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NSB NEW LONDON
5090.3a

Phase II
Remedial Investigation Report
for
Naval Submarine Base
New London
Groton, Connecticut

Volume IV - Appendices F.1 - F.10

Northern Division
Naval Facilities Engineering Command
Contract Number N62472-90-D-1298
Contract Task Order 0129

February 1995

Halliburton NUS
CORPORATION

D-01-95-10

PHASE II
REMEDIAL INVESTIGATION REPORT
FOR
NAVAL SUBMARINE BASE, NEW LONDON
GROTON, CONNECTICUT

VOLUME IV - APPENDICES F.1 - F.10

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Northern Division
Environmental Branch, Code 18
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, Pennsylvania 19113-2090

Submitted by:
Halliburton NUS Corporation
993 Old Eagle School Road, Suite 415
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CONTRACT NUMBER N62472-90-D-1298
CONTRACT TASK ORDER 0129

FEBRUARY 1995

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APPENDIX F

RISK ASSESSMENT CALCULATIONS

F.1 BACKGROUND SOIL
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APPENDIX F.1

BACKGROUND SOIL

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: ALUMINUM
ter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	11300	9.332558	1467732.	.0023451
2	7630	8.939843	23829042	.1946058
3	15400	9.642123	8343432.	.0681932
4	15500	9.648595	8931132.	.0716155
5	17600	9.775654	25892832	.1557641
6	16900	9.735069	19258932	.1253757
7	16700	9.723164	17543532	.1170868
8	13600	9.517825	1184832.	.0187253
9	14200	9.560997	2851032.	.0324046
10	12900	9.464983	150932.3	.0070557
11	10400	9.249561	4458432.	.0172721
12	10300	9.239899	4890732.	.0199051
13	14400	9.574983	3566432.	.0376356
14	12100	9.400961	169332.3	.0003990
15	14000	9.546813	2215632.	.0274989
16	11900	9.384294	373932.3	.0000110
17	13000	9.472705	238632.3	.0084126
18	12800	9.457200	83232.25	.0058089
19	4880	8.492900	58239792	.7886933
20	4720	8.459564	60707472	.8490157
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	12511.5	9.380985	3586.503	.3661912
		11860.69		

Upper 95% confidence limit on arithmetic mean: 13898.10
Upper 95% confidence limit on geometric mean: 14866.16

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND ALUMINUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	4720	2.2278e7	8.459564	71.56422
2	4880	2.3814e7	8.492900	72.12936
3	7630	5.8217e7	8.939843	79.92080
4	10300	1.0609e8	9.239899	85.37574
5	10400	1.0816e8	9.249561	85.55438
6	11300	1.2769e8	9.332558	87.09664
7	11900	1.4161e8	9.384294	88.06497
8	12100	1.4641e8	9.400961	88.37806
9	12800	1.6384e8	9.457200	89.43864
10	12900	1.6641e8	9.464983	89.58590
11	13000	1.69e8	9.472705	89.73213
12	13600	1.8496e8	9.517825	90.58899
13	14000	1.96e8	9.546813	91.14163
14	14200	2.0164e8	9.560997	91.41267
15	14400	2.0736e8	9.574983	91.68031
16	15400	2.3716e8	9.642123	92.97053
17	15500	2.4025e8	9.648595	93.09539
18	16700	2.7889e8	9.723164	94.53992
19	16900	2.8561e8	9.735069	94.77157
20	17600	3.0976e8	9.775654	95.56341
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	250230	3.3751e9	187.6197	1762.605

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2.4440e8 (normal distribution)

d = 2.547824 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND ALUMINUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.288e4	6.0974e3
.3211	1.202e4	3.8596e3
.2565	9.07e3	2.3265e3
.2085	5.2e3	1.0842e3
.1686	5e3	8.43e2
.1334	3.1e3	4.1354e2
.1013	2.3e3	2.3299e2
.0711	1.9e3	1.3509e2
.0422	8e2	3.376e1
.014	1e2	1.4e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.5027e4
	Summation**2:	2.2582e8

Wcalc = .9240055 Wtable = .905 Wcalc - Wtable = .0190055

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND ALUMINUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.316090	.6230371
.3211	1.242168	.3988603
.2565	.7833209	.2009218
.2085	.4086961	.0852131
.1686	.3925617	.0661859
.1334	.2424255	.0323396
.1013	.1767036	.0179001
.0711	.1458519	.0103701
.0422	.0606246	.0025584
.014	.0077220	.0001081
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.437494
	Summation**2:	2.066390

Wcalc = .8110411 Wtable = .905 Wcalc - Wtable = -.093959

Arithmetic Average: 12511.5 Geometric Mean: ERROR

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: ARSENIC
er Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.5	.9162907	.1105563	.0780693
2	1.7	.5306283	.2185563	.0112899
3	1.9	.6418539	.0715563	.0000247
4	2.6	.9555114	.1870563	.1015247
5	3.5	1.252763	1.775556	.3793094
6	3.5	1.252763	1.775556	.3793094
7	1.4	.3364722	.5890563	.0902460
8	3.3	1.193922	1.282556	.3102941
9	.72	-.328504	2.095256	.9319702
10	.53	-.634878	2.681406	1.617374
11	2	.6931472	.0280563	.0031658
12	2.3	.8329091	.0175563	.0384266
13	3.6	1.280934	2.052056	.4148028
14	1.9	.6418539	.0715563	.0000247
15	2.7	.9932518	.2835563	.1269994
16	3.1	1.131402	.8695563	.2445502
17	2.5	.9162907	.1105563	.0780693
18	1.2	.1823216	.9360563	.2066252
19	1.9	.6418539	.0715563	.0000247
20	.5	-.693147	2.780556	1.768978
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	2.1675	.6368820	.9735495	.5974101
		1.890577		

Upper 95% confidence limit on arithmetic mean: 2.543890
Upper 95% confidence limit on geometric mean: 3.012992

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND ARSENIC (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.5	2.5e-1	-.693147	.4804530
2	.53	2.809e-1	-.634878	.4030704
3	.72	5.184e-1	-.328504	.1079149
4	1.2	1.44e0	.1823216	.0332412
5	1.4	1.96e0	.3364722	.1132136
6	1.7	2.89e0	.5306283	.2815663
7	1.9	3.61e0	.6418539	.4119764
8	1.9	3.61e0	.6418539	.4119764
9	1.9	3.61e0	.6418539	.4119764
10	2	4e0	.6931472	.4804530
11	2.3	5.29e0	.8329091	.6937376
12	2.5	6.25e0	.9162907	.8395887
13	2.5	6.25e0	.9162907	.8395887
14	2.6	6.76e0	.9555114	.9130021
15	2.7	7.29e0	.9932518	.9865491
16	3.1	9.61e0	1.131402	1.280071
17	3.3	1.089e1	1.193922	1.425451
18	3.5	1.225e1	1.252763	1.569415
19	3.5	1.225e1	1.252763	1.569415
20	3.6	1.296e1	1.280934	1.640792
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	43.35	111.9693	12.73764	14.89345

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 18.00818 (normal distribution)

d = 6.781078 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND ARSENIC (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4734	3.1e0	1.4675e0
	.3211	2.97e0	9.537e-1
	.2565	2.78e0	7.131e-1
	.2085	2.1e0	4.379e-1
	.1686	1.7e0	2.866e-1
	.1334	1e0	1.334e-1
	.1013	7e-1	7.091e-2
	.0711	6e-1	4.266e-2
	.0422	6e-1	2.532e-2
	.014	3e-1	4.2e-3
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.1352e0
Summation**2:			1.7100e1

Wcalc = .9495790 Wtable = .905 Wcalc - Wtable = .0445790

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND ARSENIC (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.974081	.9345300
.3211	1.887641	.6061216
.2565	1.581267	.4055950
.2085	1.011601	.2109188
.1686	.7949299	.1340252
.1334	.4626235	.0617140
.1013	.3136576	.0317735
.0711	.2744368	.0195125
.0422	.2744368	.0115812
.014	.1397619	.0019567
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.417728
Summation**2:		5.845410

Wcalc = .8620179 Wtable = .905 Wcalc - Wtable = -.042982

Arithmetic Average: 2.1675 Geometric Mean: 1.8906e0

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: BARIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	22.3	3.104587	115.4550	.0879795
2	20.8	3.034953	149.9400	.1341369
3	19.4	2.965273	186.1860	.1900323
4	19.5	2.970414	183.4670	.1855762
5	39	3.663562	35.46203	.0688336
6	47.9	3.869116	220.6710	.2189449
7	35.7	3.575151	7.049025	.0302588
8	20	2.995732	170.1720	.1644041
9	35.7	3.575151	7.049025	.0302588
10	57.2	4.046554	583.4640	.4164817
11	14.4	2.667228	347.6360	.5387146
12	13.6	2.610070	378.1080	.6258870
13	34	3.526361	.912025	.0156652
14	26.7	3.284664	40.25903	.0135807
15	37.4	3.621671	18.96603	.0486073
16	26.6	3.280911	41.53803	.0144694
17	53.3	3.975936	410.2650	.3303219
18	69.8	4.245634	1350.930	.7130688
19	28	3.332205	25.45203	.0047604
20	39.6	3.678829	42.96803	.0770779
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	33.045	3.401200	15.07167	.4535857
		30.00008		

Upper 95% confidence limit on arithmetic mean: 38.87195
Upper 95% confidence limit on geometric mean: 40.78152

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BARIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	13.6	1.8496e2	2.610070	6.812464
2	14.4	2.0736e2	2.667228	7.114106
3	19.4	3.7636e2	2.965273	8.792844
4	19.5	3.8025e2	2.970414	8.823362
5	20	4e2	2.995732	8.974412
6	20.8	4.3264e2	3.034953	9.210940
7	22.3	4.9729e2	3.104587	9.638458
8	26.6	7.0756e2	3.280911	10.76438
9	26.7	7.1289e2	3.284664	10.78901
10	28	7.84e2	3.332205	11.10359
11	34	1.156e3	3.526361	12.43522
12	35.7	1.2745e3	3.575151	12.78170
13	35.7	1.2745e3	3.575151	12.78170
14	37.4	1.3988e3	3.621671	13.11650
15	39	1.521e3	3.663562	13.42168
16	39.6	1.5682e3	3.678829	13.53378
17	47.9	2.2944e3	3.869116	14.97005
18	53.3	2.8409e3	3.975936	15.80807
19	57.2	3.2718e3	4.046554	16.37460
20	69.8	4.8720e3	4.245634	18.02541
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	660.9	26155.39	68.02400	235.2723

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 4315.950 (normal distribution)

d = 3.909060 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BARIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	5.62e1	2.6605e1
.3211	4.28e1	1.3743e1
.2565	3.39e1	8.6954e0
.2085	2.84e1	5.9214e0
.1686	1.96e1	3.3046e0
.1334	1.82e1	2.4279e0
.1013	1.51e1	1.5296e0
.0711	9.1e0	6.470e-1
.0422	9e0	3.798e-1
.014	6e0	8.4e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		6.3338e1
Summation**2:		4.0117e3

Wcalc = .9295001 Wtable = .905 Wcalc - Wtable = .0245001

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BARIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.635564	.7742761
.3211	1.379326	.4429015
.2565	1.010663	.2592351
.2085	.8987010	.1873792
.1686	.6830968	.1151701
.1334	.6286087	.0838564
.1013	.5170840	.0523806
.0711	.2942395	.0209204
.0422	.2904871	.0122586
.014	.1941560	.0027182
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.951096
Summation**2:		3.806776

Wcalc = .9738342 Wtable = .905 Wcalc - Wtable = .0688342

Arithmetic Average: 33.045 Geometric Mean: 3.0000e1

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: BERYLLIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.58	-.544727	.0153141	.0861453
2	.39	-.941609	.0043891	.0106866
3	.265	-1.32803	.0365766	.2398972
4	.62	-.478036	.0268141	.1297416
5	.385	-.954512	.0050766	.0135209
6	.34	-1.07881	.0135141	.0578774
7	.72	-.328504	.0695641	.2598230
8	.56	-.579818	.0107641	.0667778
9	.69	-.371064	.0546391	.2182466
10	.57	-.562119	.0129391	.0762387
11	.35	-1.04982	.0112891	.0447702
12	.35	-1.04982	.0112891	.0447702
13	.395	-.928870	.0037516	.0082151
14	.54	-.616186	.0070141	.0493045
15	.6	-.510826	.0206641	.1071952
16	.42	-.867501	.0013141	.0008566
17	.55	-.597837	.0087891	.0577900
18	.3	-1.20397	.0244141	.1337660
19	.25	-1.38629	.0425391	.3003719
20	.25	-1.38629	.0425391	.3003719
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	.45625	-.838232	.1492426	.3407706
		.4324743		

Upper 95% confidence limit on arithmetic mean: .5139496
Upper 95% confidence limit on geometric mean: .5305390

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BERYLLIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.25	6.25e-2	-1.38629	1.921812
2	.25	6.25e-2	-1.38629	1.921812
3	.265	7.023e-2	-1.32803	1.763652
4	.3	9e-2	-1.20397	1.449551
5	.34	1.156e-1	-1.07881	1.163830
6	.35	1.225e-1	-1.04982	1.102126
7	.35	1.225e-1	-1.04982	1.102126
8	.385	1.482e-1	-.954512	.9110931
9	.39	1.521e-1	-.941609	.8866266
10	.395	1.560e-1	-.928870	.8627986
11	.42	1.764e-1	-.867501	.7525572
12	.54	2.916e-1	-.616186	.3796854
13	.55	3.025e-1	-.597837	.3574091
14	.56	3.136e-1	-.579818	.3361895
15	.57	3.249e-1	-.562119	.3159777
16	.58	3.364e-1	-.544727	.2967277
17	.6	3.6e-1	-.510826	.2609428
18	.62	3.844e-1	-.478036	.2285182
19	.69	4.761e-1	-.371064	.1376883
20	.72	5.184e-1	-.328504	.1079149
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	9.125	4.586475	-16.7646	16.25904

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = .4231938 (normal distribution)

d = 2.206367 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BERYLLIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4734	4.7e-1	2.225e-1
	.3211	4.4e-1	1.413e-1
	.2565	3.55e-1	9.106e-2
	.2085	3e-1	6.255e-2
	.1686	2.4e-1	4.046e-2
	.1334	2.2e-1	2.935e-2
	.1013	2.1e-1	2.127e-2
	.0711	1.65e-1	1.173e-2
	.0422	1.5e-1	6.33e-3
	.014	2.5e-2	3.5e-4
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			6.269e-1
Summation**2:			3.930e-1

Wcalc = .9286197 Wtable = .905 Wcalc - Wtable = .0236197

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BERYLLIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.057790	.5007579
.3211	1.015231	.3259906
.2565	.8499897	.2180223
.2085	.6931472	.1445212
.1686	.5340825	.0900463
.1334	.4877032	.0650596
.1013	.4700036	.0476114
.0711	.3566749	.0253596
.0422	.3254224	.0137328
.014	.0613689	.0008592
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.431961
Summation**2:		2.050512

Wcalc = .9293613 Wtable = .905 Wcalc - Wtable = .0243613

Arithmetic Average: .45625 Geometric Mean: 4.325e-1

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: BORON
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	3.5	1.252763	.2407129	.0509161
2	3.3	1.193922	.0844629	.0278240
3	1.1	.0953102	3.645713	.8682641
4	5.8	1.757858	7.787588	.5339822
5	3.1	1.131402	.0082129	.0108754
6	1.9	.6418539	1.230713	.1484277
7	3.4	1.223775	.1525879	.0386745
8	2.9	1.064711	.0119629	.0014133
9	3.6	1.280934	.3488379	.0644229
10	3.3	1.193922	.0844629	.0278240
11	2.7	.9932518	.0957129	.0011469
12	1.25	.2231436	3.095400	.6463735
13	2	.6931472	1.018838	.1115359
14	3	1.098612	.0000879	.0051116
15	3.7	1.308333	.4769629	.0790823
16	3.6	1.280934	.3488379	.0644229
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	3.009375	1.027117	1.114483	.4227132
		2.793002		

Upper 95% confidence limit on arithmetic mean: 3.497797
Upper 95% confidence limit on geometric mean: 3.790594

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BORON (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.1	1.21e0	.0953102	.0090840
2	1.25	1.5625e0	.2231436	.0497930
3	1.9	3.61e0	.6418539	.4119764
4	2	4e0	.6931472	.4804530
5	2.7	7.29e0	.9932518	.9865491
6	2.9	8.41e0	1.064711	1.133609
7	3	9e0	1.098612	1.206949
8	3.1	9.61e0	1.131402	1.280071
9	3.3	1.089e1	1.193922	1.425451
10	3.3	1.089e1	1.193922	1.425451
11	3.4	1.156e1	1.223775	1.497626
12	3.5	1.225e1	1.252763	1.569415
13	3.6	1.296e1	1.280934	1.640792
14	3.6	1.296e1	1.280934	1.640792
15	3.7	1.369e1	1.308333	1.711735
16	5.8	3.364e1	1.757858	3.090064
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	48.15	143.5325	16.43387	19.55981

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 18.63109 (normal distribution)

d = 2.680297 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BORON (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.7e0	2.3763e0
.329	2.45e0	8.061e-1
.2521	1.7e0	4.286e-1
.1939	1.6e0	3.102e-1
.1447	8e-1	1.158e-1
.1005	5e-1	5.025e-2
.0593	3e-1	1.779e-2
.0196	2e-1	3.92e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	4.1089e0
	Summation**2:	1.6883e1

Wcalc = .9061765 Wtable = .887 Wcalc - Wtable = .0191765

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGAL
Chemical:	BACKGROUND BORON (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.662548	.8405841
.329	1.085189	.3570273
.2521	.6390800	.1611121
.1939	.5877867	.1139718
.1447	.2595112	.0375513
.1005	.1590647	.0159860
.0593	.0953102	.0056519
.0196	.0625204	.0012254
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.533110
Summation**2:		2.350426

Wcalc = .8769273 Wtable = .887 Wcalc - Wtable = -.010073

Arithmetic Average: 3.009375 Geometric Mean: 2.7930e0

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: CALCIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	222	5.402677	28662.49	.0939023
2	499	6.212606	11599.29	.2535061
3	102	4.624973	83694.49	1.175358
4	115	4.744932	76341.69	.9296433
5	258	5.552960	17768.89	.0243836
6	283	5.645447	11728.89	.0040533
7	254	5.537334	18851.29	.0295077
8	245	5.501258	21403.69	.0432033
9	146	4.983607	60172.09	.5263584
10	177	5.176150	45924.49	.2840490
11	212	5.356586	32148.49	.1242746
12	233	5.451038	25058.89	.0666021
13	314	5.749393	5975.29	.0016225
14	278	5.627621	12836.89	.0066408
15	254	5.537334	18851.29	.0295077
16	268	5.590987	15202.89	.0139536
17	1170	7.064759	606373.7	1.837778
18	1170	7.064759	606373.7	1.837778
19	981	6.888572	347746.1	1.391126
20	645	6.469250	64363.69	.5778099
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	391.3	5.709112	333.3307	.6977807
		301.6032		

Upper 95% confidence limit on arithmetic mean: 520.1710
Upper 95% confidence limit on geometric mean: 547.8387

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCA
Chemical:	BACKGROUND CALCIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	102	1.0404e4	4.624973	21.39037
2	115	1.3225e4	4.744932	22.51438
3	146	2.1316e4	4.983607	24.83633
4	177	3.1329e4	5.176150	26.79253
5	212	4.4944e4	5.356586	28.69302
6	222	4.9284e4	5.402677	29.18892
7	233	5.4289e4	5.451038	29.71382
8	245	6.0025e4	5.501258	30.26384
9	254	6.4516e4	5.537334	30.66207
10	254	6.4516e4	5.537334	30.66207
11	258	6.6564e4	5.552960	30.83536
12	268	7.1824e4	5.590987	31.25914
13	278	7.7284e4	5.627621	31.67012
14	283	8.0089e4	5.645447	31.87107
15	314	9.8596e4	5.749393	33.05552
16	499	2.4900e5	6.212606	38.59647
17	645	4.1603e5	6.469250	41.85120
18	981	9.6236e5	6.888572	47.45243
19	1170	1.3689e6	7.064759	49.91082
20	1170	1.3689e6	7.064759	49.91082
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	7826	5173392	114.1822	661.1303

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2111078. (normal distribution)

d = 9.251059 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCA
Chemical:	BACKGROUND CALCIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.068e3	5.0559e2
.3211	1.055e3	3.3876e2
.2565	8.35e2	2.1418e2
.2085	4.68e2	9.7578e1
.1686	2.87e2	4.8388e1
.1334	9.2e1	1.2273e1
.1013	5e1	5.065e0
.0711	3.3e1	2.3463e0
.0422	1.4e1	5.908e-1
.014	4e0	5.6e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.2248e3
Summation**2:		1.5002e6

Wcalc = .7106319 Wtable = .905 Wcalc - Wtable = -.194368

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCA
Chemical:	BACKGROUND CALCIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.439786	1.154995
.3211	2.319827	.7448964
.2565	1.904966	.4886237
.2085	1.293101	.2696115
.1686	.8560198	.1443249
.1334	.3467156	.0462519
.1013	.1944084	.0196936
.0711	.1263629	.0089844
.0422	.0536527	.0022641
.014	.0156253	.0002188
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.879864
Summation**2:		8.293617

Wcalc = .8965046 Wtable = .905 Wcalc - Wtable = -.008495

Arithmetic Average: 391.3 Geometric Mean: 3.0160e2

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: CADMIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 4
Degrees of Freedom: 3

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	6.9	1.931521	15.21	1.292503
2	1.2	.1823216	3.24	.3749319
3	2.9	1.064711	.01	.0729391
4	1	0	4	0
5		0	0	0
6		0	0	0
7		0	0	0
8		0	0	0
9		0	0	0
10		0	0	0
11		0	0	0
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	3	.7946384	2.736177	.7616591
		2.213640		

Upper 95% confidence limit on arithmetic mean: 6.219113
Upper 95% confidence limit on geometric mean: 9.384401

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCD
Chemical:	BACKGROUND CADMIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 4 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1	1e0	0	0
2	1.2	1.44e0	.1823216	.0332412
3	2.9	8.41e0	1.064711	1.133609
4	6.9	4.761e1	1.931521	3.730775
5		0	0	0
6		0	0	0
7		0	0	0
8		0	0	0
9		0	0	0
10		0	0	0
11		0	0	0
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	12	58.46	3.178554	4.897625

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 22.46 (normal distribution)

d = 2.371824 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCD
Chemical:	BACKGROUND CADMIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.6872	5.9e0	4.0545e0
.1677	1.7e0	2.851e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		4.3396e0
Summation**2:		1.8832e1

Wcalc = .8384625 Wtable = .748 Wcalc - Wtable = .0904625

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCD
Chemical:	BACKGROUND CADMIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.6872	1.931521	1.327342
.1677	.8823892	.1479767
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.475318
Summation**2:		2.176564

Wcalc = .9176750 Wtable = .748 Wcalc - Wtable = .1696750

Arithmetic Average: 3 Geometric Mean: 2.2136e0

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: COBALT
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	4.7	1.547563	1.204506	.0154857
2	5	1.609438	.6360063	.0039145
3	2.2	.7884574	12.94201	.7806550
4	5.4	1.686399	.1580063	.0002072
5	3	1.098612	7.826006	.3287783
6	8	2.079442	4.851006	.1660052
7	5.4	1.686399	.1580063	.0002072
8	5.1	1.629241	.4865063	.0018287
9	7.9	2.066863	4.420506	.1559133
10	4	1.386294	3.231006	.0816301
11	5.4	1.686399	.1580063	.0002072
12	2.85	1.047319	8.687756	.3902316
13	6.8	1.916923	1.005006	.0599850
14	7	1.945910	1.446006	.0750245
15	7.1	1.960095	1.696506	.0829962
16	7.4	2.001480	2.568006	.1085543
17	8.5	2.140066	7.303506	.2190820
18	12.8	2.549445	49.03501	.7699027
19	3.5	1.252763	5.278506	.1757632
20	3.9	1.360977	3.600506	.0967382
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	5.7975	1.672004	2.478246	.4300006
		5.322825		

Upper 95% confidence limit on arithmetic mean: 6.755630
Upper 95% confidence limit on geometric mean: 7.070855

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCO
Chemical:	BACKGROUND COBALT (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.2	4.84e0	.7884574	.6216650
2	2.85	8.1225e0	1.047319	1.096877
3	3	9e0	1.098612	1.206949
4	3.5	1.225e1	1.252763	1.569415
5	3.9	1.521e1	1.360977	1.852257
6	4	1.6e1	1.386294	1.921812
7	4.7	2.209e1	1.547563	2.394950
8	5	2.5e1	1.609438	2.590290
9	5.1	2.601e1	1.629241	2.654425
10	5.4	2.916e1	1.686399	2.843941
11	5.4	2.916e1	1.686399	2.843941
12	5.4	2.916e1	1.686399	2.843941
13	6.8	4.624e1	1.916923	3.674592
14	7	4.9e1	1.945910	3.786566
15	7.1	5.041e1	1.960095	3.841972
16	7.4	5.476e1	2.001480	4.005922
17	7.9	6.241e1	2.066863	4.271922
18	8	6.4e1	2.079442	4.324077
19	8.5	7.225e1	2.140066	4.579883
20	12.8	1.6384e2	2.549445	6.499671
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	115.95	788.9125	33.44008	59.42507

