Flare Site	FA-4/0	**614**
phosphorus, total (as P)	458	590	Flare Site	FA-4/0.5	519
phosphorus, total (as P)	458	590	TNT Strips	TNT-1C5A/0	485
phosphorus, total (as P)	458	590	Flare Site	FA-4/1	483
phosphorus, total (as P)	458	590	HTF	HF-3A/0.5	470
phosphorus, total (as P)	458	590	Ambient	NO-129	460
vanadium	96.4	116	NVML	LFP-22-S2/4	**123**

TABLE 4
Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
vanadium	96.4	116	Demolition Site #3	DA3-3/6	115
vanadium	96.4	116	Ambient	NO-38	113
vanadium	96.4	116	NVML	LFP-14-S1/5	113
vanadium	96.4	116	NVML	LFP-22-S1/2	112
vanadium	96.4	116	NVML	LFP-16-S1/3.5	112
vanadium	96.4	116	NVML	LFP-14-S2/7	110
vanadium	96.4	116	Demolition Site #3	DA3-2-4	110
vanadium	96.4	116	NVML	LFP-1-S2/8.5	109
vanadium	96.4	116	NVML	LFP-1-S1/6.5	109
vanadium	96.4	116	NVML	LFP-12-S2/6	109
vanadium	96.4	116	NVML	LFP-24-S1/8	108
vanadium	96.4	116	NVML	LFP-16-S2/5.5	108
vanadium	96.4	116	Misc. NV	TW-6/4.5	107
vanadium	96.4	116	Misc. NV	TW-6/9	104
vanadium	96.4	116	Misc. NV	MW-6/1	103
vanadium	96.4	116	NVML	LFP-3-S2/6.5	103
vanadium	96.4	116	HTF	HF-4/4.5	102
vanadium	96.4	116	NVML	LFP-24-S1A/8	100
vanadium	96.4	116	Misc. NV	TW-5A/0.5	99.9
vanadium	96.4	116	Misc. NV	MW-6/0.5	99.4
vanadium	96.4	116	TNT Strips	TNT-5B-2	98
vanadium	96.4	116	NVML	LFP-27-S2/3	97.9
vanadium	96.4	116	NVML	LFP-20-S2/4	97.9
vanadium	96.4	116	TNT Strips	TNT-5B-1	97
vanadium	96.4	116	TNT Strips	TNT-4A-1	97
vanadium	96.4	116	Demolition Site #3	DA3-2-1	97
vanadium	96.4	116	Demolition Site #3	DA3-2-.5	97
vanadium	96.4	116	Misc. NV	TW-1/5.5	96.8
vanadium	96.4	116	NVML	LFP-12-S1/4	96.6
zinc	106	142	Flare Site	FA3-.5	**2000**
zinc	106	142	Flare Site	FA2-1	**270**
zinc	106	142	Flare Site	FA2-2	**240**
zinc	106	142	Flare Site	FA-4/0	**237**
zinc	106	142	Flare Site	FA-6A/1	**158**
zinc	106	142	Flare Site	FA-4/0.5	136
zinc	106	142	Flare Site	FA-4/1	135
zinc	106	142	Demolition Site #1	DA1-1-2	130
zinc	106	142	Ambient	NO-129	123
zinc	106	142	Demolition Site #3	DA3-4/10.5	122
zinc	106	142	Misc. NV	TW-6/4.5	120
zinc	106	142	Demolition Site #2	DA2-2-1	120
zinc	106	142	Demolition Site #1	DA1-1-1	120
zinc	106	142	Misc. NV	TW-5/20.5	119
zinc	106	142	HTF	HF-4/23.5	118
zinc	106	142	AR/PD Site	AR-4/15.5	117
zinc	106	142	Misc. NV	TW-8/15.5	114
zinc	106	142	HTF	HF-1A/0.5	114
zinc	106	142	Demolition Site #3	DA3-5/7.5	114
zinc	106	142	HTF	HF-3/20.5	113
zinc	106	142	HTF	HF-3/10.5	113
zinc	106	142	HTF	HF-1/5	113
zinc	106	142	AR/PD Site	AR-2/10.5	113
zinc	106	142	Demolition Site #3	DA3-3/15.5	112
zinc	106	142	Misc. NV	TW-7/8	111
zinc	106	142	HTF	HF-1A/1	110
zinc	106	142	Demolition Site #1	DA1-2-2	110
zinc	106	142	TNT Strips	TNT-1C3/3.5	109

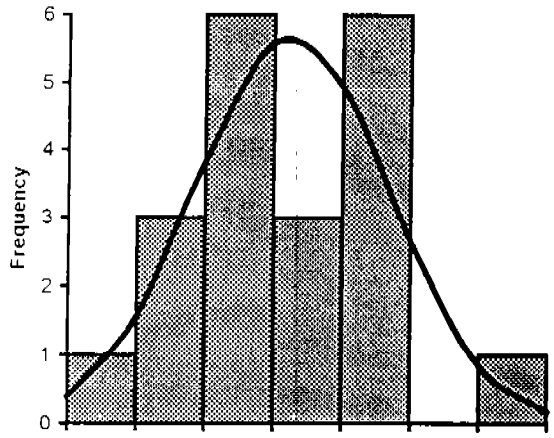
TABLE 4

Soil Samples Exceeding the Upper Tolerance Limit (UTL), shown in Boldface, and the 95th Percentile of the Ambient Soil Data Set, In Order of Decreasing Concentration

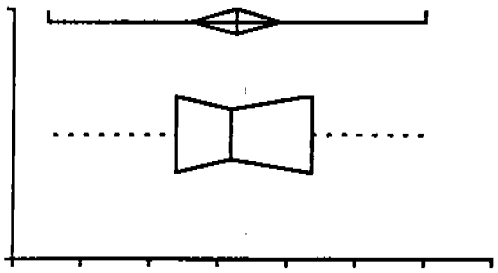
Parameter	95th Percentile[1] (mg/kg)	UTL[2] (mg/kg)	Area of Interest[3]	Sample ID	Result (mg/kg)
zinc	106	142	NVML	LFP-3-S1/4.5	109
zinc	106	142	Demolition Site #3	DA3-6/16.5	109
zinc	106	142	AR/PD Site	AR-2/5.5	109
zinc	106	142	Misc. NV	TW-5/10.5	108

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Aluminum (untransformed)
Date	6 May 2001

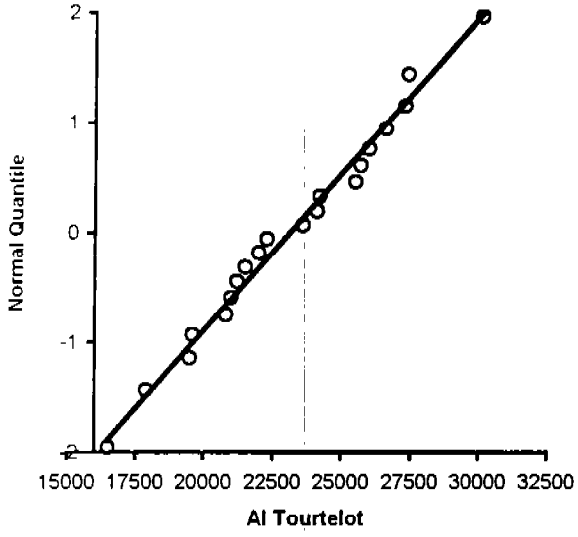


n	20
Mean	23140.000
95% CI	21496.617 to 24783.383
Variance	12329894.7368
SD	3511.3950
SE	785.1718
CV	15%



Median	22950.000
95.9% CI	21000.000 to 25700.000
Range	13600
IQR	4975

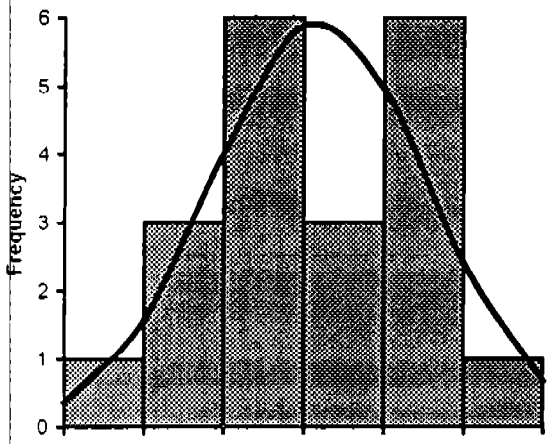
Percentile	
2.5th	-
25th	20950.000
50th	22950.000
75th	25925.000
97.5th	-



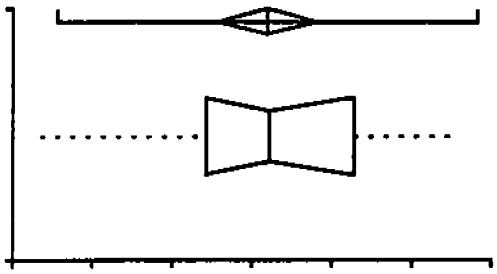
	Coefficient	p
Shapiro-Wilk	0.9846	0.9789
Skewness	0.0240	0.9603
Kurtosis	-0.5139	0.6772

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Aluminum (log-transformed)
Date	6 May 2001

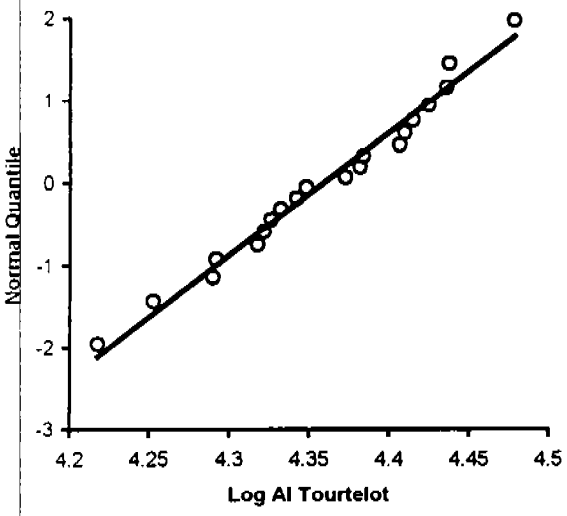


n	20
Mean	4.359
95% CI	4.328 to 4.391
Variance	0.0045
SD	0.0672
SE	0.0150
CV	2%



Median	4.361
95.9% CI	4.322 to 4.410
Range	0.261082551
IQR	0.092532987

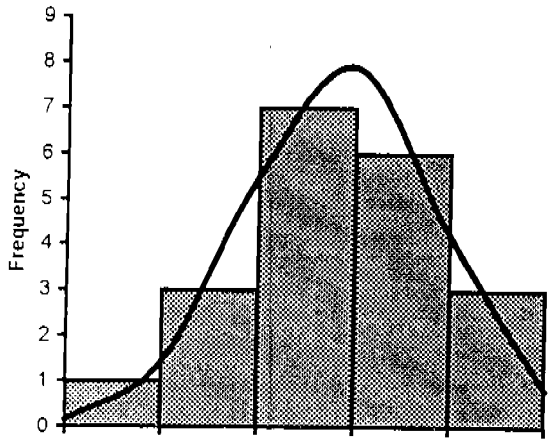
Percentile	
2.5th	-
25th	4.321
50th	4.361
75th	4.414
97.5th	-



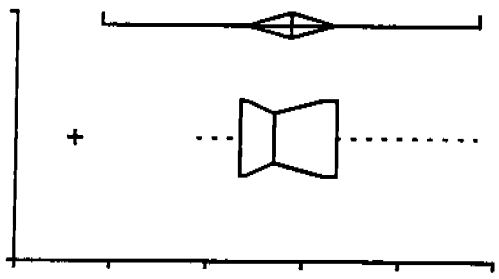
	Coefficient	p
Shapiro-Wilk	0.9797	0.9304
Skewness	-0.3031	0.5324
Kurtosis	-0.3540	0.8464

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Antimony (untransformed)
Date	6 May 2001

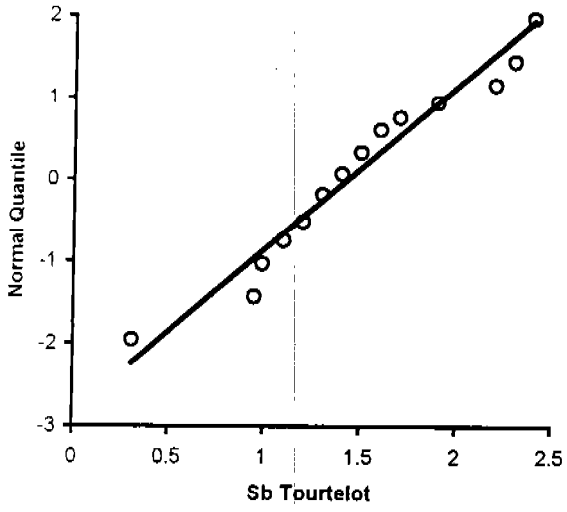


n	20
Mean	1.432
95% CI	1.198 to 1.666
Variance	0.2509
SD	0.5009
SE	0.1120
CV	35%



Median	1.350
95.9% CI	1.200 to 1.600
Range	2.09
IQR	0.5

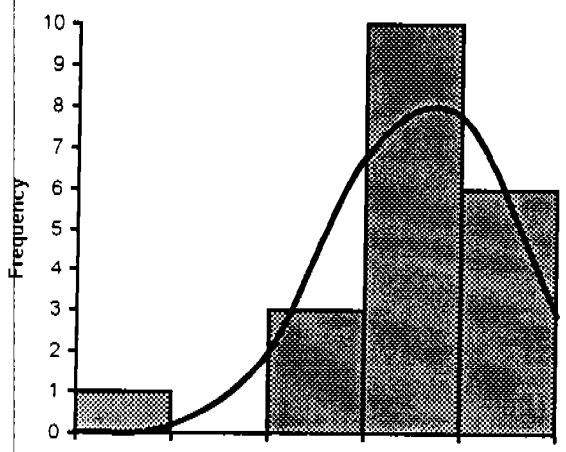
Percentile	
2.5th	-
25th	1.175
50th	1.350
75th	1.675
97.5th	-



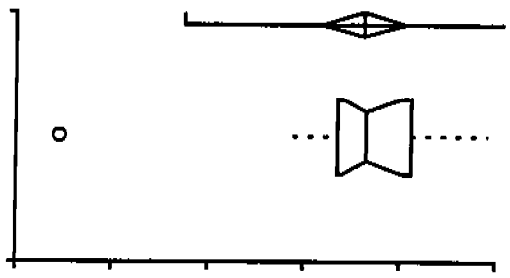
	Coefficient	p
Shapiro-Wilk	0.9535	0.4227
Skewness	0.1749	0.7173
Kurtosis	0.5721	0.4335

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Antimony (log-transformed)
Date	6 May 2001

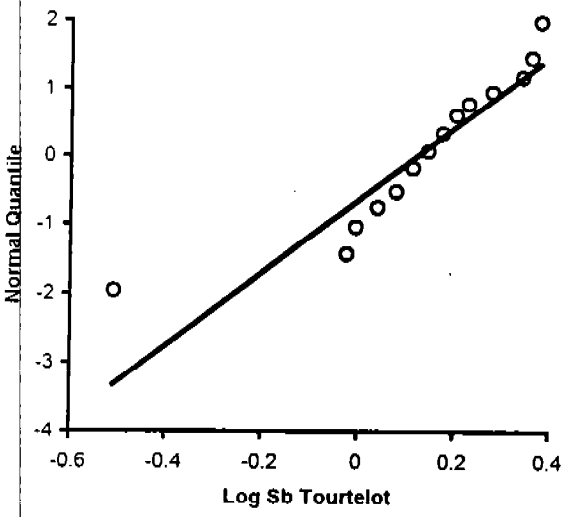


n	20
Mean	0.124
95% CI	0.035 to 0.213
Variance	0.0361
SD	0.1900
SE	0.0425
CV	154%



Median	0.130
95.9% CI	0.079 to 0.204
Range	0.888849548
IQR	0.154132581

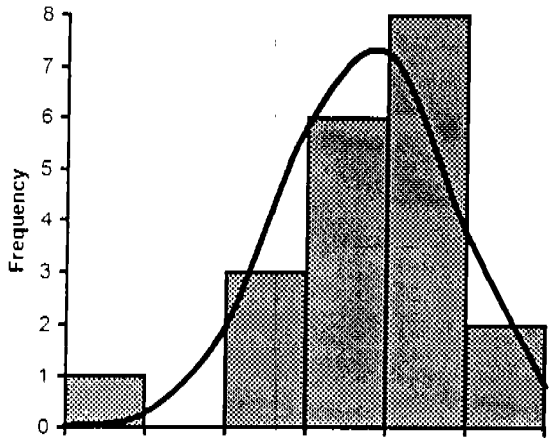
Percentile	
2.5th	-
25th	0.070
50th	0.130
75th	0.224
97.5th	-



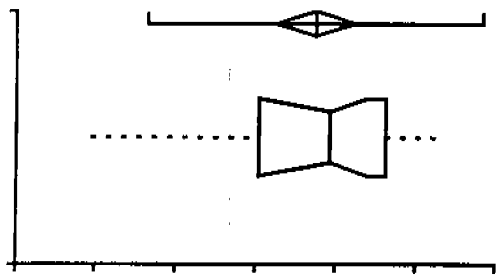
	Coefficient	p
Shapiro-Wilk	0.8373	0.0033
Skewness	-1.8258	0.0017
Kurtosis	5.9683	0.0021

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Arsenic (untransformed)
Date	25 March 2001

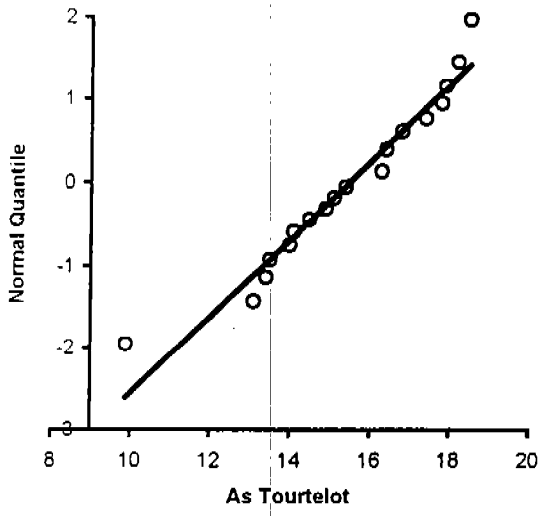


n	20
Mean	15.495
95% CI	14.495 to 16.495
Variance	4.5689
SD	2.1375
SE	0.4780
CV	14%



Median	15.850
95.9% CI	14.100 to 16.800
Range	8.6
IQR	3.175

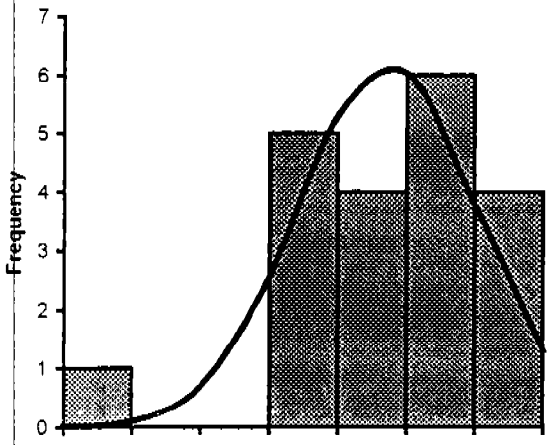
Percentile	
2.5th	-
25th	14.075
50th	15.850
75th	17.250
97.5th	-



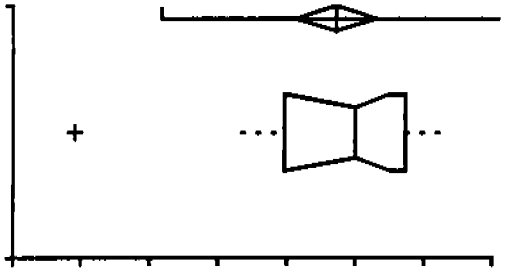
	Coefficient	p
Shapiro-Wilk	0.9446	0.2920
Skewness	-0.7700	0.1269
Kurtosis	0.8657	0.3090

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Arsenic (log-transformed)
Date	25 March 2001

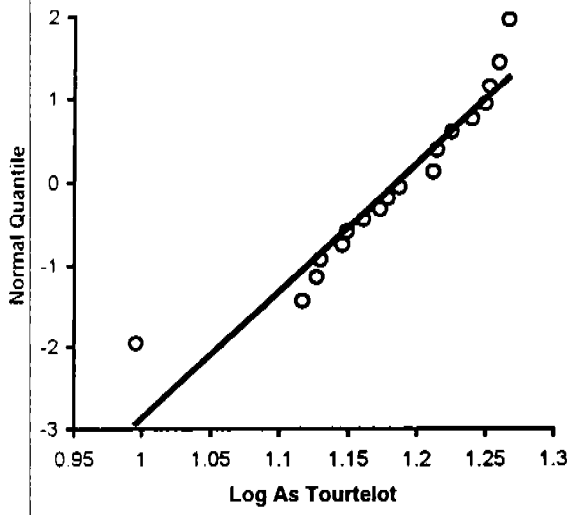


n	20
Mean	1.186
95% CI	1.156 to 1.216
Variance	0.0042
SD	0.0647
SE	0.0145
CV	5%



Median	1.200
95.9% CI	1.149 to 1.225
Range	0.271536534
IQR	0.088292913

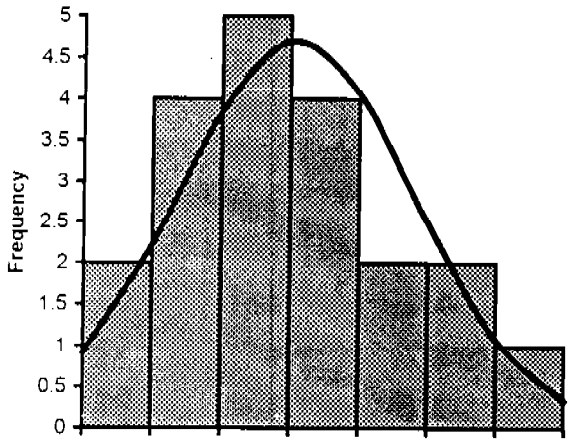
Percentile	
2.5th	-
25th	1.148
50th	1.200
75th	1.237
97.5th	-



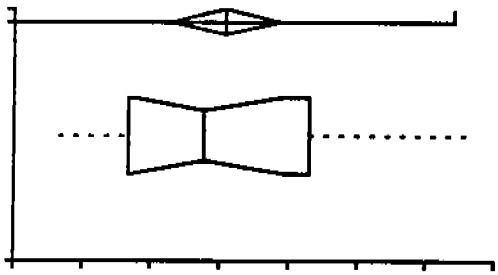
	Coefficient	p
Shapiro-Wilk	0.9021	0.0452
Skewness	-1.2699	0.0181
Kurtosis	2.5725	0.0456

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Barium (untransformed)
Date	25 March 2001

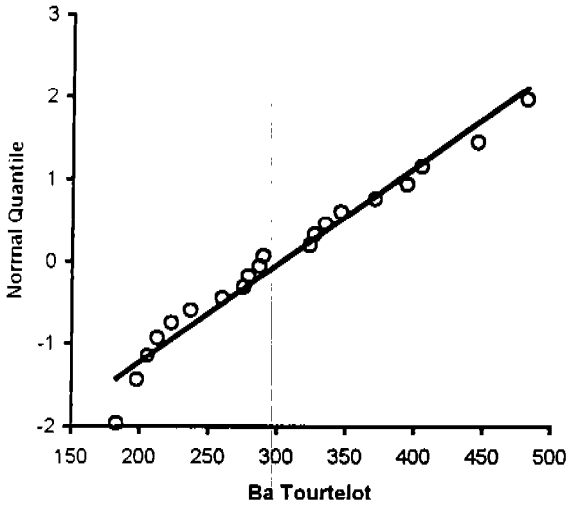


n	20
Mean	304.100
95% CI	264.368 to 343.832
Variance	7207.0421
SD	84.8943
SE	18.9829
CV	28%



Median	288.500
95.9% CI	237.000 to 346.000
Range	299
IQR	131.25

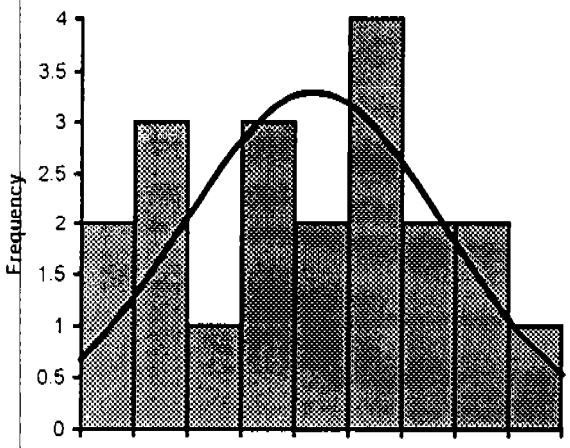
Percentile	
2.5th	-
25th	233.500
50th	288.500
75th	364.750
97.5th	-



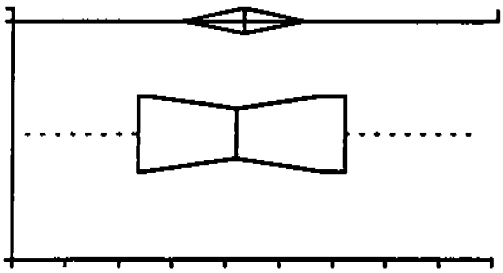
	Coefficient	p
Shapiro-Wilk	0.9603	0.5493
Skewness	0.4804	0.3279
Kurtosis	-0.5181	0.6727

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Barium (log-transformed)
Date	25 March 2001

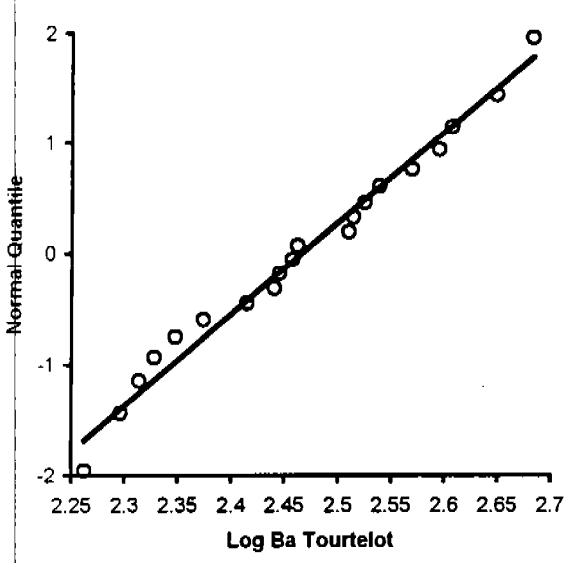


n	20
Mean	2.467
95% CI	2.410 to 2.524
Variance	0.0147
SD	0.1213
SE	0.0271
CV	5%



Median	2.460
95.9% CI	2.375 to 2.539
Range	0.420595949
IQR	0.193661982

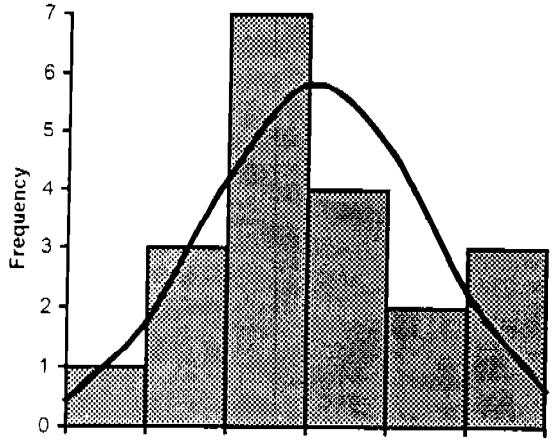
Percentile	
2.5th	-
25th	2.368
50th	2.460
75th	2.562
97.5th	-