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 116.6924 (normal distribution)

d = 3.513110 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCO
Chemical:	BACKGROUND COBALT (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4734	1.06e1	5.0180e0
	.3211	5.65e0	1.8142e0
	.2565	5e0	1.2825e0
	.2085	4.4e0	9.174e-1
	.1686	3.5e0	5.901e-1
	.1334	3.1e0	4.135e-1
	.1013	2.3e0	2.330e-1
	.0711	1.8e0	1.280e-1
	.0422	3e-1	1.266e-2
	.014	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.0409e1
Summation**2:			1.0836e2

Wcalc = .9285622 Wtable = .905 Wcalc - Wtable = .0235622

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCO
Chemical:	BACKGROUND COBALT (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.760988	.8336516
.3211	1.092747	.3508811
.2565	.9808293	.2515827
.2085	.8140998	.1697398
.1686	.6405034	.1079889
.1334	.5738004	.0765450
.1013	.3983476	.0403526
.0711	.3074847	.0218622
.0422	.0571584	.0024121
.014	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		1.855016
Summation**2:		3.441084

Wcalc = .9794980 Wtable = .905 Wcalc - Wtable = .0744980

Arithmetic Average: 5.7975 Geometric Mean: 5.3228e0

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: CHROMIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	14.1	2.646175	1.946025	.0028359
2	11.8	2.468100	13.65303	.0535127
3	14	2.639057	2.235025	.0036446
4	15.1	2.714695	.156025	.0002331
5	19.3	2.960105	14.47803	.0679527
6	21.5	3.068053	36.06003	.1358846
7	16.4	2.797281	.819025	.0095753
8	18.1	2.895912	6.786025	.0386061
9	14.6	2.681022	.801025	.0003388
10	17.8	2.879198	5.313025	.0323175
11	10.2	2.322388	28.03703	.1421591
12	10.8	2.379546	22.04303	.1023242
13	16.5	2.803360	1.010025	.0108020
14	18.1	2.895912	6.786025	.0386061
15	17.7	2.873565	4.862025	.0303237
16	16.9	2.827314	1.974025	.0163548
17	20.5	3.020425	25.05003	.1030392
18	20.7	3.030134	27.09203	.1093665
19	6.2	1.824549	86.39703	.7654122
20	9.6	2.261763	34.75103	.1915503
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	15.495	2.699428	4.105513	.3124470
		14.87122		

Upper 95% confidence limit on arithmetic mean: 17.08226
Upper 95% confidence limit on geometric mean: 17.82992

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCR
Chemical:	BACKGROUND CHROMIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	6.2	3.844e1	1.824549	3.328980
2	9.6	9.216e1	2.261763	5.115572
3	10.2	1.0404e2	2.322388	5.393485
4	10.8	1.1664e2	2.379546	5.662240
5	11.8	1.3924e2	2.468100	6.091515
6	14	1.96e2	2.639057	6.964624
7	14.1	1.9881e2	2.646175	7.002241
8	14.6	2.1316e2	2.681022	7.187876
9	15.1	2.2801e2	2.714695	7.369568
10	16.4	2.6896e2	2.797281	7.824783
11	16.5	2.7225e2	2.803360	7.858829
12	16.9	2.8561e2	2.827314	7.993702
13	17.7	3.1329e2	2.873565	8.257374
14	17.8	3.1684e2	2.879198	8.289784
15	18.1	3.2761e2	2.895912	8.386306
16	18.1	3.2761e2	2.895912	8.386306
17	19.3	3.7249e2	2.960105	8.762222
18	20.5	4.2025e2	3.020425	9.122966
19	20.7	4.2849e2	3.030134	9.181710
20	21.5	4.6225e2	3.068053	9.412949
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	309.9	5122.15	53.98855	147.5930

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 320.2495 (normal distribution)

d = 1.854839 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCR
Chemical:	BACKGROUND CHROMIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.53e1	7.2430e0
.3211	1.11e1	3.5642e0
.2565	1.03e1	2.6420e0
.2085	8.5e0	1.7723e0
.1686	6.3e0	1.0622e0
.1334	4.1e0	5.469e-1
.1013	3.7e0	3.748e-1
.0711	3.1e0	2.204e-1
.0422	1.8e0	7.596e-2
.014	1e-1	1.4e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.7503e1
	Summation**2:	3.0636e2

Wcalc = .9566278 Wtable = .905 Wcalc - Wtable = .0516278

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCR
Chemical:	BACKGROUND CHROMIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.243504	.5886746
.3211	.7683706	.2467238
.2565	.6980372	.1790465
.2085	.5805590	.1210465
.1686	.4278124	.0721292
.1334	.2568546	.0342644
.1013	.2330237	.0236053
.0711	.1925431	.0136898
.0422	.1126189	.0047525
.014	.0060790	.0000851
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.284018
Summation**2:		1.648702

Wcalc = .8888650 Wtable = .905 Wcalc - Wtable = -.016135

Arithmetic Average: 15.495 Geometric Mean: 1.4871e1

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: COPPER
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	6.5	1.871802	48.8601	.2864895
2	6.5	1.871802	48.8601	.2864895
3	5.4	1.686399	65.4481	.5193369
4	7.1	1.960095	40.8321	.1997683
5	17.9	2.884801	19.4481	.2282464
6	24.2	3.186353	114.7041	.6073137
7	16.7	2.815409	10.3041	.1667574
8	25	3.218876	132.4801	.6590623
9	11.6	2.451005	3.5721	.0019321
10	25.6	3.242592	146.6521	.6981322
11	5.5	1.704748	63.8401	.4932270
12	4.5	1.504077	80.8201	.8153583
13	5.4	1.686399	65.4481	.5193369
14	6.4	1.856298	50.2681	.3033270
15	10.3	2.332144	10.1761	.0056108
16	12.1	2.493205	1.9321	.0074229
17	26.1	3.261935	159.0121	.7308301
18	32.8	3.490429	372.8761	1.173711
19	10.6	2.360854	8.3521	.0021340
20	9.6	2.261763	15.1321	.0211081
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	13.49	2.407049	8.763014	.6376599
		11.10116		

Upper 95% confidence limit on arithmetic mean: 16.87792
Upper 95% confidence limit on geometric mean: 18.61043

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCU
Chemical:	BACKGROUND COPPER (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	4.5	2.025e1	1.504077	2.262249
2	5.4	2.916e1	1.686399	2.843941
3	5.4	2.916e1	1.686399	2.843941
4	5.5	3.025e1	1.704748	2.906166
5	6.4	4.096e1	1.856298	3.445842
6	6.5	4.225e1	1.871802	3.503643
7	6.5	4.225e1	1.871802	3.503643
8	7.1	5.041e1	1.960095	3.841972
9	9.6	9.216e1	2.261763	5.115572
10	10.3	1.0609e2	2.332144	5.438895
11	10.6	1.1236e2	2.360854	5.573632
12	11.6	1.3456e2	2.451005	6.007426
13	12.1	1.4641e2	2.493205	6.216073
14	16.7	2.7889e2	2.815409	7.926526
15	17.9	3.2041e2	2.884801	8.322075
16	24.2	5.8564e2	3.186353	10.15284
17	25	6.25e2	3.218876	10.36116
18	25.6	6.5536e2	3.242592	10.51441
19	26.1	6.8121e2	3.261935	10.64022
20	32.8	1.0758e3	3.490429	12.18309
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	269.8	5098.62	48.14099	123.6033

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 1459.018 (normal distribution)

d = 7.725594 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCU
Chemical:	BACKGROUND COPPER (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.83e1	1.3397e1
.3211	2.07e1	6.6468e0
.2565	2.02e1	5.1813e0
.2085	1.95e1	4.0658e0
.1686	1.78e1	3.0011e0
.1334	1.14e1	1.5208e0
.1013	1.02e1	1.0333e0
.0711	5e0	3.555e-1
.0422	2e0	8.44e-2
.014	3e-1	4.2e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.5290e1
Summation**2:		1.2454e3

Wcalc = .8535885 Wtable = .905 Wcalc - Wtable = -.051411

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGCU
Chemical:	BACKGROUND COPPER (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.986351	.9403386
.3211	1.575536	.5059047
.2565	1.556193	.3991636
.2085	1.514128	.3156956
.1686	1.330055	.2242472
.1334	1.012999	.1351340
.1013	.9436065	.0955873
.0711	.5331107	.0379042
.0422	.1892420	.0079860
.014	.0287101	.0004019
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.662363
Summation**2:		7.088178

Wcalc = .9174930 Wtable = .905 Wcalc - Wtable = .0124930

Arithmetic Average: 13.49 Geometric Mean: 1.1101e1

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: IRON
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	11000	9.305651	3794704	.0169431
2	8390	9.034796	20775364	.1608172
3	13800	9.532424	725904	.0093331
4	14000	9.546813	1106704	.0123202
5	16800	9.729134	14837904	.0860355
6	17200	9.752665	18079504	.1003931
7	16100	9.686575	9935104	.0628798
8	13600	9.517825	425104	.0067255
9	13800	9.532424	725904	.0093331
10	15300	9.635608	5531904	.0399169
11	9730	9.182969	10355524	.0639315
12	9630	9.172639	11009124	.0692624
13	12300	9.417355	419904	.0003408
14	14400	9.574983	2108304	.0193676
15	13700	9.525151	565504	.0079808
16	13700	9.525151	565504	.0079808
17	14200	9.560997	1567504	.0156703
18	17000	9.740969	16418704	.0931181
19	6480	8.776476	41835024	.4347296
20	7830	8.965718	26193924	.2209924
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	12948	9.435816	3137.021	.2751145
		12529.19		

Upper 95% confidence limit on arithmetic mean: 14160.82
Upper 95% confidence limit on geometric mean: 14601.27

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGFE
Chemical:	BACKGROUND IRON (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	6480	4.1990e7	8.776476	77.02653
2	7830	6.1309e7	8.965718	80.38410
3	8390	7.0392e7	9.034796	81.62754
4	9630	9.2737e7	9.172639	84.13730
5	9730	9.4673e7	9.182969	84.32692
6	11000	1.21e8	9.305651	86.59513
7	12300	1.5129e8	9.417355	88.68657
8	13600	1.8496e8	9.517825	90.58899
9	13700	1.8769e8	9.525151	90.72850
10	13700	1.8769e8	9.525151	90.72850
11	13800	1.9044e8	9.532424	90.86710
12	13800	1.9044e8	9.532424	90.86710
13	14000	1.96e8	9.546813	91.14163
14	14200	2.0164e8	9.560997	91.41267
15	14400	2.0736e8	9.574983	91.68031
16	15300	2.3409e8	9.635608	92.84494
17	16100	2.5921e8	9.686575	93.82973
18	16800	2.8224e8	9.729134	94.65605
19	17000	2.89e8	9.740969	94.88647
20	17200	2.9584e8	9.752665	95.11447
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	[illegible]	3.9400e9	188.7163	1782.131

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 1.8698e8 (normal distribution)

d = 1.438072 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGFE
Chemical:	BACKGROUND IRON (mg/kg)	Operator:	AEM

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.072e4	5.0748e3
.3211	9.17e3	2.9445e3
.2565	8.41e3	2.1572e3
.2085	6.47e3	1.3490e3
.1686	5.57e3	9.3910e2
.1334	3.4e3	4.5356e2
.1013	1.9e3	1.9247e2
.0711	4e2	2.844e1
.0422	1e2	4.22e0
.014	1e2	1.4e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.3145e4
Summation**2:		1.7278e8

Wcalc = .9240852 Wtable = .905 Wcalc - Wtable = .0190852

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGFE
Chemical:	BACKGROUND IRON (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	.9761889	.4621278
.3211	.7752508	.2489330
.2565	.6943384	.1780978
.2085	.5139360	.1071557
.1686	.4526389	.0763149
.1334	.2693329	.0359290
.1013	.1436427	.0145510
.0711	.0289875	.0020610
.0422	.0072728	.0003069
.014	.0072728	.0001018
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.125579
Summation**2:		1.266928

Wcalc = .8809909 Wtable = .905 Wcalc - Wtable = -.024009

Arithmetic Average: 12948 Geometric Mean: ERROR

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: MERCURY
er Matrix: BACKGROUND SOIL

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.04	-3.21888	.0000118	.0170867
2	.03	-3.50656	.0000431	.0246383
3	.045	-3.10109	.0000712	.0617519
4	.05	-2.99573	.0001806	.1252168
5	.055	-2.90042	.0003399	.2017537
6	.04	-3.21888	.0000118	.0170867
7	.04	-3.21888	.0000118	.0170867
8	.045	-3.10109	.0000712	.0617519
9	.02	-3.91202	.0002743	.3163285
10	.02	-3.91202	.0002743	.3163285
11	.035	-3.35241	.0000024	.0000079
12	.03	-3.50656	.0000431	.0246383
13	.03	-3.50656	.0000431	.0246383
14	.045	-3.10109	.0000712	.0617519
15	.025	-3.68888	.0001337	.1151159
16	.035	-3.35241	.0000024	.0000079
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	.0365625	-3.34959	.0102825	.3038848
		.0350987		

Upper 95% confidence limit on arithmetic mean: .0410688
Upper 95% confidence limit on geometric mean: .0425899

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: LEAD
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	8.6	2.151762	1.0609	.1079283
2	2.8	1.029619	22.7529	.6298300
3	12.3	2.509599	22.3729	.4710922
4	5.7	1.740466	3.4969	.0068511
5	17.5	2.862201	98.6049	1.079444
6	6.5	1.871802	1.1449	.0023585
7	6.3	1.840550	1.6129	.0002997
8	3.8	1.335001	14.2129	.2383750
9	16.2	2.785011	74.4769	.9250083
10	5.8	1.757858	3.1329	.0042745
11	7.6	2.028148	.0009	.0419883
12	3.7	1.308333	14.9769	.2651271
13	10.6	2.360854	9.1809	.2890313
14	4.8	1.568616	7.6729	.0648323
15	11.1	2.406945	12.4609	.3407143
16	4.6	1.526056	8.8209	.0883168
17	16.3	2.791165	76.2129	.9368834
18	2.9	1.064711	21.8089	.5753632
19	2.3	.8329091	27.7729	.9807507
20	2	.6931472	31.0249	1.277105
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	7.57	1.823238	4.881771	.6619578
		6.191874		

Upper 95% confidence limit on arithmetic mean: 9.457371
Upper 95% confidence limit on geometric mean: 10.71526

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGPB
Chemical:	BACKGROUND LEAD (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2	4e0	.6931472	.4804530
2	2.3	5.29e0	.8329091	.6937376
3	2.8	7.84e0	1.029619	1.060116
4	2.9	8.41e0	1.064711	1.133609
5	3.7	1.369e1	1.308333	1.711735
6	3.8	1.444e1	1.335001	1.782228
7	4.6	2.116e1	1.526056	2.328848
8	4.8	2.304e1	1.568616	2.460556
9	5.7	3.249e1	1.740466	3.029223
10	5.8	3.364e1	1.757858	3.090064
11	6.3	3.969e1	1.840550	3.387623
12	6.5	4.225e1	1.871802	3.503643
13	7.6	5.776e1	2.028148	4.113385
14	8.6	7.396e1	2.151762	4.630081
15	10.6	1.1236e2	2.360854	5.573632
16	11.1	1.2321e2	2.406945	5.793385
17	12.3	1.5129e2	2.509599	6.298088
18	16.2	2.6244e2	2.785011	7.756288
19	16.3	2.6569e2	2.791165	7.790603
20	17.5	3.0625e2	2.862201	8.192194
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	151.4	1598.9	36.46475	74.80949

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 452.802 (normal distribution)

d = 8.325574 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGPB
Chemical:	BACKGROUND LEAD (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.55e1	7.3377e0
.3211	1.4e1	4.4954e0
.2565	1.34e1	3.4371e0
.2085	9.4e0	1.9599e0
.1686	7.4e0	1.2476e0
.1334	6.8e0	9.071e-1
.1013	4e0	4.052e-1
.0711	2.8e0	1.991e-1
.0422	8e-1	3.376e-2
.014	5e-1	7e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		2.0030e1
Summation**2:		4.0120e2

Wcalc = .8860316 Wtable = .905 Wcalc - Wtable = -.018968

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGPB
Chemical:	BACKGROUND LEAD (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.169054	1.026830
.3211	1.958256	.6287960
.2565	1.755392	.4502580
.2085	1.444889	.3012593
.1686	1.098612	.1852260
.1334	1.025853	.1368488
.1013	.6257059	.0633840
.0711	.4595323	.0326727
.0422	.1313360	.0055424
.014	.0826917	.0011577
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.831975
Summation**2:		8.020082

Wcalc = .9633068 Wtable = .905 Wcalc - Wtable = .0583068

Arithmetic Average: 7.57 Geometric Mean: 6.1919e0

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: MAGNESIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1980	7.590852	408960.3	.0411253
2	2230	7.709757	151710.3	.0070374
3	1410	7.251345	1462890.	.2940902
4	1810	7.501082	655290.3	.0855935
5	2460	7.807917	25440.25	.0002037
6	3460	8.149024	706440.3	.1262936
7	1910	7.554859	503390.3	.0570194
8	2870	7.962067	62750.25	.0283658
9	2010	7.605890	371490.3	.0352522
10	3650	8.202482	1061930.	.1671474
11	1560	7.352441	1122540.	.1946616
12	1680	7.426549	882660.3	.1347600
13	2010	7.605890	371490.3	.0352522
14	2800	7.937375	32580.25	.0206580
15	2210	7.700748	167690.3	.0086300
16	2590	7.859413	870.25	.0043253
17	4170	8.335671	2404050.	.2937917
18	6990	8.852236	19101270	1.120613
19	2070	7.635304	301950.3	.0250722
20	2520	7.832014	9900.25	.0014721
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	2619.5	7.793646	1252.477	.3756653
		2425.143		

Upper 95% confidence limit on arithmetic mean: 3103.728
Upper 95% confidence limit on geometric mean: 3064.788

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGMG
Chemical:	BACKGROUND MAGNESIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1410	1.9881e6	7.251345	52.58200
2	1560	2.4336e6	7.352441	54.05839
3	1680	2.8224e6	7.426549	55.15363
4	1810	3.2761e6	7.501082	56.26623
5	1910	3.6481e6	7.554859	57.07589
6	1980	3.9204e6	7.590852	57.62104
7	2010	4.0401e6	7.605890	57.84956
8	2010	4.0401e6	7.605890	57.84956
9	2070	4.2849e6	7.635304	58.29787
10	2210	4.8841e6	7.700748	59.30152
11	2230	4.9729e6	7.709757	59.44035
12	2460	6.0516e6	7.807917	60.96356
13	2520	6.3504e6	7.832014	61.34045
14	2590	6.7081e6	7.859413	61.77038
15	2800	7.84e6	7.937375	63.00192
16	2870	8.2369e6	7.962067	63.39452
17	3460	1.1972e7	8.149024	66.40659
18	3650	1.3323e7	8.202482	67.28072
19	4170	1.7389e7	8.335671	69.48342
20	6990	4.8860e7	8.852236	78.36208
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	52390	1.6704e8	155.8729	1217.500

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 29805295 (normal distribution)

d = 2.681364 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGMG
Chemical:	BACKGROUND MAGNESIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	5.58e3	2.6416e3
.3211	2.61e3	8.3807e2
.2565	1.97e3	5.0531e2
.2085	1.65e3	3.4403e2
.1686	9.6e2	1.6186e2
.1334	8.2e2	1.0939e2
.1013	5.8e2	5.8754e1
.0711	5.1e2	3.6261e1
.0422	3.9e2	1.6458e1
.014	2e1	2.8e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.7120e3
Summation**2:		2.2203e7

Wcalc = .7449234 Wtable = .905 Wcalc - Wtable = -.160077

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGMG
Chemical:	BACKGROUND MAGNESIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.600891	.7578617
.3211	.9832302	.3157152
.2565	.7759334	.1990269
.2085	.6479417	.1350959
.1686	.4072088	.0686554
.1334	.3465226	.0462261
.1013	.2535232	.0256819
.0711	.2261242	.0160774
.0422	.1726127	.0072843
.014	.0090091	.0001261
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.571751
Summation**2:		2.470401

Wcalc = .9213224 Wtable = .905 Wcalc - Wtable = .0163224

Arithmetic Average: 2619.5 Geometric Mean: ERROR

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGMN
Chemical:	BACKGROUND MANGANESE (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	63.6	4.0450e3	4.152613	17.24420
2	68.7	4.7197e3	4.229749	17.89078
3	69.5	4.8303e3	4.241327	17.98885
4	72.4	5.2418e3	4.282206	18.33729
5	83.9	7.0392e3	4.429626	19.62158
6	84.1	7.0728e3	4.432007	19.64268
7	91.2	8.3174e3	4.513055	20.36766
8	95.8	9.1776e3	4.562263	20.81424
9	124	1.5376e4	4.820282	23.23511
10	125	1.5625e4	4.828314	23.31261
11	128	1.6384e4	4.852030	23.54220
12	143	2.0449e4	4.962845	24.62983
13	145	2.1025e4	4.976734	24.76788
14	155	2.4025e4	5.043425	25.43614
15	156	2.4336e4	5.049856	25.50105
16	160	2.56e4	5.075174	25.75739
17	172	2.9584e4	5.147494	26.49670
18	188	3.5344e4	5.236442	27.42032
19	195	3.8025e4	5.273000	27.80452
20	237	5.6169e4	5.468060	29.89968
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	2537.2	372385.8	95.57650	459.7107

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 45422.17 (normal distribution)

d = 2.967351 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGMN
Chemical:	BACKGROUND MANGANESE (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.734e2	8.2088e1
.3211	1.263e2	4.0555e1
.2565	1.185e2	3.0395e1
.2085	9.96e1	2.0767e1
.1686	7.61e1	1.2830e1
.1334	7.19e1	9.5915e0
.1013	6.38e1	6.4629e0
.0711	4.92e1	3.4981e0
.0422	1.9e1	8.018e-1
.014	3e0	4.2e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.0703e2
Summation**2:		4.2862e4

Wcalc = .9436336 Wtable = .905 Wcalc - Wtable = .0386336

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGMN
Chemical:	BACKGROUND MANGANESE (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.315447	.6227325
.3211	1.043250	.3349877
.2565	.9951152	.2552471
.2085	.8652882	.1804126
.1686	.6455482	.1088394
.1334	.6178494	.0824211
.1013	.5303702	.0537265
.0711	.4144711	.0294689
.0422	.1425631	.0060162
.014	.0237165	.0003320
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.674184
Summation**2:		2.802892

Wcalc = .9445770 Wtable = .905 Wcalc - Wtable = .0395770

Arithmetic Average: 127.86 Geometric Mean: 1.1896e2

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: MANGANESE
er Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	83.9	4.429626	1932.482	.1219402
2	91.2	4.513055	1343.956	.0706338
3	63.6	4.152613	4129.348	.3921409
4	72.4	4.282206	3075.812	.2466302
5	172	5.147494	1948.340	.1359172
6	156	5.049856	791.8596	.0734578
7	84.1	4.432007	1914.938	.1202830
8	128	4.852030	.0196	.0053590
9	188	5.236442	3616.820	.2094133
10	69.5	4.241327	3405.890	.2889044
11	68.7	4.229749	3499.906	.3014843
12	124	4.820282	14.8996	.0017186
13	95.8	4.562263	1027.844	.0468992
14	160	5.075174	1032.980	.0878226
15	143	4.962845	229.2196	.0338632
16	125	4.828314	8.1796	.0024491
17	195	5.273000	4507.780	.2442085
18	237	5.468060	11911.54	.4750450
19	155	5.043425	736.5796	.0700132
20	145	4.976734	293.7796	.0391679
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	127.86	4.778825	48.89418	.3951916
		118.9645		

Upper 95% confidence limit on arithmetic mean: 146.7633
Upper 95% confidence limit on geometric mean: 152.9719

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGHG
Chemical:	BACKGROUND MERCURY (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.02	4e-4	-3.91202	15.30392
2	.02	4e-4	-3.91202	15.30392
3	.025	6.25e-4	-3.68888	13.60783
4	.03	9e-4	-3.50656	12.29595
5	.03	9e-4	-3.50656	12.29595
6	.03	9e-4	-3.50656	12.29595
7	.035	1.225e-3	-3.35241	11.23863
8	.035	1.225e-3	-3.35241	11.23863
9	.04	1.6e-3	-3.21888	10.36116
10	.04	1.6e-3	-3.21888	10.36116
11	.04	1.6e-3	-3.21888	10.36116
12	.045	2.025e-3	-3.10109	9.616776
13	.045	2.025e-3	-3.10109	9.616776
14	.045	2.025e-3	-3.10109	9.616776
15	.05	2.5e-3	-2.99573	8.974412
16	.055	3.025e-3	-2.90042	8.412448
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	.585	.022975	-53.5935	180.9015

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = .0015859 (normal distribution)

d = 1.385190 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGHG
Chemical:	BACKGROUND MERCURY (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	3.5e-2	1.770e-2
.329	3e-2	9.87e-3
.2521	2e-2	5.042e-3
.1939	1.5e-2	2.909e-3
.1447	1.5e-2	2.171e-3
.1005	1e-2	1.005e-3
.0593	5e-3	2.965e-4
.0196	5e-3	9.8e-5
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	3.909e-2
	Summation**2:	1.528e-3

Wcalc = .9633132 Wtable = .887 Wcalc - Wtable = .0763132

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGHG
Chemical:	BACKGROUND MERCURY (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.011601	.5114654
.329	.9162907	.3014597
.2521	.5877867	.1481810
.1939	.4054651	.0786197
.1447	.4054651	.0586708
.1005	.2876821	.0289120
.0593	.1335314	.0079184
.0196	.1335314	.0026172
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.137844
	Summation**2:	1.294690

Wcalc = .9346657 Wtable = .887 Wcalc - Wtable = .0476657

Arithmetic Average: .0365625 Geometric Mean: 3.510e-2

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: NICKEL
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	7.4	2.001480	.7612563	.0000056
2	7.3	1.987874	.9457563	.0001264
3	2.6	.9555114	32.17726	1.089109
4	6.6	1.887070	2.797256	.0125543
5	4.15	1.423108	16.99501	.3317842
6	5.95	1.783391	5.394006	.0465370
7	10	2.302585	2.984256	.0920938
8	9.1	2.208274	.6847563	.0437475
9	6.6	1.887070	2.797256	.0125543
10	7.7	2.041220	.3277563	.0017728
11	6.5	1.871802	3.141756	.0162087
12	7.2	1.974081	1.150256	.0006267
13	3.85	1.348073	19.55851	.4238561
14	8.9	2.186051	.3937563	.0349450
15	7.9	2.066863	.1387563	.0045897
16	9	2.197225	.5292563	.0392472
17	25.3	3.230804	289.9358	1.517058
18	15.3	2.727853	49.38576	.5310581
19	7.5	2.014903	.5967563	.0002492
20	6.6	1.887070	2.797256	.0125543
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	8.2725	1.999115	4.776546	.4707596
		7.382523		

Upper 95% confidence limit on arithmetic mean: 10.11919
Upper 95% confidence limit on geometric mean: 10.21053

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGNI
Chemical:	BACKGROUND NICKEL (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.6	6.76e0	.9555114	.9130021
2	3.85	1.4823e1	1.348073	1.817301
3	4.15	1.7223e1	1.423108	2.025237
4	5.95	3.5403e1	1.783391	3.180484
5	6.5	4.225e1	1.871802	3.503643
6	6.6	4.356e1	1.887070	3.561032
7	6.6	4.356e1	1.887070	3.561032
8	6.6	4.356e1	1.887070	3.561032
9	7.2	5.184e1	1.974081	3.896996
10	7.3	5.329e1	1.987874	3.951644
11	7.4	5.476e1	2.001480	4.005922
12	7.5	5.625e1	2.014903	4.059834
13	7.7	5.929e1	2.041220	4.166580
14	7.9	6.241e1	2.066863	4.271922
15	8.9	7.921e1	2.186051	4.778820
16	9	8.1e1	2.197225	4.827796
17	9.1	8.281e1	2.208274	4.876476
18	10	1e2	2.302585	5.301898
19	15.3	2.3409e2	2.727853	7.441181
20	25.3	6.4009e2	3.230804	10.43810
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	165.45	1802.178	39.98231	84.13993

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 433.4924 (normal distribution)

d = 4.210678 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGNI
Chemical:	BACKGROUND NICKEL (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.27e1	1.0746e1
.3211	1.145e1	3.6766e0
.2565	5.85e0	1.5005e0
.2085	3.15e0	6.568e-1
.1686	2.5e0	4.215e-1
.1334	2.3e0	3.068e-1
.1013	1.3e0	1.317e-1
.0711	1.1e0	7.821e-2
.0422	3e-1	1.266e-2
.014	1e-1	1.4e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.7532e1
Summation**2:		3.0738e2

Wcalc = .7090862 Wtable = .905 Wcalc - Wtable = -.195914

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGNI
Chemical:	BACKGROUND NICKEL (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.275293	1.077124
.3211	1.379780	.4430473
.2565	.8794768	.2255858
.2085	.4248832	.0885881
.1686	.3254224	.0548662
.1334	.2989816	.0398841
.1013	.1797931	.0182130
.0711	.1541507	.0109601
.0422	.0408220	.0017227
.014	.0136057	.0001905
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.960182
Summation**2:		3.842312

Wcalc = .9125162 Wtable = .905 Wcalc - Wtable = .0075162

Arithmetic Average: 8.2725 Geometric Mean: 7.3825e0

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: POTASSIUM
er Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	338	5.823046	389688.1	.4830923
2	683	6.526495	77980.56	.0000706
3	229	5.433722	537655.6	1.175863
4	316	5.755742	417639.1	.5811807
5	669	6.505784	85995.56	.0001515
6	1430	7.265430	218790.1	.5585102
7	297	5.693732	442557.6	.6795730
8	527	6.267201	189442.6	.0629477
9	580	6.363028	146115.1	.0240455
10	2580	7.855545	2617115.	1.788773
11	278	5.627621	468198.1	.7929425
12	351	5.860786	373626.6	.4320539
13	444	6.095825	268583.1	.1783117
14	485	6.184149	227767.6	.1115195
15	336	5.817111	392189.1	.4913774
16	622	6.432940	115770.1	.0072512
17	2130	7.663877	1363640.	1.312819
18	2650	7.882315	2848500.	1.861098
19	1730	7.455877	589440.1	.8794358
20	2570	7.851661	2584860.	1.778401
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	962.25	6.518094	869.2269	.8334904
		677.2865		

Upper 95% confidence limit on arithmetic mean: 1298.307
Upper 95% confidence limit on geometric mean: 1508.914

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGK
Chemical:	BACKGROUND POTASSIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	229	5.2441e4	5.433722	29.52533
2	278	7.7284e4	5.627621	31.67012
3	297	8.8209e4	5.693732	32.41859
4	316	9.9856e4	5.755742	33.12857
5	336	1.1290e5	5.817111	33.83878
6	338	1.1424e5	5.823046	33.90786
7	351	1.2320e5	5.860786	34.34882
8	444	1.9714e5	6.095825	37.15908
9	485	2.3523e5	6.184149	38.24370
10	527	2.7773e5	6.267201	39.27780
11	580	3.364e5	6.363028	40.48813
12	622	3.8688e5	6.432940	41.38272
13	669	4.4756e5	6.505784	42.32523
14	683	4.6649e5	6.526495	42.59514
15	1430	2.0449e6	7.265430	52.78647
16	1730	2.9929e6	7.455877	55.59010
17	2130	4.5369e6	7.663877	58.73501
18	2570	6.6049e6	7.851661	61.64858
19	2580	6.6564e6	7.855545	61.70958
20	2650	7.0225e6	7.882315	62.13089
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	19045	32874055	130.3619	862.9105

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 14355554 (normal distribution)

d = 13.19942 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGK
Chemical:	BACKGROUND POTASSIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.421e3	1.1461e3
.3211	2.302e3	7.3917e2
.2565	2.273e3	5.8302e2
.2085	1.814e3	3.7822e2
.1686	1.394e3	2.3503e2
.1334	1.092e3	1.4567e2
.1013	3.32e2	3.3632e1
.0711	2.25e2	1.5998e1
.0422	1.37e2	5.7814e0
.014	5.3e1	7.42e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.2834e3
Summation**2:		1.0781e7

Wcalc = .7509654 Wtable = .905 Wcalc - Wtable = -.154035

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGK
Chemical:	BACKGROUND POTASSIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.448593	1.159164
.3211	2.227924	.7153863
.2565	2.157929	.5535088
.2085	1.908135	.3978462
.1686	1.638766	.2762959
.1334	1.442384	.1924140
.1013	.6657086	.0674363
.0711	.4099595	.0291481
.0422	.2487912	.0104990
.014	.0958276	.0013416
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.403040
Summation**2:		11.58068

Wcalc = .8773630 Wtable = .905 Wcalc - Wtable = -.027637

Arithmetic Average: 962.25 Geometric Mean: 6.7729e2

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: SODIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	25.3	3.230804	352.5945	.0773833
2	27.3	3.306887	281.4845	.0408429
3	13.45	2.598979	938.0438	.8281069
4	26.8	3.288402	298.5120	.0486560
5	15.55	2.744061	813.8183	.5851061
6	19.15	2.952303	621.3803	.3098928
7	33	3.496508	122.7110	.0001556
8	30.1	3.404525	195.3705	.0109114
9	28	3.332205	258.4860	.0312506
10	41	3.713572	9.471006	.0418567
11	27.3	3.306887	281.4845	.0408429
12	26.4	3.273364	312.4940	.0555163
13	12	2.484907	1028.966	1.048732
14	30.7	3.424263	178.9575	.0071775
15	22.9	3.131137	448.4865	.1427676
16	34.1	3.529297	99.55051	.0004127
17	118	4.770685	5464.536	1.591891
18	80.5	4.388257	1326.599	.7731233
19	147	4.990433	10593.04	2.194693
20	123	4.812184	6228.761	1.698334
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	44.0775	3.508983	39.63966	.7081352
		33.41426		

Upper 95% confidence limit on arithmetic mean: 59.40283
Upper 95% confidence limit on geometric mean: 61.58065

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: SELENIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.31	-1.17118	.0093848	.0373496
2	.17	-1.77196	.0561098	.6304905
3	.24	-1.42712	.0278473	.2017751
4	.8	-.223144	.1545473	.5696912
5	.445	-.809681	.0014535	.0283052
6	.665	-.407968	.0666285	.3248479
7	.3	-1.20397	.0114223	.0510987
8	.35	-1.04982	.0032348	.0051696
9	.26	-1.34707	.0215723	.1362726
10	.37	-.994252	.0013598	.0002667
11	.5	-.693147	.0086723	.0810970
12	.51	-.673345	.0106348	.0927677
13	.22	-1.51413	.0349223	.2875161
14	.47	-.755023	.0039848	.0496844
15	.41	-.891598	.0000098	.0074519
16	.49	-.713350	.0069098	.0699987
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	.406875	-.977922	.1670716	.4142288
		.3760916		

Upper 95% confidence limit on arithmetic mean: .4800941
Upper 95% confidence limit on geometric mean: .5059653

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGSE
Chemical:	BACKGROUND SELENIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.17	2.89e-2	-1.77196	3.139831
2	.22	4.84e-2	-1.51413	2.292583
3	.24	5.76e-2	-1.42712	2.036661
4	.26	6.76e-2	-1.34707	1.814607
5	.3	9e-2	-1.20397	1.449551
6	.31	9.61e-2	-1.17118	1.371670
7	.35	1.225e-1	-1.04982	1.102126
8	.37	1.369e-1	-.994252	.9885376
9	.41	1.681e-1	-.891598	.7949472
10	.47	2.209e-1	-.755023	.5700591
11	.49	2.401e-1	-.713350	.5088681
12	.495	2.450e-1	-.703198	.4944867
13	.5	2.5e-1	-.693147	.4804530
14	.51	2.601e-1	-.673345	.4533929
15	.65	4.225e-1	-.430783	.1855739
16	.8	6.4e-1	-.223144	.0497930
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	6.545	3.094725	-15.5631	17.73314

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = .4174109 (normal distribution)

d = 2.595028 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGSE
Chemical:	BACKGROUND SELENIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	6.3e-1	3.185e-1
.329	4.3e-1	1.415e-1
.2521	2.7e-1	6.807e-2
.1939	2.4e-1	4.654e-2
.1447	1.95e-1	2.822e-2
.1005	1.8e-1	1.809e-2
.0593	1.2e-1	7.116e-3
.0196	4e-2	7.84e-4
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		6.288e-1
Summation**2:		3.954e-1

Wcalc = .9472652 Wtable = .887 Wcalc - Wtable = .0602652

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGSE
Chemical:	BACKGROUND SELENIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.548813	.7830800
.329	1.083345	.3564204
.2521	.7537718	.1900259
.1939	.6539265	.1267963
.1447	.5007753	.0724622
.1005	.4578331	.0460122
.0593	.2947995	.0174816
.0196	.1026542	.0020120
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.594291
Summation**2:		2.541763

Wcalc = .9794742 Wtable = .887 Wcalc - Wtable = .0924742

Arithmetic Average: .4090625 Geometric Mean: 3.781e-1

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGNA
Chemical:	BACKGROUND SODIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	12	1.44e2	2.484907	6.174761
2	13.45	1.8090e2	2.598979	6.754692
3	15.55	2.4180e2	2.744061	7.529869
4	19.15	3.6672e2	2.952303	8.716091
5	22.9	5.2441e2	3.131137	9.804018
6	25.3	6.4009e2	3.230804	10.43810
7	26.4	6.9696e2	3.273364	10.71491
8	26.8	7.1824e2	3.288402	10.81359
9	27.3	7.4529e2	3.306887	10.93550
10	27.3	7.4529e2	3.306887	10.93550
11	28	7.84e2	3.332205	11.10359
12	30.1	9.0601e2	3.404525	11.59079
13	30.7	9.4249e2	3.424263	11.72557
14	33	1.089e3	3.496508	12.22557
15	34.1	1.1628e3	3.529297	12.45594
16	41	1.681e3	3.713572	13.79062
17	80.5	6.4803e3	4.388257	19.25680
18	118	1.3924e4	4.770685	22.75943
19	123	1.5129e4	4.812184	23.15712
20	147	2.1609e4	4.990433	24.90442
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	881.55	68711.27	70.17966	255.7869

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 29854.75 (normal distribution)

d = 9.527653 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGNA
Chemical:	BACKGROUND SODIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.35e2	6.3909e1
.3211	1.0955e2	3.5177e1
.2565	1.0245e2	2.6278e1
.2085	6.135e1	1.2791e1
.1686	1.81e1	3.0517e0
.1334	8.8e0	1.1739e0
.1013	6.6e0	6.686e-1
.0711	3.9e0	2.773e-1
.0422	2.8e0	1.182e-1
.014	7e-1	9.8e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.4345e2
Summation**2:		2.0579e4

Wcalc = .6893136 Wtable = .905 Wcalc - Wtable = -.215686

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGNA
Chemical:	BACKGROUND SODIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.505526	1.186116
.3211	2.213205	.7106602
.2565	2.026624	.5198291
.2085	1.435954	.2993965
.1686	.5824352	.0981986
.1334	.2984930	.0398190
.1013	.2231436	.0226044
.0711	.1358608	.0096597
.0422	.0976385	.0041203
.014	.0253178	.0003544
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		2.890758
Summation**2:		8.356483

Wcalc = .8770767 Wtable = .905 Wcalc - Wtable = -.027923

Arithmetic Average: 44.0775 Geometric Mean: 3.3414e1

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: THALLIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.08	-2.52573	.0009766	.0661336
2	.085	-2.46510	.0006891	.0386280
3	.105	-2.25379	.0000391	.0002181
4	.1	-2.30259	.0001266	.0011574
5	.095	-2.35388	.0002641	.0072785
6	.105	-2.25379	.0000391	.0002181
7	.085	-2.46510	.0006891	.0386280
8	.2	-1.60944	.0078766	.4344473
9	.075	-2.59027	.0013141	.1034929
10	.29	-1.23787	.0319516	1.062321
11	.09	-2.40795	.0004516	.0194272
12	.09	-2.40795	.0004516	.0194272
13	.09	-2.40795	.0004516	.0194272
14	.095	-2.35388	.0002641	.0072785
15	.105	-2.25379	.0000391	.0002181
16	.09	-2.40795	.0004516	.0194272
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	.11125	-2.26856	.0554226	.3500218
		.1034606		

Upper 95% confidence limit on arithmetic mean: .1355390
Upper 95% confidence limit on geometric mean: .1307882

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGTL
Chemical:	BACKGROUND THALLIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.075	5.625e-3	-2.59027	6.709484
2	.08	6.4e-3	-2.52573	6.379305
3	.085	7.225e-3	-2.46510	6.076738
4	.085	7.225e-3	-2.46510	6.076738
5	.09	8.1e-3	-2.40795	5.798202
6	.09	8.1e-3	-2.40795	5.798202
7	.09	8.1e-3	-2.40795	5.798202
8	.09	8.1e-3	-2.40795	5.798202
9	.095	9.025e-3	-2.35388	5.540743
10	.095	9.025e-3	-2.35388	5.540743
11	.1	1e-2	-2.30259	5.301898
12	.105	1.103e-2	-2.25379	5.079592
13	.105	1.103e-2	-2.25379	5.079592
14	.105	1.103e-2	-2.25379	5.079592
15	.2	4e-2	-1.60944	2.590290
16	.29	8.41e-2	-1.23787	1.532333
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	1.78	.2441	-36.2970	84.17986

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = .046075 (normal distribution)

d = 1.837729 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGTL
Chemical:	BACKGROUND THALLIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	2.15e-1	1.087e-1
.329	1.2e-1	3.948e-2
.2521	2e-2	5.042e-3
.1939	2e-2	3.878e-3
.1447	1.5e-2	2.171e-3
.1005	1e-2	1.005e-3
.0593	5e-3	2.965e-4
.0196	5e-3	9.8e-5
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.607e-1
	Summation**2:	2.582e-2

Wcalc = .5603068 Wtable = .887 Wcalc - Wtable = -.326693

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGTL
Chemical:	BACKGROUND THALLIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.352393	.6837698
.329	.9162907	.3014597
.2521	.2113091	.0532710
.1939	.2113091	.0409728
.1447	.1541507	.0223056
.1005	.1053605	.0105887
.0593	.0540672	.0032062
.0196	.0540672	.0010597
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.116634
	Summation**2:	1.246870

Wcalc = .6784845 Wtable = .887 Wcalc - Wtable = -.208515

Arithmetic Average: .11125 Geometric Mean: 1.035e-1

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: VANADIUM
Enter Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	23.4	3.152736	2.4649	.0002093
2	16	2.772589	80.4609	.1557212
3	25.2	3.226844	.0529	.0035569
4	24.6	3.202746	.1369	.0012633
5	33.3	3.505557	69.3889	.1144831
6	35.1	3.558201	102.6169	.1528788
7	29.4	3.380995	19.6249	.0457065
8	25.2	3.226844	.0529	.0035569
9	28.5	3.349904	12.4609	.0333793
10	29.1	3.370738	17.0569	.0414262
11	17.8	2.879198	51.4089	.0829472
12	17.3	2.850707	58.8289	.1001706
13	28.4	3.346389	11.7649	.0321073
14	23.9	3.173878	1.1449	.0000445
15	26.8	3.288402	3.3489	.0146889
16	24.2	3.186353	.5929	.0003667
17	33.2	3.502550	67.7329	.1124569
18	35.5	3.569533	110.8809	.1618684
19	9	2.197225	255.0409	.9408599
20	13.5	2.602690	131.5609	.3186763
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	24.97	3.167204	7.242499	.3491620
		23.74101		

Upper 95% confidence limit on arithmetic mean: 27.77007
Upper 95% confidence limit on geometric mean: 29.32885

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGV
Chemical:	BACKGROUND VANADIUM (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	9	8.1e1	2.197225	4.827796
2	13.5	1.8225e2	2.602690	6.773994
3	16	2.56e2	2.772589	7.687248
4	17.3	2.9929e2	2.850707	8.126528
5	17.8	3.1684e2	2.879198	8.289784
6	23.4	5.4756e2	3.152736	9.939744
7	23.9	5.7121e2	3.173878	10.07350
8	24.2	5.8564e2	3.186353	10.15284
9	24.6	6.0516e2	3.202746	10.25758
10	25.2	6.3504e2	3.226844	10.41252
11	25.2	6.3504e2	3.226844	10.41252
12	26.8	7.1824e2	3.288402	10.81359
13	28.4	8.0656e2	3.346389	11.19832
14	28.5	8.1225e2	3.349904	11.22186
15	29.1	8.4681e2	3.370738	11.36188
16	29.4	8.6436e2	3.380995	11.43112
17	33.2	1.1022e3	3.502550	12.26786
18	33.3	1.1089e3	3.505557	12.28893
19	35.1	1.2320e3	3.558201	12.66080
20	35.5	1.2603e3	3.569533	12.74156
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	499.4	13466.64	63.34408	202.9400

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 996.622 (normal distribution)

d = 2.316368 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGV
Chemical:	BACKGROUND VANADIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	2.65e1	1.2545e1
.3211	2.16e1	6.9358e0
.2565	1.73e1	4.4375e0
.2085	1.59e1	3.3152e0
.1686	1.16e1	1.9558e0
.1334	5.7e0	7.604e-1
.1013	4.6e0	4.660e-1
.0711	4.2e0	2.986e-1
.0422	2.2e0	9.284e-2
.014	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		3.0807e1
Summation**2:		9.4907e2

Wcalc = .9522906 Wtable = .905 Wcalc - Wtable = .0472906

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGV
Chemical:	BACKGROUND VANADIUM (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.372308	.6496507
.3211	.9555114	.3068147
.2565	.7329687	.1880065
.2085	.6518434	.1359093
.1686	.5017962	.0846028
.1334	.2180022	.0290815
.1013	.1760256	.0178314
.0711	.1600365	.0113786
.0422	.0856554	.0036147
.014	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.426890
Summation**2:		2.036016

Wcalc = .8789688 Wtable = .905 Wcalc - Wtable = -.026031

Arithmetic Average: 24.97 Geometric Mean: 2.3741e1

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: ZINC
er Matrix: BACKGROUND SOIL

Enter number of samples: 20
Degrees of Freedom: 19

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	19.4	2.965273	63.8401	.0411210
2	13.9	2.631889	181.9801	.2874754
3	19.7	2.980619	59.1361	.0351328
4	18.5	2.917771	79.0321	.0626428
5	25.6	3.242592	3.2041	.0055556
6	26	3.258097	1.9321	.0081073
7	20.4	3.015535	48.8601	.0232627
8	20.8	3.034953	43.4281	.0177165
9	23.7	3.165475	13.6161	.0000067
10	31.3	3.443618	15.2881	.0759344
11	21.1	3.049273	39.5641	.0141094
12	19.2	2.954910	67.0761	.0454312
13	21.7	3.077312	32.3761	.0082345
14	22.4	3.109061	24.9001	.0034804
15	17.4	2.856470	99.8001	.0970858
16	17.4	2.856470	99.8001	.0970858
17	125	4.828314	9527.712	2.756455
18	34.2	3.532226	46.3761	.1326194
19	25.6	3.242592	3.2041	.0055556
20	24.5	3.198673	8.3521	.0009374
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
Mean:	27.39	3.168056	23.46271	.4423591
		23.76125		

Upper 95% confidence limit on arithmetic mean: 36.46106
Upper 95% confidence limit on geometric mean: 31.94499

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGZN
Chemical:	BACKGROUND ZINC (mg/kg)	Operator:	AEH

Enter Number of Occurrences (n): 20 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	13.9	1.9321e2	2.631889	6.926839
2	17.4	3.0276e2	2.856470	8.159422
3	17.4	3.0276e2	2.856470	8.159422
4	18.5	3.4225e2	2.917771	8.513386
5	19.2	3.6864e2	2.954910	8.731495
6	19.4	3.7636e2	2.965273	8.792844
7	19.7	3.8809e2	2.980619	8.884087
8	20.4	4.1616e2	3.015535	9.093451
9	20.8	4.3264e2	3.034953	9.210940
10	21.1	4.4521e2	3.049273	9.298066
11	21.7	4.7089e2	3.077312	9.469851
12	22.4	5.0176e2	3.109061	9.666260
13	23.7	5.6169e2	3.165475	10.02023
14	24.5	6.0025e2	3.198673	10.23151
15	25.6	6.5536e2	3.242592	10.51441
16	25.6	6.5536e2	3.242592	10.51441
17	26	6.76e2	3.258097	10.61519
18	31.3	9.7969e2	3.443618	11.85851
19	34.2	1.1696e3	3.532226	12.47662
20	125	1.5625e4	4.828314	23.31261
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	547.8	25463.72	63.36112	204.4495

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 10459.48 (normal distribution)

d = 3.717950 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGZN
Chemical:	BACKGROUND ZINC (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4734	1.111e2	5.2595e1
.3211	1.68e1	5.3945e0
.2565	1.39e1	3.5654e0
.2085	7.5e0	1.5638e0
.1686	6.4e0	1.0790e0
.1334	6.2e0	8.271e-1
.1013	4.8e0	4.862e-1
.0711	3.3e0	2.346e-1
.0422	1.6e0	6.752e-2
.014	6e-1	8.4e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		6.5821e1
Summation**2:		4.3324e3

Wcalc = .4142113 Wtable = .905 Wcalc - Wtable = -.490789

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	SUBASE NEW LONDON	Date:	11/29/94
Location:	GROTON, CT	Filename:	BKGZN
Chemical:	BACKGROUND ZINC (mg/kg)	Operator:	AEH

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4734	2.196425	1.039788
	.3211	.6757554	.2169851
	.2565	.5871479	.1506034
	.2085	.3403258	.0709579
	.1686	.2876821	.0485032
	.1334	.2773193	.0369944
	.1013	.2180545	.0220889
	.0711	.1499401	.0106607
	.0422	.0741080	.0031274
	.014	.0280392	.0003925
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.600101
Summation**2:			2.560324

Wcalc = .6886386 Wtable = .905 Wcalc - Wtable = -.216361

Arithmetic Average: 27.39 Geometric Mean: 2.3761e1

APPENDIX F.2

REGION III COC SCREENING CONCENTRATIONS

United States
Environmental Protection Agency

Region III
Philadelphia, PA 19107

EPA/903/R-93-001
January 1993

Region III
Technical Guidance Manual
Risk Assessment

Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening

EPA Contact: Dr. Roy L. Smith

EPA
Region III

Hazardous Waste Management Division
Office of Superfund Programs
January 1993

Human health risk assessment includes effort-intensive steps which require many detailed calculations by experts. Most baseline risk assessments are dominated by a few chemicals and a few routes of exposure. Effort expended on minor contaminants and exposure routes, i.e., those which do not influence overall risk, is essentially wasted. This guidance is intended to identify and focus on dominant contaminants of concern and exposure routes at the earliest feasible point in the baseline risk assessment. Use of these methods will decrease effort and time spent assessing risk, without loss of protectiveness. This guidance is not intended for other risk assessment activities, such as determining preliminary remediation goals.