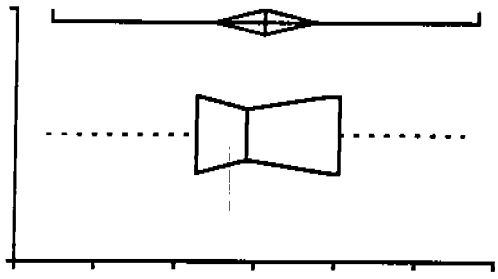
	Coefficient	p
Shapiro-Wilk	0.9741	0.8385
Skewness	0.0159	0.9736
Kurtosis	-0.9030	0.2869

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Beryllium (untransformed)
Date	25 March 2001

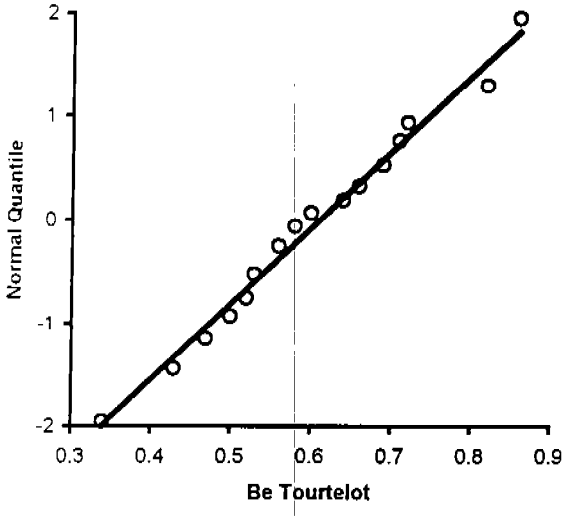


n	20
Mean	0.612
95% CI	0.548 to 0.675
Variance	0.0186
SD	0.1363
SE	0.0305
CV	22%



Median	0.590
95.9% CI	0.530 to 0.690
Range	0.52
IQR	0.1775

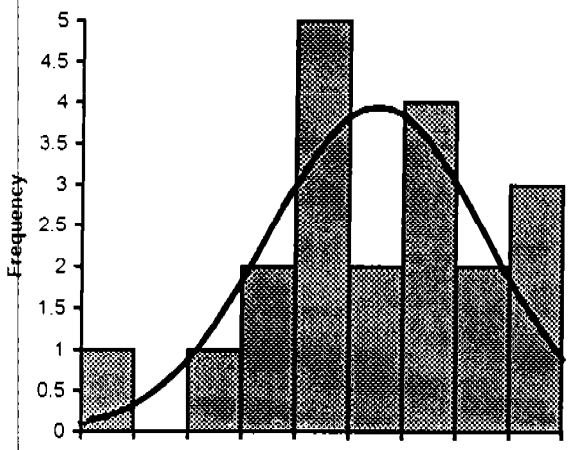
Percentile	
2.5th	-
25th	0.528
50th	0.590
75th	0.705
97.5th	-



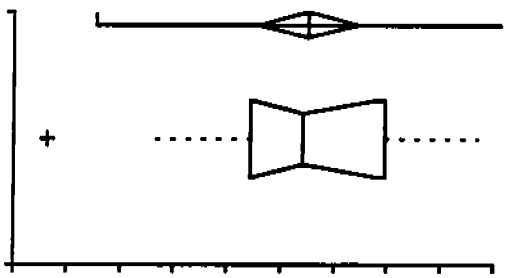
	Coefficient	p
Shapiro-Wilk	0.9778	0.9027
Skewness	0.1027	0.8313
Kurtosis	-0.3649	0.8351

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Beryllium (log-transformed)
Date	25 March 2001

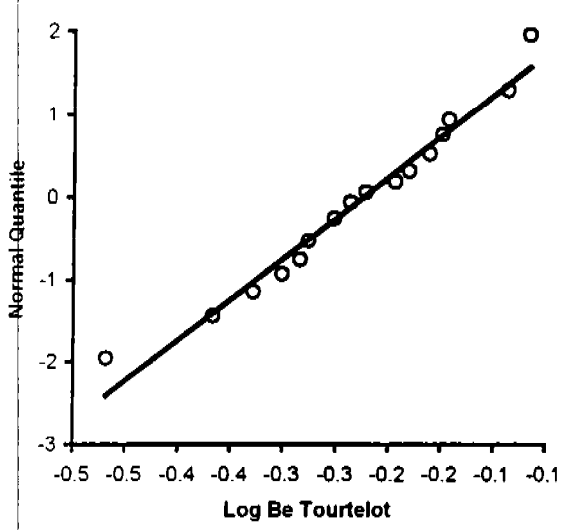


n	20
Mean	-0.224
95% CI	-0.272 to -0.177
Variance	0.0102
SD	0.1009
SE	0.0226
CV	-45%



Median	-0.229
95.9% CI	-0.276 to -0.161
Range	0.403019534
IQR	0.125948296

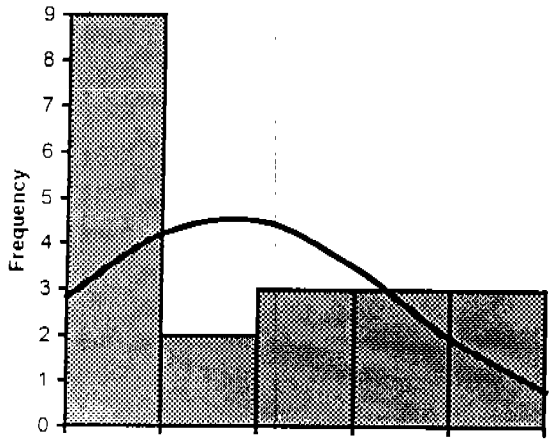
Percentile	
2.5th	-
25th	-0.278
50th	-0.229
75th	-0.152
97.5th	-



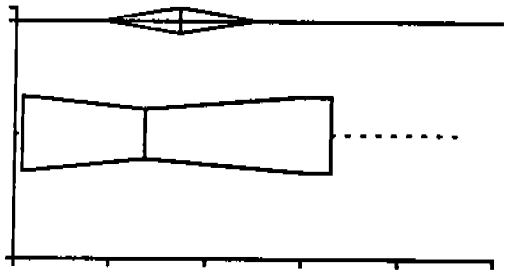
	Coefficient	p
Shapiro-Wilk	0.9696	0.7469
Skewness	-0.4908	0.3179
Kurtosis	0.3710	0.5447

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Cadmium (untransformed)
Date	25 March 2001

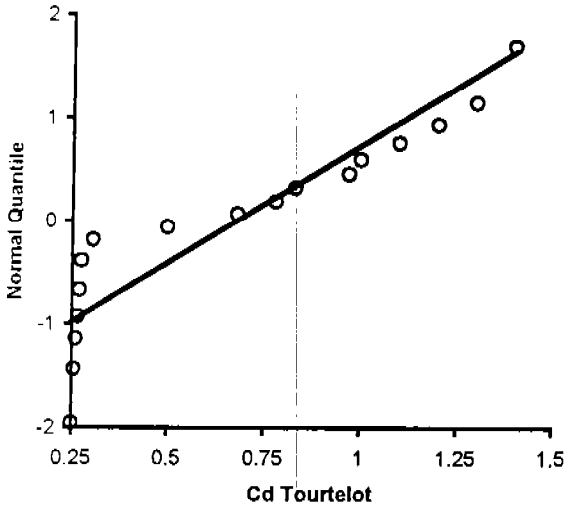


n	20
Mean	0.679
95% CI	0.474 to 0.884
Variance	0.1915
SD	0.4376
SE	0.0979
CV	64%



Median	0.590
95.9% CI	0.270 to 1.000
Range	1.15
IQR	0.805

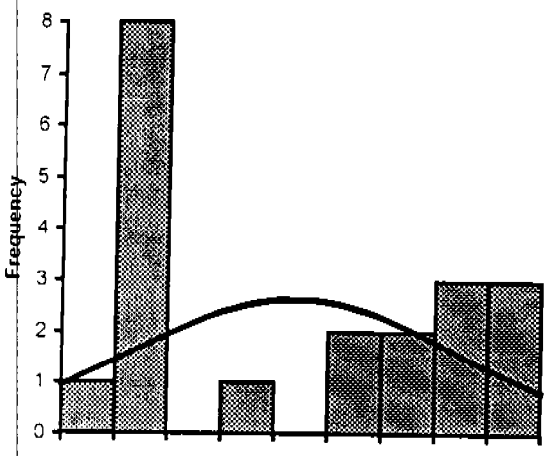
Percentile	
2.5th	-
25th	0.270
50th	0.590
75th	1.075
97.5th	-



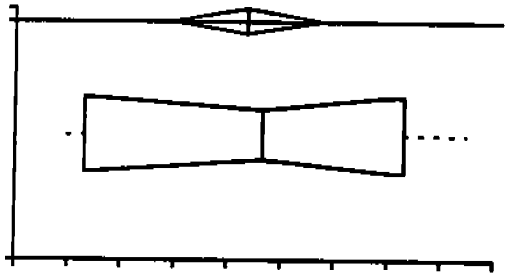
	Coefficient	p
Shapiro-Wilk	0.8356	0.0031
Skewness	0.4453	0.3632
Kurtosis	-1.4347	0.0188

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Cadmium (log-transformed)
Date	25 March 2001

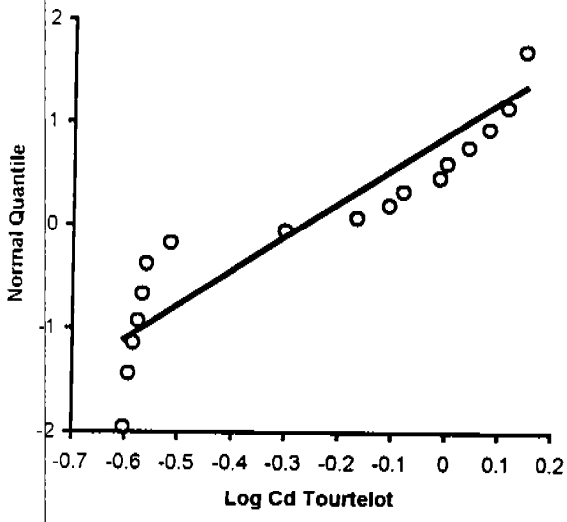


n	20
Mean	-0.264
95% CI	-0.405 to -0.122
Variance	0.0916
SD	0.3026
SE	0.0677
CV	-115%



Median	-0.234
95.9% CI	-0.569 to 0
Range	0.748188027
IQR	0.59968075

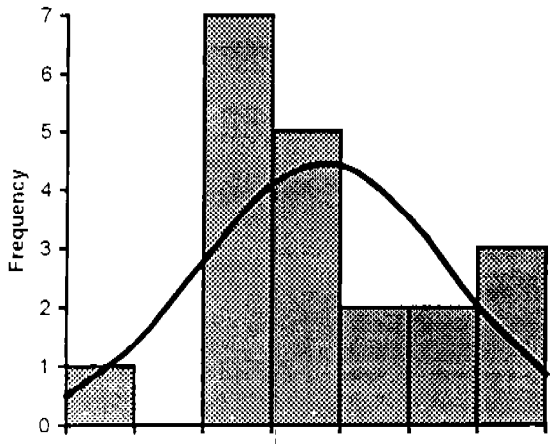
Percentile	
2.5th	-
25th	-0.569
50th	-0.234
75th	0.031
97.5th	-



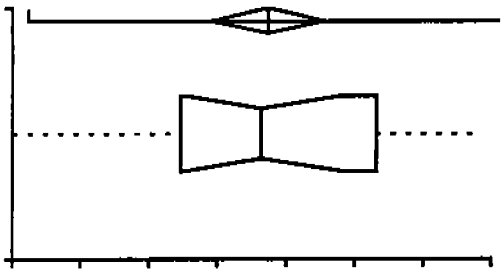
	Coefficient	p
Shapiro-Wilk	0.8209	0.0018
Skewness	0.0883	0.8547
Kurtosis	-1.8865	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Chromium (untransformed)
Date	25 March 2001

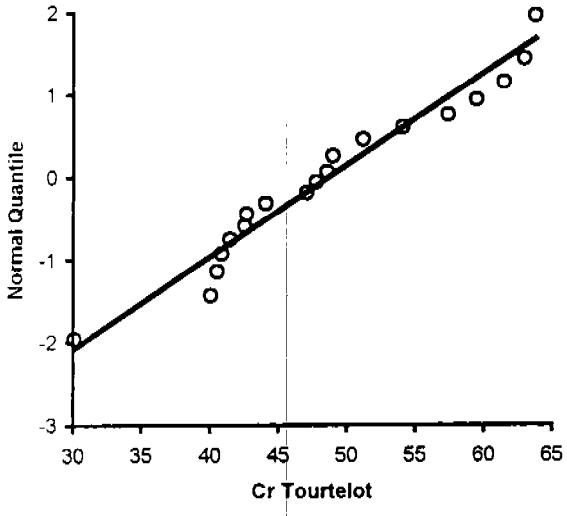


n	20
Mean	48.730
95% CI	44.544 to 52.916
Variance	80.0106
SD	8.9449
SE	2.0001
CV	18%



Median	48.200
95.9% CI	42.600 to 54.100
Range	33.7
IQR	14.25

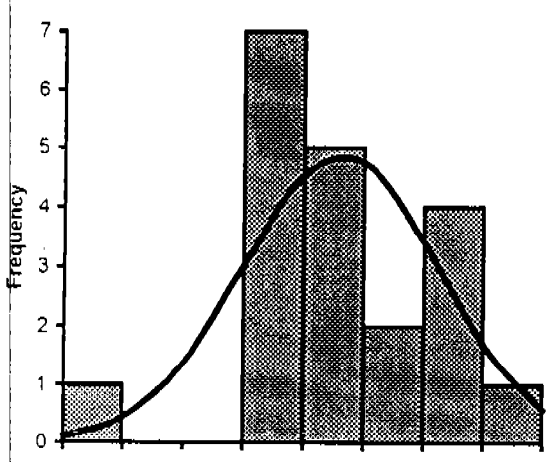
Percentile	
2.5th	-
25th	42.325
50th	48.200
75th	56.575
97.5th	-



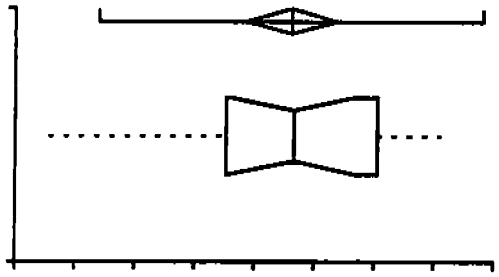
	Coefficient	p
Shapiro-Wilk	0.9528	0.4122
Skewness	0.1163	0.8094
Kurtosis	-0.3832	0.8160

analysed with: Analyse-it + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Chromium (log-transformed)
Date	25 March 2001

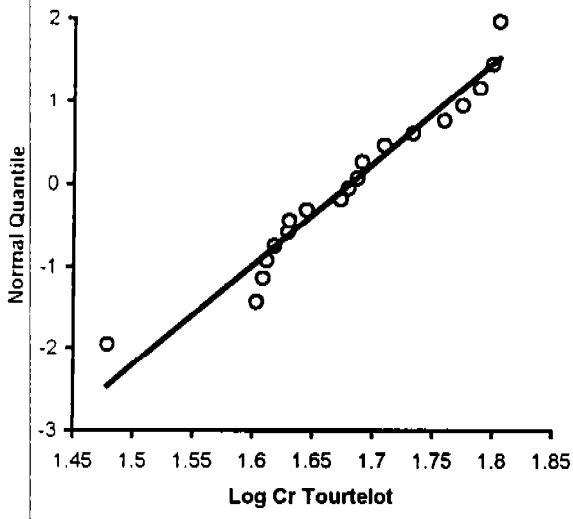


n	20
Mean	1.681
95% CI	1.642 to 1.719
Variance	0.0067
SD	0.0818
SE	0.0183
CV	5%



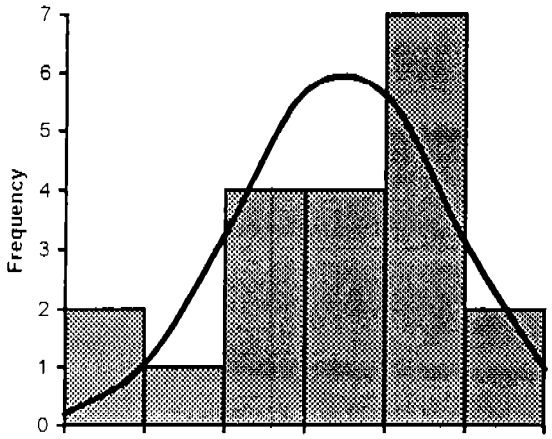
Median	1.683
95.9% CI	1.629 to 1.733
Range	0.326254183
IQR	0.125914012

Percentile	
2.5th	-
25th	1.627
50th	1.683
75th	1.752
97.5th	-

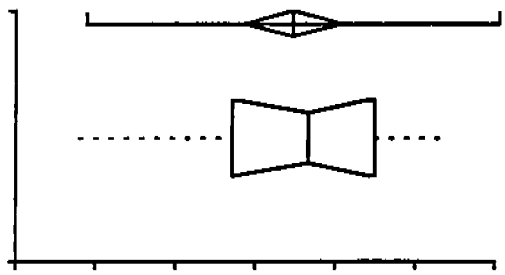


	Coefficient	p
Shapiro-Wilk	0.9483	0.3419
Skewness	-0.3885	0.4259
Kurtosis	0.4594	0.4930

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Cobalt (untransformed)
Date	25 March 2001

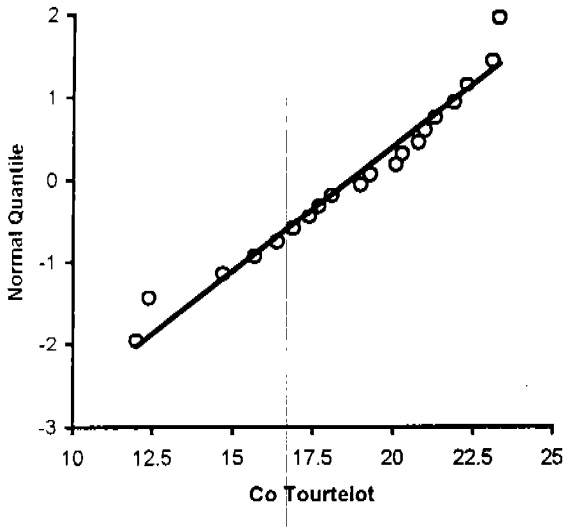


n	20
Mean	18.685
95% CI	17.143 to 20.227
Variance	10.8582
SD	3.2952
SE	0.7368
CV	18%



Median	19.150
95.9% CI	16.900 to 21.000
Range	11.3
IQR	4.45

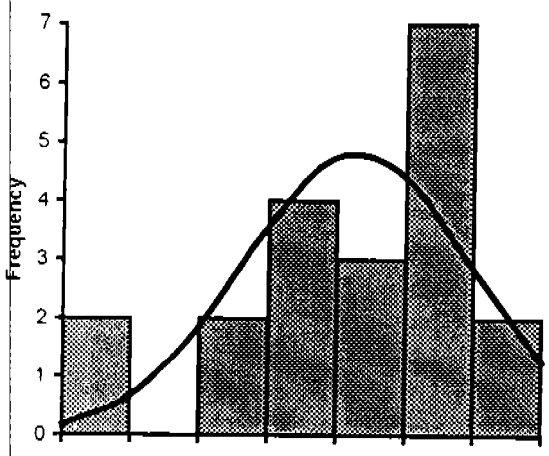
Percentile	
2.5th	-
25th	16.775
50th	19.150
75th	21.225
97.5th	-



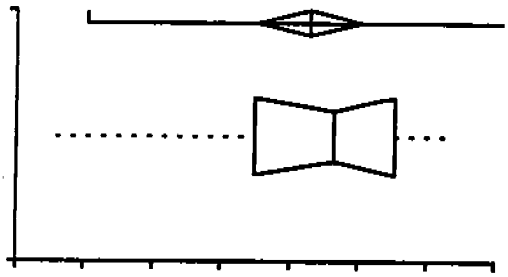
	Coefficient	p
Shapiro-Wilk	0.9527	0.4098
Skewness	-0.5654	0.2529
Kurtosis	-0.3850	0.8140

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Cobalt (log-transformed)
Date	25 March 2001

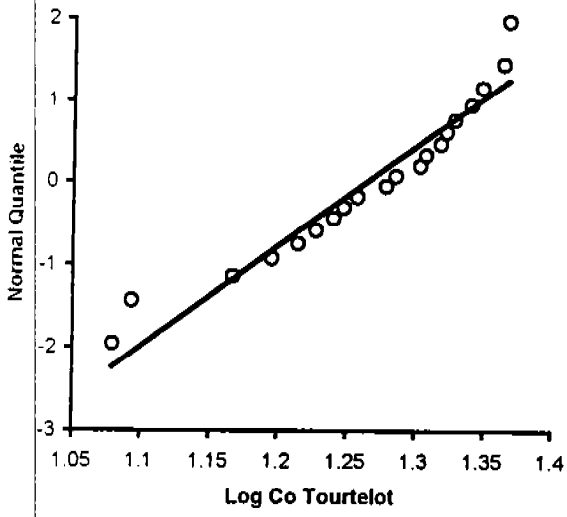


n	20
Mean	1.264
95% CI	1.226 to 1.303
Variance	0.0068
SD	0.0827
SE	0.0185
CV	7%



Median	1.282
95.9% CI	1.228 to 1.322
Range	0.288174675
IQR	0.102213536

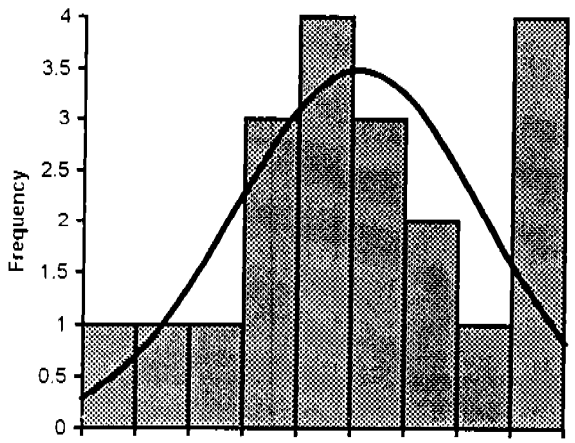
Percentile	
2.5th	-
25th	1.225
50th	1.282
75th	1.327
97.5th	-



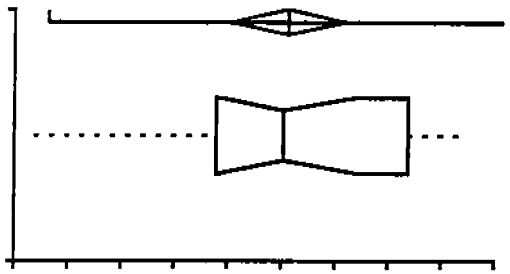
	Coefficient	p
Shapiro-Wilk	0.9193	0.0960
Skewness	-0.9226	0.0723
Kurtosis	0.3000	0.5897

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Copper (untransformed)
Date	25 March 2001

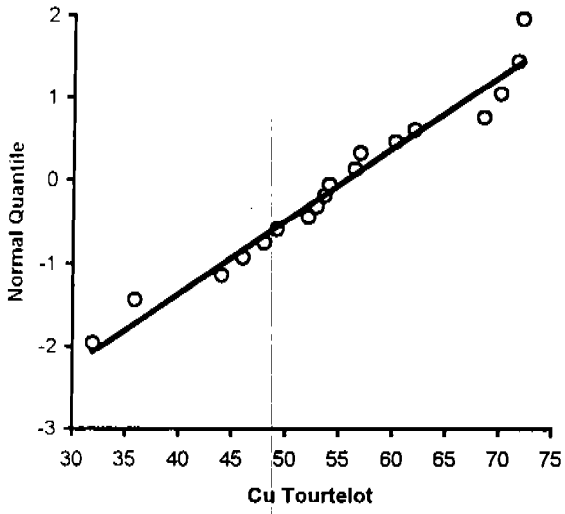


n	20
Mean	55.600
95% CI	50.248 to 60.952
Variance	130.7779
SD	11.4358
SE	2.5571
CV	21%



Median	55.200
95.9% CI	49.200 to 62.000
Range	40.2
IQR	17.975

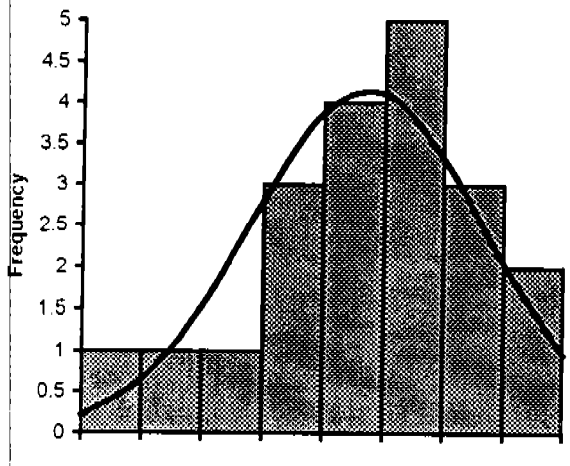
Percentile	
2.5th	-
25th	48.900
50th	55.200
75th	66.875
97.5th	-



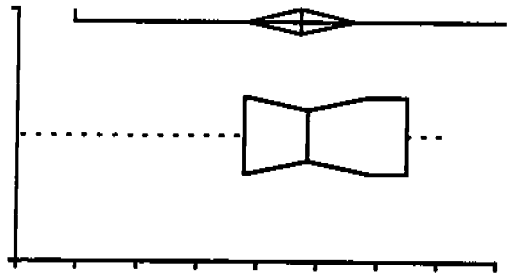
	Coefficient	p
Shapiro-Wilk	0.9532	0.4181
Skewness	-0.2701	0.5774
Kurtosis	-0.3397	0.8613

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Copper (log-transformed)
Date	25 March 2001