SELECTING CONTAMINANTS AND EXPOSURE ROUTES OF CONCERN

Most samples from hazardous waste sites are analyzed for 103 target compounds and analytes recommended by the EPA Superfund program. Semi-volatile analysis can detect additional tentatively identified compounds not on the target lists. Special analytical services procedures, if used, may find still more contaminants. The combined number of contaminants detected at a site sometimes exceeds one hundred.

While EPA considers it necessary to gather information on many contaminants, very little of this data actually influences the overall quantitative assessment of health risk. For most sites, baseline risk assessments are dominated by a few contaminants and a few routes of exposure. The remaining tens, or hundreds, of detected contaminants have a minimal influence on total risk. This small impact is lost by rounding. Entire environmental media may contain not a single contaminant at a concentration which could adversely affect public health. Quantitative risk calculations using data from such "risk-free" media have no effect on the overall risk estimate for the site.

The EPA baseline risk assessment process at several points requires careful data evaluation by scientific experts. These evaluations, which are contaminant-specific, include: (1) statistical comparisons between site-related and background samples, (2) special handling of undetected contaminants, (3) calculation of toxicity equivalence, (4) evaluation of frequency of detection, and (5) comparison with ARARs. Because overall risk is usually driven by a few contaminants and exposure routes, effort spent in detailed evaluation of minor contaminants and routes of exposure is essentially wasted. For some sites, this wasted effort exceeds 90% of the total.

The baseline risk assessment process can be made more efficient by focusing on dominant contaminants and routes of exposure at the earliest feasible stage. The mechanisms recommended for this are (1) a re-ordering of the process of eliminating contaminants and routes of exposure, and (2) use of a risk-based concentration screen. Appropriately used, this process can dramatically reduce the effort of risk assessment, while not changing the result significantly.

EXISTING GUIDANCE

Chapter 5 of "RAGS IA" (Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A); EPA, 1989) provides a detailed procedure for evaluating data for a baseline risk assessment. This

procedure includes steps by which the risk assessor selects contaminants of concern in each exposure medium. These steps are summarized in Table 1.

There are two major limitations to the RAGS procedure. First, the eliminating step (a concentration toxicity screen) comes late in the process. Many of the preceding steps (e.g., evaluation of quantitation limits, comparison with background, calculation of toxicity equivalence, and evaluation of frequency of detection) are contaminant- and medium-specific. They require the sustained attention of an expert, and cannot be automated. If the contaminant is eliminated, this work is wasted.

The second limitation is that the concentration toxicity screen compares only relative risk among contaminants in the same medium. While very efficient at selecting dominant contaminants in each medium, this method does not evaluate significance of total risk for the medium. Thus, the concentration toxicity screen can eliminate contaminants, but not routes of exposure.

RECOMMENDED METHODOLOGY

This guidance makes two changes intended to remove the limitations in existing guidance. These recommendations are intended for baseline risk assessments.

*1. **Re-ordering of steps.** The eliminating screen is moved forward in the data evaluation process to a point immediately following data quality evaluation. The new process is shown in Table 2. Effort-intensive steps such as evaluation of quantitation limits and comparison with background now follow the eliminating screen. The steps are divided into four categories: data quality evaluation, initial data set reduction, re-inclusion of special cases, and optional final data set reduction.*

The data quality evaluation steps (evaluating appropriateness of methods and qualifiers, significance of blank contamination, and need for special analyses) should be done as described in RAGS IA, Chapter 5. Next, the risk assessor should consult with the RPM to discuss the use of the risk-based concentration table (described in item [2] below) as a screening mechanism. With the RPM's approval, the risk assessor should reduce the data set and document the rationale for eliminating contaminants and routes of exposure from further analysis.

After the initial data set reduction, the risk assessor and RPM should consider re-including specific contaminants on the basis of historical data, toxicity, mobility, persistence, bioaccumulation, special exposure routes, special treatability problems, or exceedance of ARARs. These activities should proceed as described in Section 5.9 of RAGS IA.

Finally, optional further reductions in the data set may be justified, based on the status of a contaminant as an essential nutrient, low frequency of detection, or no statistical difference between site and background levels. These evaluations, the most complicated and contaminant-specific, are saved for last.

*2. **Screening by risk-based concentrations.** The screening method is changed from the relative concentration toxicity screen of RAGS IA to an absolute comparison of risk. This is done by means of a table of risk-based concentrations (Appendix I). This table contains levels of nearly 600 contaminants in air, drinking water, fish tissue, and soil, which correspond to a systemic hazard quotient of 0.1 or a lifetime cancer risk of 10^{-6}. The risk-based concentrations were developed using protective default exposure scenarios suggested by EPA (1991) and the best available reference doses and carcinogenic potency slopes (see the table for sources), and represent relatively protective environmental concentrations at which EPA would typically not take action.*

The risk-based concentration screen is used as follows:

(a) The risk assessor extracts the maximum concentration of each substance detected in each medium.

(b) If the maximum concentration exceeds the risk-based concentration for that medium, the contaminant is retained for risk assessment, for all routes of exposure involving that medium. Otherwise the contaminant is dropped for that medium.

(c) If a specific contaminant does not exceed its risk-based concentration for any medium, the contaminant is dropped from the risk assessment.

(d) If no contaminant in a specific medium exceeds its risk-based concentration, the medium is dropped from the risk assessment.

(e) All contaminants and exposure routes which are dropped are kept on a sub-list and considered for re-inclusion, based on special properties.

(f) If the risk assessor wants to include a route of exposure not covered in the risk-based concentration table, the equations provided in Appendix I can serve as the basis for new risk-

based concentrations. Similarly, the risk assessor can use the same equations to calculate alternate risk levels (i.e., other than a systemic hazard quotient of 0.1 and lifetime cancer risk of 10^{-6}) to be the basis for screening.

SUMMARY

The process by which contaminants and exposure routes are selected in quantitative risk assessment can be made less effort-intensive by two simple changes. First, high-effort steps should be postponed until later in the selection process, because performing these operations on trivial contaminants and exposure routes is pointless. Second, changing from a relative concentration toxicity screen to an absolute risk-based concentration screen improves the risk assessor's ability to focus on dominant contaminants and exposure routes at an earlier stage.

REFERENCES

EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors". OSWER Directive 9285.6-03, Office of Emergency and Remedial Response, March 25, 1991.

EPA, 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, December, 1989. EPA/540/1-89/002.

For additional information, call (215) 597-6682.

Approved by: _____

Thomas C. Voltaggio, Director
Hazardous Waste Management Division

Table 1. Summary of existing EPA guidance on selecting contaminants of concern (EPA, 1989, chapter 5)
Section 5.1: Combining data from site investigations
1. Determine if methods are appropriate
2. Evaluate quantitation limits
3. Determine if qualifiers are appropriate
4. Determine if significant blank contamination exists
5. Determine if special analyses for tentatively identified compounds are needed
6. Compare site samples to background
Section 5.9: Further reduction in the number of chemicals (optional)
7. Consult with RPM
8. Document rationale for eliminating chemicals
9. Examine historical information
10. Consider exceptional toxicity, mobility, persistence, or bioaccumulation
11. Consider special exposure routes
12. Consider special treatability problems
13. Determine if contaminants exceed ARARs
14. Group chemicals by class, evaluate toxicity equivalence
15. Evaluate frequency of detection
16. Evaluate essentiality
17. Use a concentration toxicity screen

Table 2. EPA Region III guidance on selecting contaminants and exposure routes of concern
A. Data quality evaluation
1. Determine if methods are appropriate
2. Determine if qualifiers are appropriate
3. Determine if significant blank contamination exists
4. Determine if special analyses for tentatively identified compounds are needed
B. Reduce data set using risk-based concentration screen
5. Consult with RPM
6. Use risk-based concentration table to screen contaminants and exposure routes of concern
7. Document rationale for eliminating chemicals and exposure routes
C. Consider re-including eliminated chemicals and routes, based on:
8. Historical information
9. Exceptional toxicity, mobility, persistence, or bioaccumulation
10. Special exposure routes
11. Special treatability problems
12. ARARs exceedance
13. Toxicity equivalence of chemical class (*e.g.*, CDD/CDFs, PAHs)
D. Make further specific reductions in data set (optional)
14. Evaluate essentiality
15. Evaluate frequency of detection
16. Compare site samples to background

Appendix I:
EPA Region III Risk-Based Screening Table
Background Information

General: Separate carcinogenic and non-carcinogenic risk-based concentrations were calculated for each compound for each pathway. The concentration in the table is the lower of the two, rounded to two significant figures. The following terms and values were used in the calculations:

VARIABLE	UNITS	VALUE	LABEL
1-General:			
Carcinogenic potency slope oral	kg-d/mg	•	CPSo
Carcinogenic potency slope inhaled	kg-d/mg	•	CPSi
Reference dose oral	mg/kg/d	•	RfDo
Reference dose inhaled	mg/kg/d	•	RfDi
Target cancer risk	unitless	1.00e-06	TR
Target hazard quotient	unitless	0.1	THQ
Body weight, adult	kg	70	BWa
Body weight, age 1-6	kg	15	BWc
Averaging time carcinogens	d	25550	ATc
Averaging time non-carcinogens	d	ED x 365	ATn
Inhalation, adult	m3/d	20	IRAa
Inhalation, child	m3/d	12	IRAc
Inhalation factor, age adjusted	m3-y/kg-d	11.66	IFAadj
Tap water ingestion, adult	L/d	2	IRWa
Tap water ingestion, child	L/d	1	IRWc
Tap water ingestion factor, age adjusted	L-y/kg-d	1.09	IFWadj
Fish ingestion	g/d	54	IRF
Soil ingestion, adult	mg/d	100	IRSa
Soil ingestion, child	mg/d	200	IRSc
Soil ingestion factor, age adjusted	mg-y/kg-d	114.29	IFSadj
2-Residential			
Exposure frequency, residential	d/y	350	EFr
Exposure duration, residential	y	30	EDtot

VARIABLE	UNITS	VALUE	LABEL
Exposure duration, age 1-6	y	6	EDc
Volatilization factor	L/m3	0.5	VF
3-Occupational			
Exposure frequency, occupational	d/y	250	EFo
Exposure duration, occupational	y	25	EDo
* = Contaminant-specific toxicity parameters			

The priority among sources of toxicological constants was as follows: (1) IRIS, (2) HEAST, (3) HEAST alternative method, (4) ECAO-Cincinnati, (5) withdrawn from IRIS, (6) withdrawn from HEAST, and (7) other EPA documents. Each source was used only if numbers from higher-priority sources were unavailable.

Algorithms:

1. Age-adjusted factors: Because contact rates with tap water, ambient air, and residential soil are different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors. These factors approximated the integrated exposure from birth until age 30 by combining contact rates, body weights, and exposure durations for two age groups - small children and adults. The age-adjusted factor for soil was obtained from RAGS IB; the others were developed by analogy.

a. Air inhalation ($[m^3 \cdot y]/[kg \cdot d]$):

$$IFAadj = \frac{EDc \cdot IRAc}{BWc} + \frac{(EDtot - EDc) \cdot IRAa}{BWa}$$

b. Tap water ingestion ($[L \cdot y]/[kg \cdot d]$):

$$IFWadj = \frac{EDc \cdot IRWc}{BWc} + \frac{(EDtot - EDc) \cdot IRWa}{BWa}$$

c. Soil ingestion ($[mg \cdot y]/[kg \cdot d]$):

$$IFSadj = \frac{EDc \cdot IRSc}{BWc} + \frac{(EDtot - EDc) \cdot IRSa}{BWa}$$

2. Residential water use ($\mu g/L$). Volatilization terms were calculated only for compounds with "***" in the "VOC" column. Compounds having a Henry's Law constant greater than 10^{-5} were considered volatile. The list may be incomplete, but is unlikely to include false positives. The equations and the volatilization factor (VF, above) were obtained from RAGS IB. Oral potency slopes and reference doses were used for both oral and inhaled exposures for volatile compounds lacking inhalation values. Inhaled potency slopes were substituted for unavailable oral potency slopes only for volatile compounds; inhaled RfDs were substituted for unavailable oral RfDs for both volatile and non-volatile compounds.

a. Carcinogens: Calculations were based on combined childhood and adult exposure.

$$\frac{TR \cdot ATc \cdot 1000\frac{\mu g}{mg}}{EFr \cdot ([VF \cdot IFAadj \cdot CPSi] + [IFWadj \cdot CPSo])}$$

b. Non-carcinogens: Calculations were based on adult exposure.

$$\frac{THQ \cdot BWa \cdot ATn \cdot 1000\frac{\mu g}{mg}}{EFr \cdot EDtot \cdot \left(\frac{VF \cdot IRAa}{RfDi} + \frac{IRWa}{RfDo}\right)}$$

3. Air ($\mu g/m^3$). Oral potency slopes and references were used where inhalation values were not available.

a. Carcinogens: Calculations were based on combined childhood and adult exposure.

$$\frac{TR \cdot ATc \cdot 1000\frac{\mu g}{mg}}{EFr \cdot IFAadj \cdot CPSi}$$

b. Non-carcinogens: Calculations were based on adult exposure.

$$\frac{THQ \cdot RfDi \cdot BWa \cdot ATn \cdot 1000\frac{\mu g}{mg}}{EFr \cdot EDtot \cdot IRAa}$$

4. Fish (mg/kg):

a. Carcinogens: Calculations were based on adult exposure.

$$\frac{TR \cdot BWa \cdot ATc}{EFr \cdot EDtot \cdot \frac{IRF}{1000\frac{g}{kg}} \cdot CPSo}$$

b. Non-carcinogens: Calculations were based on adult exposure.

$$\frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFr \cdot EDtot \cdot \frac{IRF}{1000\frac{g}{kg}}}$$

5. Soil commercial/industrial (mg/kg): The default exposure assumption that only 50% of incidental soil ingestion occurs at work has been omitted. Calculations were based on adult occupational exposure.

a. Carcinogens:

$$\frac{TR \cdot BWa \cdot ATc}{EFo \cdot EDo \cdot \frac{IRSa}{10^6 \frac{mg}{kg}} \cdot CPSo}$$

b. Non-carcinogens:

$$\frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFo \cdot EDo \cdot \frac{IRSa}{10^6 \frac{mg}{kg}}}$$

6. Soil residential (mg/kg):

a. Carcinogens: Calculations were based on combined childhood and adult exposure.

$$\frac{TR \cdot ATc}{EFr \cdot \frac{IFSadj}{10^6 \frac{mg}{kg}} \cdot CPSo}$$

b. Non-carcinogens: Calculations were based on childhood exposure only.

$$\frac{THQ \cdot RfDo \cdot BWc \cdot ATn}{EFr \cdot EDc \cdot \frac{IRSc}{10^6 \frac{mg}{kg}}}$$

EPA Region III COC Screening Table: R.L. Smith (18-Mar-94)

Sources: i=IRIS h=HEAST a=HEAST alt. w=Withdrawn from IRIS or HEAST e=EPA-ECAO o=Other EPA documents *F=final D=draft P=proposed T=tentative [c=carcinogen n=noncarcinogen*

Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg•d/mg	CPSi kg•d/mg	VOC	MCL mg/L	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
Acephate	30560191	4.00E-03 i		8.70E-03 i				7.7 c	0.72 c	0.36 c	330 c	31 n
Acetaldehyde	75070		2.57E-03 i		7.70E-03 i			9.4 n	0.81 c			
Acetochlor	34256821	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Acetone	67641	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Acetone cyanohydrin	75865	7.00E-02 h	2.86E-03 h					260 n	1 n	9.5 n	7200 n	550 n
Acetonitrile	75078	6.00E-03 i	1.43E-02 h					22 n	5.2 n	0.81 n	610 n	47 n
Acetophenone	98862	1.00E-01 i	5.71E-06 w			•••		0.0042 n	0.0021 n	14 n	10000 n	780 n
Acifluorfen	62476599	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Acrolein	107028	2.00E-02 h	5.71E-06 i					73 n	0.0021 n	2.7 n	2000 n	160 n
Acrylamide	79061	2.00E-04 i		4.50E+00 i	4.55E+00 i			0.015 c	0.0014 c	0.0007 c	0.64 c	0.14 c
Acrylic acid	79107	8.00E-02 i	8.57E-05 i					290 n	0.031 n	11 n	8200 n	630 n
Acrylonitrile	107131		5.71E-04 i	5.40E-01 i	2.38E-01 i			0.12 c	0.026 c	0.0058 c	5.3 c	1.2 c
Alachlor	15972608	1.00E-02 i		8.00E-02 h			0.002 F	0.84 c	0.078 c	0.039 c	36 c	8 c
Alar	1596845	1.50E-01 i						550 n	55 n	20 n	15000 n	1200 n
Aldicarb	116063	1.00E-03 i					0.007 D	3.7 n	0.37 n	0.14 n	100 n	7.8 n
Aldicarb sulfone	1646884	1.00E-03 i					0.007 D	3.7 n	0.37 n	0.14 n	100 n	7.8 n
Aldrin	309002	3.00E-05 i		1.70E+01 i	1.71E+01 i			0.004 c	0.00037 c	0.00019 c	0.17 c	0.038 c
Ally	74223646	2.50E-01 i						910 n	91 n	34 n	26000 n	2000 n
Allyl alcohol	107186	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Allyl chloride	107051	5.00E-02 w	2.86E-04 i					180 n	0.1 n	6.8 n	5100 n	390 n
Aluminum	7429905	2.90E+00 o						11000 n	1100 n	390 n	300000 n	23000 n
Aluminum phosphide	20859738	4.00E-04 i						1.5 n	0.15 n	0.054 n	41 n	3.1 n
Amdro	67485294	3.00E-04 i						1.1 n	0.11 n	0.041 n	31 n	2.3 n
Ametryn	834128	9.00E-03 i						33 n	3.3 n	1.2 n	920 n	70 n
m-Aminophenol	591275	7.00E-02 h						260 n	26 n	9.5 n	7200 n	550 n
4-Aminopyridine	504245	2.00E-05 h						0.073 n	0.0073 n	0.0027 n	2 n	0.16 n
Amitraz	33089611	2.50E-03 i						9.1 n	0.91 n	0.34 n	260 n	20 n
Ammonia	7664417		2.86E-02 i					100 n	10 n			
Ammonium sulfamate	7773060	2.00E-01 i						730 n	73 n	27 n	20000 n	1600 n
Aniline	62533		2.86E-04 i	5.70E-03 i				1 n	0.1 n	0.55 c	500 c	110 c
Antimony and compounds	7440360	4.00E-04 i					0.006 F	1.5 n	0.15 n	0.054 n	41 n	3.1 n
Antimony pentoxide	1314609	5.00E-04 h						1.8 n	0.18 n	0.068 n	51 n	3.9 n
Antimony potassium tartrate	304610	9.00E-04 h						3.3 n	0.33 n	0.12 n	92 n	7 n
Antimony tetroxide	1332316	4.00E-04 h						1.5 n	0.15 n	0.054 n	41 n	3.1 n
Antimony trioxide	1309644	4.00E-04 h						1.5 n	0.15 n	0.054 n	41 n	3.1 n
Apollo	74115245	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Aramite	140578	5.00E-02 h		2.50E-02 i	2.49E-02 i			2.7 c	0.25 c	0.13 c	110 c	26 c
[illegible]ic	7440382	3.00E-04 i					0.05 •	1.1 n	0.11 n	0.041 n	31 n	2.3 n
[illegible]ic (as carcinogen)	744032	3.00E-04		1.75E+00 i	1.51E+01 i		0.05 •	0.038 c	0.00041 c	0.0018 c	[illegible]6 c	0.17 c

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Assure	76578148	9.00E-03 i						33 n	3.3 n	1.2 n	920 n	70 n
Asulam	3337711	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Atrazine	1912249	3.50E-02 i		2.22E-01 h			0.003 F	0.3 c	0.028 c	0.014 c	13 c	2.9 c
Avermectin B1	65195553	4.00E-04 i						1.5 n	0.15 n	0.054 n	41 n	3.1 n
Azobenzene	103333			1.10E-01 i	1.08E-01 i			0.61 c	0.058 c	0.029 c	26 c	5.8 c
Barium and compounds	7440393	7.00E-02 i	1.43E-04 h				2 F	260 n	0.052 n	9.5 n	7200 n	550 n
Baygon	114261	4.00E-03 i						15 n	1.5 n	0.54 n	410 n	31 n
Bayleton	43121433	3.00E-02 i						110 n	11 n	4.1 n	3100 n	230 n
Baythroid	68359375	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
Benefin	1861401	3.00E-01 i						1100 n	110 n	41 n	31000 n	2300 n
Benomyl	17804352	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Bentazon	25057890	2.50E-03 i						9.1 n	0.91 n	0.34 n	260 n	20 n
Benzaldehyde	100527	1.00E-01 i				***		61 n	37 n	14 n	10000 n	780 n
Benzene	71432		1.43E-04 e	2.90E-02 i	2.90E-02 i	***	0.005 F	0.087 n	0.052 n	0.11 c	99 c	22 c
Benzidine	92875	3.00E-03 i		2.30E+02 i	2.35E+02 i			0.00029 c	0.00003 c	0.00001 c	0.012 c	0.0028 c
Benzoic acid	65850	4.00E+00 i						15000 n	1500 n	540 n	410000 n	31000 n
Benzotrichloride	98077			1.30E+01 i				0.0052 c	0.00048 c	0.00024 c	0.22 c	0.049 c
Benzyl alcohol	100516	3.00E-01 h						1100 n	110 n	41 n	31000 n	2300 n
Benzyl chloride	100447			1.70E-01 i		***		0.062 c	0.037 c	0.019 c	17 c	3.8 c
Beryllium and compounds	7440417	5.00E-03 i		4.30E+00 i	8.40E+00 i		0.004 F	0.016 c	0.00075 c	0.00073 c	0.67 c	0.15 c
Bidrin	141662	1.00E-04 i						0.37 n	0.037 n	0.014 n	10 n	0.78 n
Biphenthrin (Talstar)	82657043	1.50E-02 i						55 n	5.5 n	2 n	1500 n	120 n
1,1-Biphenyl	92524	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Bis(2-chloroethyl)ether	111444			1.10E+00 i	1.16E+00 i	***		0.0092 c	0.0054 c	0.0029 c	2.6 c	0.58 c
Bis(2-chloroisopropyl)ether	39638329	4.00E-02 i		7.00E-02 h	3.50E-02 h	***		0.26 c	0.18 c	0.045 c	41 c	9.1 c
Bis(chloromethyl)ether	542881			2.20E+02 i	2.17E+02 i	***		0.00005 c	0.00003 c	0.00001 c	0.013 c	0.0029 c
Bis(2-chloro-1-methylethyl)ether				7.00E-02 w	7.00E-02 w			0.96 c	0.089 c	0.045 c	41 c	9.1 c
Bis(2-ethylhexyl)phthalate (DEHP)	117817	2.00E-02 i		1.40E-02 i			0.006 F	4.8 c	0.45 c	0.23 c	200 c	46 c
Bisphenol A	80057	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Boron (and borates)	7440428	9.00E-02 i	5.71E-03 h					330 n	2.1 n	12 n	9200 n	700 n
Boron trifluoride	7637072		2.00E-04 h					0.73 n	0.073 n			
Bromodichloromethane	75274	2.00E-02 i		6.20E-02 i		***	0.1 T	0.17 c	0.1 c	0.051 c	46 c	10 c
Bromoethene	593602				1.10E-01 h	***		0.096 c	0.057 c			
Bromoform (tribromomethane)	75252	2.00E-02 i		7.90E-03 i	3.85E-03 i	***	0.1 T	2.4 c	1.6 c	0.4 c	360 c	81 c
Bromomethane	74839	1.40E-03 i	1.43E-03 i			***		0.87 n	0.52 n	0.19 n	140 n	11 n
4-Bromophenyl phenyl ether	101553	5.80E-02 o						210 n	21 n	7.8 n	5900 n	450 n
Bromophos	2104963	5.00E-03 h						18 n	1.8 n	0.68 n	510 n	39 n
Bromoxynil	1689845	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Bromoxynil octanoate	1689992	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n