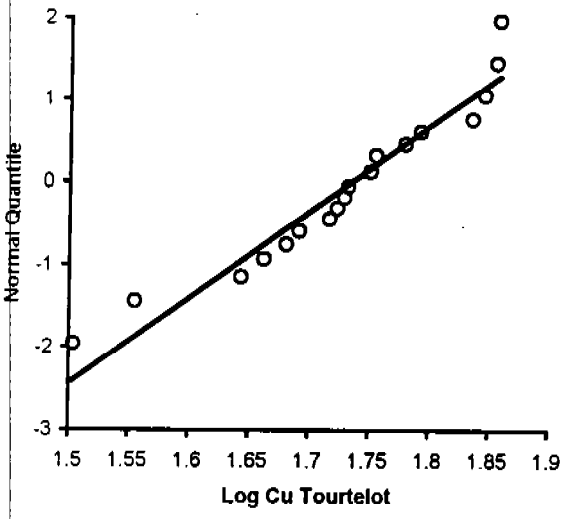


n	20
Mean	1.736
95% CI	1.691 to 1.780
Variance	0.0092
SD	0.0960
SE	0.0215
CV	6%



Median	1.742
95.9% CI	1.692 to 1.792
Range	0.354144582
IQR	0.135581715

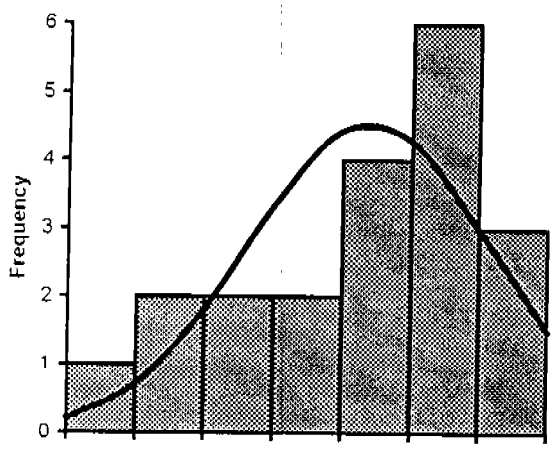
Percentile	
2.5th	-
25th	1.689
50th	1.742
75th	1.825
97.5th	-



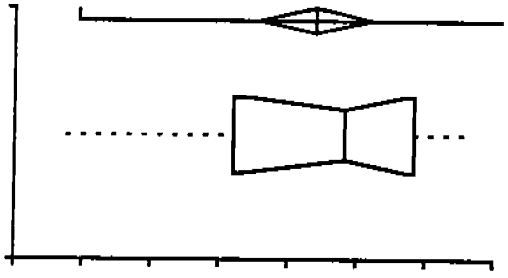
	Coefficient	p
Shapiro-Wilk	0.9290	0.1478
Skewness	-0.8062	0.1114
Kurtosis	0.6230	0.4090

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Iron (untransformed)
Date	6 May 2001

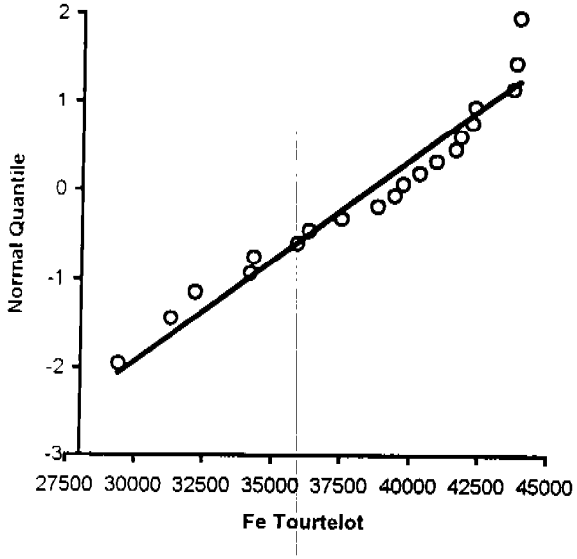


n	20
Mean	38475.000
95% CI	36417.200 to 40532.800
Variance	19332500.0000
SD	4396.8739
SE	983.1709
CV	11%



Median	39550.000
95.9% CI	35900.000 to 41800.000
Range	14500
IQR	6600

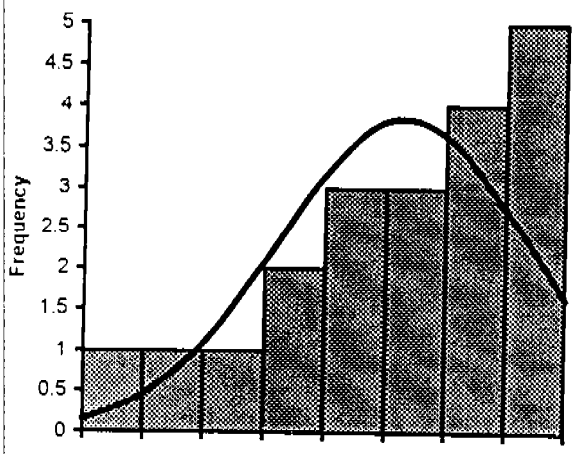
Percentile	
2.5th	-
25th	35500.000
50th	39550.000
75th	42100.000
97.5th	-



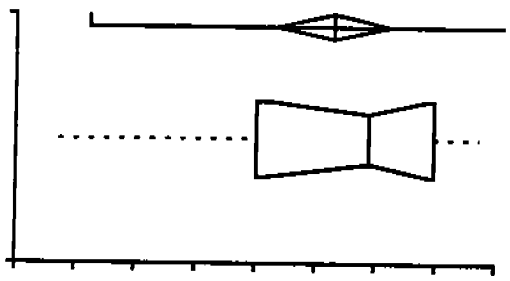
	Coefficient	p
Shapiro-Wilk	0.9299	0.1535
Skewness	-0.6135	0.2166
Kurtosis	-0.6831	0.4982

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Iron (log-transformed)
Date	6 May 2001

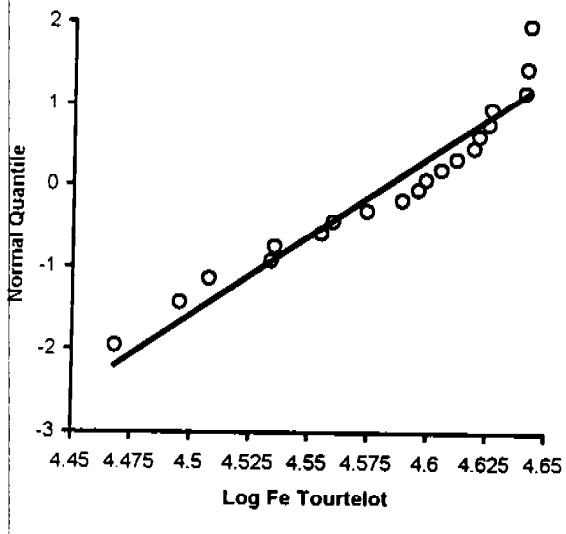


n	20
Mean	4.582
95% CI	4.558 to 4.607
Variance	0.0027
SD	0.0518
SE	0.0116
CV	1%



Median	4.597
95.9% CI	4.555 to 4.621
Range	0.17411719
IQR	0.074134042

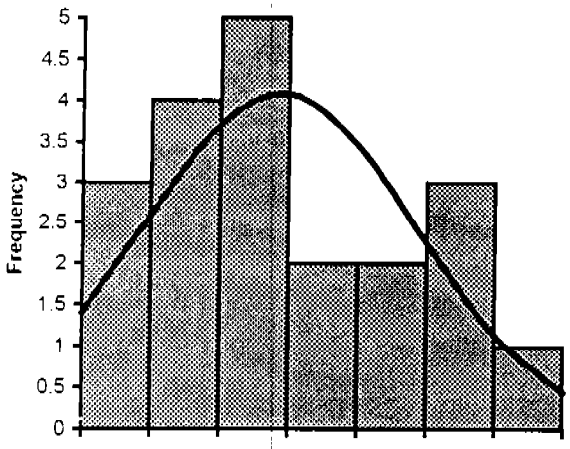
Percentile	
2.5th	-
25th	4.550
50th	4.597
75th	4.624
97.5th	-



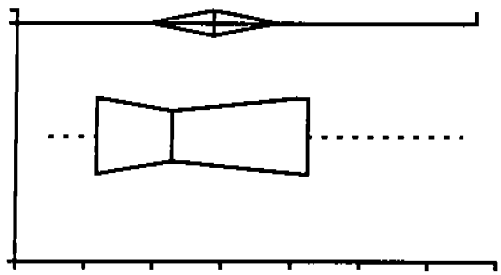
	Coefficient	p
Shapiro-Wilk	0.9154	0.0807
Skewness	-0.7824	0.1214
Kurtosis	-0.3587	0.8415

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Lead (untransformed)
Date	25 March 2001

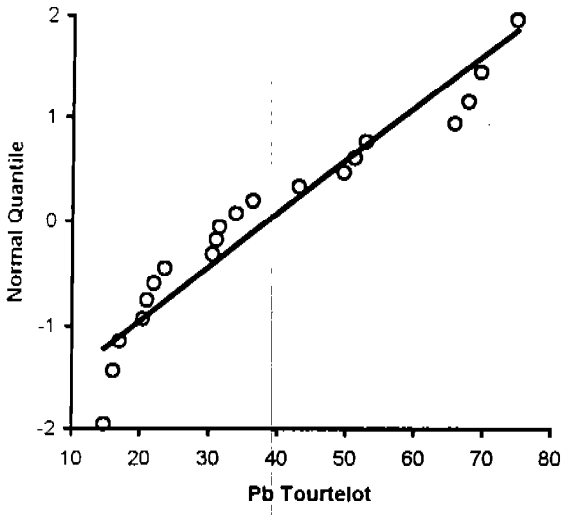


n	20
Mean	38.650
95% CI	29.515 to 47.785
Variance	381.0089
SD	19.5195
SE	4.3647
CV	51%



Median	32.750
95.9% CI	22.000 to 51.200
Range	60
IQR	30.65

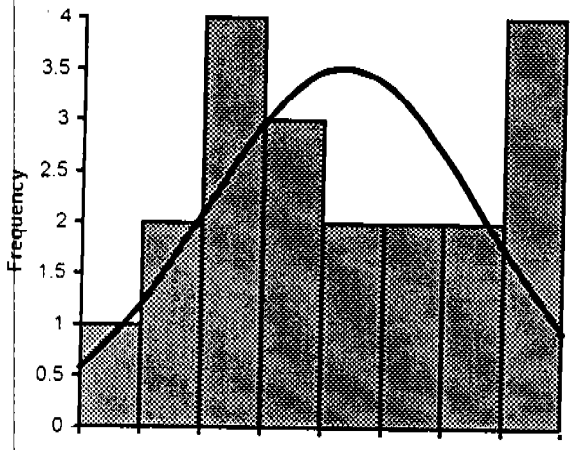
Percentile	
2.5th	-
25th	21.750
50th	32.750
75th	52.400
97.5th	-



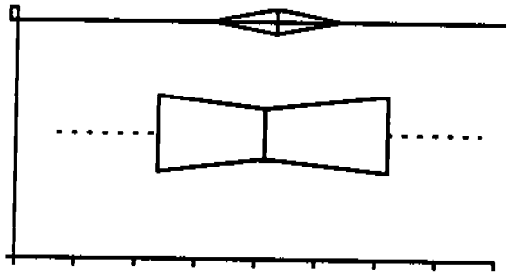
	Coefficient	p
Shapiro-Wilk	0.9085	0.0597
Skewness	0.5617	0.2558
Kurtosis	-0.9958	0.2118

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Lead (log-transformed)
Date	25 March 2001

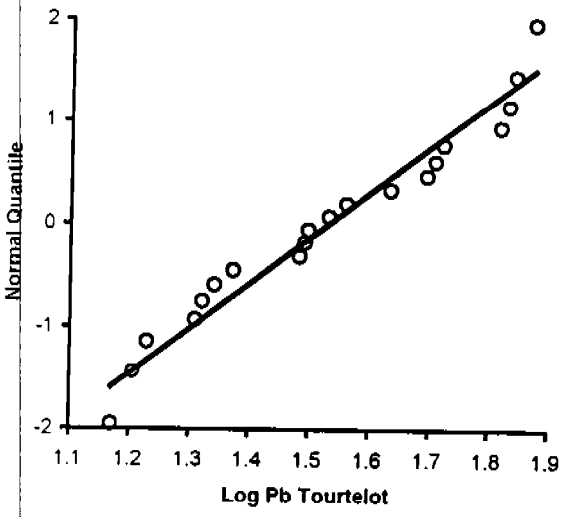


n	20
Mean	1.532
95% CI	1.426 to 1.639
Variance	0.0514
SD	0.2268
SE	0.0507
CV	15%



Median	1.515
95.9% CI	1.342 to 1.709
Range	0.703639882
IQR	0.381921098

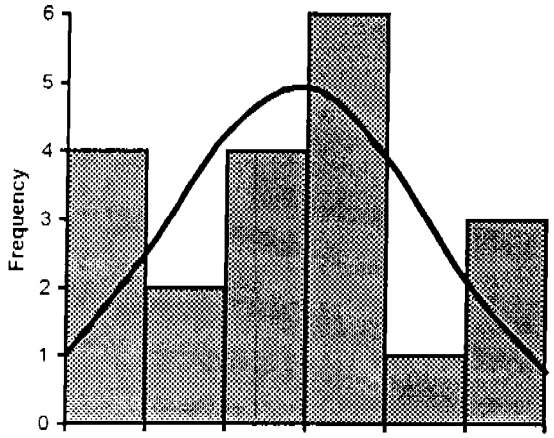
Percentile	
2.5th	-
25th	1.337
50th	1.515
75th	1.719
97.5th	-



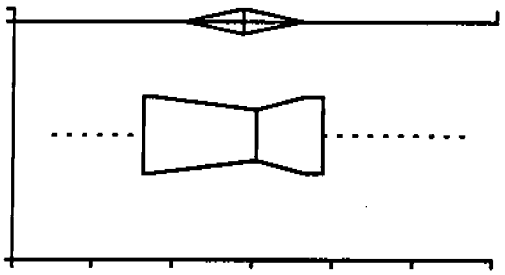
	Coefficient	p
Shapiro-Wilk	0.9436	0.2796
Skewness	-0.0194	0.9679
Kurtosis	-1.2554	0.0651

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Manganese (untransformed)
Date	6 May 2001

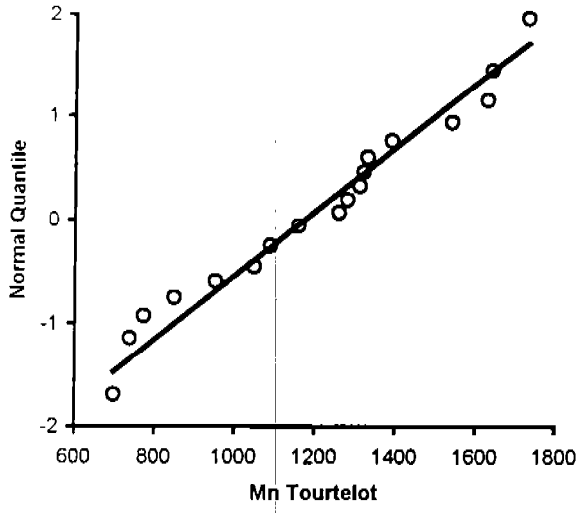


n	20
Mean	1176.600
95% CI	1025.414 to 1327.786
Variance	104352.8842
SD	323.0370
SE	72.2333
CV	27%



Median	1210.000
95.9% CI	952.000 to 1330.000
Range	1031
IQR	448.5

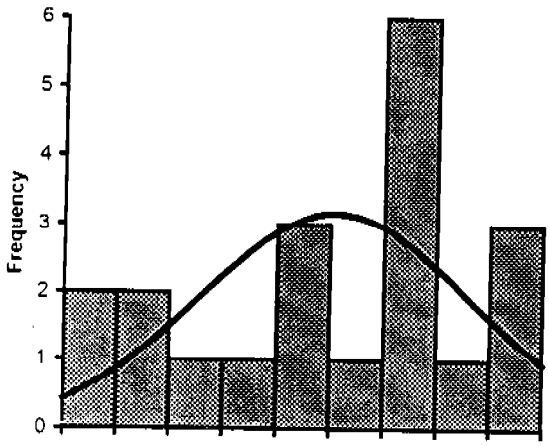
Percentile	
2.5th	-
25th	926.500
50th	1210.000
75th	1375.000
97.5th	-



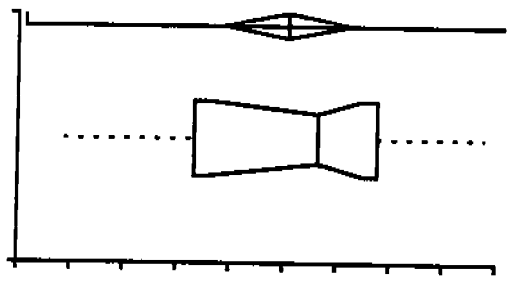
	Coefficient	p
Shapiro-Wilk	0.9500	0.3675
Skewness	0.0236	0.9609
Kurtosis	-0.9872	0.2182

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Manganese (log-transformed)
Date	6 May 2001

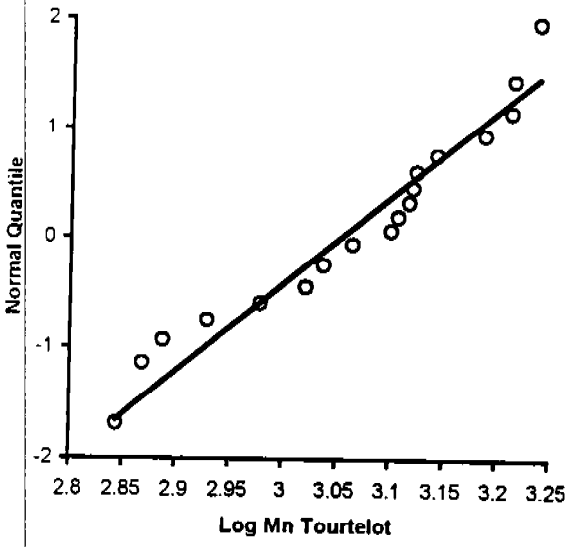


n	20
Mean	3.054
95% CI	2.995 to 3.113
Variance	0.0159
SD	0.1259
SE	0.0282
CV	4%



Median	3.082
95.9% CI	2.979 to 3.124
Range	0.393568927
IQR	0.171891568

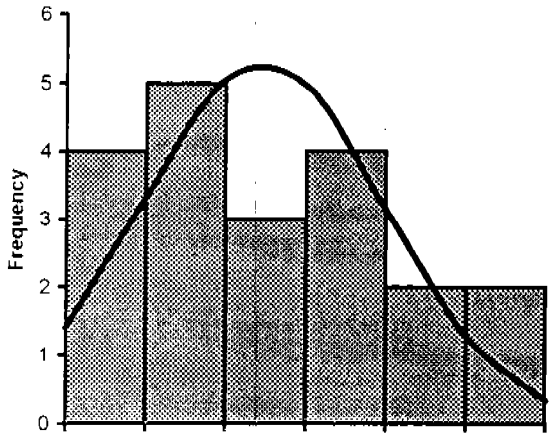
Percentile	
2.5th	-
25th	2.966
50th	3.082
75th	3.138
97.5th	-



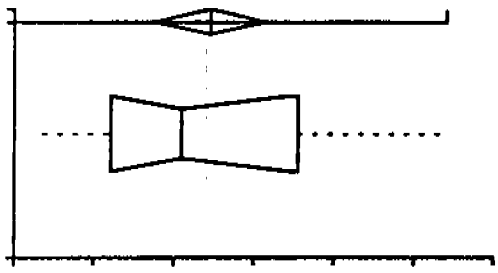
	Coefficient	p
Shapiro-Wilk	0.9330	0.1767
Skewness	-0.3839	0.4313
Kurtosis	-0.9674	0.2336

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Mercury (untransformed)
Date	25 March 2001

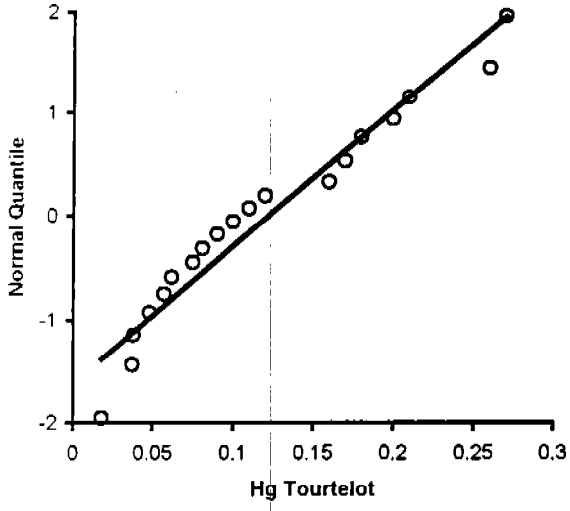


n	20
Mean	0.123
95% CI	0.087 to 0.158
Variance	0.0057
SD	0.0754
SE	0.0169
CV	61%



Median	0.105
95.9% CI	0.062 to 0.170
Range	0.252
IQR	0.11675

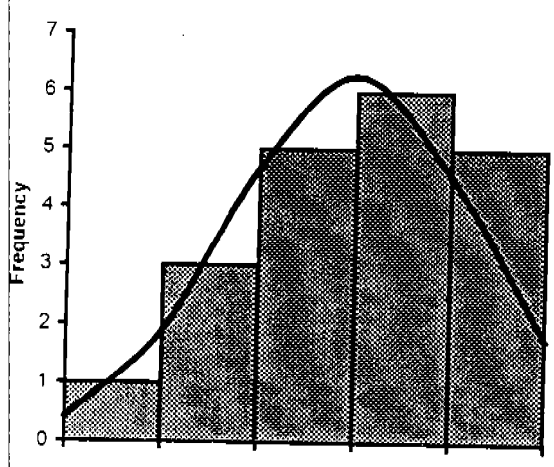
Percentile	
2.5th	-
25th	0.061
50th	0.105
75th	0.178
97.5th	-



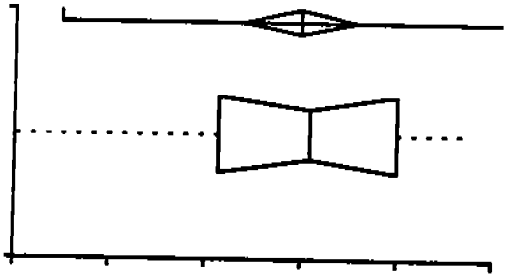
	Coefficient	p
Shapiro-Wilk	0.9384	0.2232
Skewness	0.5166	0.2941
Kurtosis	-0.7738	0.4066

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Mercury (log-transformed)
Date	25 March 2001

analysed with: Analyse-It + General v1.50

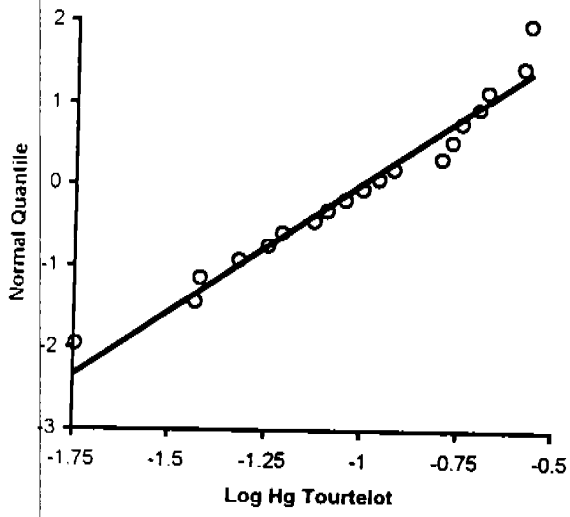


n	20
Mean	-1.006
95% CI	-1.155 to -0.857
Variance	0.1011
SD	0.3180
SE	0.0711
CV	-32%



Median	-0.979
95.9% CI	-1.208 to -0.770
Range	1.176091259
IQR	0.465804128

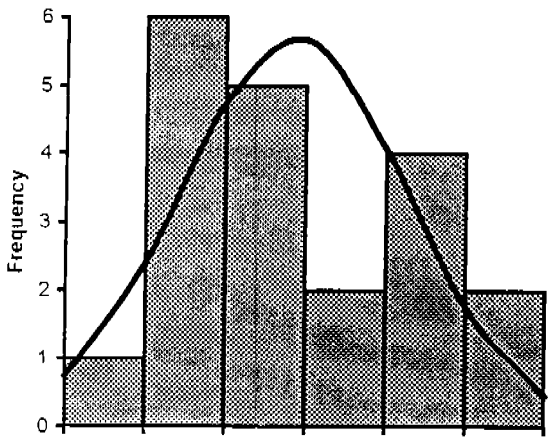
Percentile	
2.5th	-
25th	-1.217
50th	-0.979
75th	-0.751
97.5th	-



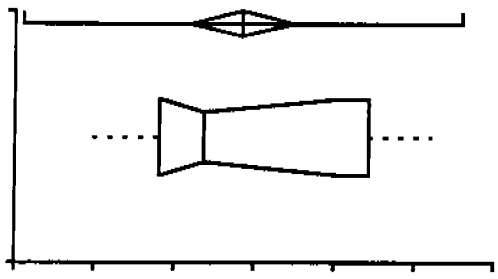
	Coefficient	p
Shapiro-Wilk	0.9541	0.4331
Skewness	-0.5994	0.2268
Kurtosis	-0.1736	0.9730

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Phosphorus (untransformed)
Date	6 May 2001

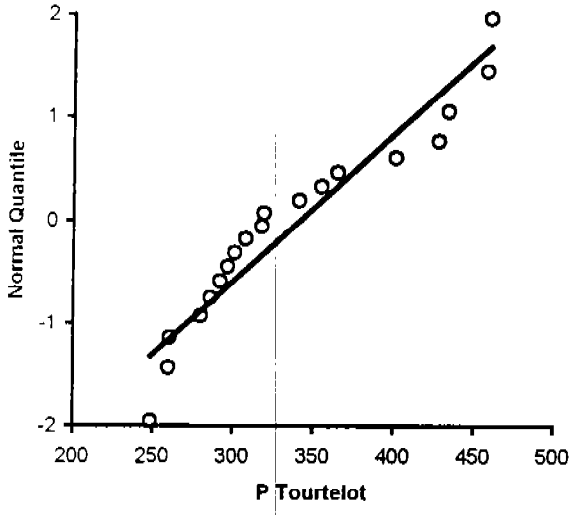


n	20
Mean	342.350
95% CI	309.560 to 375.140
Variance	4908.5553
SD	70.0611
SE	15.6661
CV	20%



Median	318.500
95.9% CI	292.000 to 401.000
Range	211
IQR	130.75

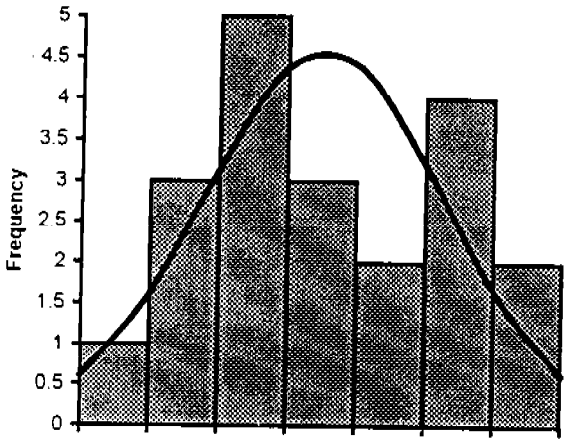
Percentile	
2.5th	-
25th	290.500
50th	318.500
75th	421.250
97.5th	-



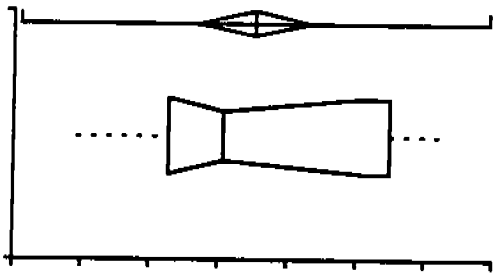
	Coefficient	p
Shapiro-Wilk	0.9053	0.0518
Skewness	0.4877	0.3209
Kurtosis	-1.1884	0.0934

analysed with: Analyse-it + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Phosphorus (log-transformed)
Date	6 May 2001

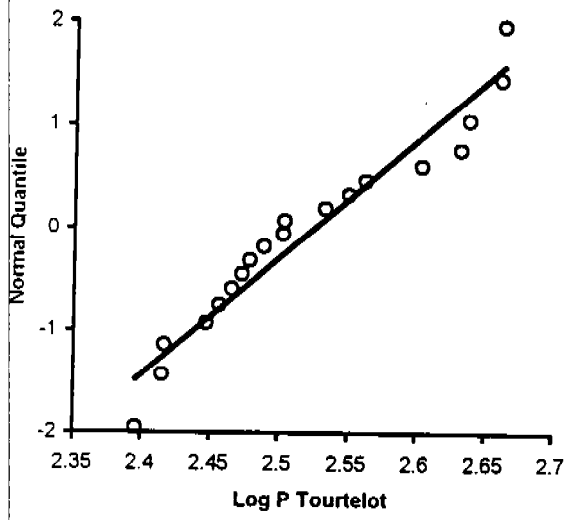


n	20
Mean	2.526
95% CI	2.485 to 2.567
Variance	0.0076
SD	0.0871
SE	0.0195
CV	3%



Median	2.503
95.9% CI	2.465 to 2.603
Range	0.266558485
IQR	0.161240273

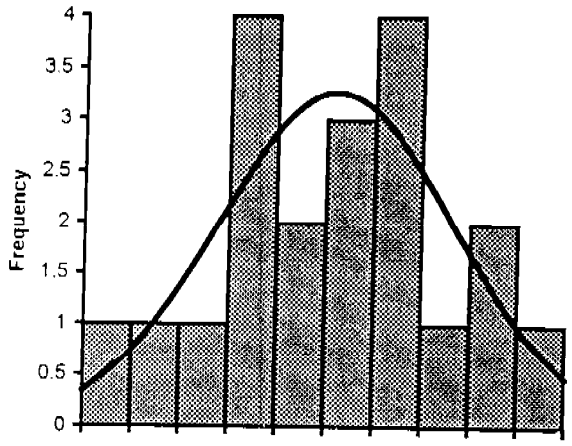
Percentile	
2.5th	-
25th	2.463
50th	2.503
75th	2.624
97.5th	-



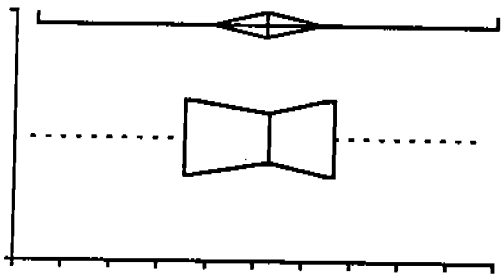
	Coefficient	p
Shapiro-Wilk	0.9261	0.1300
Skewness	0.2831	0.5594
Kurtosis	-1.2560	0.0648

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Nickel (untransformed)
Date	25 March 2001

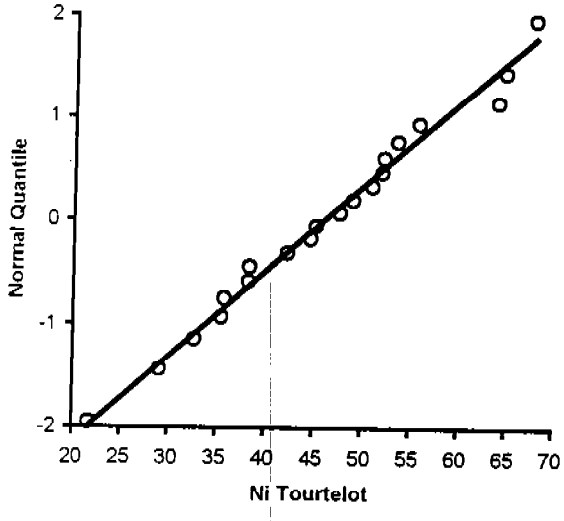


n	20
Mean	46.090
95% CI	40.382 to 51.798
Variance	148.7357
SD	12.1957
SE	2.7270
CV	26%



Median	46.450
95.9% CI	38.300 to 52.200
Range	46.2
IQR	15.575

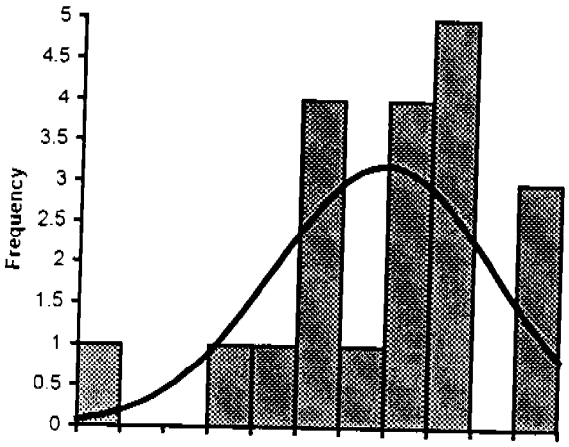
Percentile	
2.5th	-
25th	37.675
50th	46.450
75th	53.250
97.5th	-



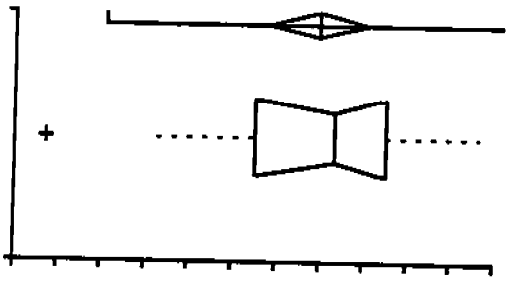
	Coefficient	p
Shapiro-Wilk	0.9823	0.9605
Skewness	-0.0126	0.9792
Kurtosis	-0.3721	0.8276

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Nickel (log-transformed)
Date	25 March 2001

analysed with: Analyse-It + General v1.50

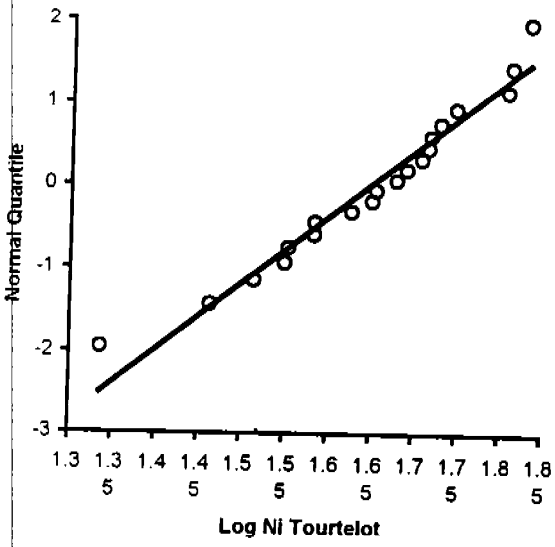


n	20
Mean	1.648
95% CI	1.590 to 1.706
Variance	0.0155
SD	0.1244
SE	0.0278
CV	8%



Median	1.667
95.9% CI	1.583 to 1.718
Range	0.49541004
IQR	0.150421381

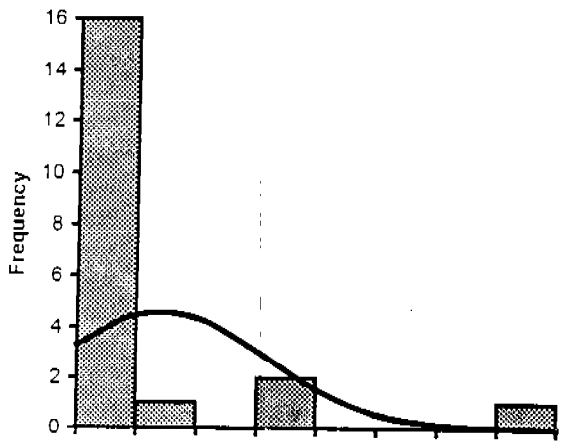
Percentile	
2.5th	-
25th	1.576
50th	1.667
75th	1.726
97.5th	-



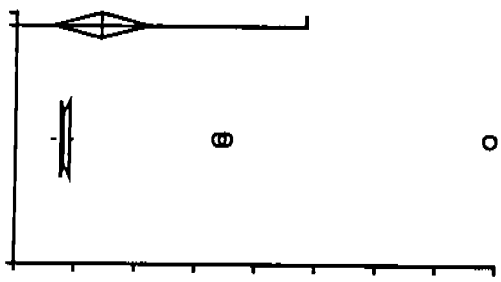
	Coefficient	p
Shapiro-Wilk	0.9586	0.5167
Skewness	-0.7253	0.1486
Kurtosis	0.6172	0.4117

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Selenium (untransformed)
Date	25 March 2001

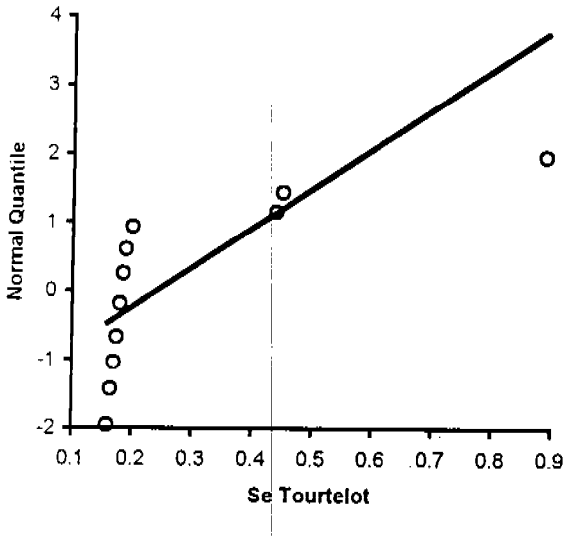


n	20
Mean	0.242
95% CI	0.161 to 0.323
Variance	0.0300
SD	0.1732
SE	0.0387
CV	72%



Median	0.180
95.9% CI	0.175 to 0.190
Range	0.73
IQR	0.015

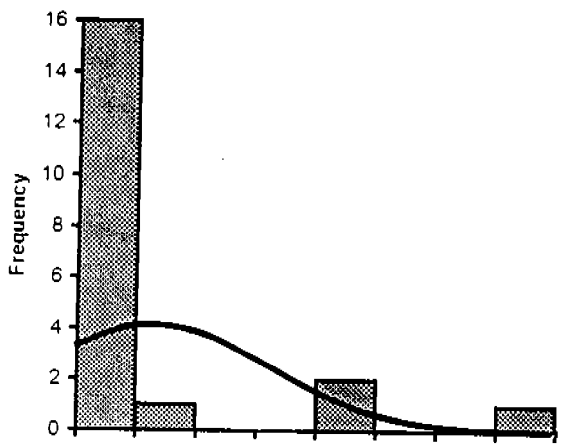
Percentile	
2.5th	-
25th	0.175
50th	0.180
75th	0.190
97.5th	-



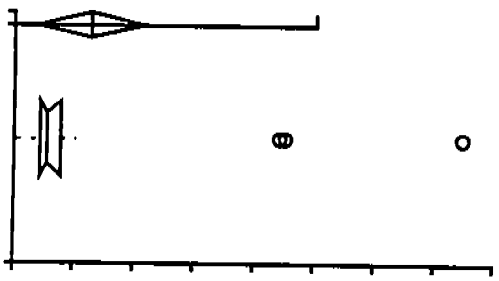
	Coefficient	p
Shapiro-Wilk	0.4720	<0.0001
Skewness	3.2064	<0.0001
Kurtosis	10.9352	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Selenium (log-transformed)
Date	25 March 2001

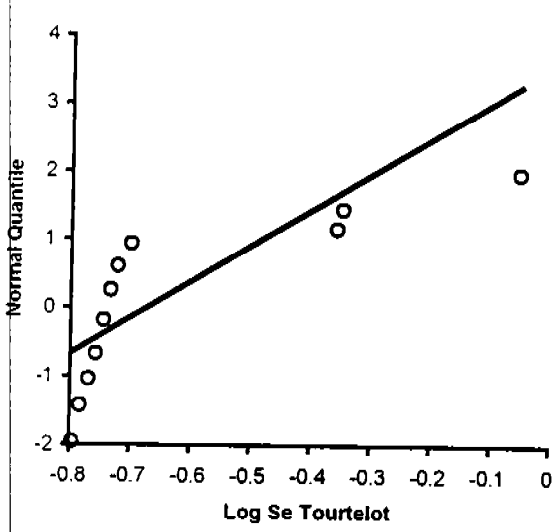


n	20
Mean	-0.672
95% CI	-0.761 to -0.582
Variance	0.0365
SD	0.1912
SE	0.0427
CV	-28%



Median	-0.745
95.9% CI	-0.757 to -0.721
Range	0.745270024
IQR	0.035715552

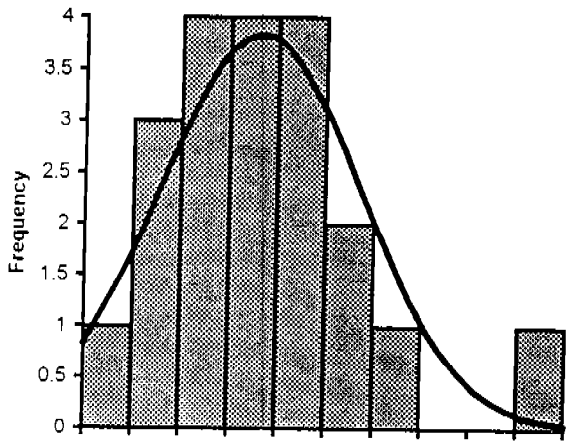
Percentile	
2.5th	-
25th	-0.757
50th	-0.745
75th	-0.721
97.5th	-



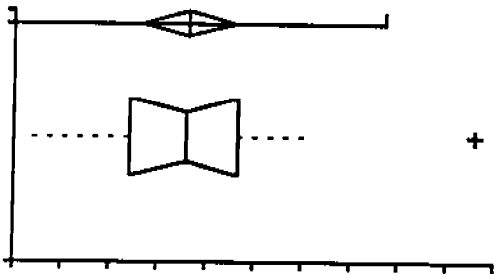
	Coefficient	p
Shapiro-Wilk	0.5677	<0.0001
Skewness	2.4812	0.0001
Kurtosis	5.7058	0.0026

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Vanadium (untransformed)
Date	25 March 2001

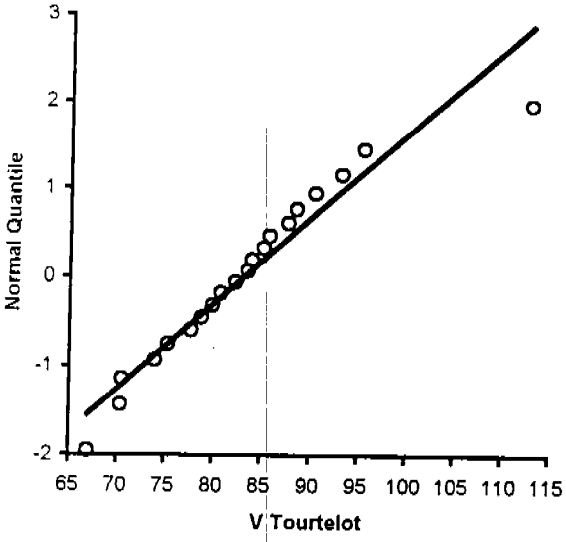


n	20
Mean	83.190
95% CI	78.322 to 88.058
Variance	108.1725
SD	10.4006
SE	2.3256
CV	13%



Median	82.950
95.9% CI	77.700 to 87.700
Range	46
IQR	11.275

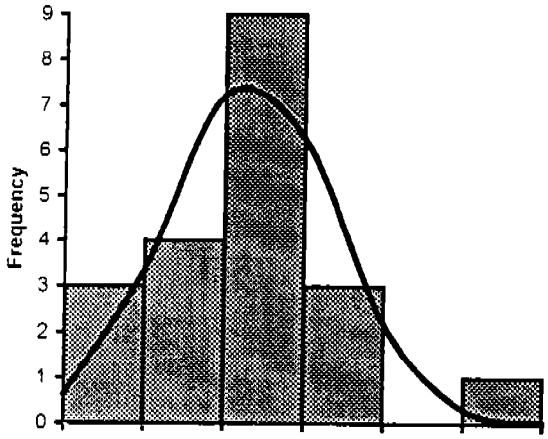
Percentile	
2.5th	-
25th	77.100
50th	82.950
75th	88.375
97.5th	-



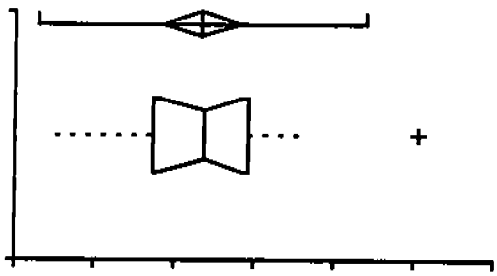
	Coefficient	p
Shapiro-Wilk	0.9382	0.2216
Skewness	1.0437	0.0453
Kurtosis	2.3918	0.0553

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Vanadium (log-transformed)
Date	25 March 2001

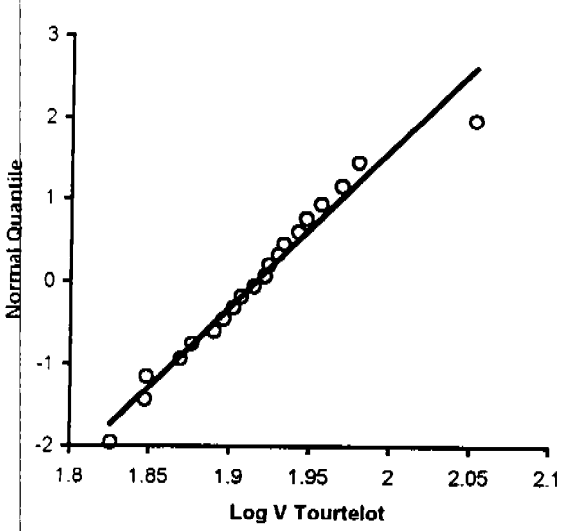


n	20
Mean	1.917
95% CI	1.893 to 1.942
Variance	0.0027
SD	0.0524
SE	0.0117
CV	3%



Median	1.919
95.9% CI	1.890 to 1.943
Range	0.227003641
IQR	0.059310682

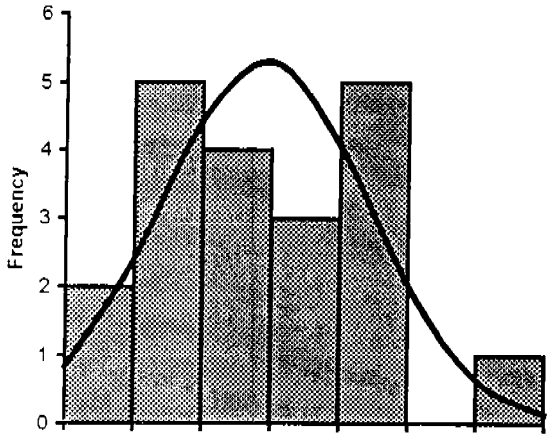
Percentile	
2.5th	-
25th	1.887
50th	1.919
75th	1.946
97.5th	-



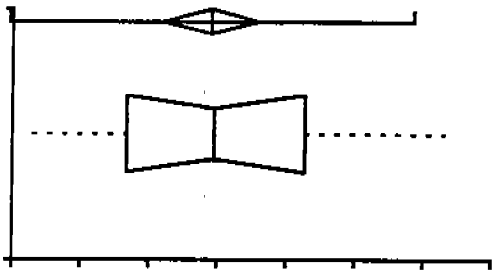
	Coefficient	p
Shapiro-Wilk	0.9697	0.7490
Skewness	0.5747	0.2455
Kurtosis	1.1951	0.2110

analysed with: Analyse-It + General v1.50

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Zinc (untransformed)
Date	25 March 2001

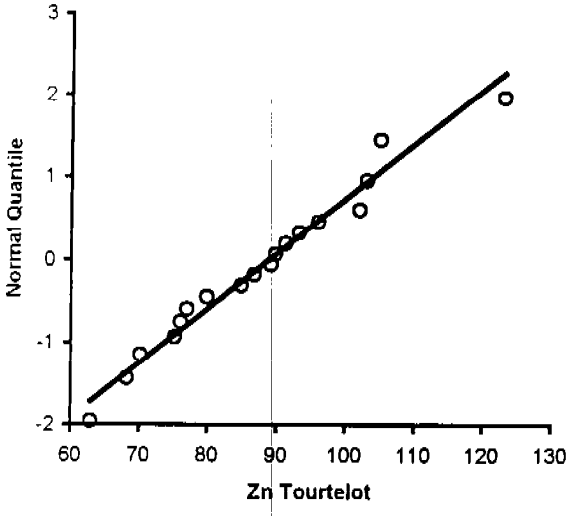


n	20
Mean	89.005
95% CI	81.958 to 96.052
Variance	226.6900
SD	15.0562
SE	3.3667
CV	17%



Median	89.500
95.9% CI	77.000 to 102.000
Range	60
IQR	25.975

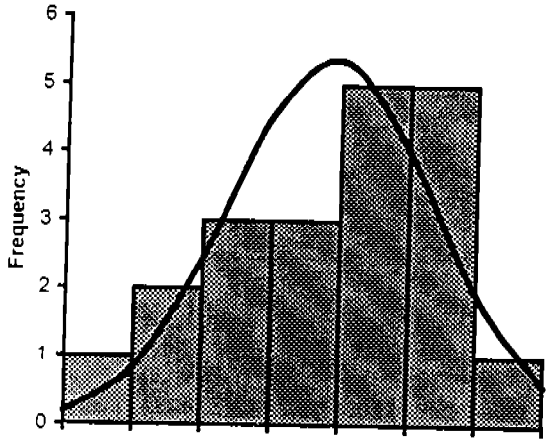
Percentile	
2.5th	-
25th	76.775
50th	89.500
75th	102.750
97.5th	-



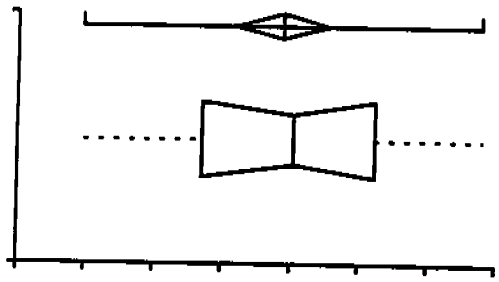
	Coefficient	p
Shapiro-Wilk	0.9720	0.7970
Skewness	0.2362	0.6255
Kurtosis	-0.1574	0.9575

Test	**Shapiro-Wilk and Descriptive Statistics**
Data Set	Tourtelot Ambient Soil Samples
Parameter	Zinc (log-transformed)
Date	25 March 2001

analysed with: Analyse-It + General v1.50

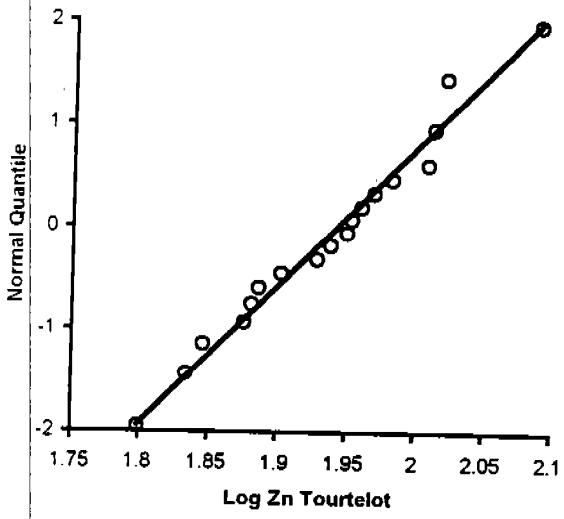


n	20
Mean	1.943
95% CI	1.909 to 1.978
Variance	0.0055
SD	0.0742
SE	0.0166
CV	4%



Median	1.952
95.9% CI	1.886 to 2.009
Range	0.290564562
IQR	0.126563753

Percentile	
2.5th	-
25th	1.885
50th	1.952
75th	2.012
97.5th	-



	Coefficient	p
Shapiro-Wilk	0.9751	0.8571
Skewness	-0.1478	0.7594
Kurtosis	-0.4392	0.7569

ATTACHMENT E-4

Cumulative Probability Plots for Inorganic Parameters

Attachment E-4:
Cumulative Probability Plots

This Attachment presents cumulative probability plots for both untransformed and log-transformed data for all 268 site samples (this includes sediment samples). These plots are used to screen for outliers and obvious departures from continuity that may represent other data populations that may, in turn, represent variability due to impact, natural geochemical processes, or analytical factors. The plots also may provide a qualitative means of estimating ambient concentrations, and can then be compared with the 95th percentiles and UTLs for consistency purposes. Examination of the shapes of the plots indicates that, in general, mixed or overlapping natural populations are likely present for most parameters. Attempts to isolate and characterize these natural but variable populations (e.g., depth and lithologic differences) are problematic, as demonstrated for selected metals in Attachment E-5 of this appendix. In general, the shape of the probability plots suggest heterogeneous data sets are pooled, but the continuous and relatively uniform nature (excluding "far outliers") of most of the plots indicates that ambient concentrations for many metals are significantly higher than the 95th percentiles of the ambient soil data set. "Far outliers" are indicated as open circles on the box-and-whisker plot and represent values 3.0 inter-quartile ranges from the quartiles (see Figure 1 of this attachment for further information).

Both the untransformed and log-transformed plots were examined and the plot exhibiting the more uniform distribution is discussed below. It is interesting to note the differences in distribution character for the site as a whole relative to only the ambient data set. For example, for many parameters, the site as a whole will exhibit a distribution more fitting with log-normality whereas the ambient data set will exhibit a distribution more fitting with normality, and vice-versa. This is likely more evidence of the heterogeneity of the soils data. (Note that ambient-only cumulative probability plots are presented in Attachment E-3 of this appendix).