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1,3-Butadiene	106990				9.80E-01 i	•••		0.011 c	0.0064 c			
1-Butanol	71363	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Butyl benzyl phthalate	85687	2.00E-01 i					0.1 P	730 n	73 n	27 n	20000 n	1600 n
Butylate	2008415	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
sec-Butylbenzene	135988	1.00E-02 e				•••	0.002 F	6.1 n	3.7 n	1.4 n	1000 n	78 n
tert-Butylbenzene	104518	1.00E-02 e				•••	0.002 F	6.1 n	3.7 n	1.4 n	1000 n	78 n
Butylphthalyl butylglycolate	85701	1.00E+00 i						3700 n	370 n	140 n	100000 n	7800 n
Cacodylic acid	75605	3.00E-03 h						11 n	1.1 n	0.41 n	310 n	23 n
Cadmium and compounds	7440439	5.00E-04 i			6.30E+00 i		0.005 F	1.8 n	0.00099 c	0.068 n	51 n	3.9 n
Caprolactam	105602	5.00E-01 i						1800 n	180 n	68 n	51000 n	3900 n
Captafol	2425061	2.00E-03 i		8.60E-03 h				7.3 n	0.73 c	0.27 n	200 n	16 n
Captan	133062	1.30E-01 i		3.50E-03 h				19 c	1.8 c	0.9 c	820 c	180 c
Carbaryl	63252	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Carbazole	86748			2.00E-02 h				3.4 c	0.31 c	0.16 c	140 c	32 c
Carbofuran	1563662	5.00E-03 i					0.04 F	18 n	1.8 n	0.68 n	510 n	39 n
Carbon disulfide	75150	1.00E-01 i	2.86E-03 h			•••		2.1 n	1 n	14 n	10000 n	780 n
Carbon tetrachloride	56235	7.00E-04 i	5.71E-04 e	1.30E-01 i	5.25E-02 i	•••	0.005 F	0.16 c	0.12 c	0.024 c	22 c	4.9 c
Carbosulfan	55285148	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
Carboxin	5234684	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Chloral	75876	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Chloramben	133904	1.50E-02 i						55 n	5.5 n	2 n	1500 n	120 n
Chloranil	118752			4.03E-01 h				0.17 c	0.016 c	0.0078 c	7.1 c	1.6 c
Chlordane	57749	6.00E-05 i		1.30E+00 i	1.29E+00 i		0.002 F	0.052 c	0.0049 c	0.0024 c	2.2 c	0.47 n
Chlorimuron-ethyl	90982324	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Chlorine dioxide	10049044		5.71E-05 i					0.21 n	0.021 n			
Chloroacetaldehyde	107200	6.90E-03 o						25 n	2.5 n	0.93 n	710 n	54 n
Chloroacetic acid	79118	2.00E-03 h						7.3 n	0.73 n	0.27 n	200 n	16 n
2-Chloroacetophenone	532274		8.57E-06 i					0.031 n	0.0031 n			
4-Chloroaniline	106478	4.00E-03 i						15 n	1.5 n	0.54 n	410 n	31 n
Chlorobenzene	108907	2.00E-02 i	5.71E-03 h			•••	0.1 F	3.9 n	2.1 n	2.7 n	2000 n	160 n
Chlorobenzilate	510156	2.00E-02 i		2.70E-01 h	2.70E-01 h			0.25 c	0.023 c	0.012 c	11 c	2.4 c
p-Chlorobenzoic acid	74113	2.00E-01 h						730 n	73 n	27 n	20000 n	1600 n
4-Chlorobenzotrifluoride	98566	2.00E-02 h						73 n	7.3 n	2.7 n	2000 n	160 n
2-Chloro-1,3-butadiene	126998	2.00E-02 h	2.00E-03 h			•••		1.4 n	0.73 n	2.7 n	2000 n	160 n
1-Chlorobutane	109693	4.00E-01 h				•••		240 n	150 n	54 n	41000 n	3100 n
Chlorodifluoromethane	75456		1.43e+01 i			•••	0.002 F	8700 n	5200 n			
Chloroethane	75003	2.00E-02 e	2.86E+00 i			•••		71 n	1000 n	2.7 n	2000 n	160 n
2-Chloroethyl vinyl ether	110758	2.50E-02 o				•••		15 n	9.1 n	3.4 n	2600 n	200 n
Chloroform	67663	1.00E-02 i		6.10E-03 i	8.05E-02 i	•••	0.1 T	0.15 c	0.078 c	0.52 c	470 c	78 n

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Chloromethane	74873			1.30E-02 h	6.30E-03 h	***		1.4 c	0.99 c	0.24 c	220 c	49 c
4-Chloro-2,2-methylaniline hydrochloride	3165933			4.60E-01 h				0.15 c	0.014 c	0.0069 c	6.2 c	1.4 c
4-Chloro-2-methylaniline	95692			5.80E-01 h				0.12 c	0.011 c	0.0054 c	4.9 c	1.1 c
beta-Chloronaphthalene	91587	8.00E-02 i						290 n	29 n	11 n	8200 n	630 n
o-Chloronitrobenzene	88733			2.50E-02 h		***		0.42 c	0.25 c	0.13 c	110 c	26 c
p-Chloronitrobenzene	121733			1.80E-02 h		***		0.59 c	0.35 c	0.18 c	160 c	35 c
2-Chlorophenol	95578	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
2-Chloropropane	75296		2.86E-02 h			***		17 n	10 n			
Chlorothalonil	1897456	1.50E-02 i		1.10E-02 h				6.1 c	0.57 c	0.29 c	260 c	58 c
o-Chlorotoluene	95498	2.00E-02 i				***		12 n	7.3 n	2.7 n	2000 n	160 n
Chlorpropham	101213	2.00E-01 i						730 n	73 n	27 n	20000 n	1600 n
Chlorpyrifos	2921882	3.00E-03 i						11 n	1.1 n	0.41 n	310 n	23 n
Chlorpyrifos-methyl	5598130	1.00E-02 h						37 n	3.7 n	1.4 n	1000 n	78 n
Chlorsulfuron	64902723	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Chlorthiophos	60238564	8.00E-04 h						2.9 n	0.29 n	0.11 n	82 n	6.3 n
Chromium III and compounds	16065831	1.00E+00 i	5.71E-07 w				0.1 F	3700 n	0.00021 n	140 n	100000 n	7800 n
Chromium VI and compounds	7440473	5.00E-03 i			4.20E+01 i		0.1 F	18 n	0.00015 c	0.68 n	510 n	39 n
Coal tar	8001589				2.20E+00 w				0.0028 c			
Coke Oven Emissions	8007452				2.17E+00 i				0.0029 c			
Copper and compounds	7440508	3.71E-02 h						140 n	14 n	5 n	3800 n	290 n
Crotonaldehyde	123739	1.00E-02 w		1.90E+00 h	1.90E+00 w			0.035 c	0.0033 c	0.0017 c	1.5 c	0.34 c
Cumene	98828	4.00E-02 i	2.57E-03 h					150 n	0.94 n	5.4 n	4100 n	310 n
Cyanides:							0.2 P					
Barium cyanide	542621	1.00E-01 h						370 n	37 n	14 n	10000 n	780 n
Calcium cyanide	592018	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
Copper cyanide	544923	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Cyanazine	21725462	2.00E-03 h		8.40E-01 h				0.08 c	0.0075 c	0.0038 c	3.4 c	0.76 c
Cyanogen	460195	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
Cyanogen bromide	506683	9.00E-02 i						330 n	33 n	12 n	9200 n	700 n
Cyanogen chloride	506774	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Free cyanide	57125	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Hydrogen cyanide	74908	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Potassium cyanide	151508	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Potassium silver cyanide	506616	2.00E-01 i						730 n	73 n	27 n	20000 n	1600 n
Silver cyanide	506649	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Sodium cyanide	143339	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
Zinc cyanide	557211	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Cyclohexanone	108941	5.00E+00 i				***		3000 n	1800 n	680 n	510000 n	39000 n
Cyclohexlamine	108918	2.00E-01 i						730 n	73 n	27 n	20000 n	1600 n

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Cyhalothrin/Karate	68085858	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Cypermethrin	52315078	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
Cyromazine	66215278	7.50E-03 i						27 n	2.7 n	1 n	770 n	59 n
Dacthal	1861321	5.00E-01 i						1800 n	180 n	68 n	51000 n	3900 n
Dalapon	75990	3.00E-02 i					0.2 F	110 n	11 n	4.1 n	3100 n	230 n
Danitol	39515418	5.00E-04 w						1.8 n	0.18 n	0.068 n	51 n	3.9 n
DDD	72548			2.40E-01 i				0.28 c	0.026 c	0.013 c	12 c	2.7 c
DDE	72559			3.40E-01 i				0.2 c	0.018 c	0.0093 c	8.4 c	1.9 c
DDT	50293	5.00E-04 i		3.40E-01 i	3.40E-01 i			0.2 c	0.018 c	0.0093 c	8.4 c	1.9 c
Decabromodiphenyl ether	1163195	1.00E-02 i				•••		6.1 n	3.7 n	1.4 n	1000 n	78 n
Demeton	8065483	4.00E-05 i						0.15 n	0.015 n	0.0054 n	4.1 n	0.31 n
Diallate	2303164			6.10E-02 h		•••		0.17 c	0.1 c	0.052 c	47 c	10 c
Diazinon	333415	9.00E-04 h						3.3 n	0.33 n	0.12 n	92 n	7 n
1,4-Dibromobenzene	106376	1.00E-02 i				•••		6.1 n	3.7 n	1.4 n	1000 n	78 n
Dibromochloromethane	124481	2.00E-02 i		8.40E-02 i		•••	0.1 T	0.13 c	0.075 c	0.038 c	34 c	7.6 c
1,2-Dibromo-3-chloropropane	96128		5.71E-05 i	1.40E+00 h	6.90E-07 h	•••	0.0002 F	0.035 n	0.021 n	0.0023 c	2 c	0.46 c
1,2-Dibromoethane	106934		5.71E-05 h	8.50E+01 i	7.70E-01 i	•••	0.00005 F	0.00075 c	0.0081 c	0.00004 c	0.034 c	0.0075 c
Dibutyl phthalate	84742	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Dicamba	1918009	3.00E-02 i						110 n	11 n	4.1 n	3100 n	230 n
1,2-Dichlorobenzene	95501	9.00E-02 i	5.71E-02 h			•••	0.6 F	37 n	21 n	12 n	9200 n	700 n
1,3-Dichlorobenzene	541731	8.90E-02 o				•••	0.6 F	54 n	32 n	12 n	9100 n	700 n
1,4-Dichlorobenzene	106467		2.29E-01 i	2.40E-02 h		•••	0.075 F	0.44 c	0.26 c	0.13 c	120 c	27 c
3,3'-Dichlorobenzidine	91941			4.50E-01 i				0.15 c	0.014 c	0.007 c	6.4 c	1.4 c
1,4-Dichloro-2-butene	764410				9.30E+00 h	•••		0.0011 c	0.00067 c			
Dichlorodifluoromethane	75718	2.00E-01 i	5.71E-02 h			•••		39 n	21 n	27 n	20000 n	1600 i
1,1-Dichloroethane	75343	1.00E-01 h	1.43E-01 h			•••		81 n	52 n	14 n	10000 n	780 n
1,2-Dichloroethane (EDC)	107062		2.86E-03 e	9.10E-02 i	9.10E-02 i	•••	0.005 F	0.12 c	0.069 c	0.035 c	31 c	7 c
1,1-Dichloroethylene	75354	9.00E-03 i		6.00E-01 i	1.75E-01 i	•••	0.007 F	0.044 c	0.036 c	0.0053 c	4.8 c	1.1 c
1,2-Dichloroethylene (cis)	156592	1.00E-02 h				•••	0.07 F	6.1 n	3.7 n	1.4 n	1000 n	78 n
1,2-Dichloroethylene (trans)	156605	2.00E-02 i				•••	0.1 F	12 n	7.3 n	2.7 n	2000 n	160 n
1,2-Dichloroethylene (mixture)	540590	9.00E-03 h				•••		5.5 n	3.3 n	1.2 n	920 n	70 n
2,4-Dichlorophenol	120832	3.00E-03 i						11 n	1.1 n	0.41 n	310 n	23 n
2,4-Dichlorophenoxyacetic Acid (2,4-D)	94757	1.00E-02 i				•••	0.07 F	6.1 n	3.7 n	1.4 n	1000 n	78 n
4-(2,4-Dichlorophenoxy)butyric Acid	94826	8.00E-03 i						29 n	2.9 n	1.1 n	820 n	63 n
1,2-Dichloropropane	78875		1.14E-03 i	6.80E-02 h		•••	0.005 F	0.16 c	0.092 c	0.046 c	42 c	9.4 c
2,3-Dichloropropanol	616239	3.00E-03 i						11 n	1.1 n	0.41 n	310 n	23 n
1,3-Dichloropropene	542756	3.00E-04 i	5.71E-03 i	1.80E-01 h	1.30E-01 h	•••		0.077 c	0.048 c	0.018 c	16 c	2.3 n
Dichlorvos	62737	5.00E-04 i		2.90E-01 i				0.23 c	0.022 c	0.011 c	9.9 c	2.2 c
D[illegible]	115322			4.40E-01 w				0.15 c	0.014 c	0.0072 c	6.5 c	1.5 c

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Dicyclopentadiene	77736	3.00E-02 h	5.71E-05 h			•••		0.042 n	0.021 n	4.1 n	3100 n	230 n
Dieldrin	60571	5.00E-05 i		1.60E+01 i	1.61E+01 i			0.0042 c	0.00039 c	0.0002 c	0.18 c	0.04 c
Diesel emissions			1.43E-03 i					5.2 n	0.52 n			
Diethyl phthalate	84662	8.00E-01 i						2900 n	290 n	110 n	82000 n	6300 n
Diethylene glycol, monobutyl ether	112345		5.71E-03 h					21 n	2.1 n			
Diethylene glycol, monoethyl ether	111900	2.00E+00 h						7300 n	730 n	270 n	200000 n	16000 n
Diethylforamide	617845	1.10E-02 h						40 n	4 n	1.5 n	1100 n	86 n
Di(2-ethylhexyl)adipate	103231	6.00E-01 i		1.20E-03 i			0.4 F	56 c	5.2 c	2.6 c	2400 c	530 c
Diethylstilbestrol	56531			4.70E+03 h				0.00001 c	1E-06 c	7E-07 c	0.00061 c	0.00014 c
Difenzoquat (Avenge)	43222486	8.00E-02 i						290 n	29 n	11 n	8200 n	630 n
Diflubenzuron	35367385	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Diisopropyl methylphosphonate (DIMP)	1445756	8.00E-02 i						290 n	29 n	11 n	8200 n	630 n
Dimethipin	55290647	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Dimethoate	60515	2.00E-04 i						0.73 n	0.073 n	0.027 n	20 n	1.6 n
3,3'-Dimethoxybenzidine	119904			1.40E-02 h				4.8 c	0.45 c	0.23 c	200 c	46 c
Dimethyl phthalate	131113	1.00E+01 h						37000 n	3700 n	1400 n	10000000 n	78000 n
Dimethyl terephthalate	120616	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Dimethylamine	124403		5.71E-06 w					0.021 n	0.0021 n			
2,4-Dimethylaniline hydrochloride	21436964			5.80E-01 h				0.12 c	0.011 c	0.0054 c	4.9 c	1.1 c
2,4-Dimethylaniline	95681			7.50E-01 h				0.09 c	0.0083 c	0.0042 c	3.8 c	0.85 c
N-N-Dimethylaniline	121697	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
3,3'-Dimethylbenzidine	119937			9.20E+00 h				0.0073 c	0.00068 c	0.00034 c	0.31 c	0.069 c
N,N-Dimethylformamide	68122	1.00E-01 h	8.57E-03 i					370 n	3.1 n	14 n	10000 n	780 n
1,1-Dimethylhydrazine	57147			2.60E+00 h	3.50E+00 h			0.026 c	0.0018 c	0.0012 c	1.1 c	0.25 c
1,2-Dimethylhydrazine	540738			3.70E+01 w	3.70E+01 w			0.0018 c	0.00017 c	0.00009 c	0.077 c	0.017 c
2,4-Dimethylphenol	105679	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
2,6-Dimethylphenol	576261	6.00E-04 i						2.2 n	0.22 n	0.081 n	61 n	4.7 n
3,4-Dimethylphenol	95658	1.00E-03 i						3.7 n	0.37 n	0.14 n	100 n	7.8 n
1,2-Dinitrobenzene	528290	4.00E-04 h						1.5 n	0.15 n	0.054 n	41 n	3.1 n
1,3-Dinitrobenzene	99650	1.00E-04 i						0.37 n	0.037 n	0.014 n	10 n	0.78 n
1,4-Dinitrobenzene	100254	4.00E-04 h						1.5 n	0.15 n	0.054 n	41 n	3.1 n
4,6-Dinitro-o-cyclohexyl phenol	131895	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
2,4-Dinitrophenol	51285	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Dinitrotoluene mixture				6.80E-01 i				0.099 c	0.0092 c	0.0046 c	4.2 c	0.94 c
2,4-Dinitrotoluene	121142	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
2,6-Dinitrotoluene	606202	1.00E-03 h						3.7 n	0.37 n	0.14 n	100 n	7.8 n
Dinoseb	88857	1.00E-03 i					0.007 F	3.7 n	0.37 n	0.14 n	100 n	7.8 n
di-n-Octyl phthalate	117840	2.00E-02 h						73 n	7.3 n	2.7 n	2000 n	160 n
1,4-Dioxane	123911			1.10E-02 i				6.1 c	0.57 c	0.29 c	260 c	58 c

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Diphenamid	957517	3.00E-02 i						110 n	11 n	4.1 n	3100 n	230 n
Diphenylamine	122394	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
1,2-Diphenylhydrazine	122667			8.00E-01 i	7.70E-01 i			0.084 c	0.0081 c	0.0039 c	3.6 c	0.8 c
Diquat	85007	2.20E-03 i					0.02 F	8 n	0.8 n	0.3 n	220 n	17 n
Direct black 38	1937377			8.60E+00 h				0.0078 c	0.00073 c	0.00037 c	0.33 c	0.074 c
Direct blue 6	2602462			8.10E+00 h				0.0083 c	0.00077 c	0.00039 c	0.35 c	0.079 c
Direct brown 95	16071866			9.30E+00 h				0.0072 c	0.00067 c	0.00034 c	0.31 c	0.069 c
Disulfoton	298044	4.00E-05 i						0.15 n	0.015 n	0.0054 n	4.1 n	0.31 n
1,4-Dithiane	505293	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
Diuron	330541	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Dodine	2439103	4.00E-03 i						15 n	1.5 n	0.54 n	410 n	31 n
Endosulfan	115297	6.00E-03 h						22 n	2.2 n	0.81 n	610 n	47 n
Endothall	145733	2.00E-02 i					0.1 F	73 n	7.3 n	2.7 n	2000 n	160 n
Endrin	72208	3.00E-04 i					0.002 F	1.1 n	0.11 n	0.041 n	31 n	2.3 n
Epichlorohydrin	106898	2.00E-03 h	2.86E-04 i	9.90E-03 i	4.20E-03 i			6.8 c	0.1 n	0.27 n	200 n	16 n
1,2-Epoxybutane	106887		5.71E-03 i					21 n	2.1 n			
Ethephon (2-chloroethyl phosphonic acid)	16672870	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Ethion	563122	5.00E-04 i						1.8 n	0.18 n	0.068 n	51 n	3.9 n
2-Ethoxyethanol acetate	111159	3.00E-01 h						1100 n	110 n	41 n	31000 n	2300 n
2-Ethoxyethanol	110805	4.00E-01 h	5.71E-02 i					1500 n	21 n	54 n	41000 n	3100 n
Ethyl acrylate	140885			4.80E-02 h				1.4 c	0.13 c	0.066 c	60 c	13 c
EPTC (S-Ethyl dipropylthiocarbamate)	759944	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
Ethyl ether	60297	2.00E-01 i				•••		120 n	73 n	27 n	20000 n	1600 n
Ethyl methacrylate	97632	9.00E-02 h						330 n	33 n	12 n	9200 n	700 n
Ethyl acetate	141786	9.00E-01 i						3300 n	330 n	120 n	92000 n	7000 n
Ethylbenzene	100414	1.00E-01 i	2.86E-01 i			•••	0.7 F	130 n	100 n	14 n	10000 n	780 n
Ethylene cyanohydrin	109784	3.00E-01 h						1100 n	110 n	41 n	31000 n	2300 n
Ethylene diamine	107153	2.00E-02 h						73 n	7.3 n	2.7 n	2000 n	160 n
Ethylene glycol	107211	2.00E+00 i						7300 n	730 n	270 n	200000 n	16000 n
Ethylene glycol, monobutyl ether	111762		5.71E-03 h					21 n	2.1 n			
Ethylene oxide	75218			1.02E+00 h	3.50E-01 h			0.066 c	0.018 c	0.0031 c	2.8 c	0.63 c
Ethylene thiourea (ETU)	96457	8.00E-05 i		6.00E-01 h				0.11 c	0.01 c	0.0053 c	4.8 c	0.63 n
Ethyl p-nitrophenyl phenylphosphorothioate	2104645	1.00E-05 i						0.037 n	0.0037 n	0.0014 n	1 n	0.078 n
Ethylnitrosourea	759739			1.40E+02 w				0.00048 c	0.00005 c	0.00002 c	0.02 c	0.0046 c
Ethylphthalyl ethyl glycolate	84720	3.00E+00 i						11000 n	1100 n	410 n	310000 n	23000 n
Express	10120	8.00E-03 i						29 n	2.9 n	1.1 n	820 n	63 n
Fenamiphos	22224926	2.50E-04 i						0.91 n	0.091 n	0.034 n	26 n	2 n
Fl[illegible]uron	2164172	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Fl[illegible]e	7782414	6.00E-02 i						220 n	22 n	8.1 n	n	470 n