The discussion is best followed when Table 3 of Attachment E-3 of this appendix is also used, as well as the scatter plots in Attachment E-2 of this appendix (remembering that the scatter plots show only in-situ soil samples).

OBSERVATIONS

Aluminum - The cumulative probability plot for aluminum (log-transformed) does not indicate any far outliers. The plot is relatively continuous and linear to concentrations greater than 35,000 mg/kg (compared with a 95th percentile value of 27,525 mg/kg and a UTL [normal] of 32,996 mg/kg,). The highest value in the data set is 36,500 mg/kg, located outside of the areas of interest in boring TW-5.

Antimony – The cumulative probability plot for antimony (log-transformed) is relatively continuous and linear (excluding variations on the low end caused by a mixture of non-detected values of varying reporting limits mixed with detected values, and the far outlier on the high end) to concentrations of approximately 2.5 mg/kg (compared with a 95th Percentile of 2.31 mg/kg and a UTL [normal] of 2.84 mg/kg). The highest result in the data set is the single far outlier of 150 mg/kg in Flare Site sample FA3-.5.

Arsenic - The cumulative probability plot for arsenic (log-transformed) is relatively continuous and linear (excluding the far outliers on the high end) to concentrations of approximately 30 mg/kg (compared with a 95th Percentile of 18.2 mg/kg and a UTL [normal] of 21.5 mg/kg). Two far outliers are indicated with highest result of 39.1 mg/kg , located outside of the areas of interest in boring TW-8 (at 15.5 ft bgs).

Barium - The cumulative probability plot for barium (log-transformed) is relatively continuous and linear (excluding variations on the low end caused by some anomalously low values in various areas of interest, and the far outliers on the high end due to barium impact to Flare Site soils) to concentrations of approximately 1,000 mg/kg (compared with a 95th Percentile of 448 mg/kg and a UTL [log-transformed] of 642 mg/kg). Six far outliers are indicated, with the five highest associated with Flare Site samples and

the highest result of 20,000 mg/kg in sample FA6A/1, which was associated with ash deposits in the Flare Site.

Beryllium - The cumulative probability plot for beryllium (normal) does not indicate any far outliers. The plot is relatively continuous and linear to concentrations approaching 1 mg/kg (compared with a 95th percentile value of 0.82 mg/kg and a UTL [normal] of 0.99 mg/kg). The highest value in the data set is 1 mg/kg at various locations.

Cadmium - The cumulative probability plot for cadmium is not uniform or continuous due to groups of non-detected data with varying detection limits. No estimate of ambient concentration based on the cumulative probability plot is attempted due the extreme heterogeneity of the data as a result of analytical effects. The highest cadmium value detected at the site is 1.6 mg/kg is Flare Site sample FA3-.5. The 95th percentile is 1.4 mg/kg and the UTL is 1.91 mg/kg.

Chromium (total) - The cumulative probability plot for chromium (normal) is relatively continuous and linear (excluding two outliers on the high end) to concentrations of approximately 75 mg/kg (compared with a 95th Percentile of 63 mg/kg and a UTL [normal] of 73.8 mg/kg). The highest result in the data set is the single far outlier of 110 mg/kg in Flare Site sample FA3-.5.

Cobalt - The cumulative probability plot for cobalt (log-transformed) is relatively continuous and linear (excluding variations on the low end caused by some anomalously low values in various areas of interest, and the far outliers on the high) to concentrations of approximately 32 mg/kg (compared with a 95th Percentile of 23.1 mg/kg and a UTL [normal] of 27.9 mg/kg). Two far outliers are indicated, with the highest of 45.7 mg/kg in sample AR-2/5.5.

Copper - The cumulative probability plot for copper (log-transformed) is highly curved but relatively continuous to concentrations (excluding the far outliers on the high end) to approximately 125 mg/kg (compared with a 95th Percentile of 71.7 mg/kg and a UTL [normal] of 87.7 mg/kg). Three far outliers are indicated, all located within the Flare Site, with the highest of 8,100 mg/kg in sample FA3-.5.

Iron - The cumulative probability plot for iron (normal) is relatively continuous and linear (excluding the near outliers on the low end and the far outlier on the high end) to concentrations of greater than 55,000 mg/kg (compared with a 95th Percentile of 43,805 mg/kg and a UTL [normal] of 50,817mg/kg). One far outlier is indicated at Flare Site sample FA3-.5 (66,000 mg/kg).

Lead - The cumulative probability plot for lead (log-transformed) is highly curved but relatively continuous to concentrations (excluding the far outliers on the high end) to approximately 100 mg/kg (compared with a 95th Percentile of 69.9 mg/kg and a UTL [log-transformed] of 148 mg/kg). Nine far outliers are indicated, with seven of the nine located in the Flare Site and with the highest of 7,600 mg/kg in sample FA3-.5.

Manganese - The cumulative probability plot for manganese (log-transformed) does not indicate any "far outliers". The plot is relatively continuous and linear to concentrations greater than 4,000 mg/kg (compared with a 95th percentile value of 1,645 mg/kg and a UTL [normal] of 2,083 mg/kg). The highest value in the data set is 4,340 mg/kg for sample AR-1/4.5.

Mercury - The cumulative probability plot for mercury (log-transformed) is relatively continuous and linear (excluding the outliers on the high end) to concentrations of approximately 0.3 mg/kg (compared with a 95th Percentile of 0.26 mg/kg and a UTL [log-transformed] of 0.77 mg/kg). Three far outliers are indicated, all located either in Demolition Site #3 of the surrounding sediment, with the highest of 11.7 mg/kg in sample WET-7.

Molybdenum - The cumulative probability plot for molybdenum (log-transformed) is relatively continuous and linear (excluding the far outliers on the low and high ends) to concentrations of approximately 2 mg/kg. No comparison to the 95th Percentile or the UTL is made as all of the molybdenum data in the

ambient soil data set is "not detected" and these values, therefore, could not be calculated. The single far outlier on the high end is 4.5 mg/kg in Flare Site sample FA3-.5.

Nickel - The cumulative probability plot for nickel (normal) is relatively continuous and linear to concentrations of approximately 80 mg/kg (compared with a 95th Percentile of 65 mg/kg and a UTL [normal] of 80.3 mg/kg) The single far outlier is 129 mg/kg in sample AR-1/4.5.

Nitrate as N – The cumulative probability plot for nitrate as N (log-transformed) is curved but relatively continuous to concentrations of approximately 3 mg/kg, excluding the near outliers on the high and low ends. No comparison to the 95th percentile or the UTL is made because data for nitrate as N were not collected in the ambient soil samples. The highest value in the data set is 10.1 mg/kg in sample AR-2A/0.5. The group of sample on the low end that are separated from the main part of the distribution are non-detected samples from several areas of interest.

Nitrite as N - The cumulative probability plot for nitrite as N is not uniform or continuous due to groups of non-detected data with varying detection limits. No estimate of ambient concentration based on the cumulative probability plot is attempted due the extreme heterogeneity of the data as a result of analytical effects. Only 11 samples exhibited detectable nitrite out of 118 samples analyzed. The detected samples, all of which appear as far outliers on the plot, are from various locations, with the highest concentration of 0.68 mg/kg located in a sample TW-7/4.5.

Phosphorus (total as P) - The cumulative probability plot for phosphorus (log-transformed) is relatively continuous and linear (excluding the near outlier on the low end and the far outliers on the high end) to concentrations of approximately 630 mg/kg (compared with a 95th Percentile of 458 mg/kg and a UTL [log-transformed] of 590 mg/kg). Two far outliers are indicated with the highest of 1,470 mg/kg in sample HF-2/5.

Selenium – The cumulative probability plot for selenium (log-transformed) is curved but relatively continuous with no far outliers indicated. Concentrations of selenium are concentrated in a range with an upper end of approximately 1 mg/kg. No comparison to the 95th percentile or the UTL is made because data for selenium in the ambient data set were mostly "not detected" and these values could not, therefore, be calculated. In the overall data set, a significant proportion of selenium values are "not detected" with differing detection limits, causing the curvature on the low end of the plot. The highest selenium value detected at the site is 2.9 mg/kg in sample LFP-24-S1/8.

Silver - The cumulative probability plot for silver is not uniform or continuous due to groups of non-detected data with varying detection limits. No estimate of ambient concentration based on the cumulative probability plot is attempted due the extreme heterogeneity of the data as a result of analytical effects. The highest silver value detected at the site is 0.89 mg/kg is Flare Site sample FA3-.5. No comparison to the 95th Percentile or the UTL is made as all of the silver data in the ambient soil data set is "not detected" and these values, therefore, could not be calculated.

Thallium: - The cumulative probability plot for thallium is not uniform or continuous due to groups of non-detected data with varying detection limits. No estimate of ambient concentration based on the cumulative probability plot is attempted due the extreme heterogeneity of the data as a result of analytical effects. The highest silver value detected at the site is 1.3 mg/kg is sample AR-1/4.5. No comparison to the 95th Percentile or the UTL is made as all of the thallium data in the ambient soil data set is "not detected" and these values, therefore, could not be calculated.

Vanadium - The cumulative probability plot for vanadium (normal) is relatively continuous and linear to concentrations of approximately125 mg/kg (compared with a 95th Percentile of 96.4 mg/kg and a UTL [normal] of 116 mg/kg). No far outliers are indicated; the highest value in the data set is 123 mg/kg in sample LFP-22-S2/4.

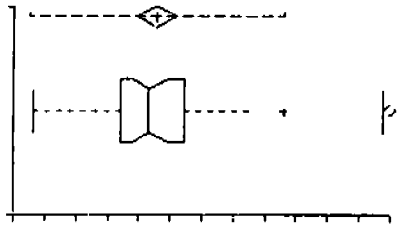
Zinc - The cumulative probability plot for zinc (log-transformed) is relatively continuous and linear (excluding the far outliers on the high end) to concentrations of approximately 160 mg/kg (compared with a

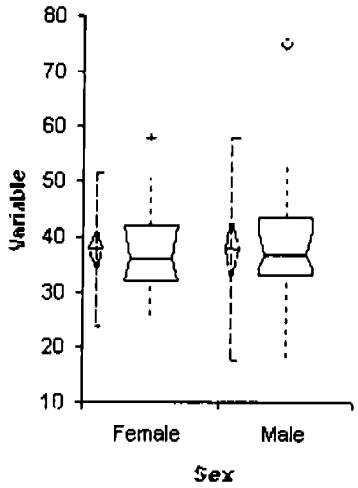
Attachment
E-4
FIGURE 1

Box-Whisker plots

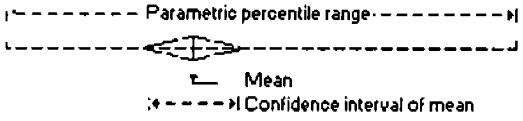
See also: Normality Test, Frequency histogram.

Box-plots graphically show the **central location** and **scatter/dispersion** of the observations of a sample(s). Single continuous descriptives shows a single horizontal box-plot for the sample. Comparative descriptives shows vertical box-plots for each sample, side-by-side for comparison.



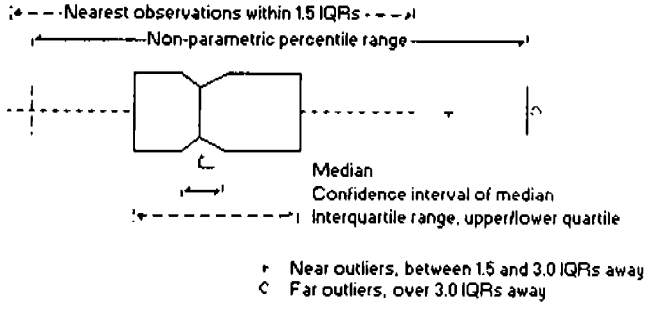


The blue line series shows **parametric statistics:**



- the blue diamond shows the **mean** and the requested **confidence interval around the mean**.
- the blue notched lines show the requested **parametric percentile range**.

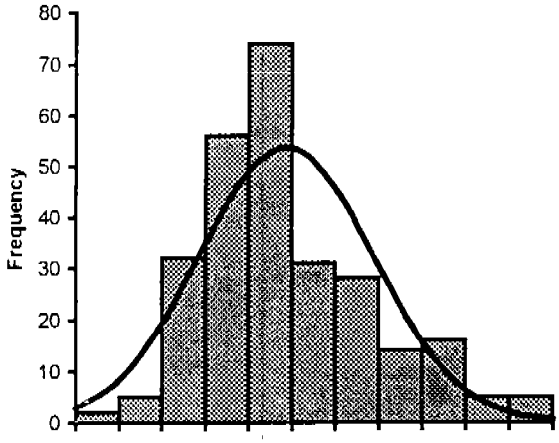
The notched box and whiskers show **non-parametric statistics**:



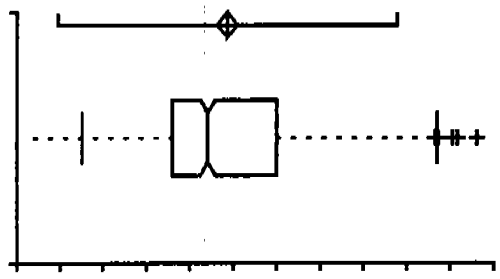
- the notched box shows the **median**, lower and upper **quartiles**, and **confidence interval around the median**.
- the dotted-line connects the **nearest observations within 1.5 IQRs** (inter-quartile ranges) of the lower and upper quartiles.
- red crosses (+) and circles (o) indicate **possible outliers** - observations more than 1.5 IQRs (**near outliers**) and 3.0 IQRs (**far outliers**) from the quartiles.
- the blue vertical lines show the requested **non-parametric percentile range**.

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Aluminum
Project	Tourtelot
Date	1 June 2001

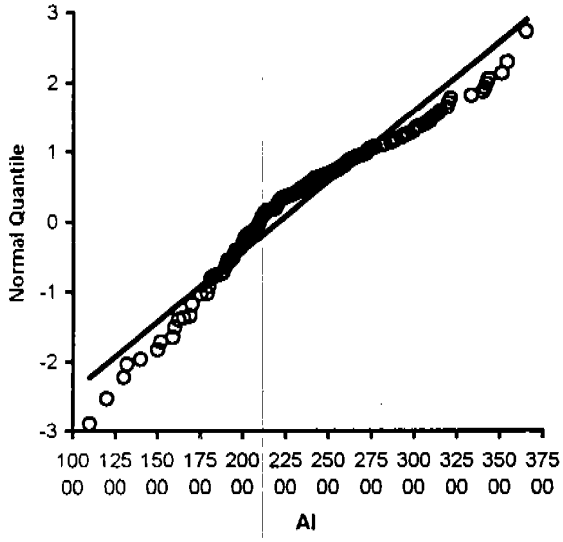


n	268 (cases excluded: 20 due to m
Mean	22147.388
95% CI	21548.456 to 22746.321
Variance	24799805.9
SD	4979.9403
SE	304.1983
CV	22%



Median	21000.000
95.6% CI	20600.000 to 21500.000
Range	25500
IQR	6000

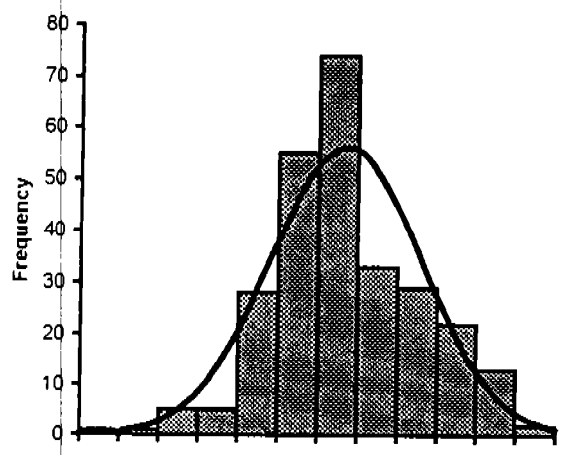
Percentile	
2.5th	13780.000
25th	19000.000
50th	21000.000
75th	25000.000
97.5th	34227.500



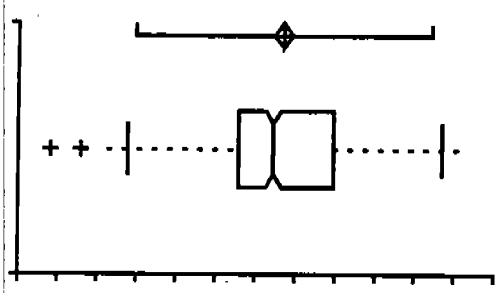
	Coefficient	p
Shapiro-Wilk	0.9519	<0.0001
Skewness	0.7480	<0.0001
Kurtosis	0.2568	0.3521

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Aluminum (log-transformed)
Project	Tourtelot
Date	1 June 2001

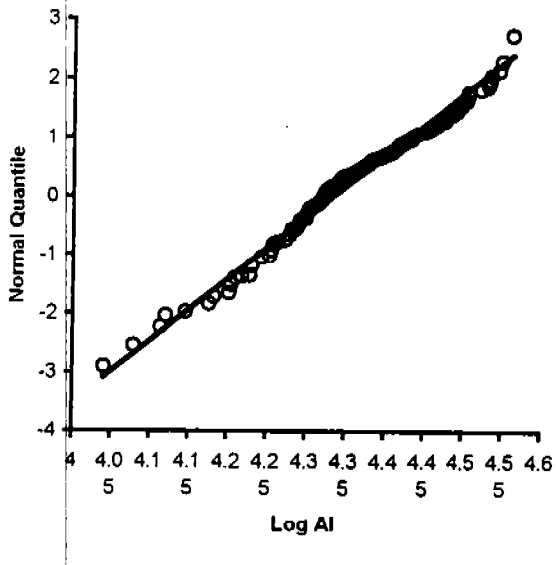


n	268 (cases excluded: 20 due to m
Mean	4.335
95% CI	4.323 to 4.346
Variance	0.0090
SD	0.0951
SE	0.0058
CV	2%



Median	4.322
95.6% CI	4.314 to 4.332
Range	0.520900179
IQR	0.119186408

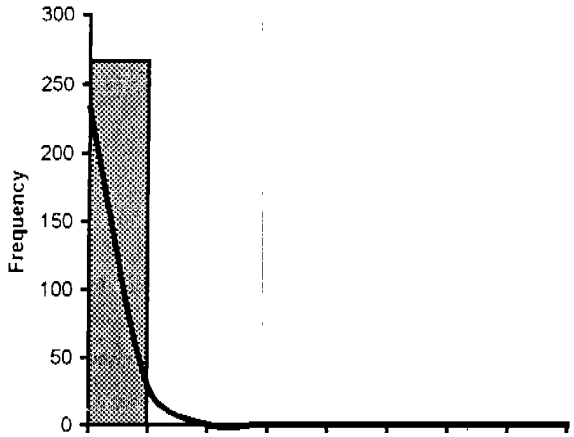
Percentile	
2.5th	4.139
25th	4.279
50th	4.322
75th	4.398
97.5th	4.534



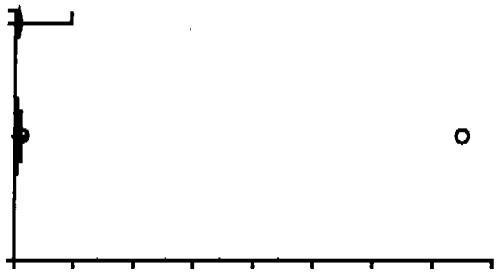
	Coefficient	p
Shapiro-Wilk	0.9845	0.0052
Skewness	0.1493	0.3110
Kurtosis	0.0544	0.7513

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Antimony
Project	Tourtelot
Date	1 June 2001

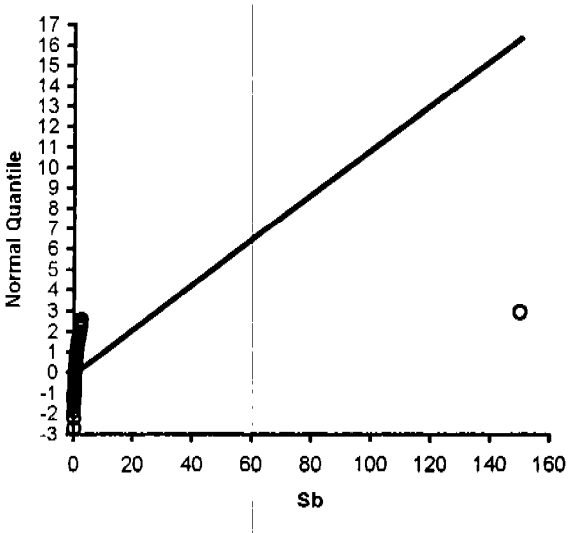


n	268 (cases excluded: 20 due to m
Mean	1.272
95% CI	0.174 to 2.370
Variance	83.3526
SD	9.1298
SE	0.5577
CV	718%



Median	0.570
95.6% CI	0.502 to 0.640
Range	149.83
IQR	0.378

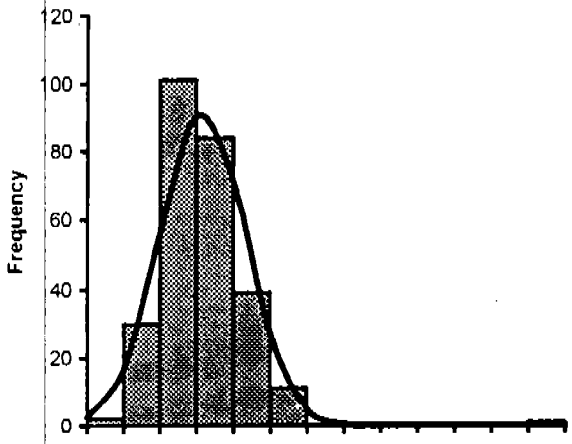
Percentile	
2.5th	0.190
25th	0.502
50th	0.570
75th	0.880
97.5th	2.200



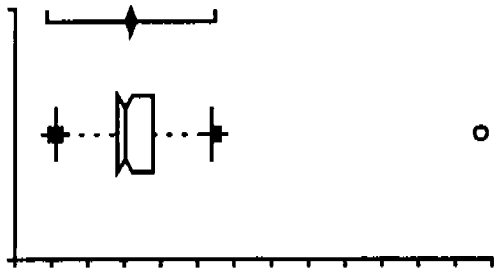
	Coefficient	p
Shapiro-Wilk	0.0530	<0.0001
Skewness	16.3128	<0.0001
Kurtosis	266.7277	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Antimony (log-transformed)
Project	Tourtelot
Date	1 June 2001

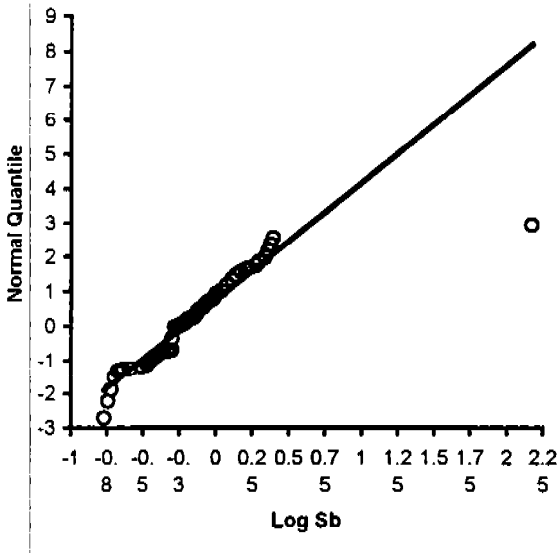


n	268 (cases excluded: 20 due to m
Mean	-0.210
95% CI	-0.245 to -0.175
Variance	0.0859
SD	0.2931
SE	0.0179
CV	-140%



Median	-0.244
95.6% CI	-0.299 to -0.194
Range	2.945642338
IQR	0.243778955

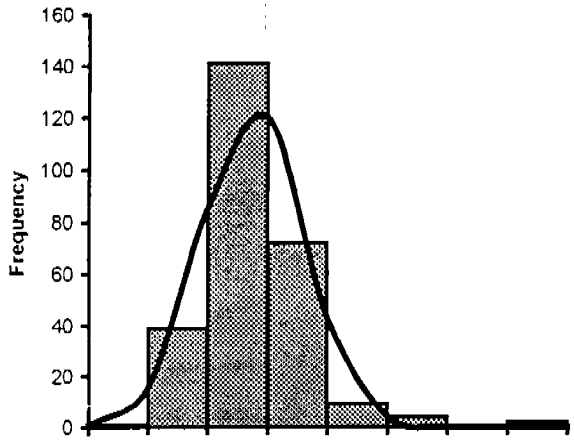
Percentile	
2.5th	-0.721
25th	-0.299
50th	-0.244
75th	-0.056
97.5th	0.342



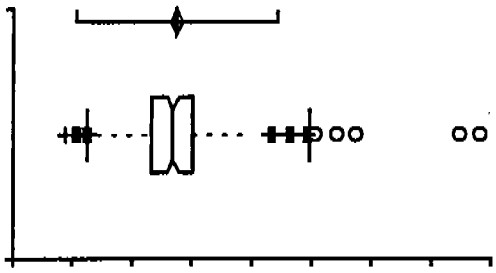
	Coefficient	p
Shapiro-Wilk	0.8679	<0.0001
Skewness	1.9247	<0.0001
Kurtosis	15.5042	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Arsenic
Project	Tourtelot
Date	1 June 2001

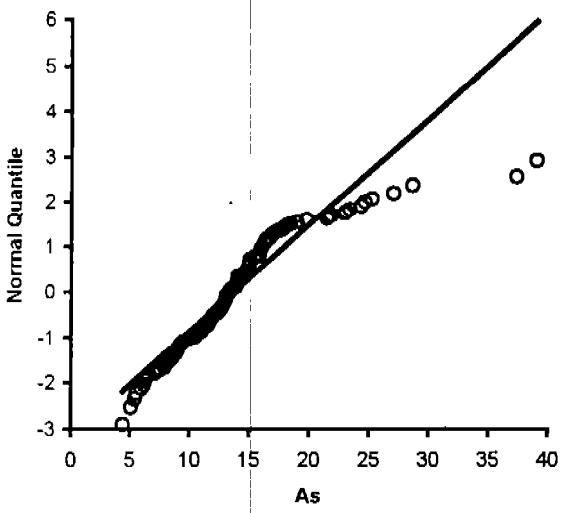


n	268 (cases excluded: 20 due to m
Mean	13.739
95% CI	13.225 to 14.254
Variance	18.2939
SD	4.2771
SE	0.2613
CV	31%



Median	13.400
95.6% CI	13.000 to 14.000
Range	34.7
IQR	3.4

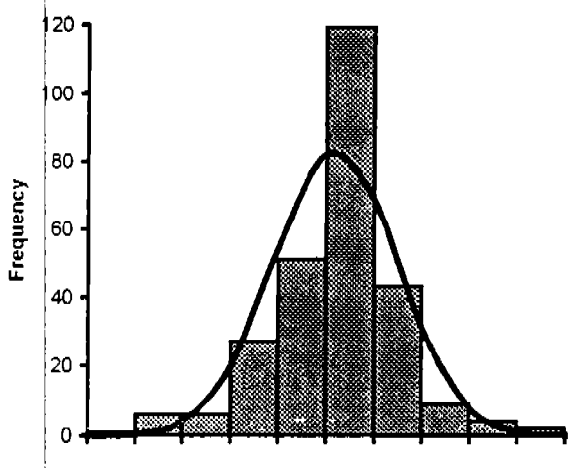
Percentile	
2.5th	6.273
25th	11.675
50th	13.400
75th	15.075
97.5th	24.865



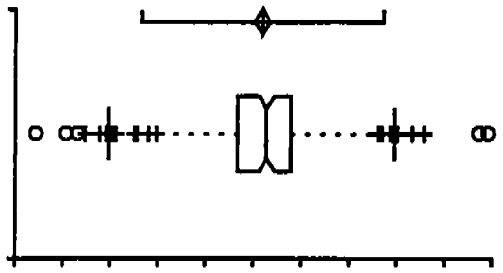
	Coefficient	p
Shapiro-Wilk	0.8587	<0.0001
Skewness	1.8934	<0.0001
Kurtosis	8.4458	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Arsenic (log-transformed)
Project	Tourtelot
Date	1 June 2001

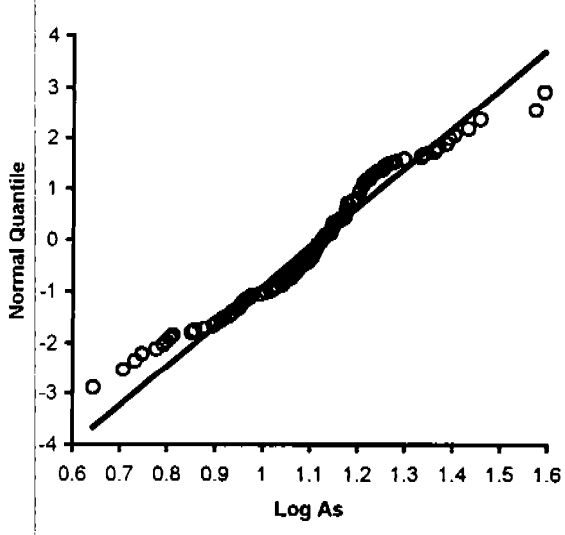


n	268 (cases excluded: 20 due to m
Mean	1.119
95% CI	1.103 to 1.135
Variance	0.0166
SD	0.1290
SE	0.0079
CV	12%



Median	1.127
95.6% CI	1.114 to 1.146
Range	0.948724081
IQR	0.111001632

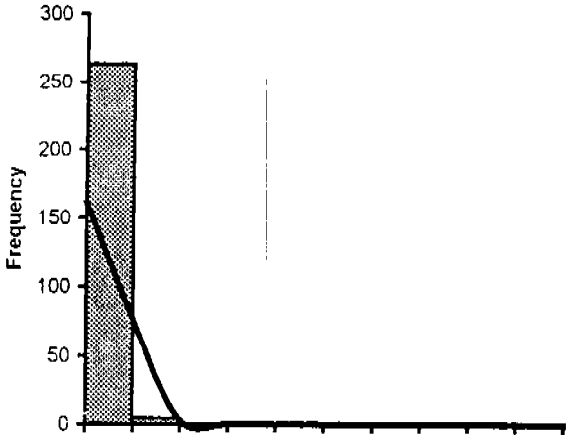
Percentile	
2.5th	0.797
25th	1.067
50th	1.127
75th	1.178
97.5th	1.396



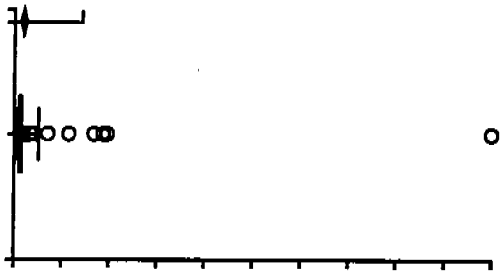
	Coefficient	p
Shapiro-Wilk	0.9449	<0.0001
Skewness	-0.2483	0.0948
Kurtosis	2.3456	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Barium
Project	Tourtelot
Date	1 June 2001

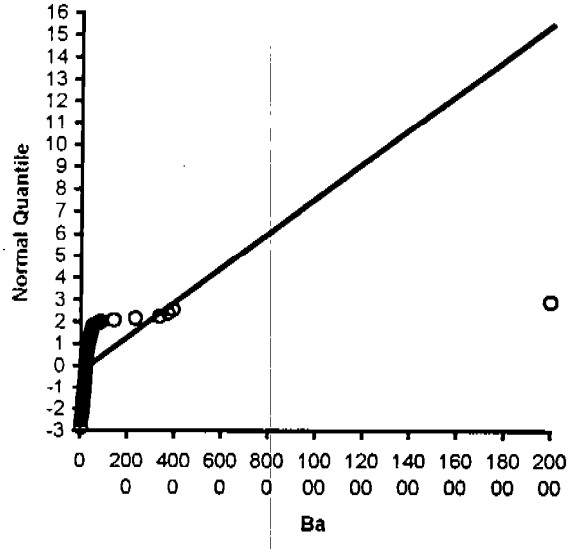


n	268 (cases excluded: 20 due to m
Mean	387.027
95% CI	234.514 to 539.541
Variance	1608086.6187
SD	1268.1036
SE	77.4618
CV	328%



Median	243.500
95.6% CI	238.000 to 250.000
Range	19947.5
IQR	98.5

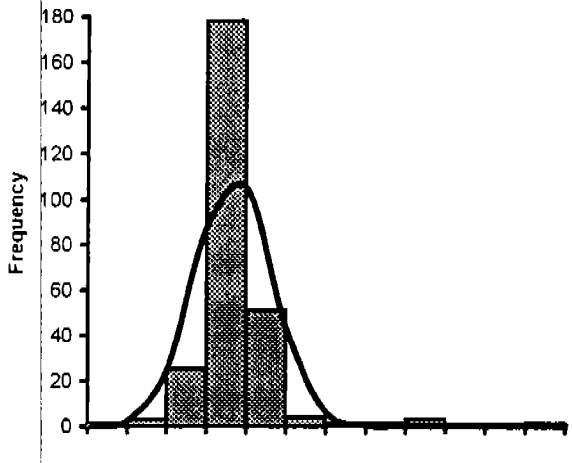
Percentile	
2.5th	130.000
25th	208.250
50th	243.500
75th	306.750
97.5th	1020.375



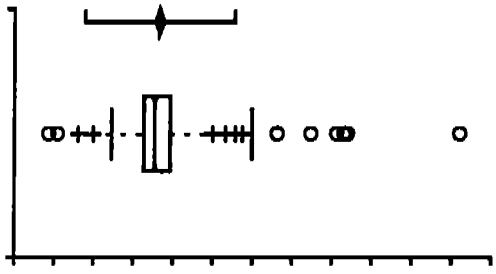
	Coefficient	p
Shapiro-Wilk	0.1125	<0.0001
Skewness	14.1795	<0.0001
Kurtosis	216.7211	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Barium (log-transformed)
Project	Tourtelot
Date	1 June 2001

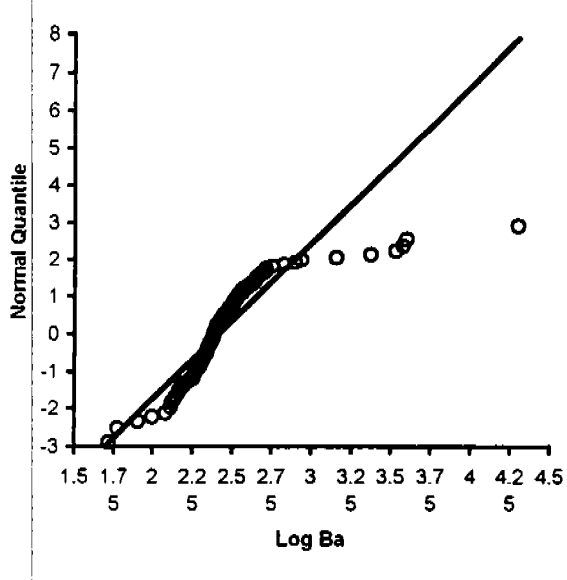


n	268 (cases excluded: 20 due to m
Mean	2.419
95% CI	2.390 to 2.448
Variance	0.0576
SD	0.2400
SE	0.0147
CV	10%



Median	2.386
95.6% CI	2.377 to 2.398
Range	2.580870692
IQR	0.168207619

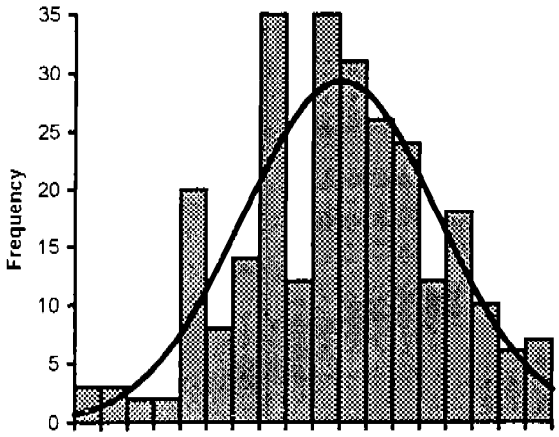
Percentile	
2.5th	2.114
25th	2.319
50th	2.386
75th	2.487
97.5th	2.997



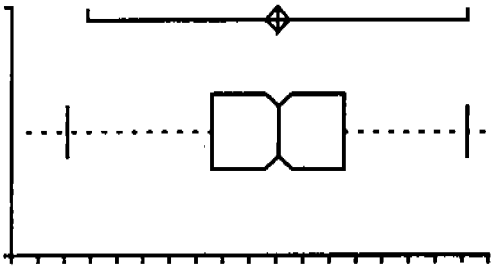
	Coefficient	p
Shapiro-Wilk	0.7293	<0.0001
Skewness	3.2189	<0.0001
Kurtosis	19.8194	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Beryllium
Project	Tourtelot
Date	1 June 2001

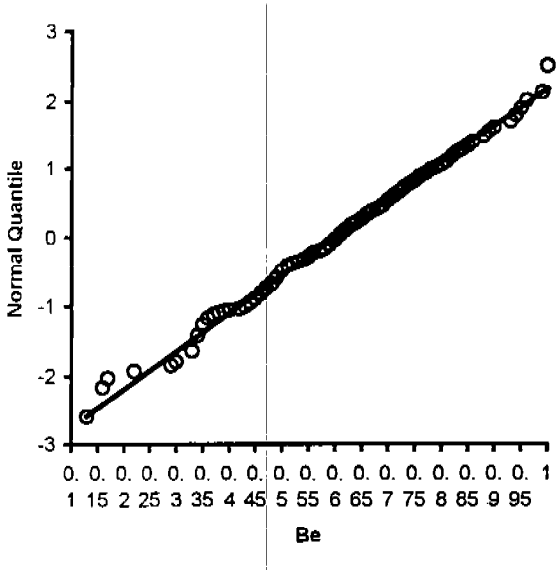


n	268 (cases excluded: 20 due to m
Mean	0.602
95% CI	0.580 to 0.624
Variance	0.0333
SD	0.1826
SE	0.0112
CV	30%



Median	0.605
95.6% CI	0.580 to 0.630
Range	0.87
IQR	0.2475

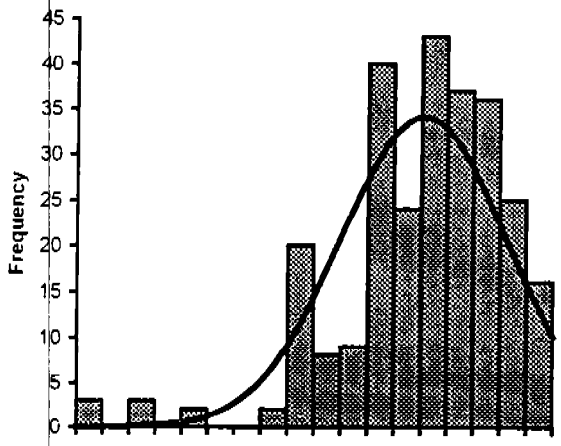
Percentile	
2.5th	0.206
25th	0.480
50th	0.605
75th	0.728
97.5th	0.960



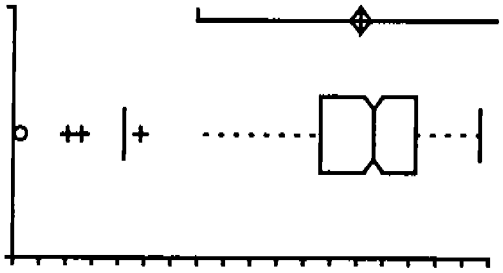
	Coefficient	p
Shapiro-Wilk	0.9912	0.1106
Skewness	-0.0955	0.5158
Kurtosis	-0.2055	0.5131

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Beryllium (log-transformed)
Project	Tourtelot
Date	1 June 2001

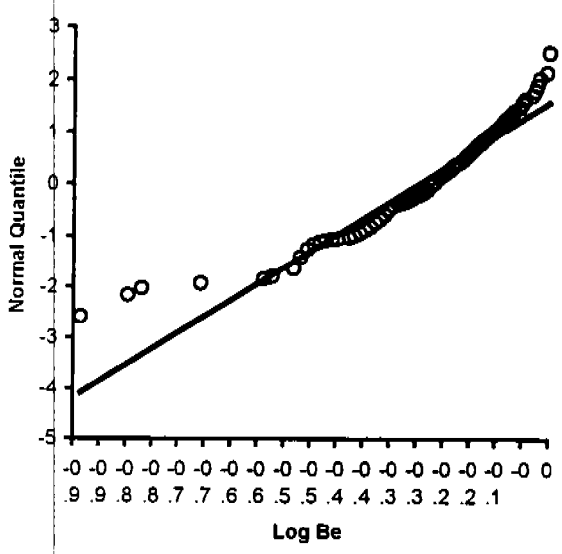


n	268 (cases excluded: 20 due to m
Mean	-0.245
95% CI	-0.264 to -0.226
Variance	0.0245
SD	0.1566
SE	0.0096
CV	-64%



Median	-0.218
95.6% CI	-0.237 to -0.201
Range	0.886056648
IQR	0.180584032

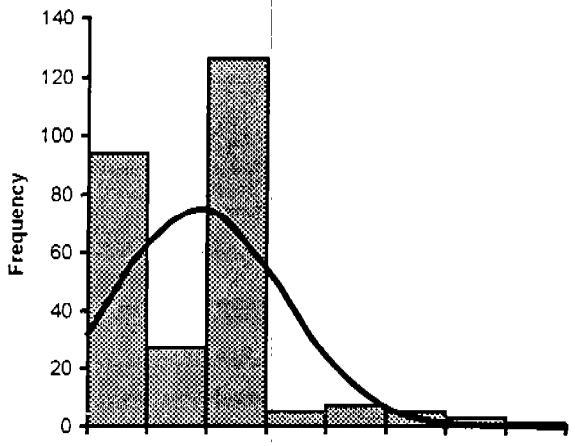
Percentile	
2.5th	-0.688
25th	-0.319
50th	-0.218
75th	-0.138
97.5th	-0.018



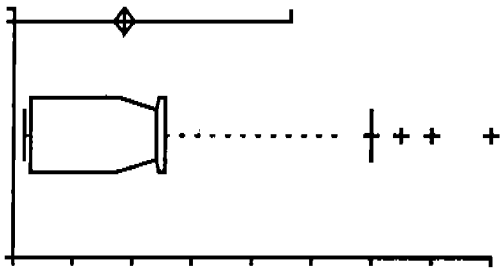
	Coefficient	p
Shapiro-Wilk	0.9075	<0.0001
Skewness	-1.3769	<0.0001
Kurtosis	3.1795	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Cadmium
Project	Tourtelot
Date	1 June 2001

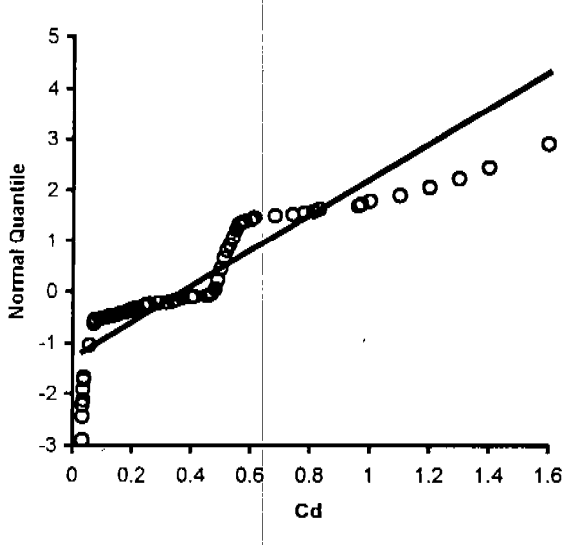


n	268 (cases excluded: 20 due to m
Mean	0.370
95% CI	0.336 to 0.405
Variance	0.0810
SD	0.2846
SE	0.0174
CV	77%



Median	0.480
95.6% CI	0.350 to 0.490
Range	1.567
IQR	0.453

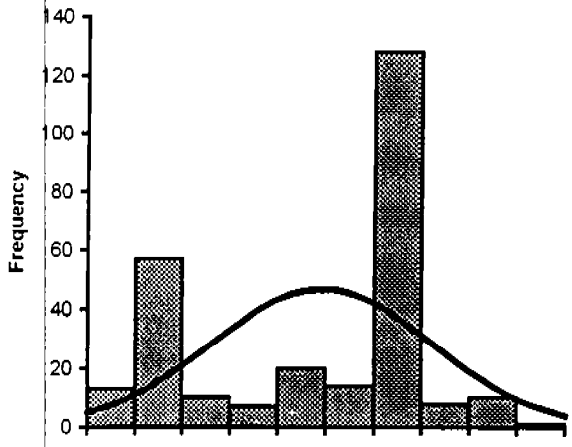
Percentile	
2.5th	0.037
25th	0.057
50th	0.480
75th	0.510
97.5th	1.200



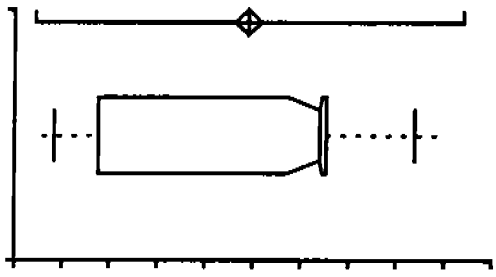
	Coefficient	p
Shapiro-Wilk	0.8398	<0.0001
Skewness	1.0433	<0.0001
Kurtosis	2.1638	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Cadmium (log-transformed)
Project	Tourtelot
Date	1 June 2001

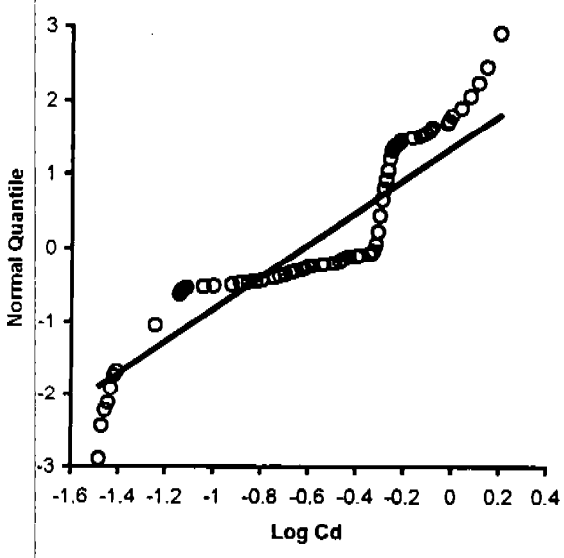


n	268 (cases excluded: 20 due to m
Mean	-0.616
95% CI	-0.672 to -0.561
Variance	0.2095
SD	0.4578
SE	0.0280
CV	-74%



Median	-0.319
95.6% CI	-0.456 to -0.310
Range	1.685606043
IQR	0.95169532

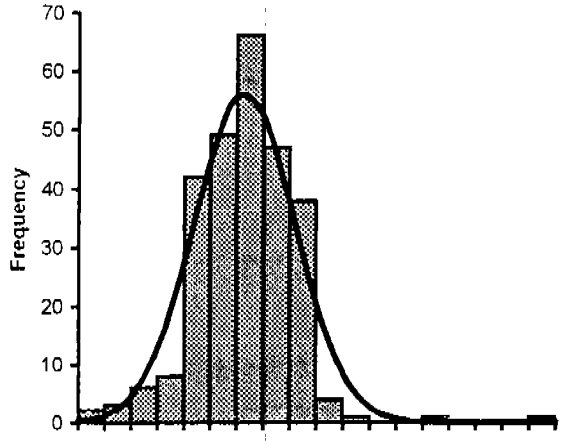
Percentile	
2.5th	-1.432
25th	-1.244
50th	-0.319
75th	-0.292
97.5th	0.079



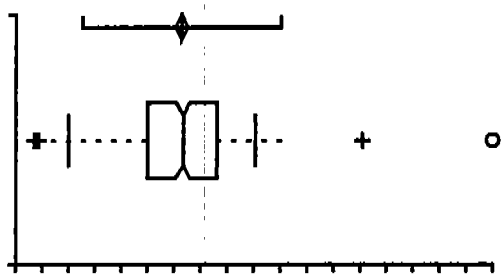
	Coefficient	p
Shapiro-Wilk	0.8319	<0.0001
Skewness	-0.5267	0.0007
Kurtosis	-1.2484	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Chromium
Project	Tourtelot
Date	1 June 2001

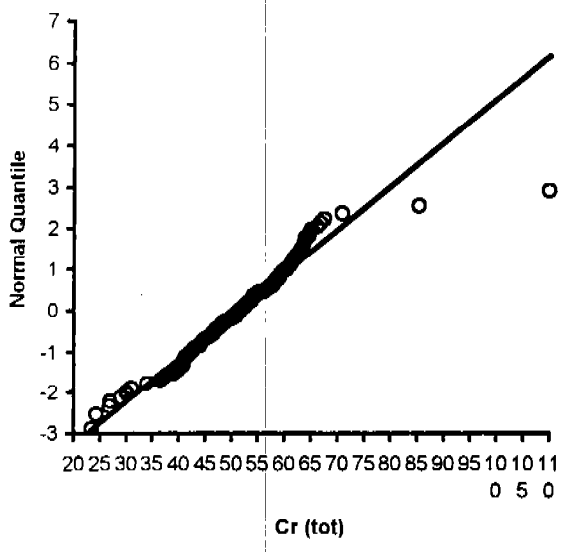


n	268 (cases excluded: 20 due to m
Mean	51.395
95% CI	50.249 to 52.542
Variance	90.8938
SD	9.5338
SE	0.5824
CV	19%



Median	51.800
95.6% CI	50.300 to 53.000
Range	86.5
IQR	13.075

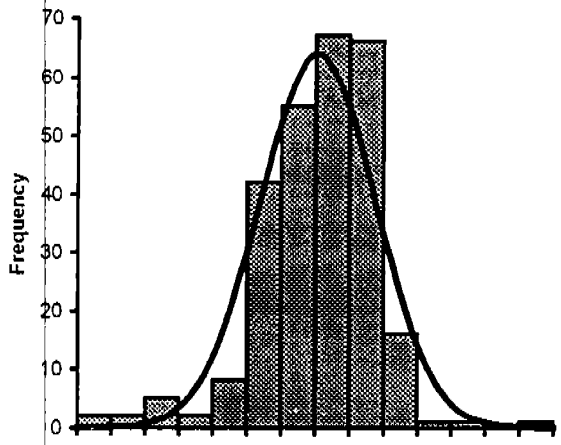
Percentile	
2.5th	30.073
25th	45.000
50th	51.800
75th	58.075
97.5th	65.403



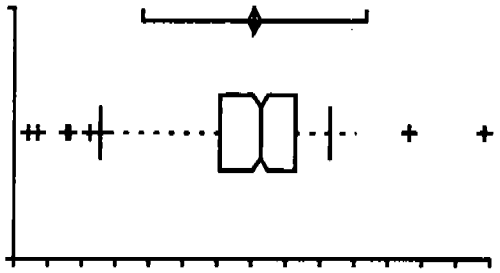
	Coefficient	p
Shapiro-Wilk	0.9423	<0.0001
Skewness	0.6009	0.0001
Kurtosis	5.2457	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Chromium (log-transformed)
Project	Tourtelot
Date	1 June 2001

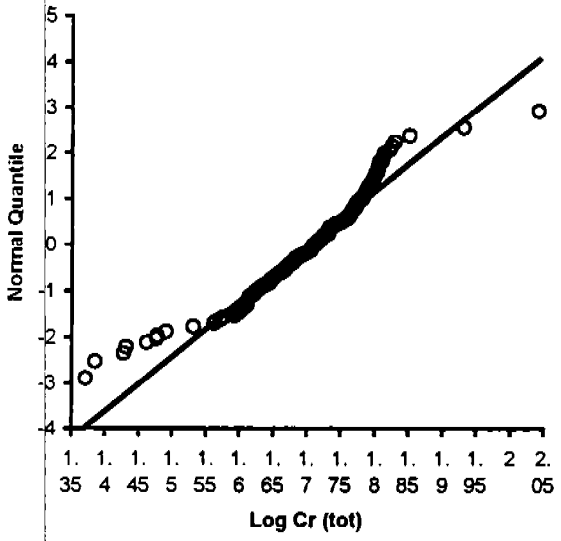


n	268 (cases excluded: 20 due to m
Mean	1.703
95% CI	1.693 to 1.713
Variance	0.0070
SD	0.0836
SE	0.0051
CV	5%



Median	1.714
95.6% CI	1.702 to 1.724
Range	0.670324823
IQR	0.110776584

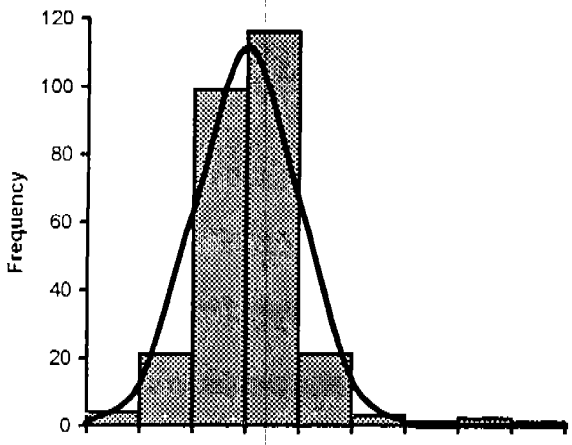
Percentile	
2.5th	1.478
25th	1.653
50th	1.714
75th	1.764
97.5th	1.816



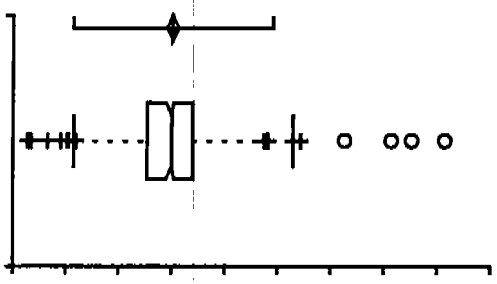
	Coefficient	p
Shapiro-Wilk	0.9409	<0.0001
Skewness	-0.7412	<0.0001
Kurtosis	2.6457	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Cobalt
Project	Tourtelot
Date	1 June 2001