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Fluoridone	59756604	8.00E-02 i						290 n	29 n	11 n	8200 n	630 n
Flurprimidol	56425913	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Flutolanil	66332965	6.00E-02 i						220 n	22 n	8.1 n	6100 n	470 n
Fluvalinate	69409945	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
Folpet	133073	1.00E-01 i		3.50E-03 i				19 c	1.8 c	0.9 c	820 c	180 c
Fomesafen	72178020			1.90E-01 i				0.35 c	0.033 c	0.017 c	15 c	3.4 c
Fonofos	944229	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Formaldehyde	50000	2.00E-01 i			4.55E-02 i			730 n	0.14 c	27 n	20000 n	1600 n
Formic Acid	64186	2.00E+00 h						7300 n	730 n	270 n	200000 n	16000 n
Fosetyl-al	39148248	3.00E+00 i						11000 n	1100 n	410 n	310000 n	23000 n
Furan	110009	1.00E-03 i						3.7 n	0.37 n	0.14 n	100 n	7.8 n
Furazolidone	67458			3.80E+00 h				0.018 c	0.0016 c	0.00083 c	0.75 c	0.17 c
Furfural	98011	3.00E-03 i	1.43E-02 h					11 n	5.2 n	0.41 n	310 n	23 n
Furium	531828			5.00E+01 h				0.0013 c	0.00013 c	0.00006 c	0.057 c	0.013 c
Furmecyclox	60568050			3.00E-02 i				2.2 c	0.21 c	0.11 c	95 c	21 c
Glufosinate-ammonium	77182822	4.00E-04 i						1.5 n	0.15 n	0.054 n	41 n	3.1 n
Glycidaldehyde	765344	4.00E-04 i	2.86E-04 h					1.5 n	0.1 n	0.054 n	41 n	3.1 n
Glyphosate	1071836	1.00E-01 i					0.7 F	370 n	37 n	14 n	10000 n	780 n
Haloxyfop-methyl	69806402	5.00E-05 i						0.18 n	0.018 n	0.0068 n	5.1 n	0.39 n
Harmony	79277273	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
HCH (alpha)	319846			6.30E+00 i	6.30E+00 i			0.011 c	0.00099 c	0.0005 c	0.45 c	0.1 c
HCH (beta)	319857			1.80E+00 i	1.80E+00 i			0.037 c	0.0035 c	0.0018 c	1.6 c	0.35 c
HCH (gamma) Lindane	58899	3.00E-04 i		1.30E+00 h			0.0002 F	0.052 c	0.0048 c	0.0024 c	2.2 c	0.49 c
HCH-technical	608731			1.80E+00 i	1.79E+00 i			0.037 c	0.0035 c	0.0018 c	1.6 c	0.35 c
Heptachlor	76448	5.00E-04 i		4.50E+00 i	4.55E+00 i	***	0.0004 F	0.0023 c	0.0014 c	0.0007 c	0.64 c	0.14 c
Heptachlor epoxide	1024573	1.30E-05 i		9.10E+00 i	9.10E+00 i	***	0.0002 F	0.0012 c	0.00069 c	0.00035 c	0.31 c	0.07 c
Hexabromobenzene	87821	2.00E-03 i				***		1.2 n	0.73 n	0.27 n	200 n	16 n
Hexachlorobenzene	118741	8.00E-04 i		1.60E+00 i	1.61E+00 i	***	0.001 F	0.0066 c	0.0039 c	0.002 c	1.8 c	0.4 c
Hexachlorobutadiene	87683	2.00E-04 h		7.80E-02 i	7.70E-02 i	***		0.12 n	0.073 n	0.027 n	20 n	1.6 n
Hexachlorocyclopentadiene	77474	7.00E-03 i	2.00E-05 h			***	0.05 F	0.015 n	0.0073 n	0.95 n	720 n	55 n
Hexachlorodibenzo-p-dioxin mixture	19408743			6.20E+03 i	4.55E+03 i			0.00001 c	1E-06 c	5E-07 c	0.00046 c	0.0001 c
Hexachloroethane	67721	1.00E-03 i		1.40E-02 i	1.40E-02 i	***		0.61 n	0.37 n	0.14 n	100 n	7.8 n
Hexachlorophene	70304	3.00E-04 i						1.1 n	0.11 n	0.041 n	31 n	2.3 n
Hexahydro-1,3,5-trinitro-1,3,5-triazine	121824	3.00E-03 i		1.10E-01 i				0.61 c	0.057 c	0.029 c	26 c	5.8 c
n-Hexane	110543	6.00E-02 h	5.71E-02 i			***		35 n	21 n	8.1 n	6100 n	470 n
Hexazinone	51235042	3.30E-02 i						120 n	12 n	4.5 n	3400 n	260 n
Hydrazine, hydrazine sulfate	302012			3.00E+00 i	1.71E+01 i			0.022 c	0.00037 c	0.0011 c	0.95 c	0.21 c
Hydrogen chloride	7647010		2.00E-03 i					7.3 n	0.73 n			
Hydrogen sulfide	7783064	3.00E-03 i	2.57E-04 i					11 n	0.094 n	0.41 n	310 n	23 n

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Hydroquinone	123319	4.00E-02 h						150 n	15 n	5.4 n	4100 n	310 n
Imazalil	35554440	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Imazaquin	81335377	2.50E-01 i						910 n	91 n	34 n	26000 n	2000 n
Iprodione	36734197	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
Isobutanol	78831	3.00E-01 i				•••		180 n	110 n	41 n	31000 n	2300 n
Isophorone	78591	2.00E-01 i		9.50E-04 i				71 c	6.6 c	3.3 c	3000 c	670 c
Isopropalin	33820530	1.50E-02 i						55 n	5.5 n	2 n	1500 n	120 n
Isopropyl methyl phosphonic acid	1832548	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Isoxaben	82558507	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Kepone	143500			1.80E+01 •				0.0037 c	0.00035 c	0.00018 c	0.16 c	0.035 c
Lactofen	77501634	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Lead (tetraethyl)	78002	1.00E-07 i						0.00037 n	0.00004 n	0.00001 n	0.01 n	0.00078 n
Linuron	330552	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Lithium	7439932	2.00E-02 •						73 n	7.3 n	2.7 n	2000 n	160 n
Londax	83056996	2.00E-01 i						730 n	73 n	27 n	20000 n	1600 n
Malathion	121755	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Maleic anhydride	108316	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Maleic hydrazide	123331	5.00E-01 i						1800 n	180 n	68 n	51000 n	3900 n
Malononitrile	109773	2.00E-05 h						0.073 n	0.0073 n	0.0027 n	2 n	0.16 n
Mancozeb	8018017	3.00E-02 h						110 n	11 n	4.1 n	3100 n	230 n
Maneb	12427382	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Manganese and compounds	7439965	5.00E-03 i	1.43e-05 i					18 n	0.0052 n	0.68 n	510 n	39 n
Mephosfolan	950107	9.00E-05 h						0.33 n	0.033 n	0.012 n	9.2 n	0.7 n
Mepiquat chloride	24307264	3.00E-02 i						110 n	11 n	4.1 n	3100 n	230 n
Mercury (inorganic)	7439976	3.00E-04 h	8.57E-05 h				0.002 F	1.1 n	0.031 n	0.041 n	31 n	2.3 n
Mercury (methyl)	22967926	3.00E-04 i					0.002 F	1.1 n	0.11 n	0.041 n	31 n	2.3 n
Merphos	150505	3.00E-05 i						0.11 n	0.011 n	0.0041 n	3.1 n	0.23 n
Merphos oxide	78488	3.00E-05 i						0.11 n	0.011 n	0.0041 n	3.1 n	0.23 n
Metalaxyl	57837191	6.00E-02 i						220 n	22 n	8.1 n	6100 n	470 n
Methacrylonitrile	126987	1.00E-04 i	2.00E-04 h					0.37 n	0.073 n	0.014 n	10 n	0.78 n
Methamidophos	10265926	5.00E-05 i						0.18 n	0.018 n	0.0068 n	5.1 n	0.39 n
Methanol	67561	5.00E-01 i						1800 n	180 n	68 n	51000 n	3900 n
Methidathion	950378	1.00E-03 i						3.7 n	0.37 n	0.14 n	100 n	7.8 n
Methomyl	16752775	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
Methoxychlor	72435	5.00E-03 i					0.04 F	18 n	1.8 n	0.68 n	510 n	39 n
2-Methoxyethanol acetate	110496	2.00E-03 h						7.3 n	0.73 n	0.27 n	200 n	16 n
2-Methoxyethanol	109864	1.00E-03 h	5.71E-03 i					3.7 n	2.1 n	0.14 n	100 n	7.8 n
2-[illegible]oxy-5-nitroaniline	99592			4.60E-02 h				1.5 c	0.14 c	0.069 c	62 c	14 c
M[illegible]cetate	79209	1.00E+00 h		[illegible]				3700 n	370 n	140 n	1[illegible]	7800 n

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Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg•d/mg	CPSi kg•d/mg	VOC	MCL mg/L	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
Methyl acrylate	96333	3.00E-02 h						110 n	11 n	4.1 n	3100 n	230 n
2-Methylaniline hydrochloride	636215			1.80E-01 h				0.37 c	0.035 c	0.018 c	16 c	3.5 c
2-Methylaniline	95534			2.40E-01 h				0.28 c	0.026 c	0.013 c	12 c	2.7 c
Methyl chlorocarbonate	79221	1.00E+00 w						3700 n	370 n	140 n	100000 n	7800 n
4-(2-Methyl-4-chlorophenoxy) butyric acid	94815	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
2-Methyl-4-chlorophenoxyacetic acid	94746	5.00E-04 i						1.8 n	0.18 n	0.068 n	51 n	3.9 n
2-(2-Methyl-14-chlorophenoxy)propionic acid	93652	1.00E-03 i						3.7 n	0.37 n	0.14 n	100 n	7.8 n
Methylcyclohexane	108872		8.57E-01 h					3100 n	310 n			
Methylene bromide	74953	1.00E-02 h				•••		6.1 n	3.7 n	1.4 n	1000 n	78 n
Methylene chloride	75092	6.00E-02 i	8.57E-01 h	7.50E-03 i	1.64E-03 i	•••	0.005 F	4.1 c	3.8 c	0.42 c	380 c	85 c
4,4'-Methylene bis(2-chloroaniline)	101144	7.00E-04 h		1.30E-01 h	1.30E-01 h			0.52 c	0.048 c	0.024 c	22 c	4.9 c
4,4'-Methylenebisbenzeneamine	101779			2.50E-01 h				0.27 c	0.025 c	0.013 c	11 c	2.6 c
4,4'-Methylene bis(N,N'-dimethyl)aniline	101611			4.60E-02 i				1.5 c	0.14 c	0.069 c	62 c	14 c
4,4'-Methylenediphenyl isocyanate	101688		5.71E-06 h			•••		0.0035 n	0.0021 n			
Methyl ethyl ketone	78933	6.00E-01 i	2.86E-01 i					2200 n	100 n	81 n	61000 n	4700 n
Methyl hydrazine	60344			1.10E+00 h				0.061 c	0.0057 c	0.0029 c	2.6 c	0.58 c
Methyl isobutyl ketone	108101	5.00E-02 h	2.29E-02 h					180 n	8.4 n	6.8 n	5100 n	390 n
Methyl methacrylate	80626	8.00E-02 h						290 n	29 n	11 n	8200 n	630 n
2-Methyl-5-nitroaniline	99558			3.30E-02 h				2 c	0.19 c	0.096 c	87 c	19 c
Methyl parathion	298000	2.50E-04 i						0.91 n	0.091 n	0.034 n	26 n	2 n
2-Methylphenol (o-cresol)	95487	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
3-Methylphenol (m-cresol)	103394	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
4-Methylphenol (p-cresol)	106445	5.00E-03 h						18 n	1.8 n	0.68 n	510 n	39 n
Methyl styrene (mixture)	25013154	6.00E-03 h	1.14E-02 h			•••		6 n	4.2 n	0.81 n	610 n	47 n
Methyl styrene (alpha)	98839	7.00E-02 h				•••		43 n	26 n	9.5 n	7200 n	550 n
Methyl tertbutyl ether (MTBE)	1634044	5.00E-03 e	8.57E-01 i			•••		18 n	310 n	0.68 n	510 n	39 n
Metolaclor (Dual)	51218452	1.50E-01 i						550 n	55 n	20 n	15000 n	1200 n
Metribuzin	21807649	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
Mirex	2385855	2.00E-04 i		1.80E+00 h				0.037 c	0.0035 c	0.0018 c	1.6 c	0.35 c
Molinate	2212671	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Molybdenum	7439987	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Monochloramine	10599903	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Naled	300765	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Napropamide	15299997	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Nickel refinery dust					8.40E-01 i				0.0075 c			
Nickel (soluble salts)	7440020	2.00E-02 i					0.1 F	73 n	7.3 n	2.7 n	2000 n	160 n
Nickel subsulfide	12035722				1.70E+00 i				0.0037 c			
Nitrapyrin	1929824	1.50E-03 w						5.5 n	0.55 n	0.2 n	150 n	12 n
Nitrate	14797558	1.60E+00 i					10 F	5800 n	580 n	220 n	160000 n	13000 n

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Nitric Oxide	10102439	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
Nitrite	14797650	1.00E-01 i					1 F	370 n	37 n	14 n	10000 n	780 n
2-Nitroaniline	88744	6.00E-05 w	5.71E-05 h					0.22 n	0.021 n	0.0081 n	6.1 n	0.47 n
3-Nitroaniline	99092	3.00E-03 o						11 n	1.1 n	0.41 n	310 n	23 n
4-Nitroaniline	100016	3.00E-03 o						11 n	1.1 n	0.41 n	310 n	23 n
Nitrobenzene	98953	5.00E-04 i	5.71E-04 h			•••		0.34 n	0.21 n	0.068 n	51 n	3.9 n
Nitrofurantoin	67209	7.00E-02 h						260 n	26 n	9.5 n	7200 n	550 n
Nitrofurazone	59870			1.50E+00 h	9.40E+00 h			0.045 c	0.00067 c	0.0021 c	1.9 c	0.43 c
Nitrogen dioxide	10102440	1.00E+00 i						3700 n	370 n	140 n	100000 n	7800 n
Nitroguanidine	556887	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
4-Nitrophenol	100027	6.20E-02 o						230 n	23 n	8.4 n	6300 n	480 n
2-Nitropropane	79469		5.71E-03 i		9.40E+00 h			21 n	0.00067 c			
N-Nitrosodi-n-butylamine	924163			5.40E+00 i	5.60E+00 i			0.012 c	0.0011 c	0.00058 c	0.53 c	0.12 c
N-Nitrosodiethanolamine	1116547			2.80E+00 i				0.024 c	0.0022 c	0.0011 c	1 c	0.23 c
N-Nitrosodiethylamine	55185			1.50E+02 i	1.51E+02 i			0.00045 c	0.00004 c	0.00002 c	0.019 c	0.0043 c
N-Nitrosodimethylamine	62759			5.10E+01 i	4.90E+01 i			0.0013 c	0.00013 c	0.00006 c	0.056 c	0.013 c
N-Nitrosodiphenylamine	86306			4.90E-03 i				14 c	1.3 c	0.64 c	580 c	130 c
N-Nitroso di-n-propylamine	621647			7.00E+00 i				0.0096 c	0.00089 c	0.00045 c	0.41 c	0.091 c
N-Nitroso-N-methylethylamine	10595956			2.20E+01 i				0.0031 c	0.00028 c	0.00014 c	0.13 c	0.029 c
N-Nitrosopyrrolidine	930552			2.10E+00 i	2.13E+00 i			0.032 c	0.0029 c	0.0015 c	1.4 c	0.3 c
m-Nitrotoluene	99081	1.00E-02 h				•••		6.1 n	3.7 n	1.4 n	1000 n	78 n
o-Nitrotoluene	88722	1.00E-02 h				•••		6.1 n	3.7 n	1.4 n	1000 n	78 n
p-Nitrotoluene	99990	1.00E-02 h				•••		6.1 n	3.7 n	1.4 n	1000 n	78 n
Norflurazon	27314132	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
NuStar	85509199	7.00E-04 i						2.6 n	0.26 n	0.095 n	72 n	5.5 n
Octabromodiphenyl ether	32536520	3.00E-03 i						11 n	1.1 n	0.41 n	310 n	23 n
Octahydro-1357-tetranitro-1357-tetrazocine	2691410	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Octamethylpyrophosphoramide	152169	2.00E-03 h						7.3 n	0.73 n	0.27 n	200 n	16 n
Oryzalin	19044883	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Oxadiazon	19666309	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Oxamyl	23135220	2.50E-02 i					0.2 F	91 n	9.1 n	3.4 n	2600 n	200 n
Oxyfluorfen	42874033	3.00E-03 i						11 n	1.1 n	0.41 n	310 n	23 n
Paclobutrazol	76738620	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Paraquat	1910425	4.50E-03 i						16 n	1.6 n	0.61 n	460 n	35 n
Parathion	56382	6.00E-03 h						22 n	2.2 n	0.81 n	610 n	47 n
Pebulate	1114712	5.00E-02 h						180 n	18 n	6.8 n	5100 n	390 n
Pendimethalin	40487421	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
P[illegible]omo-6-chloro cyclohexane	87843			2.30E-02 h				2.9 c	0.27 c	0.14 c	120 c	28 c
Pe[illegible]romodiphenyl ether	32534819	2.00E-03 i						7.3 n	0.73 n	0.27 n	[illegible] n	16 n

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Pentachlorobenzene	608935	8.00E-04 i				•••		0.49 n	0.29 n	0.11 n	82 n	6.3 n
Pentachloronitrobenzene	82688	3.00E-03 i		2.60E-01 h		•••		0.041 c	0.024 c	0.012 c	11 c	2.5 c
Pentachlorophenol	87865	3.00E-02 i		1.20E-01 i			0.001 F	0.56 c	0.052 c	0.026 c	24 c	5.3 c
Permethrin	52645531	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n
Phenmedipham	13684634	2.50E-01 i						910 n	91 n	34 n	26000 n	2000 n
Phenol	108952	6.00E-01 i						2200 n	220 n	81 n	61000 n	4700 n
m-Phenylenediamine	108452	6.00E-03 i						22 n	2.2 n	0.81 n	610 n	47 n
o-Phenylenediamine	95545	6.00E-03 h						22 n	2.2 n	0.81 n	610 n	47 n
p-Phenylenediamine	106503	1.90E-01 h						690 n	69 n	26 n	19000 n	1500 n
Phenylmercuric acetate	62384	8.00E-05 i						0.29 n	0.029 n	0.011 n	8.2 n	0.63 n
2-Phenylphenol	90437			1.94E-03 h				35 c	3.2 c	1.6 c	1500 c	330 c
Phorate	298022	2.00E-04 h						0.73 n	0.073 n	0.027 n	20 n	1.6 n
Phosmet	732116	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Phosphine	7803512	3.00E-04 i	8.57E-06 h					1.1 n	0.0031 n	0.041 n	31 n	2.3 n
Phosphorus (white)	7723140	2.00E-05 i						0.073 n	0.0073 n	0.0027 n	2 n	0.16 n
p-Phthalic acid	100210	1.00E+00 h						3700 n	370 n	140 n	100000 n	7800 n
Phthalic anhydride	85449	2.00E+00 i	3.43E-01 h					7300 n	130 n	270 n	200000 n	16000 n
Picloram	1918021	7.00E-02 i					0.5 F	260 n	26 n	9.5 n	7200 n	550 n
Pirimiphos-methyl	29232937	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
Polybrominated biphenyls		7.00E-06 h		8.90E+00 h				0.0076 c	0.0007 c	0.00035 c	0.32 c	0.055 n
Polychlorinated biphenyls (PCBs)	1336363			7.70E+00 i			0.0005 F	0.0087 c	0.00081 c	0.00041 c	0.37 c	0.083 c
Aroclor 1016	12674112	7.00E-05 i						0.26 n	0.026 n	0.0095 n	7.2 n	0.55 n
Polychlorinated terphenyls (PCTs)				4.50E+00 e				0.015 c	0.0014 c	0.0007 c	0.64 c	0.14 c
Polynuclear aromatic hydrocarbons												
Acenaphthene	83329	6.00E-02 i						220 n	22 n	8.1 n	6100 n	470 n
Anthracene	120127	3.00E-01 i						1100 n	110 n	41 n	31000 n	2300 n
Benzo[a]pyrene	50328			7.30E+00 i	6.10E+00 h		0.0002 F	0.0092 c	0.001 c	0.00043 c	0.39 c	0.088 c
Benzo[b]fluoranthene	205992			7.30E-01 e	6.10E-01 e		0.0002 P	0.092 c	0.01 c	0.0043 c	3.9 c	0.88 c
Benzo[k]fluoranthene	207089			7.30E-02 e	6.10E-02 e		0.0002 P	0.92 c	0.1 c	0.043 c	39 c	8.8 c
Benz[a]anthracene	56553			7.30E-01 e	6.10E-01 e		0.0001 P	0.092 c	0.01 c	0.0043 c	3.9 c	0.88 c
Chrysene	218019			7.30E-03 e	6.10E-03 e		0.0002 P	9.2 c	1 c	0.43 c	390 c	88 c
Dibenz[ah]anthracene	53703			7.30E+00 e	6.10E+00 e		0.0003 P	0.0092 c	0.001 c	0.00043 c	0.39 c	0.088 c
Fluoranthene	206440	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
Fluorene	86737	4.00E-02 i						150 n	15 n	5.4 n	4100 n	310 n
Indeno[1,2,3-cd]pyrene	193395			7.30E-01 e	6.10E-01 e		0.0004 P	0.092 c	0.01 c	0.0043 c	3.9 c	0.88 c
Naphthalene	91203	4.00E-02 w						150 n	15 n	5.4 n	4100 n	310 n
Pyrene	129000	3.00E-02 i						110 n	11 n	4.1 n	3100 n	230 n
Prochloraz	67747095	9.00E-03 i		1.50E-01 i				0.45 c	0.042 c	0.021 c	19 c	4.3 c
Profluralin	26399360	6.00E-03 h						22 n	2.2 n	0.81 n	610 n	47 n

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Prometon	1610180	1.50E-02 i						55 n	5.5 n	2 n	1500 n	120 n
Prometryn	7287196	4.00E-03 i						15 n	1.5 n	0.54 n	410 n	31 n
Pronamide	23950585	7.50E-02 i						270 n	27 n	10 n	7700 n	590 n
Propachlor	1918167	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Propanil	709988	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Propargite	2312358	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Propargyl alcohol	107197	2.00E-03 i						7.3 n	0.73 n	0.27 n	200 n	16 n
Propazine	139402	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Propham	122429	2.00E-02 i						73 n	7.3 n	2.7 n	2000 n	160 n
Propiconazole	60207901	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Propylene glycol	57556	2.00E+01 h						73000 n	7300 n	2700 n	1000000 n	160000 n
Propylene glycol, monoethyl ether	52125538	7.00E-01 h						2600 n	260 n	95 n	72000 n	5500 n
Propylene glycol, monomethyl ether	107982	7.00E-01 h	5.71E-01 i					2600 n	210 n	95 n	72000 n	5500 n
Propylene oxide	75569		8.57E-03 i	2.40E-01 i	1.29E-02 i			0.28 c	0.49 c	0.013 c	.12 c	2.7 c
Pursuit	81335775	2.50E-01 i						910 n	91 n	34 n	26000 n	2000 n
Pydrin	51630581	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
Pyridine	110861	1.00E-03 i						3.7 n	0.37 n	0.14 n	100 n	7.8 n
Quinalphos	13593038	5.00E-04 i						1.8 n	0.18 n	0.068 n	51 n	3.9 n
Quinoline	91225			1.20E+01 h				0.0056 c	0.00052 c	0.00026 c	0.24 c	0.053 c
Resmethrin	10463868	3.00E-02 i						110 n	11 n	4.1 n	3100 n	230 n
Ronnel	299843	5.00E-02 h						180 n	18 n	6.8 n	5100 n	390 n
Rotenone	83794	4.00E-03 i						15 n	1.5 n	0.54 n	410 n	31 n
Savey	78587050	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
Selenious Acid	7783008	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Selenium	7782492	5.00E-03 i					0.05 F	18 n	1.8 n	0.68 n	510 n	39 n
Selenourea	630104	5.00E-03 h						18 n	1.8 n	0.68 n	510 n	39 n
Sethoxydim	74051802	9.00E-02 i						330 n	33 n	12 n	9200 n	700 n
Silver and compounds	7440224	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Simazine	122349	5.00E-03 i		1.20E-01 h			0.004 F	0.56 c	0.052 c	0.026 c	24 c	5.3 c
Sodium azide	26628228	4.00E-03 i						15 n	1.5 n	0.54 n	410 n	31 n
Sodium diethyldithiocarbamate	148185	3.00E-02 i		2.70E-01 h				0.25 c	0.023 c	0.012 c	11 c	2.4 c
Sodium fluoroacetate	62748	2.00E-05 i						0.073 n	0.0073 n	0.0027 n	2 n	0.16 n
Sodium metavanadate	13718268	1.00E-03 h						3.7 n	0.37 n	0.14 n	100 n	7.8 n
Strontium, stable	7440246	6.00E-01 i						2200 n	220 n	81 n	61000 n	4700 n
Strychnine	57249	3.00E-04 i						1.1 n	0.11 n	0.041 n	31 n	2.3 n
Styrene	100425	2.00E-01 i	2.86E-01 i			***	0.1 F	160 n	100 n	27 n	20000 n	1600 n
Systhane	88671890	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
2,3,7,8-TCDD (dioxin)	1746016			1.50E+05 h	1.50E+05 h		3E-08 F	5E-07 c	4E-08 c	2E-08 c	0.00002 c	4.30E-06 c
Tebuthiuron	34014181	7.00E-02 i						260 n	26 n	9.5 n	n	550 n