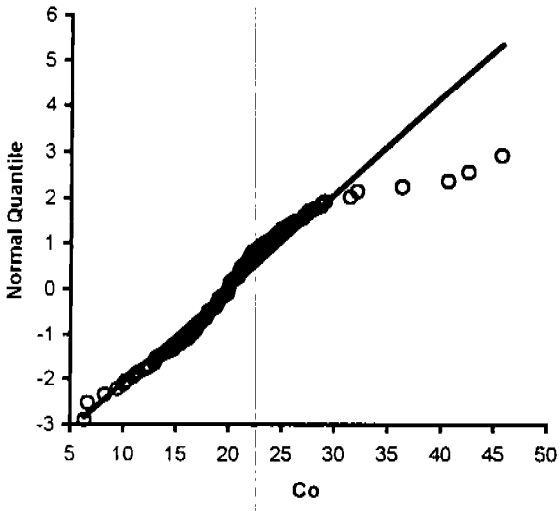


n	268 (cases excluded: 20 due to m
Mean	20.105
95% CI	19.528 to 20.683
Variance	23.0424
SD	4.8003
SE	0.2932
CV	24%



Median	20.000
95.6% CI	19.500 to 20.200
Range	39.3
IQR	4.325

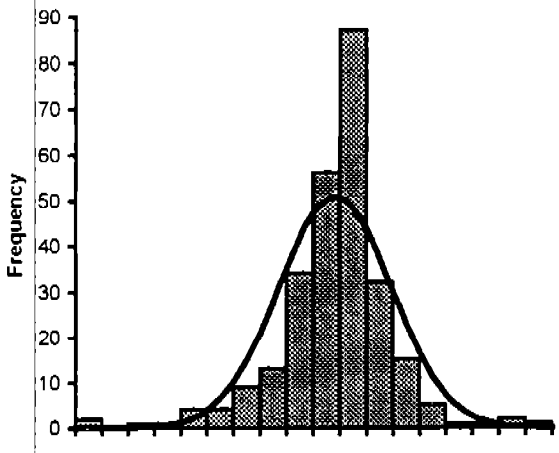
Percentile	
2.5th	10.808
25th	17.675
50th	20.000
75th	22.000
97.5th	31.400



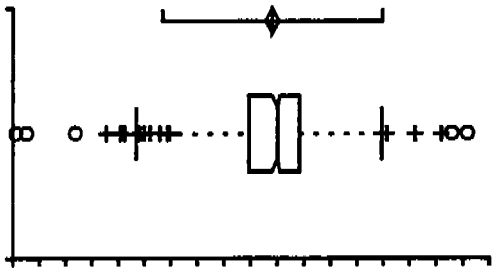
	Coefficient	p
Shapiro-Wilk	0.9109	<0.0001
Skewness	1.1882	<0.0001
Kurtosis	5.7956	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Cobalt (log-transformed)
Project	Tourtelot
Date	1 June 2001

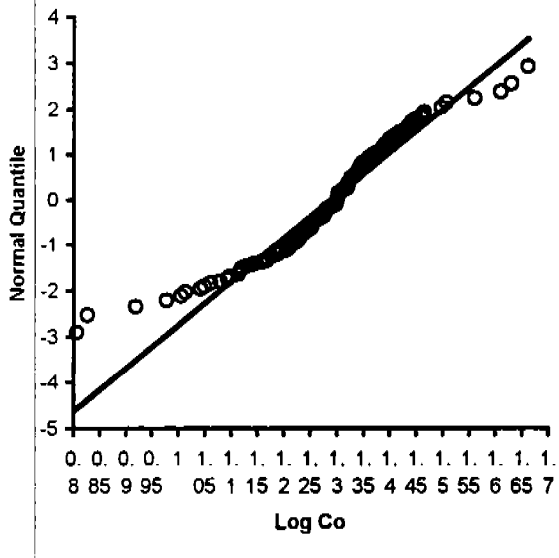


n	268 (cases excluded: 20 due to m
Mean	1.291
95% CI	1.278 to 1.304
Variance	0.0112
SD	0.1057
SE	0.0065
CV	8%



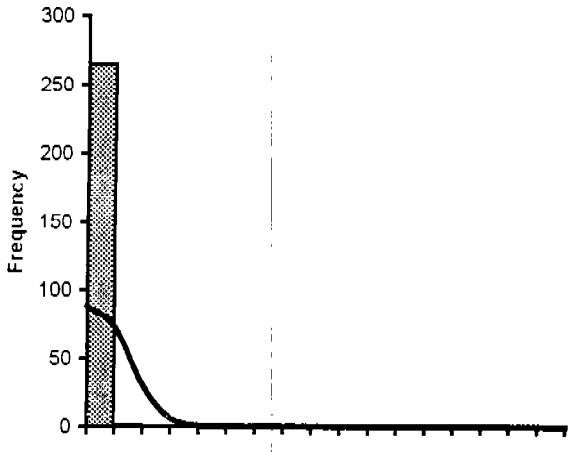
Median	1.301
95.6% CI	1.290 to 1.305
Range	0.853736226
IQR	0.095064564

Percentile	
2.5th	1.034
25th	1.247
50th	1.301
75th	1.342
97.5th	1.497

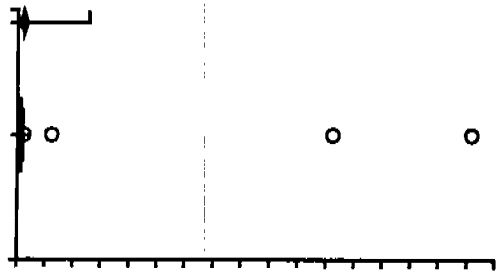


	Coefficient	p
Shapiro-Wilk	0.9271	<0.0001
Skewness	-0.7526	<0.0001
Kurtosis	4.0657	<0.0001

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Copper
Project	Tourtelot
Date	1 June 2001

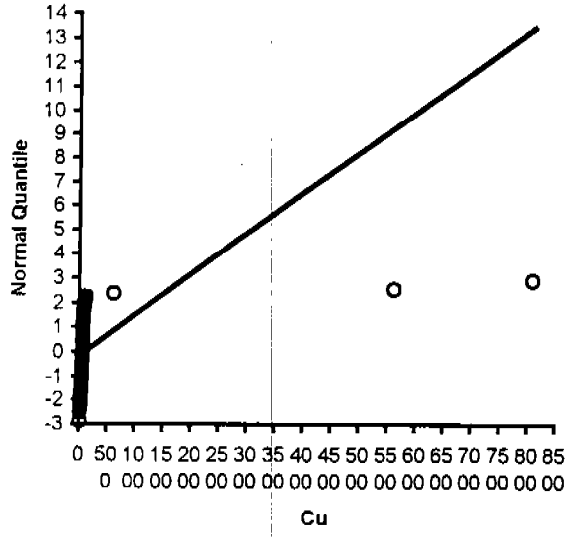


n	268 (cases excluded: 20 due to m
Mean	115.288
95% CI	43.469 to 187.106
Variance	356585.2021
SD	597.1476
SE	36.4766
CV	518%



Median	62.550
95.6% CI	60.200 to 64.000
Range	8077.2
IQR	13.375

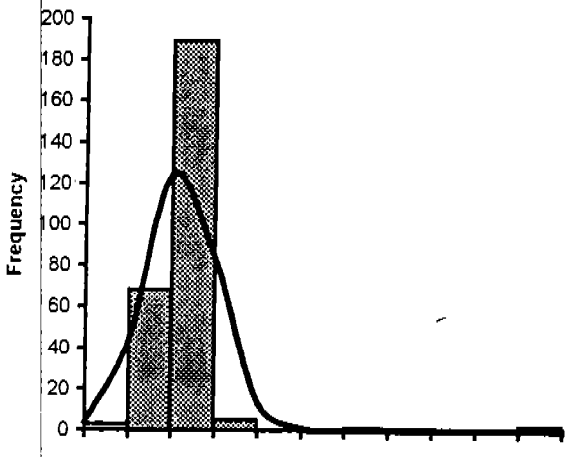
Percentile	
2.5th	35.185
25th	56.000
50th	62.550
75th	69.375
97.5th	101.100



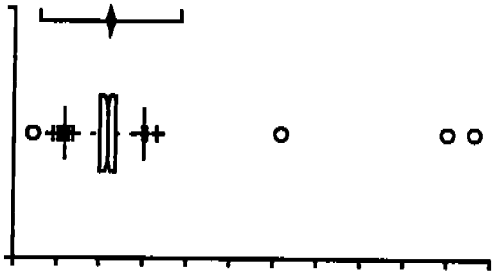
	Coefficient	p
Shapiro-Wilk	0.0729	<0.0001
Skewness	11.9950	<0.0001
Kurtosis	147.2801	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Copper (log-transformed)
Project	Tourtelot
Date	1 June 2001

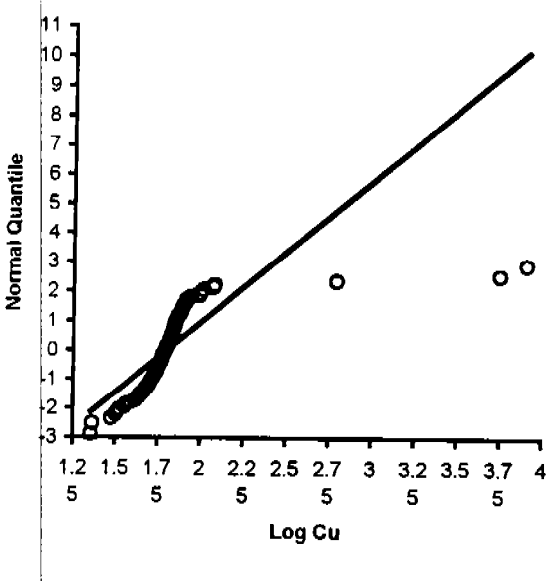


n	268 (cases excluded: 20 due to m
Mean	1.805
95% CI	1.780 to 1.830
Variance	0.0433
SD	0.2080
SE	0.0127
CV	12%



Median	1.796
95.6% CI	1.780 to 1.806
Range	2.550550172
IQR	0.093014884

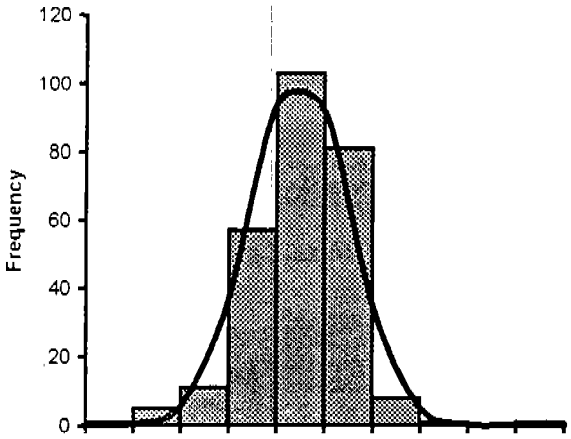
Percentile	
2.5th	1.546
25th	1.748
50th	1.796
75th	1.841
97.5th	2.005



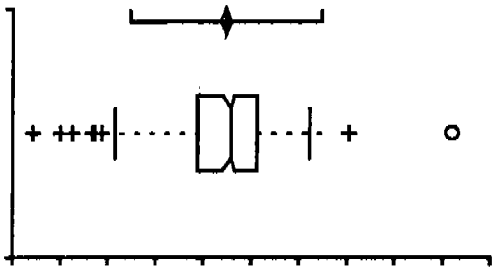
	Coefficient	p
Shapiro-Wilk	0.4317	<0.0001
Skewness	7.2522	<0.0001
Kurtosis	68.5569	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Iron
Project	Tourtelot
Date	1 June 2001

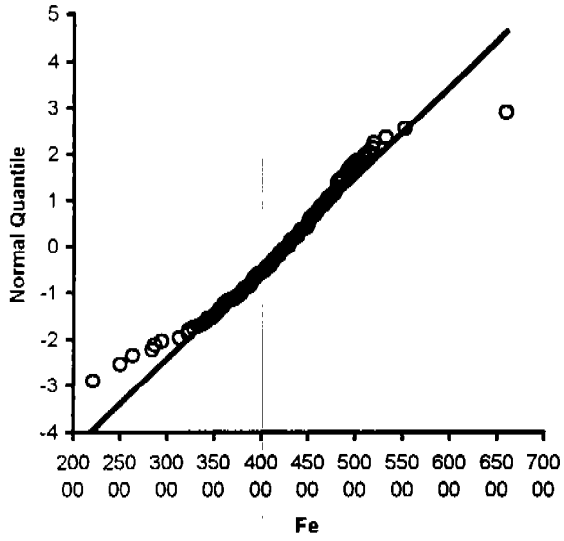


n	268 (cases excluded: 20 due to m
Mean	42375.746
95% CI	41760.940 to 42990.553
Variance	26131806.5571
SD	5111.9279
SE	312.2607
CV	12%



Median	42900.000
95.6% CI	42000.000 to 43300.000
Range	43900
IQR	6250

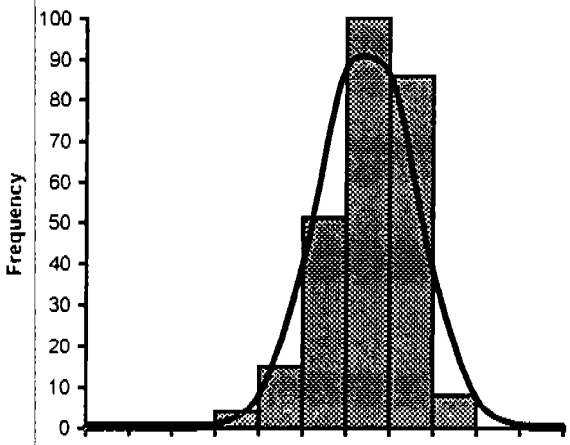
Percentile	
2.5th	30777.500
25th	39400.000
50th	42900.000
75th	45650.000
97.5th	51110.000



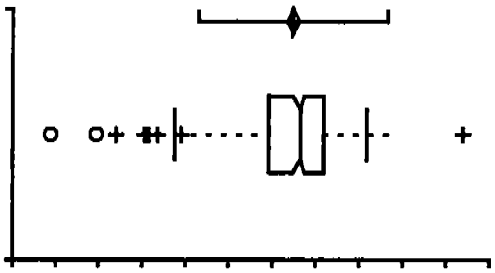
	Coefficient	p
Shapiro-Wilk	0.9655	<0.0001
Skewness	-0.3251	0.0302
Kurtosis	2.5480	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Iron (log-transformed)
Project	Tourtelot
Date	1 June 2001

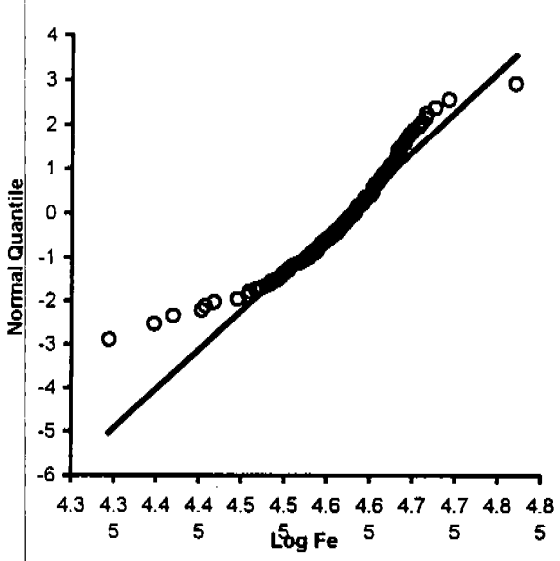


n	268 (cases excluded: 20 due to m
Mean	4.624
95% CI	4.617 to 4.630
Variance	0.0031
SD	0.0554
SE	0.0034
CV	1%



Median	4.632
95.6% CI	4.623 to 4.636
Range	0.475151662
IQR	0.063943777

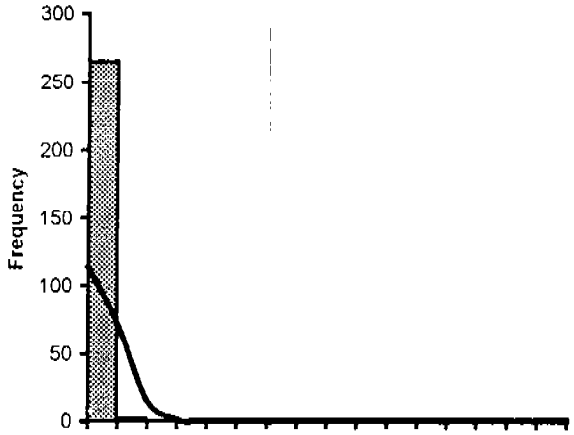
Percentile	
2.5th	4.488
25th	4.595
50th	4.632
75th	4.659
97.5th	4.709



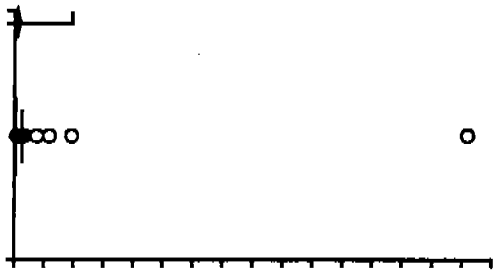
	Coefficient	p
Shapiro-Wilk	0.9296	<0.0001
Skewness	-1.1485	<0.0001
Kurtosis	3.9128	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Lead
Project	Tourtelot
Date	1 June 2001

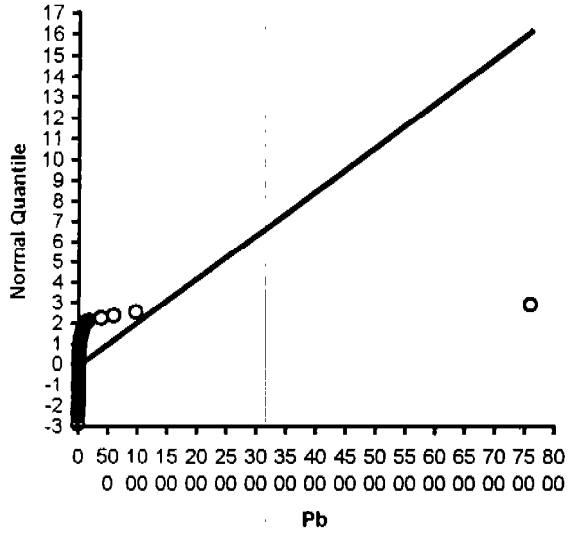


n	268 (cases excluded: 20 due to m
Mean	54.037
95% CI	-2.323 to 110.397
Variance	219601.4690
SD	468.6165
SE	28.6253
CV	867%



Median	11.450
95.6% CI	11.000 to 12.000
Range	7598
IQR	7.675

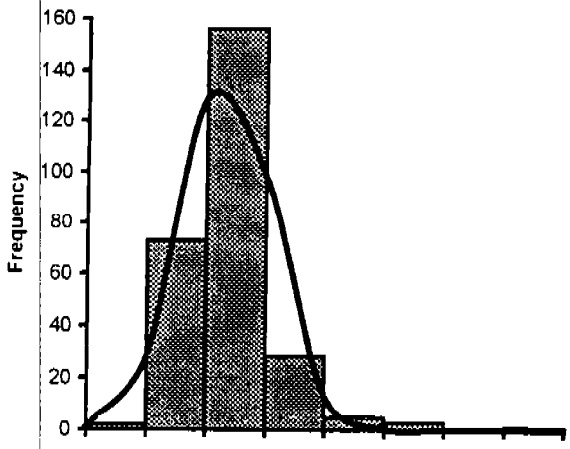
Percentile	
2.5th	5.770
25th	9.700
50th	11.450
75th	17.375
97.5th	124.125



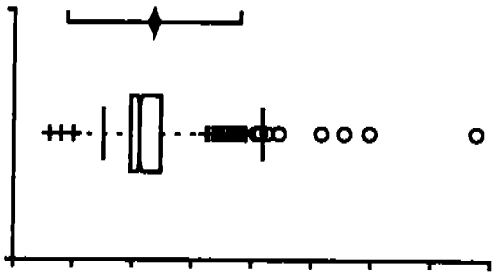
	Coefficient	p
Shapiro-Wilk	0.0627	<0.0001
Skewness	15.7906	<0.0001
Kurtosis	254.5657	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Lead (log-transformed)
Project	Tourtelot
Date	1 June 2001

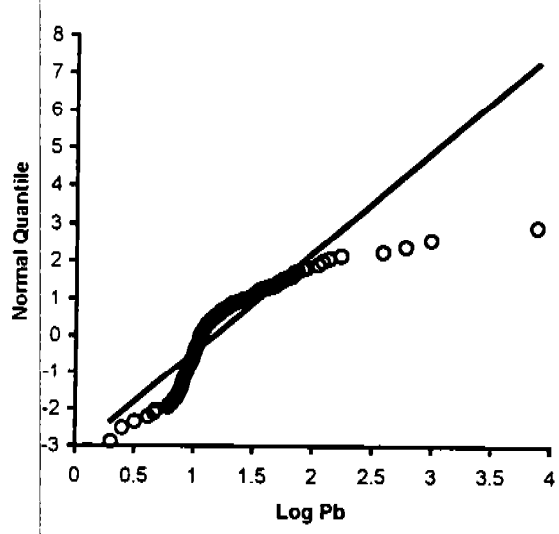


n	268 (cases excluded: 20 due to m
Mean	1.174
95% CI	1.129 to 1.218
Variance	0.1390
SD	0.3728
SE	0.0228
CV	32%



Median	1.059
95.6% CI	1.041 to 1.079
Range	3.579783597
IQR	0.253119033

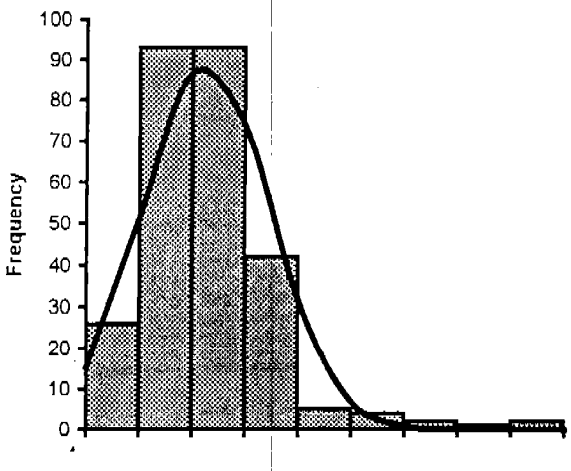
Percentile	
2.5th	0.759
25th	0.987
50th	1.059
75th	1.240
97.5th	2.093



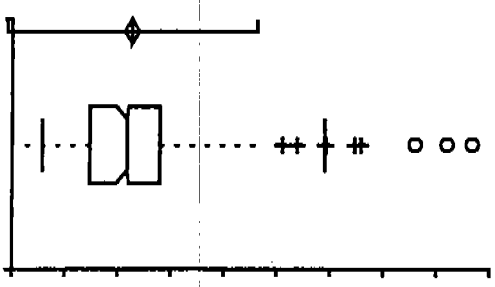
	Coefficient	p
Shapiro-Wilk	0.7508	<0.0001
Skewness	2.8093	<0.0001
Kurtosis	13.5321	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Manganese
Project	Tourtelot
Date	1 June 2001

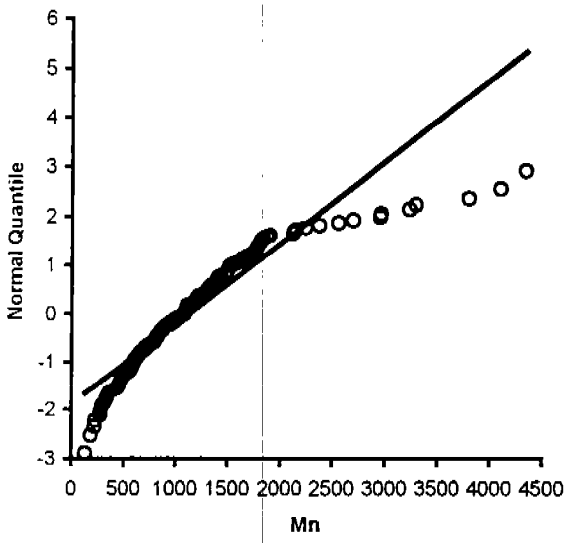


n	268 (cases excluded. 20 due to m
Mean	1132.183
95% CI	1059.683 to 1204.683
Variance	363385.7005
SD	602.8148
SE	36.8228
CV	53%



Median	1090.000
95.6% CI	991.000 to 1100.000
Range	4209
IQR	662.5

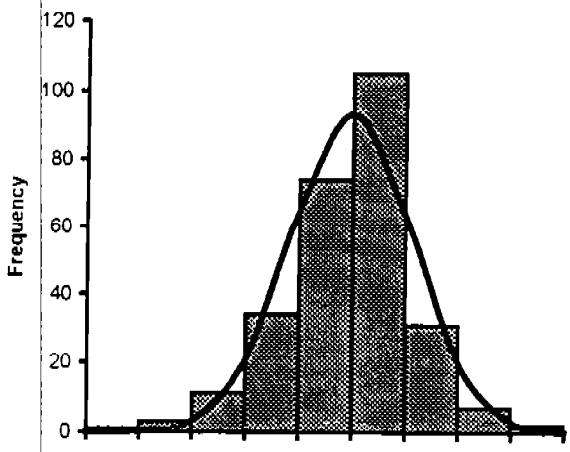
Percentile	
2.5th	287.250
25th	737.500
50th	1090.000
75th	1400.000
97.5th	2952.750



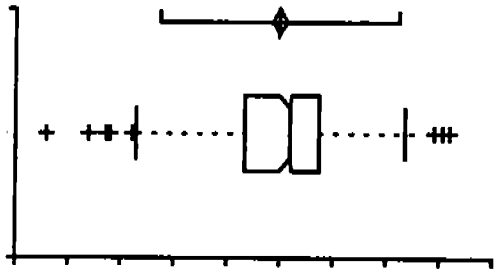
	Coefficient	p
Shapiro-Wilk	0.8656	<0.0001
Skewness	1.9072	<0.0001
Kurtosis	6.5931	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Manganese (log-transformed)
Project	Tourtelot
Date	1 June 2001

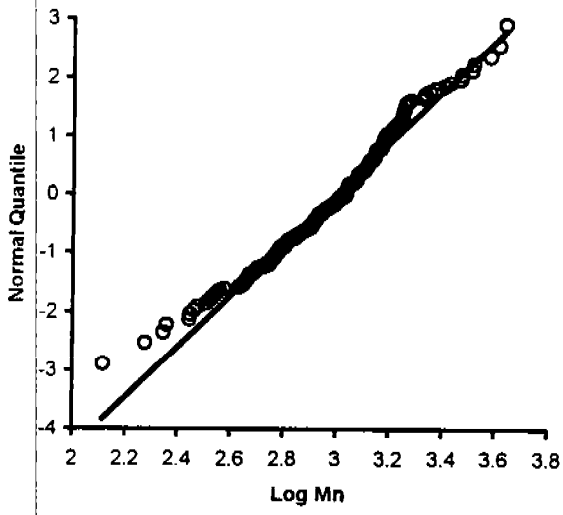


n	268 (cases excluded: 20 due to m
Mean	2.997
95% CI	2.970 to 3.025
Variance	0.0526
SD	0.2294
SE	0.0140
CV	8%