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Temephos	3383968	2.00E-02 h						73 n	7.3 n	2.7 n	2000 n	160 n
Terbacil	5902512	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Terbufos	13071799	2.50E-05 h						0.091 n	0.0091 n	0.0034 n	2.6 n	0.2 n
Terbutryn	886500	1.00E-03 i						3.7 n	0.37 n	0.14 n	100 n	7.8 n
1,2,4,5-Tetrachlorobenzene	95943	3.00E-04 i				•••		0.18 n	0.11 n	0.041 n	31 n	2.3 n
1,1,1,2-Tetrachloroethane	630206	3.00E-02 i		2.60E-02 i	2.59E-02 i	•••		0.41 c	0.24 c	0.12 c	110 c	25 c
1,1,2,2-Tetrachloroethane	630206			2.00E-01 i	2.03E-01 i	•••		0.052 c	0.031 c	0.016 c	14 c	3.2 c
Tetrachloroethylene (PCE)	127184	1.00E-02 i		5.20E-02 o	2.03E-03 o	•••	0.005 F	1.1 c	3.1 c	0.061 c	55 c	12 c
2,3,4,6-Tetrachlorophenol	58902	3.00E-02 i						110 n	11 n	4.1 n	3100 n	230 n
p,a,a,a-Tetrachlorotoluene	5216251			2.00E+01 h		•••		0.00053 c	0.00031 c	0.00016 c	0.14 c	0.032 c
Tetrachlorovinphos	961115	3.00E-02 i		2.40E-02 h				2.8 c	0.26 c	0.13 c	120 c	27 c
Tetraethyldithiopyrophosphate	3689245	5.00E-04 i						1.8 n	0.18 n	0.068 n	51 n	3.9 n
Thallic oxide	1314325	7.00E-05 h						0.26 n	0.026 n	0.0095 n	7.2 n	0.55 n
Thallium							0.002 F					
Thallium acetate	563688	9.00E-05 i						0.33 n	0.033 n	0.012 n	9.2 n	0.7 n
Thallium carbonate	6533739	8.00E-05 i						0.29 n	0.029 n	0.011 n	8.2 n	0.63 n
Thallium chloride	7791120	8.00E-05 i						0.29 n	0.029 n	0.011 n	8.2 n	0.63 n
Thallium nitrate	10102451	9.00E-05 i						0.33 n	0.033 n	0.012 n	9.2 n	0.7 n
Thallium selenite	12039520	9.00E-05 w						0.33 n	0.033 n	0.012 n	9.2 n	0.7 n
Thallium sulfate	7446186	8.00E-05 i						0.29 n	0.029 n	0.011 n	8.2 n	0.63 n
Thiobencarb	28249776	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
2-(Thiocyanomethylthio)-benzothiazole	21564170	3.00E-02 h						110 n	11 n	4.1 n	3100 n	230 n
Thiofanox	39196184	3.00E-04 h						1.1 n	0.11 n	0.041 n	31 n	2.3 n
Thiophanate-methyl	23564058	8.00E-02 i						290 n	29 n	11 n	8200 n	630 n
Thiram	137268	5.00E-03 i						18 n	1.8 n	0.68 n	510 n	39 n
Tin and compounds		6.00E-01 h						2200 n	220 n	81 n	61000 n	4700 n
Toluene	108883	2.00E-01 i	1.14E-01 w			•••	1 F	75 n	42 n	27 n	20000 n	1600 n
Toluene-2,4-diamine	95807			3.20E+00 h				0.021 c	0.002 c	0.00099 c	0.89 c	0.2 c
Toluene-2,5-diamine	95705	6.00E-01 h						2200 n	220 n	81 n	61000 n	4700 n
Toluene-2,6-diamine	823405	2.00E-01 h						730 n	73 n	27 n	20000 n	1600 n
p-Toluidine	106490			1.90E-01 h				0.35 c	0.033 c	0.017 c	15 c	3.4 c
Toxaphene	8001352			1.10E+00 i	1.12E+00 i		0.003 F	0.061 c	0.0056 c	0.0029 c	2.6 c	0.58 c
Tralomethrin	66841256	7.50E-03 i						27 n	2.7 n	1 n	770 n	59 n
Triallate	2303175	1.30E-02 i						47 n	4.7 n	1.8 n	1300 n	100 n
Triasulfuron	82097505	1.00E-02 i						37 n	3.7 n	1.4 n	1000 n	78 n
1,2,4-Tribromobenzene	615543	5.00E-03 i				•••		3 n	1.8 n	0.68 n	510 n	39 n
Tributyltin oxide (TBTO)	56359	3.00E-05 i						0.11 n	0.011 n	0.0041 n	3.1 n	0.23 n
2,4,6-Trichloroaniline hydrochloride	33663502			2.90E-02 h				2.3 c	0.22 c	0.11 c	99 c	22 c
2,4,6-Trichloroaniline	634935			3.40E-02 h				2 c	0.18 c	0.093 c	84 c	19 c

Sources: i=IRIS h=HEAST a=HEAST alt. w=Withdrawn from IRIS or HEAST e=EPA-ECAO o=Other EPA documents *F=final D=draft P=proposed T=tentative / c=carcinogen n=noncarcinogen*

Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg•d/mg	CPSi kg•d/mg	VOC	MCL mg/L	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
1,2,4-Trichlorobenzene	120821	1.00E-02 i	2.57E-03 h			***	0.07 F	1.8 n	0.94 n	1.4 n	1000 n	78 n
1,1,1-Trichloroethane	71556	9.00E-02 w	2.86E-01 w			***	0.2 F	130 n	100 n	12 n	9200 n	700 n
1,1,2-Trichloroethane	79005	4.00E-03 i		5.70E-02 i	5.60E-02 i	***	0.005 F	0.19 c	0.11 c	0.055 c	50 c	11 c
Trichloroethylene (TCE)	79016	6.00E-03 e		1.10E-02 w	6.00E-03 e	***	0.005 F	1.6 c	1 c	0.29 c	260 c	47 n
Trichlorofluoromethane	75694	3.00E-01 i	2.00E-01 h			***		130 n	73 n	41 n	31000 n	2300 n
2,4,5-Trichlorophenol	95954	1.00E-01 i						370 n	37 n	14 n	10000 n	780 n
2,4,6-Trichlorophenol	88062			1.10E-02 i	1.09E-02 i			6.1 c	0.57 c	0.29 c	260 c	58 c
2,4,5-Trichlorophenoxyacetic acid	93765	1.00E-02 i					0.05 F	37 n	3.7 n	1.4 n	1000 n	78 n
2-(2,4,5-Trichlorophenoxy)propionic acid	93721	8.00E-03 i						29 n	2.9 n	1.1 n	820 n	63 n
1,1,2-Trichloropropane	598776	5.00E-03 i				***		3 n	1.8 n	0.68 n	510 n	39 n
1,2,3-Trichloropropane	96184	6.00E-03 i				***		3.7 n	2.2 n	0.81 n	610 n	47 n
1,2,3-TCP as carcinogen	96184			2.70E+00 e		***		0.0039 c	0.0023 c	0.0012 c	1.1 c	0.24 c
1,2,3-Trichloropropene	96195	5.00E-03 h				***		3 n	1.8 n	0.68 n	510 n	39 n
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	3.00E+01 i	8.57E+00 h			***		5900 n	3100 n	4100 n	1000000 n	230000 n
Tridiphane	58138082	3.00E-03 i						11 n	1.1 n	0.41 n	310 n	23 n
Triethylamine	121448		2.00E-03 i					7.3 n	0.73 n			
Trifluralin	1582098	7.50E-03 i		7.70E-03 i				8.7 c	0.81 c	0.41 c	370 c	59 n
1,2,4-Trimethylbenzene	95636	5.00e-04 e				***	0.002 F	0.3 n	0.18 n	0.068 n	51 n	3.9 n
1,3,5-Trimethylbenzene	108678	4.00e-04 e				***	0.002 F	0.24 n	0.15 n	0.054 n	41 n	3.1 n
Trimethyl phosphate	512561			3.70E-02 h				1.8 c	0.17 c	0.085 c	77 c	17 c
1,3,5-Trinitrobenzene	99354	5.00E-05 i						0.18 n	0.018 n	0.0068 n	5.1 n	0.39 n
Trinitrophenylmethylnitramine	479458	1.00E-02 h						37 n	3.7 n	1.4 n	1000 n	78 n
2,4,6-Trinitrotoluene	118967	5.00E-04 i		3.00E-02 i				1.8 n	0.18 n	0.068 n	51 n	3.9 n
Uranium (soluble salts)	7440611	3.00E-03 i						11 n	1.1 n	0.41 n	310 n	23 n
Vanadium	7440622	7.00E-03 h						26 n	2.6 n	0.95 n	720 n	55 n
Vanadium pentoxide	1314621	9.00E-03 i						33 n	3.3 n	1.2 n	920 n	70 n
Vanadium sulfate	36907423	2.00E-02 h						73 n	7.3 n	2.7 n	2000 n	160 n
Vernam	1929777	1.00E-03 i						3.7 n	0.37 n	0.14 n	100 n	7.8 n
Vinclozolin	50471448	2.50E-02 i						91 n	9.1 n	3.4 n	2600 n	200 n
Vinyl acetate	108054	1.00E+00 h	5.71E-02 i					3700 n	21 n	140 n	100000 n	7800 n
Vinyl bromide	593602		8.57E-04 i			***		0.52 n	0.31 n			
Vinyl chloride	75014			1.90E+00 h	3.00E-01 h	***	0.002 F	0.019 c	0.021 c	0.0017 c	1.5 c	0.34 c
Warfarin	81812	3.00E-04 i						1.1 n	0.11 n	0.041 n	31 n	2.3 n
m-Xylene	108323	2.00E+00 h	2.00E-01 w			***	10 F	140 n	73 n	270 n	200000 n	16000 n
o-Xylene	95476	2.00E+00 h	2.00E-01 w			***	10 F	140 n	73 n	270 n	200000 n	16000 n
p-Xylene	106423		8.57E-02 w			***	10 F	52 n	31 n			
Xylene (mixed)	1330207	2.00E+00 i				***	10 F	1200 n	730 n	270 n	200000 n	16000 n
Zin[illegible]	7440666	3.00E-01 i						1100 n	110 n	41 n	31000 n	2300 n
Zi[illegible]sphide	1314847	3.00E-04 i						1.1 n	0.11 n	0.041 n	[illegible]	2.3 n

Sources: i=IRIS h=HEAST a=HEAST alt. w=Withdrawn from IRIS or HEAST e=EPA-ECAO o=Other EPA documents F=final D=draft P=proposed T=tentative / c=carcinogen n=noncarcinogen

Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg•d/mg	CPSi kg•d/mg	VOC	MCL mg/L	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
Zineb	12122677	5.00E-02 i						180 n	18 n	6.8 n	5100 n	390 n

APPENDIX F.3

SAMPLE CALCULATIONS

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR "W-TEST"	
BASED ON Gilbert, 1987	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/09/95

OBJECTIVE: To determine the distribution of a data set (log normal or normal) using the Shapiro-Wilk "W-Test." Distribution is determined by proof of a given null hypothesis.

RELEVANT EQUATIONS:

$$d = \sum_i x_i^2 - \frac{1}{n}\left(\sum_i x_i\right)^2$$

where: d = the denominator of the W-Test statistic
x_i = individual sample result
n = population of the sample set

$k = \frac{n}{2}$, if n is even
$k = \frac{n-1}{2}$, if n is odd

$$W = \frac{1}{d}\left[\sum_{i=1}^{k} a_i \left(x_{n-i+1} - x_i\right)\right]^2$$

where: W - calculated W-Test result
a_i = coefficient for W-Test (found in Table A6, Gilbert 1987)
x_i = individual sample result

SAMPLE CALCULATIONS:

The null hypothesis to be tested is:

H_0 = the sample population is normally/log normally distributed

vs.

H_A = the sample population does not have a normal/log normal distribution.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR "W-TEST"	
BASED ON GILBERT, 1987	DRAWING NUMBER
BY KMB / CHECKED BY KAJ	APPROVED BY / DATE 01/09/95

For vanadium in sediment (Site 2 - Area A Weapons Area):

sample	x_i (mg/kg)	$\ln x_i$	x_i^2	$(\ln x_i)^2$
1	1.2	0.1823	1.44	0.0332
2	1.4	0.3365	1.96	0.1132
3	1.6	0.4700	2.56	0.2209
4	4.6	1.5261	21.16	2.3288
5	5.1	1.6292	26.01	2.6544
6	5.6	1.7228	31.36	2.9679
7	6.2	1.8245	38.44	3.329
8	6.4	1.8563	40.96	3.4458
9	6.7	1.9021	44.89	3.6180
10	6.9	1.9315	47.61	3.7308
11	8.4	2.1282	70.56	4.5294
12	9.6	2.2618	92.16	5.1156
13	10.25	2.3273	105.0625	5.4162
14	11.4	2.4336	129.96	5.9225
15	13.5	2.6027	182.25	6.774
$\Sigma_i =$	98.85	25.1349	836.3825	50.1997

$$d_{normal} = 836.3825 - \left(\frac{1}{15}\right)(98.85)^2 = 184.961$$

$$d_{lognormal} = 50.1997 - \left(\frac{1}{15}\right)(25.1349)^2 = 8.0822$$

$$k = \frac{n-1}{2} = \frac{15-1}{2} = 7$$

$$W_{calc\ normal} = \left(\frac{1}{184.961}\right)\left[(0.5151)(13.5-1.2) + (0.3306)(11.4-1.4) + (0.2495)(10.25-1.6) + (0.1878)(9.6-4.6) + (0.1353)(8.4-5.1) + (0.0880)(6.9-5.6) + (0.0433)(6.7-6.2)\right]^2$$

$$= 0.959$$

CLIENT: NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER: 9594
SUBJECT: SAMPLE CALCULATIONS FOR "W-TEST"	
BASED ON: GILBERT, 1987	DRAWING NUMBER:
BY: KMS / CHECKED BY: KAJ	APPROVED BY: / DATE: 01/09/95

$$W_{\substack{calc\\lognormal}} = \left(\frac{1}{8.0822}\right)\left[(0.515)(2.6027-0.1823)+(0.3306)(2.4336-0.3365)+(0.2495)(2.3273-0.4700)+(0.1878)(2.2618-1.5261)+(0.1353)(2.1282-1.6292)+(0.0880)(1.9315-1.7228)+(0.0433)(1.9021-1.8245)\right]^2$$

$$= 0.8562$$

$W_{0.05} = 0.881$ (from Table A7, Gilbert 1987)

$W_{\substack{calc\\normal}} - W_{table} = 0.959 - 0.881 = 0.078$, $\therefore$ Null hypothesis is accepted.

$W_{\substack{calc\\lognormal}} - W_{table} = 0.8562 - 0.881 = -0.0248$, $\therefore$ Null hypothesis is rejected.

Table A6 Coefficients a_i for the Shapiro-Wilk W Test for Normality

i \ n	2	3	4	5	6	7	8	9	10
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739
2	-	0.0000	0.1677	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291
3	-	-	-	0.0000	0.0875	0.1401	0.1743	0.1976	0.2141
4	-	-	-	-	-	0.0000	0.0561	0.0947	0.1224
5	-	-	-	-	-	-	-	0.0000	0.0399

i \ n	11	12	13	14	15	16	17	18	19	20
1	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886	0.4808	0.4734
2	0.3315	0.3325	0.3325	0.3318	0.3306	0.3290	0.3273	0.3253	0.3232	0.3211
3	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553	0.2561	0.2565
4	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027	0.2059	0.2085
5	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587	0.1641	0.1686
6	0.0000	0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197	0.1271	0.1334
7	-	-	0.0000	0.0240	0.0433	0.0593	0.0725	0.0837	0.0932	0.1013
8	-	-	-	-	0.0000	0.0196	0.0359	0.0496	0.0612	0.0711
9	-	-	-	-	-	-	0.0000	0.0163	0.0303	0.0422
10	-	-	-	-	-	-	-	-	0.0000	0.0140

i \ n	21	22	23	24	25	26	27	28	29	30
1	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254
2	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944
3	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487
4	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148
5	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870
6	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630
7	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415
8	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219
9	0.0530	0.0618	0.0696	0.0764	0.0823	0.0876	0.0923	0.0965	0.1002	0.1036
10	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862
11	0.0000	0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0598	0.0650	0.0697
12	-	-	0.0000	0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537
13	-	-	-	-	0.0000	0.0094	0.0178	0.0253	0.0320	0.0381
14	-	-	-	-	-	-	0.0000	0.0084	0.0159	0.0227
15	-	-	-	-	-	-	-	-	0.0000	0.0076

Source: From Shapiro and Wilk, 1965. Used by permission.
This table is used in Section 12.3.1.

CLIENT	JOB NUMBER
NSB-NLON, GROTON, CONNECTICUT	9594

SUBJECT: SAMPLE CALCULATIONS FOR "W-TEST"

BASED ON	DRAWING NUMBER
GILBERT, 1987	

BY	CHECKED BY	APPROVED BY	DATE
KMS	KAJ		01/09/95

Table A6 (continued)

t \ n	31	32	33	34	35	36	37	38	39	40
1	0.4220	0.4188	0.4156	0.4127	0.4096	0.4068	0.4040	0.4015	0.3989	0.3964
2	0.2921	0.2898	0.2876	0.2854	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737
3	0.2475	0.2462	0.2451	0.2439	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368
4	0.2145	0.2141	0.2137	0.2132	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098
5	0.1874	0.1878	0.1880	0.1882	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878
6	0.1641	0.1651	0.1660	0.1667	0.1673	0.1678	0.1683	0.1686	0.1689	0.1691
7	0.1433	0.1449	0.1463	0.1475	0.1487	0.1496	0.1505	0.1513	0.1520	0.1526
8	0.1243	0.1265	0.1284	0.1301	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376
9	0.1066	0.1093	0.1116	0.1140	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237
10	0.0899	0.0931	0.0961	0.0988	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108
11	0.0739	0.0777	0.0812	0.0844	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986
12	0.0585	0.0629	0.0669	0.0706	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870
13	0.0435	0.0485	0.0530	0.0572	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759
14	0.0289	0.0344	0.0395	0.0441	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651
15	0.0144	0.0206	0.0262	0.0314	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546
16	0.0000	0.0068	0.0131	0.0187	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444
17	-	-	0.0000	0.0062	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343
18	-	-	-	-	0.0000	0.0057	0.0110	0.0158	0.0203	0.0244
19	-	-	-	-	-	-	0.0000	0.0053	0.0101	0.0146
20	-	-	-	-	-	-	-	-	0.0000	0.0049

t \ n	41	42	43	44	45	46	47	48	49	50
1	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1693	0.1694	0.1695	0.1695	0.1695	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.1551	0.1553	0.1554
8	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1249	0.1259	0.1269	0.1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1123	0.1136	0.1149	0.1160	0.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0677	0.0701	0.0724	0.0745	0.0765	0.0783	0.0801	0.0817	0.0832	0.0846
15	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764
16	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21	0.0000	0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22	-	-	0.0000	0.0042	0.0081	0.0118	0.0153	0.0185	0.0215	0.0244
23	-	-	-	-	0.0000	0.0039	0.0076	0.0111	0.0143	0.0174
24	-	-	-	-	-	-	0.0000	0.0037	0.0071	0.0104
25	-	-	-	-	-	-	-	-	0.0000	0.0035

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR "W-TEST"	
BASED ON GILBERT, 1987	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/09/95

Table A7 Quantiles of the Shapiro-Wilk W Test for Normality (Values of W Such That $100p\%$ of the Distribution of W Is Less Than W_p)

n	$W_{0.01}$	$W_{0.02}$	$W_{0.05}$	$W_{0.10}$	$W_{0.50}$
3	0.753	0.756	0.767	0.789	0.959
4	0.687	0.707	0.748	0.792	0.935
5	0.686	0.715	0.762	0.806	0.927
6	0.713	0.743	0.788	0.826	0.927
7	0.730	0.760	0.803	0.838	0.928
8	0.749	0.778	0.818	0.851	0.932
9	0.764	0.791	0.829	0.859	0.935
10	0.781	0.806	0.842	0.869	0.938
11	0.792	0.817	0.850	0.876	0.940
12	0.805	0.828	0.859	0.883	0.943
13	0.814	0.837	0.866	0.889	0.945
14	0.825	0.846	0.874	0.895	0.947
15	0.835	0.855	0.881	0.901	0.950
16	0.844	0.863	0.887	0.906	0.952
17	0.851	0.869	0.892	0.910	0.954
18	0.858	0.874	0.897	0.914	0.956
19	0.863	0.879	0.901	0.917	0.957
20	0.868	0.884	0.905	0.920	0.959
21	0.873	0.888	0.908	0.923	0.960
22	0.878	0.892	0.911	0.926	0.961
23	0.881	0.895	0.914	0.928	0.962
24	0.884	0.898	0.916	0.930	0.963
25	0.886	0.901	0.918	0.931	0.964
26	0.891	0.904	0.920	0.933	0.965
27	0.894	0.906	0.923	0.935	0.965
28	0.896	0.908	0.924	0.936	0.966
29	0.898	0.910	0.926	0.937	0.966
30	0.900	0.912	0.927	0.939	0.967
31	0.902	0.914	0.929	0.940	0.967
32	0.904	0.915	0.930	0.941	0.968
33	0.906	0.917	0.931	0.942	0.968
34	0.908	0.919	0.933	0.943	0.969
35	0.910	0.920	0.934	0.944	0.969
36	0.912	0.922	0.935	0.945	0.970
37	0.914	0.924	0.936	0.946	0.970
38	0.916	0.925	0.938	0.947	0.971
39	0.917	0.927	0.939	0.948	0.971
40	0.919	0.928	0.940	0.949	0.972
41	0.920	0.929	0.941	0.950	0.972
42	0.922	0.930	0.942	0.951	0.972
43	0.923	0.932	0.943	0.951	0.973
44	0.924	0.933	0.944	0.952	0.973
45	0.926	0.934	0.945	0.953	0.973
46	0.927	0.935	0.945	0.953	0.974
47	0.928	0.936	0.946	0.954	0.974
48	0.929	0.937	0.947	0.954	0.974
49	0.929	0.937	0.947	0.955	0.974
50	0.930	0.938	0.947	0.955	0.974

Source: After Shapiro and Wilk, 1965.

The null hypothesis of a normal distribution is rejected at the α significance level if the calculated W is less than W_α.

This table is used in Section 12.3.1.

REFERENCES:

Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand-Reinhold Company, New York, New York.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR 95% UCL FOR NORMALLY DISTRIBUTED DATA	
BASED ON	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/09/95

OBJECTIVE: To calculate the 95% UCL (upper confidence limit) of a data set, which is assumed to be normally distributed.

RELEVANT EQUATIONS:

$$\bar{X} = \frac{\sum_i x_i}{n} \qquad s = \sqrt{\frac{\sum x_i^2 - \frac{(\sum_i x_i)^2}{n}}{n-1}} \qquad UCL = \bar{X} + t_{1-\alpha}\left(\frac{s}{\sqrt{n}}\right)$$

where: $\bar{X}$ = arithmetic average of a data set
x_i = individual sample value
n = population of a data set
s = standard deviation of a data set
UCL = upper confidence limit
$t_{1-\alpha}$ = one-sided t distribution factor

For the 95% UCL: $1-\alpha = 0.95$, $t_{1-\alpha} = 1.761$ for degrees of freedom = 14 (from Table A2, Gilbert, 1987.) ($df = n-1 = 15-1$)

SAMPLE CALCULATIONS:

For vanadium in sediment (site 2-Area A Weapons Center), $n = 15$, $df = 14$:

CLIENT	JOB NUMBER
NSB-NLON, GROTON, CONNECTICUT	9594

SUBJECT: SAMPLE CALCULATIONS FOR 95% UCL FOR NORMALLY DISTRIBUTED DATA

BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
KMS	KAJ		01/09/95

sample	x_i (mg/kg)	x_i^2
1	1.2	1.44
2	1.4	1.96
3	1.6	2.56
4	4.6	21.26
5	5.1	26.01
6	5.6	31.36
7	6.2	38.44
8	6.4	40.96
9	6.7	44.89
10	6.9	47.61
11	8.4	70.56
12	9.6	92.16
13	10.25	105.0625
14	11.4	129.96
15	13.5	182.25
	$\Sigma = 98.85$	836.3825

$$\bar{x} = 98.85/15 = 6.59 \text{ mg/kg}$$

$$s = \sqrt{\frac{836.3825 - \frac{(98.85)^2}{15}}{15-1}} = 3.635$$

$$UCL = 6.59 + (1.761)\left(\frac{3.635}{\sqrt{15}}\right) = \boxed{8.24 \text{ mg/kg}}$$

CLIENT	JOB NUMBER
NSB-NLON, GROTON, CONNECTICUT	9594

SUBJECT: SAMPLE CALCULATIONS FOR 95% UCL FOR NORMAL DISTRIBUTE DATA

BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
KMS	KAJ		01/09/95

Table A2 Quantiles of the t Distribution (Values of t Such That $100p\%$ of the Distribution Is Less Than t_p)

Degrees of Freedom	$t_{0.60}$	$t_{0.70}$	$t_{0.80}$	$t_{0.90}$	$t_{0.95}$	$t_{0.975}$	$t_{0.990}$	$t_{0.995}$
1	.325	.727	1.376	3.078	6.314	12.706	31.821	63.657
2	.289	.617	1.061	1.886	2.920	4.303	6.965	9.925
3	.277	.584	.978	1.638	2.353	3.182	4.541	5.841
4	.271	.569	.941	1.533	2.132	2.776	3.747	4.604
5	.267	.559	.920	1.476	2.015	2.571	3.365	4.032
6	.265	.553	.906	1.440	1.943	2.447	3.143	3.707
7	.263	.549	.896	1.415	1.895	2.365	2.998	3.499
8	.262	.546	.889	1.397	1.860	2.306	2.896	3.355
9	.261	.543	.883	1.383	1.833	2.262	2.821	3.250
10	.260	.542	.879	1.372	1.812	2.228	2.764	3.169
11	.260	.540	.876	1.363	1.796	2.201	2.718	3.106
12	.259	.539	.873	1.356	1.782	2.179	2.681	3.055
13	.259	.538	.870	1.350	1.771	2.160	2.650	3.012
14	.258	.537	.868	1.345	1.761	2.145	2.624	2.977
15	.258	.536	.866	1.341	1.753	2.131	2.602	2.947
16	.258	.535	.865	1.337	1.746	2.120	2.583	2.921
17	.257	.534	.863	1.333	1.740	2.110	2.567	2.898
18	.257	.534	.862	1.330	1.734	2.101	2.552	2.878
19	.257	.533	.861	1.328	1.729	2.093	2.539	2.861
20	.257	.533	.860	1.325	1.725	2.086	2.528	2.845
21	.257	.532	.859	1.323	1.721	2.080	2.518	2.831
22	.256	.532	.858	1.321	1.717	2.074	2.508	2.819
23	.256	.532	.858	1.319	1.714	2.069	2.500	2.807
24	.256	.531	.857	1.318	1.711	2.064	2.492	2.797
25	.256	.531	.856	1.316	1.708	2.060	2.485	2.787
26	.256	.531	.856	1.315	1.706	2.056	2.479	2.779
27	.256	.531	.855	1.314	1.703	2.052	2.473	2.771
28	.256	.530	.855	1.313	1.701	2.048	2.467	2.763
29	.256	.530	.854	1.311	1.699	2.045	2.462	2.756
30	.256	.530	.854	1.310	1.697	2.042	2.457	2.750
40	.255	.529	.851	1.303	1.684	2.021	2.423	2.704
60	.254	.527	.848	1.296	1.671	2.000	2.390	2.660
120	.254	.526	.845	1.289	1.658	1.980	2.358	2.617
∞	.253	.524	.842	1.282	1.645	1.960	2.326	2.576

Source: From Fisher and Yates, 1974. Used by permission.
This table is first used in Section 4.4.2.