Median	3.037
95.6% CI	2.996 to 3.041
Range	1.520218434
IQR	0.278368713

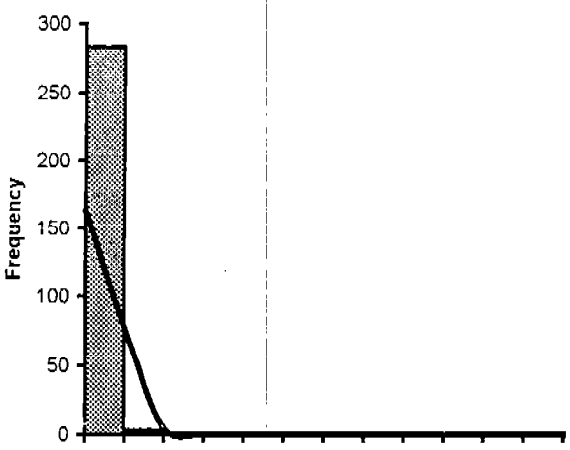
Percentile	
2.5th	2.458
25th	2.868
50th	3.037
75th	3.146
97.5th	3.470



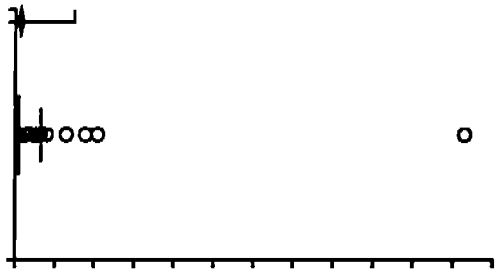
	Coefficient	p
Shapiro-Wilk	0.9755	0.0001
Skewness	-0.4945	0.0013
Kurtosis	1.1384	0.0054

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Mercury
Project	Tourtelot
Date	1 June 2001

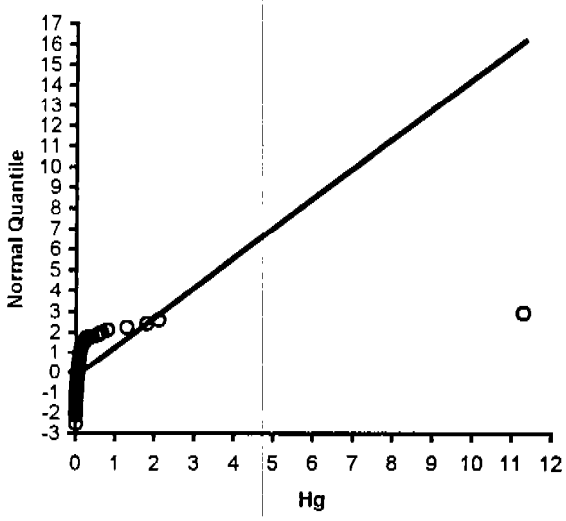


n	288
Mean	0.140
95% CI	0.060 to 0.221
Variance	0.4793
SD	0.6923
SE	0.0408
CV	493%



Median	0.058
96.1% CI	0.052 to 0.067
Range	11.2901
IQR	0.05525

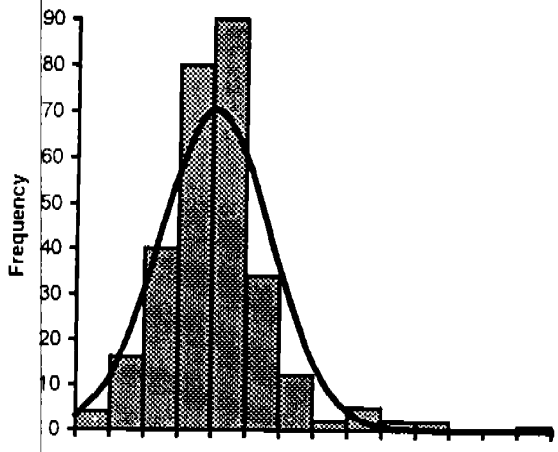
Percentile	
2.5th	0.012
25th	0.036
50th	0.058
75th	0.091
97.5th	0.650



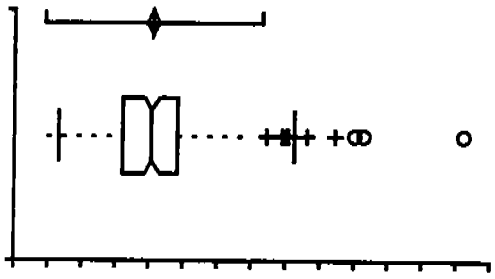
	Coefficient	p
Shapiro-Wilk	0.1143	<0.0001
Skewness	14.8641	<0.0001
Kurtosis	237.6126	<0.0001

analysed with: Analyse-It - General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Mercury (log-transformed)
Project	Tourtelot
Date	1 June 2001

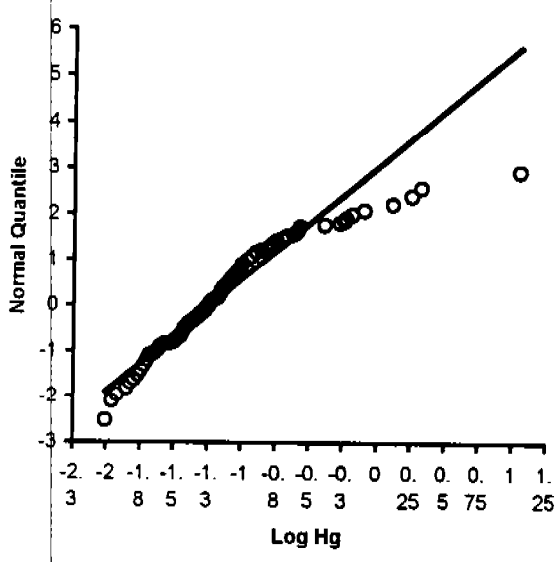


n	288
Mean	-1.228
95% CI	-1.275 to -1.180
Variance	0.1667
SD	0.4082
SE	0.0241
CV	-33%



Median	-1.237
96.1% CI	-1.284 to -1.174
Range	3.057443249
IQR	0.405797506

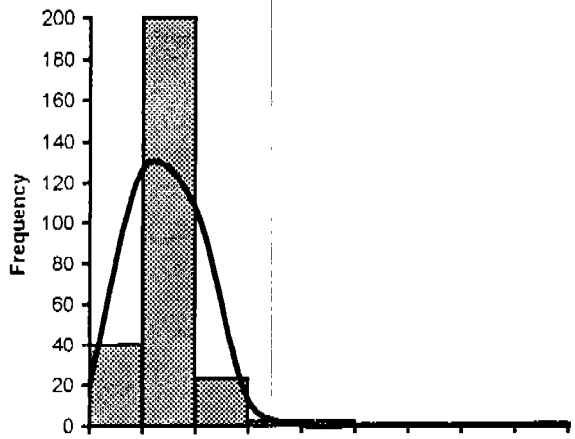
Percentile	
2.5th	-1.921
25th	-1.447
50th	-1.237
75th	-1.041
97.5th	-0.187



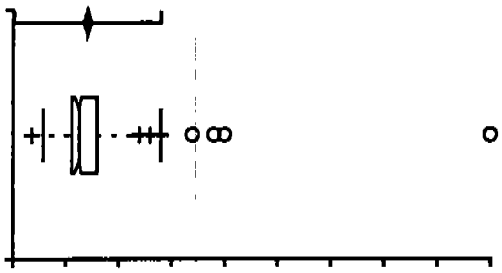
	Coefficient	p
Shapiro-Wilk	0.9212	<0.0001
Skewness	1.2986	<0.0001
Kurtosis	4.5138	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Molybdenum
Project	Tourtelot
Date	1 June 2001

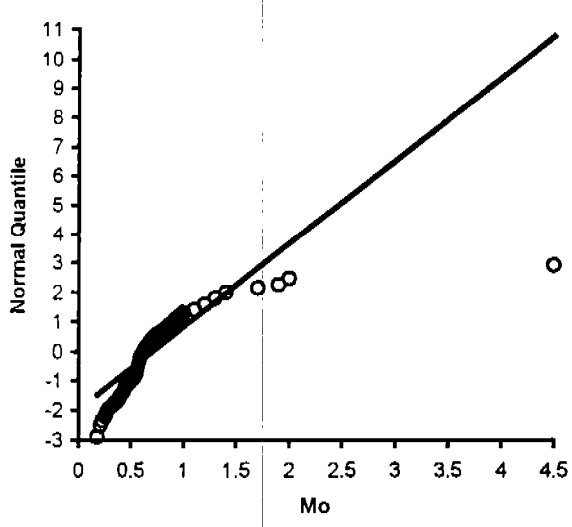


n	268 (cases excluded: 20 due to m
Mean	0.708
95% CI	0.666 to 0.751
Variance	0.1253
SD	0.3539
SE	0.0216
CV	50%



Median	0.630
95.6% CI	0.590 to 0.650
Range	4.32
IQR	0.2375

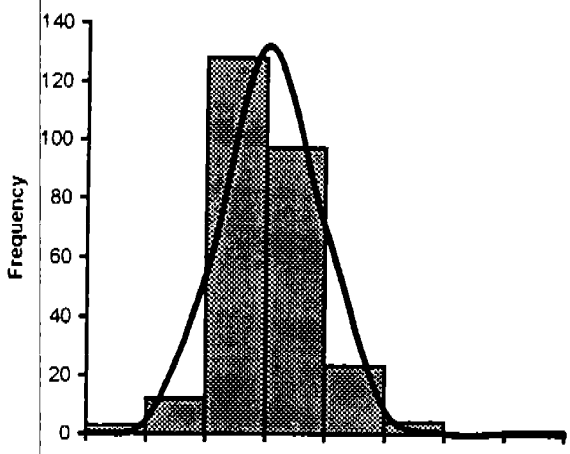
Percentile	
2.5th	0.285
25th	0.560
50th	0.630
75th	0.798
97.5th	1.400



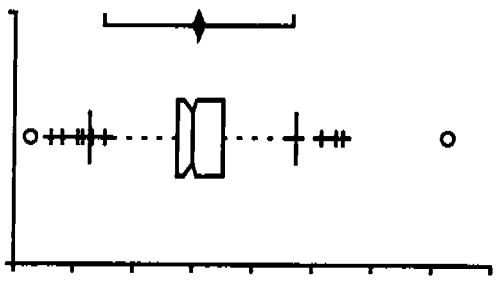
	Coefficient	p
Shapiro-Wilk	0.6410	<0.0001
Skewness	5.3677	<0.0001
Kurtosis	50.1137	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Molybdenum (log-transformed)
Project	Tourtelot
Date	1 June 2001

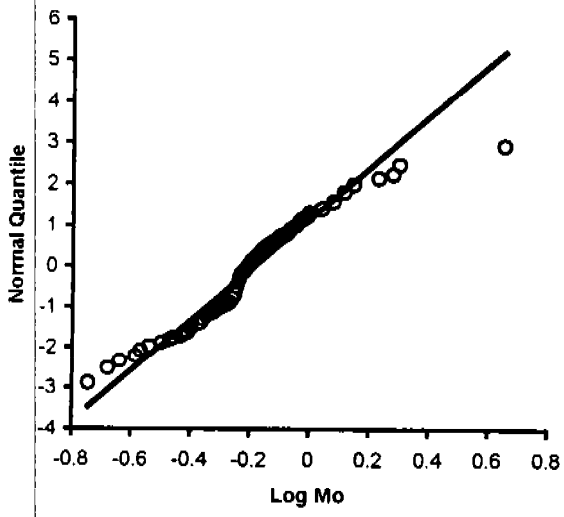


n	268 (cases excluded: 20 due to m
Mean	-0.183
95% CI	-0.202 to -0.163
Variance	0.0260
SD	0.1612
SE	0.0098
CV	-88%



Median	-0.201
95.6% CI	-0.229 to -0.187
Range	1.397940009
IQR	0.153536236

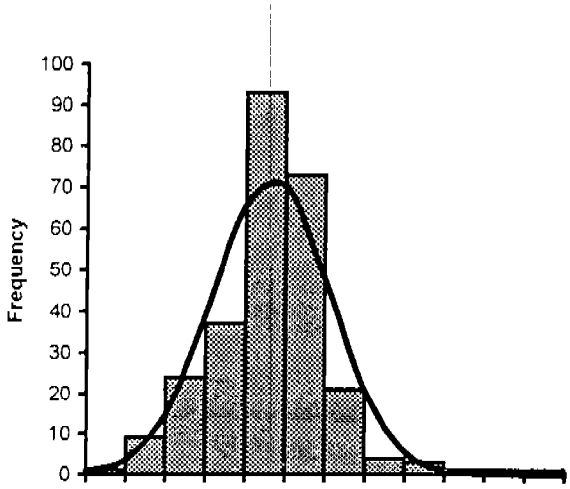
Percentile	
2.5th	-0.546
25th	-0.252
50th	-0.201
75th	-0.098
97.5th	0.146



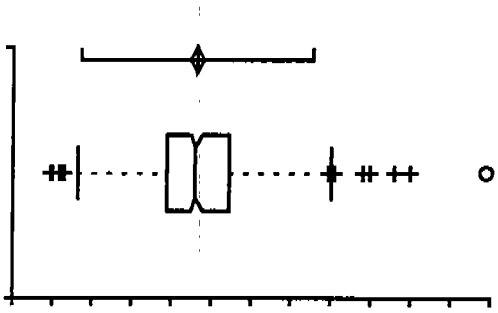
	Coefficient	p
Shapiro-Wilk	0.9431	<0.0001
Skewness	0.5110	0.0009
Kurtosis	3.5706	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Nickel
Project	Tourtelot
Date	1 June 2001

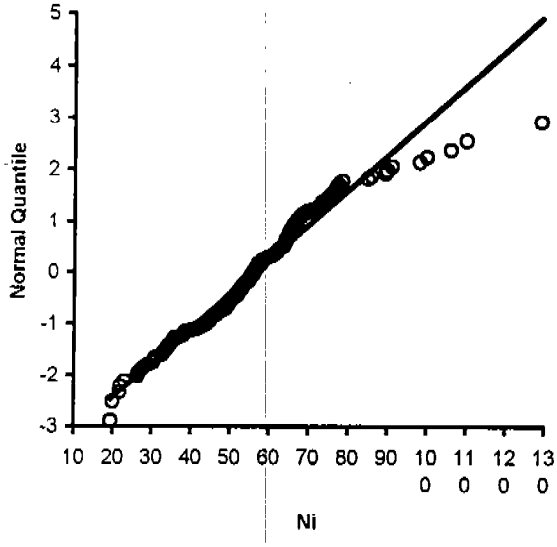


n	268 (cases excluded: 20 due to m
Mean	56.421
95% CI	54.638 to 58.205
Variance	219.8607
SD	14.8277
SE	0.9057
CV	26%



Median	56.000
95.6% CI	55.000 to 57.900
Range	109.5
IQR	15.575

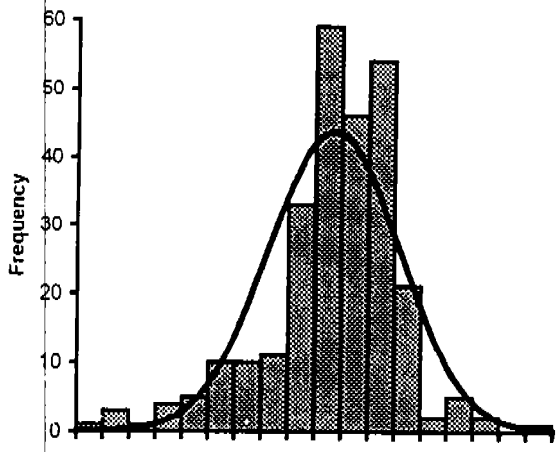
Percentile	
2.5th	26.473
25th	49.000
50th	56.000
75th	64.575
97.5th	90.175



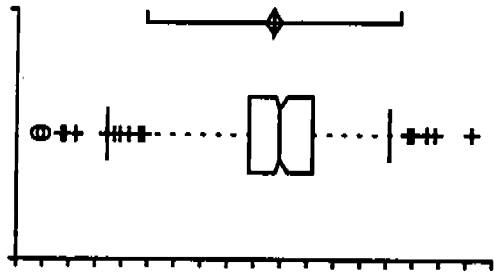
	Coefficient	p
Shapiro-Wilk	0.9550	<0.0001
Skewness	0.5932	0.0002
Kurtosis	2.8613	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Nickel (log-transformed)
Project	Tourtelot
Date	1 June 2001

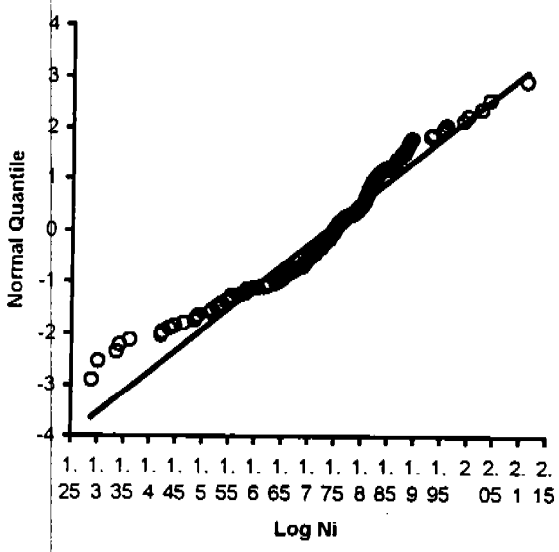


n	268 (cases excluded: 20 due to m
Mean	1.735
95% CI	1.721 to 1.750
Variance	0.0149
SD	0.1221
SE	0.0075
CV	7%



Median	1.748
95.6% CI	1.740 to 1.763
Range	0.820555099
IQR	0.119868237

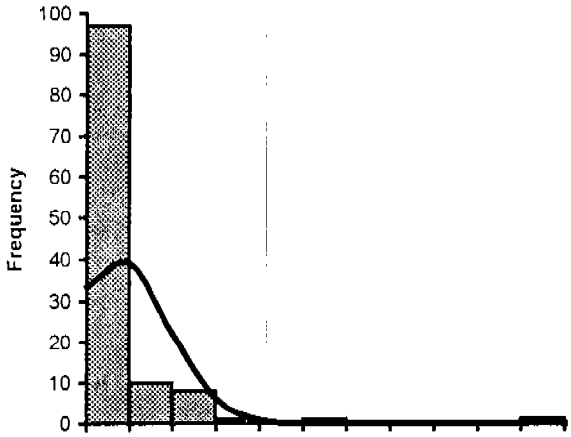
Percentile	
2.5th	1.423
25th	1.690
50th	1.748
75th	1.810
97.5th	1.955



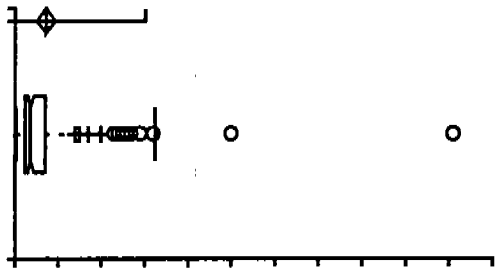
	Coefficient	p
Shapiro-Wilk	0.9390	<0.0001
Skewness	-0.8543	<0.0001
Kurtosis	1.9783	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Nitrate as N
Project	Tourtelot
Date	1 June 2001

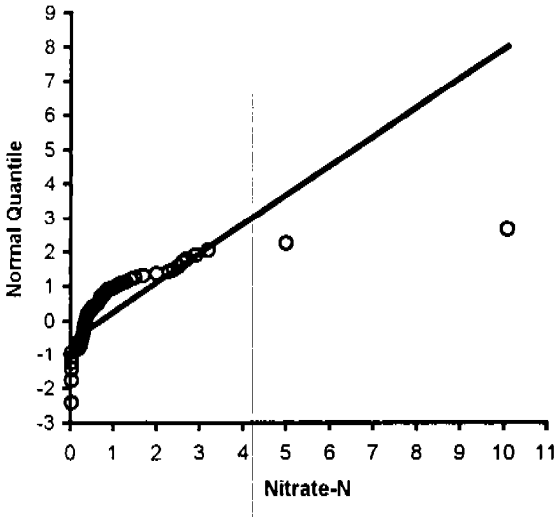


n	118 (cases excluded: 170 due to
Mean	0.712
95% CI	0.498 to 0.926
Variance	1.3749
SD	1.1726
SE	0.1079
CV	165%



Median	0.350
96.6% CI	0.310 to 0.440
Range	10.073
IQR	0.4525

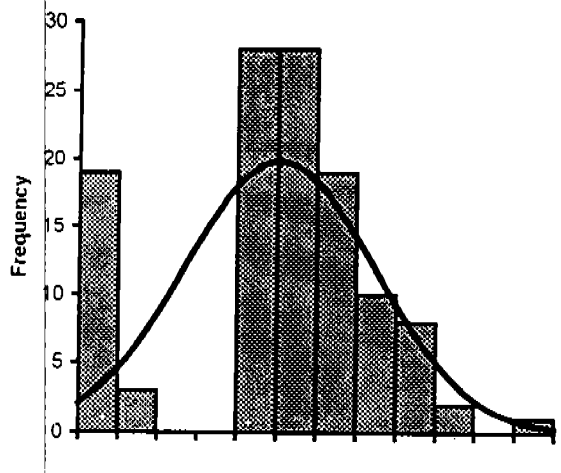
Percentile	
2.5th	0.028
25th	0.240
50th	0.350
75th	0.693
97.5th	3.245



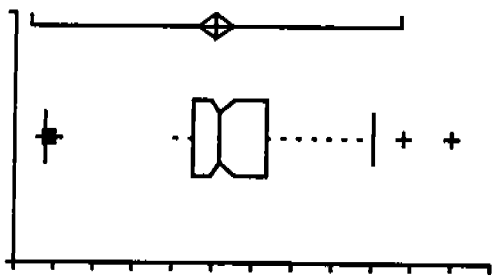
	Coefficient	p
Shapiro-Wilk	0.5056	<0.0001
Skewness	5.1839	<0.0001
Kurtosis	36.1411	<0.0001

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Nitrate as N (log-transformed)
Project	Tourtelot
Date	1 June 2001

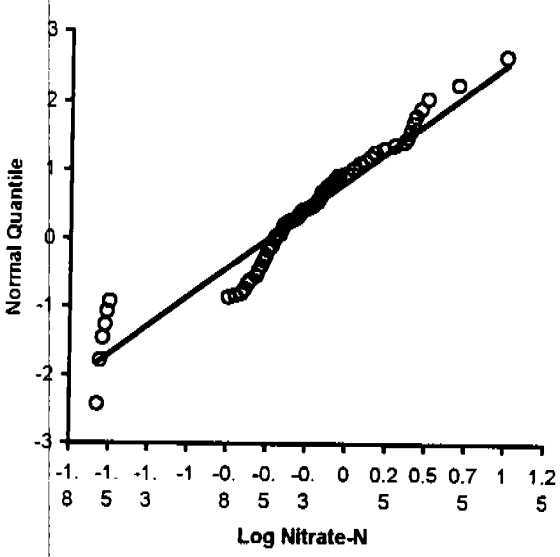


n	118 (cases excluded: 170 due to
Mean	-0.487
95% CI	-0.595 to -0.379
Variance	0.3516
SD	0.5929
SE	0.0546
CV	-122%



Median	-0.456
96.6% CI	-0.509 to -0.357
Range	2.57295761
IQR	0.460200086

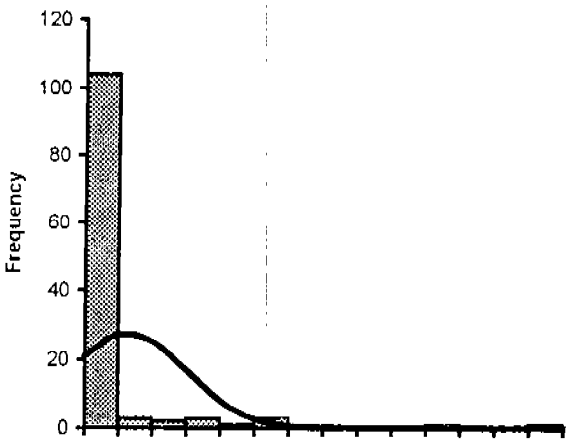
Percentile	
2.5th	-1.553
25th	-0.620
50th	-0.456
75th	-0.160
97.5th	0.510



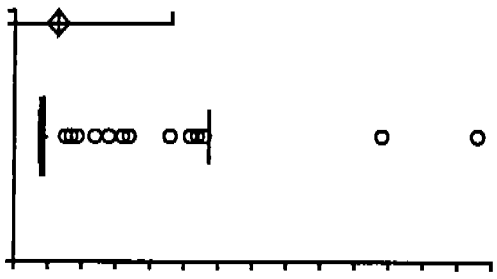
	Coefficient	p
Shapiro-Wilk	0.9064	<0.0001
Skewness	-0.4401	0.0498
Kurtosis	-0.1382	0.8644

analysed with: Analyse-It + General v1.50

Test	**Cumulative Probability and Other Statistics**
Data Set	All Soil and Sediment
Parameter	Nitrite as N
Project	Tourtelot
Date	1 June 2001

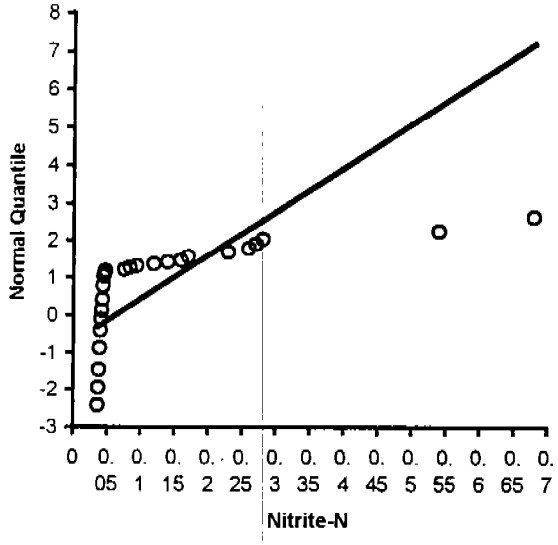


n	118 (cases excluded: 170 due to
Mean	0.064
95% CI	0.048 to 0.080
Variance	0.0073
SD	0.0856
SE	0.0079
CV	134%



Median	0.042
96.6% CI	0.040 to 0.043
Range	0.644
IQR	0.005

Percentile	
2.5th	0.037
25th	0.039
50th	0.042
75th	0.044
97.5th	0.287



	Coefficient	p
Shapiro-Wilk	0.3198	<0.0001
Skewness	5.1924	<0.0001
Kurtosis	30.6926	<0.0001