REFERENCES:

Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring. Van-Nostrand-Reinhold Company, New York, NY.

USEPA (U.S. Environmental Protection Agency), May 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. OSWER Publication No. 9285.7-081.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR 95% UCL for LogNormally Distributed Data	
BASED ON	DRAWING NUMBER
BY KMG / CHECKED BY KAJ	APPROVED BY / DATE 01/09/95

OBJECTIVE: To calculate the 95% UCL (upper confidence limit) of a data set, which is assumed to be normally distributed.

RELEVANT EQUATIONS:

$$\bar{X}_g = e^{\bar{x}} \qquad UCL = e^{\left(\bar{x} + 0.5s^2 + \frac{SH_{1-\alpha}}{\sqrt{n-1}}\right)}$$

$$\bar{x} = \frac{\sum_i \ln x_i}{n} \qquad S = \sqrt{\frac{\sum_i (\ln x_i - \bar{x})^2}{n-1}}$$

where: $\bar{X}_g$ = geometric mean of a data set
e = constant, base of the Natural Log ($e = 2.718$)
$\bar{x}$ = mean of the transformed data
x_i = individual sample value
n = population of sample set
UCL = upper confidence limit of transformed data (95%)
S = standard deviation of data set
$H_{1-\alpha}$ = H-statistic for computing one-sided confidence limit ($1-\alpha = 95\%$)

SAMPLE CALCULATIONS:

For in sediment (Site 2 - Area A Weapons Center),
$n = 15$; $H_{0.95} = 2.388$ (interpolated from Table A12, Gilbert, 1987).

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR 95% UCL FOR LOGNORMALLY DISTRIBUTED DATA	
BASED ON	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/09/95

Sample	x_i (mg/kg)	$\ln x_i$	$(\ln x_i - \bar{x})^2$
1	1.2	0.1823	2.2311
2	1.4	0.3365	1.7943
3	1.6	0.4700	1.4544
4	4.6	1.5261	0.0225
5	5.1	1.6292	0.0022
6	5.6	1.7228	0.0022
7	6.2	1.8245	0.0221
8	6.4	1.8563	0.0325
9	6.7	1.9021	0.0511
10	6.9	1.9315	0.0653
11	8.4	2.1282	0.2045
12	9.6	2.2618	0.3432
13	10.25	2.3273	0.4242
14	11.4	2.4336	0.574
15	13.5	2.6027	0.8588
	$\Sigma =$	25.1349	8.0364

$$\bar{x} = (25.1349/15) = 1.676$$

$$\bar{x}_g = e^{(1.676)} = 5.344$$

$$s = \sqrt{\frac{8.0364}{15-1}} = 0.758$$

$$UCL = e^{\left(1.676 + (0.5)(0.758)^2 + \frac{(0.758)(2.388)}{\sqrt{15-1}}\right)} = \boxed{11.55 \text{ mg/kg}}$$

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR 95% UCL FOR LOGNORMALLY DISTRIBUTED DATA	
BASED ON	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/09/95

Table A12 Values of $H_{1-\alpha} = H_{0.95}$ for Computing a One-Sided Upper 95% Confidence Limit on a Lognormal Mean

	n									
s_y	3	5	7	10	12	15	21	31	51	101
0.10	2.750	2.035	1.886	1.802	1.775	1.749	1.722	1.701	1.684	1.670
0.20	3.295	2.198	1.992	1.881	1.843	1.809	1.771	1.742	1.718	1.697
0.30	4.109	2.402	2.125	1.977	1.927	1.882	1.833	1.793	1.761	1.733
0.40	5.220	2.651	2.282	2.089	2.026	1.968	1.905	1.856	1.813	1.777
0.50	6.495	2.947	2.465	2.220	2.141	2.068	1.989	1.928	1.876	1.830
0.60	7.807	3.287	2.673	2.368	2.271	2.181	2.085	2.010	1.946	1.891
0.70	9.120	3.662	2.904	2.532	2.414	2.306	2.191	2.102	2.025	1.960
0.80	10.43	4.062	3.155	2.710	2.570	2.443	2.307	2.202	2.112	2.035
0.90	11.74	4.478	3.420	2.902	2.738	2.589	2.432	2.310	2.206	2.117
1.00	13.05	4.905	3.696	3.103	2.915	2.744	2.564	2.423	2.306	2.205
1.25	16.33	6.001	4.426	3.639	3.389	3.163	2.923	2.737	2.580	2.447
1.50	19.60	7.120	5.184	4.207	3.896	3.612	3.311	3.077	2.881	2.713
1.75	22.87	8.250	5.960	4.795	4.422	4.081	3.719	3.437	3.200	2.997
2.00	26.14	9.387	6.747	5.396	4.962	4.564	4.141	3.812	3.533	3.295
2.50	32.69	11.67	8.339	6.621	6.067	5.557	5.013	4.588	4.228	3.920
3.00	39.23	13.97	9.945	7.864	7.191	6.570	5.907	5.388	4.947	4.569
3.50	45.77	16.27	11.56	9.118	8.326	7.596	6.815	6.201	5.681	5.233
4.00	52.31	18.58	13.18	10.38	9.469	8.630	7.731	7.024	6.424	5.908
4.50	58.85	20.88	14.80	11.64	10.62	9.669	8.652	7.854	7.174	6.590
5.00	65.39	23.19	16.43	12.91	11.77	10.71	9.579	8.688	7.929	7.277
6.00	78.47	27.81	19.68	15.45	14.08	12.81	11.44	10.36	9.449	8.661
7.00	91.55	32.43	22.94	18.00	16.39	14.90	13.31	12.05	10.98	10.05
8.00	104.6	37.06	26.20	20.55	18.71	17.01	15.18	13.74	12.51	11.45
9.00	117.7	41.68	29.46	23.10	21.03	19.11	17.05	15.43	14.05	12.85
10.00	130.8	46.31	32.73	25.66	23.35	21.22	18.93	17.13	15.59	14.26

Source: After Land, 1975.
This table is used in Section 13.2.

REFERENCES:

Gilbert, R.O., 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand-Reinhold Company. New York, NY.

USEPA (U.S. Environmental Protection Agency), May 1992. Supplemental Guidance to RAGS: Calculating the Concentration Term. OSWER Publication No. 9285.7-081.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INCIDENTAL INGESTION OF SOIL/SEDIMENT	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

OBJECTIVE: To calculate estimated intakes and risks (noncarcinogenic and carcinogenic) associated with the incidental ingestion of contaminated soil. Central Tendency (CTE) and Reasonable Maximum (RME) Exposures are calculated.

RELEVANT EQUATIONS:

$$IEX = \frac{C \times IR \times FI \times BIO \times EF \times ED}{BW \times AT \times CF}$$

where: IEX = estimated exposure intake (mg/kg-day)
C = contaminant concentration in soil/sediment (mg/kg)
IR = soil/sediment ingestion rate (mg/day)
FI = fraction ingested from contaminated source (unitless)
BIO = bioavailability (unitless)
EF = exposure frequency (days/yr)
ED = exposure duration (yrs)
BW = body weight (kg)
AT = averaging time (days)
CF = conversion factor (10^6 mg/kg)

$$HQ = IEX_n / RfD$$

$$ICR = IEX_c \times CSF$$

where: HQ = chemical-specific Hazard Quotient (unitless)
IEX_n = estimated exposure intake for noncarcinogenic effects (mg/kg-day)
RfD = chemical-specific Reference Dose (mg/kg-day)
ICR = chemical specific Incremental cancer Risk (unitless)
IEX_c = estimated exposure intake for carcinogenic effects (mg/kg-day)
CSF = chemical-specific Cancer Slope Factor (kg-day/mg)

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT: NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER: 9594
SUBJECT: SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INCIDENTAL INGESTION OF SOIL/SEDIM	
BASED ON: USEPA, DECEMBER 1989	DRAWING NUMBER:
BY: KMS; CHECKED BY: KAJ	APPROVED BY: ; DATE: 01/07/95

SAMPLE CALCULATIONS:

For a full-time employee, the following assumptions are made:

Parameter	CTE	RME
C (mg/kg)	95% UCL	95% UCL
IR (mg/day)	50	100
FI (unitless)	1	1
BIO (unitless)	0.3 - PCB, chlordane, DDT, DDD, DDE 1 - all others	0.3 - PCB, chlordane, DDE, DDD, DDT 1 - all other chemicals
EF (days/yr)	150	250
ED (yrs)	6	25
BW (kg)	70	70
ATn (days)	ED x 365 days/yr	ED x 365 days/yr
ATc (days)	70yrs x 365 days/yr	70yrs x 365 days/yr

For heptachlor epoxide @ a concentration of 0.017 mg/kg in soil (Site 8 - Goss Cove landfill):

$$IEX_{n\text{-}CTE} = \frac{(0.017\ \frac{mg}{kg})(50\ \frac{mg}{day})(1)(1)(150\ \frac{days}{yr})(6\ yrs)}{(70\ kg)(6\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{4.99 \times 10^{-9}\ mg/kg\text{-}day}$$

$$IEX_{c\text{-}CTE} = \frac{(0.017\ \frac{mg}{kg})(50\ \frac{mg}{day})(1)(1)(150\ \frac{days}{yr})(6\ yrs)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{4.28 \times 10^{-10}\ mg/kg\text{-}day}$$

$$IEX_{n\text{-}RME} = \frac{(0.017\ \frac{mg}{kg})(100\ \frac{mg}{day})(1)(1)(250\ \frac{days}{yr})(25\ yrs)}{(70\ kg)(25\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{1.66 \times 10^{-8}\ mg/kg\text{-}day}$$

$$IEX_{c\text{-}RME} = \frac{(0.017\ \frac{mg}{kg})(100\ \frac{mg}{day})(1)(1)(250\ \frac{days}{yr})(25\ yrs)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{5.94 \times 10^{-9}\ mg/kg\text{-}day}$$

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INCIDENTAL INGESTION OF SOIL/SEDIMENT	
BASED ON USEPA, December 1989	DRAWING NUMBER
BY KMB / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

Risks are then calculated in the following manner. (The oral RfD = 1.30×10^{-5} mg/kg-day and the oral CSF = 9.10×10^{0} kg-day/mg for heptachlor epoxide.)

$$HQ_{CTE} = (4.99 \times 10^{-9}\ mg/kg\text{-}day) / (1.30 \times 10^{-5}\ mg/kg\text{-}day) = \boxed{3.84 \times 10^{-4}}$$

$$ICR_{CTE} = (4.28 \times 10^{-10}\ mg/kg\text{-}day)(9.10 \times 10^{0}\ kg\text{-}day/mg) = \boxed{3.89 \times 10^{-9}}$$

$$HQ_{RME} = (1.66 \times 10^{-8}\ mg/kg\text{-}day) / (1.30 \times 10^{-5}\ mg/kg\text{-}day) = \boxed{1.28 \times 10^{-3}}$$

$$ICR_{RME} = (5.94 \times 10^{-9}\ mg/kg\text{-}day)(9.10 \times 10^{0}\ kg\text{-}day/mg) = \boxed{5.41 \times 10^{-8}}$$

REFERENCES:

USEPA (U.S. Environmental Protection Agency), December 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (PART A). EPA 540/1-89/002.

USEPA (U.S. Environmental Protection Agency), May 1989. Exposure Factors Handbook. EPA/600/8-89/043.

USEPA (U.S. Environmental Protection Agency), March 25, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH SOIL/SEDIMENT	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

OBJECTIVE: To calculate estimated intakes and risks (noncarcinogenic and carcinogenic) associated with the dermal contact with contaminated soil. Central Tendency (CTE) and Reasonable Maximum Exposures (RME) are calculated.

RELEVANT EQUATIONS:

$$DEX = \frac{C \times SA \times AF \times ABS \times EF \times ED}{BW \times AT \times CF}$$

where: DEX = estimated dermal exposure intake (mg/kg-day)
C = contaminant concentration in soil/sediment (mg/kg)
SA = skin surface area available for contact (cm^2/day)
AF = adherence factor (mg/cm^2)
ABS = absorption factor (unitless)
EF = exposure frequency (days/yr)
ED = exposure duration (yrs)
BW = body weight (kg)
AT = averaging time (days)
CF = Conversion factor (10^6 mg/kg)

$$HQ = DEX_n / RfD$$

$$ICR = DEX_c \times CSF$$

where: HQ = chemical-specific Hazard Quotient (unitless)
DEX_n = estimated dermal exposure intake for noncarcinogenic effects (mg/kg-day)
RfD = chemical-specific Reference Dose (mg/kg-day)
ICR = chemical-specific Incremental Cancer Risk (unitless)
DEX_c = estimated dermal exposure intake for carcinogenic effects (mg/kg-day)
CSF = chemical-specific Cancer Slope Factor (kg-day/mg)

CLIENT: NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER: 9594
SUBJECT: SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH SOIL/SEDIMENT	
BASED ON: USEPA, DECEMBER 1989	DRAWING NUMBER:
BY: KMS / CHECKED BY: KAJ	APPROVED BY: / DATE: 01/07/95

SAMPLE CALCULATIONS:

For an occasional visitor, the following assumptions are made:

Parameter	CTE	RME
C (mg/kg)	95% UCL	95% UCL
SA (cm^2/day)	20,000 x 0.19 (1)	20,000 x 0.19 (1)
AF (mg/cm^2)	0.2	1.0
ABS (unitless)	0.50 - VOAs	0.50 - VOAs
	0.01 - Metals	0.01 - Metals
	0.05 - All other chemicals	0.05 - all other chemicals
EF (days/yr)	12	24
ED (yrs)	6	25
BW (kg)	70	70
AT_n (days)	ED x 365 days/yr	ED x 365 days/yr
AT_c (days)	70yrs x 365 days/yr	70yrs x 365 days/yr

(1) SA = Body surface area x fraction of area exposed.

For carbazole @ a concentration of 7.2 mg/kg and zinc @ a concentration of 5,550 mg/kg in soil (Site 8 - Goss Cove Landfill).

carbazole (carcinogen)

$$DEX_{c-CTE} = \frac{(7.2\ \frac{mg}{kg})(20{,}000\ \frac{cm^2}{day} \times 0.19)(0.2\ \frac{mg}{cm^2})(0.05)(12\ \frac{days}{yr})(6\ yrs)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{1.10 \times 10^{-8}\ mg/kg\text{-}day}$$

$$DEX_{c-RME} = \frac{(7.2\ \frac{mg}{kg})(20{,}000\ \frac{cm^2}{day} \times 0.19)(1.0\ \frac{mg}{cm^2})(0.05)(24\ \frac{days}{yr})(25\ yrs)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{4.59 \times 10^{-7}\ mg/kg\text{-}day}$$

zinc (noncarcinogen)

$$DEX_{n-CTE} = \frac{(5{,}550\ \frac{mg}{kg})(20{,}000\ \frac{cm^2}{day} \times 0.19)(0.2\ \frac{mg}{cm^2})(0.01)(12\ \frac{days}{yr})(6\ yrs)}{(70\ kg)(6\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{1.98 \times 10^{-5}\ mg/kg\text{-}day}$$

$$DEX_{n-RME} = \frac{(5{,}550\ \frac{mg}{kg})(20{,}000\ \frac{cm^2}{day} \times 0.19)(1.0\ \frac{mg}{cm^2})(0.01)(24\ \frac{days}{yr})(25\ yrs)}{(70\ kg)(25\ yrs \times 365\ \frac{days}{yr})(10^6\ \frac{mg}{kg})} = \boxed{1.98\ [illegible]^{-4}\ mg/kg\text{-}day}$$

CLIENT	JOB NUMBER
NSB-NLON, GROTON, CONNECTICUT	9594

SUBJECT: SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH SOIL/SEDIMENT

BASED ON	DRAWING NUMBER	
USEPA, DECEMBER 1989		

BY	CHECKED BY	APPROVED BY	DATE
KMS	KAJ		01/07/95

Risks are then calculated in the following manner. (The dermal CSF = 2.0×10^{-2} kg-day/mg for carbazole. For zinc, the dermal RfD = 1.5×10^{-1} mg/kg-day.)

carbazole:

$ICR_{CTE} = (1.10 \times 10^{-8}\ mg/kg\text{-}day)(2.0 \times 10^{-2}\ kg\text{-}day/mg) = \boxed{2.20 \times 10^{-10}}$

$ICR_{RME} = (4.59 \times 10^{-7}\ mg/kg\text{-}day)(2.0 \times 10^{-2}\ kg\text{-}day/mg) = \boxed{9.18 \times 10^{-9}}$

zinc:

$HQ_{CTE} = (1.98 \times 10^{-5}\ mg/kg\text{-}day)/(1.5 \times 10^{-1}\ mg/kg\text{-}day) = \boxed{1.32 \times 10^{-4}}$

$HQ_{RME} = (1.98 \times 10^{-4}\ mg/kg\text{-}day)/(1.5 \times 10^{-1}\ mg/kg\text{-}day) = \boxed{1.32 \times 10^{-3}}$

REFERENCES:

USEPA (U.S. Environmental Protection Agency), December 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (PART A). EPA 540/1-89/002.

USEPA (U.S. Environmental Protection Agency), May 1989. Exposure Factors Handbook. EPA/600/8-89/043.

USEPA (U.S. Environmental Protection Agency), March 25, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA (U.S. Environmental Protection Agency), January 1992. Dermal Exposure Assessment: Principles and Applications: Interim Report. EPA/600/8-91/011B.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS FOR INHALATION OF FUGITIVE DUST	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMG / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

OBJECTIVE: To calculate estimated exposure intakes and risks (noncarcinogenic and carcinogenic) associated with inhalation of contaminated fugitive dust. Central Tendency (CTE) and Reasonable Maximum (RME) Exposures are calculated.

RELEVANT EQUATIONS:

$$IEX = \frac{C \times IR \times ET \times EF \times ED}{BW \times AT}$$

where: IEX = estimated exposure intake (mg/kg-day)
C = contaminant concentration in air (mg/m³)
IR = inhalation rate (m³/hr)
ET = exposure time (hrs/day)
EF = exposure frequency (days/yr)
ED = exposure duration (yrs)
BW = body weight (kg)
AT = averaging time (days)

$$HQ = IEX_n / RfD$$

$$ICR = IEX_c \times CSF$$

where: HQ = chemical-specific Hazard Quotient (unitless)
IEX_n = estimated exposure intake for noncarcinogenic effects (mg/kg-day)
RfD = chemical-specific Reference Dose (mg/kg-day)
ICR = chemical-specific Incremental Cancer Risk (unitless)
IEX_c = estimated exposure intake for carcinogenic effects (mg/kg-day)
CSF = chemical-specific Cancer Slope Factor (kg-day/mg)

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS FOR INHALATION OF FUGITIVE DU	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

SAMPLE CALCULATIONS:

For a child recreation user, the following exposure assumptions are made:

Parameter	CTE	RME
C (mg/m³)(1)	95% UCL × 0.018	95% UCL × 0.018
IR (m³/hr)	3.2	3.2
ET (hrs/day)	1	2
EF (days/yr)	56	56
ED (yrs)	6	6
BW (kg)	40	40
AT_n (days)	ED × 365 days/yr	ED × 365 days/yr
AT_c (days)	70yrs × 365 days/yr	70yrs × 365 days/yr

(1) C = contaminant concentration in soil × concentration as PM_{10} emissions.

For manganese @ a concentration of 388 mg/kg in soil and for arsenic @ a concentration of 25.3 mg/kg in soil (for Site 8 - Gross Cove Landfill):

manganese

$$IEX_{n\text{-}CTE} = \frac{\left(388\,\frac{mg}{kg} \times 0.018\,\frac{mg}{m^3} \times \frac{kg}{10^6\,mg}\right)\left(3.2\,\frac{m^3}{hr}\right)\left(1\,\frac{hrs}{day}\right)\left(56\,\frac{days}{yr}\right)\left(6\,yrs\right)}{(40\,kg)\left(6\,yrs \times 365\,\frac{days}{yr}\right)} = \boxed{8.57 \times 10^{-8}\ mg/kg\text{-}day}$$

$$IEX_{n\text{-}RME} = \frac{\left(388\,\frac{mg}{kg} \times 0.018\,\frac{mg}{m^3} \times \frac{kg}{10^6\,mg}\right)\left(3.2\,\frac{m^3}{hr}\right)\left(2\,\frac{hrs}{day}\right)\left(56\,\frac{days}{yr}\right)\left(6\,yrs\right)}{(40\,kg)\left(6\,yrs \times 365\,\frac{days}{yr}\right)} = \boxed{1.71 \times 10^{-7}\ mg/kg\text{-}day}$$

arsenic

$$IEX_{c\text{-}CTE} = \frac{\left(25.3\,\frac{mg}{kg} \times 0.018\,\frac{mg}{m^3} \times \frac{kg}{10^6\,mg}\right)\left(3.2\,\frac{m^3}{hr}\right)\left(1\,\frac{hr}{day}\right)\left(56\,\frac{days}{yr}\right)\left(6\,yrs\right)}{(40\,kg)\left(70\,yrs \times 365\,days/yr\right)} = \boxed{4.79 \times 10^{-10}\ mg/kg\text{-}day}$$

$$IEX_{c\text{-}RME} = \frac{\left(25.3\,\frac{mg}{kg} \times 0.018\,\frac{mg}{m^3} \times \frac{kg}{10^6\,mg}\right)\left(3.2\,\frac{m^3}{hr}\right)\left(2\,\frac{hrs}{day}\right)\left(56\,\frac{days}{yr}\right)\left(6\,yrs\right)}{(40\,kg)\left(70\,yrs \times 365\,\frac{days}{yr}\right)} = \boxed{9.58 \times 10^{-10}\ mg/kg\text{-}day}$$

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS FOR INHALATION OF FUGITIVE DUST	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

Risks are then calculated in the following manner. (The inhalation RfD = 1.43×10^{-5} mg/kg-day for manganese. For arsenic, the inhalation CSF = 1.51×10^{1} kg-day/mg.)

manganese

$$HQ_{CTE} = (8.57 \times 10^{-8}\ mg/kg\text{-}day)/(1.43 \times 10^{-5}\ mg/kg\text{-}day) = \boxed{5.99 \times 10^{-3}}$$

$$HQ_{RME} = (1.71 \times 10^{-7}\ mg/kg\text{-}day)/(1.43 \times 10^{-5}\ mg/kg\text{-}day) = \boxed{1.20 \times 10^{-2}}$$

arsenic

$$ICR_{CTE} = (4.79 \times 10^{-10}\ mg/kg\text{-}day)(1.51 \times 10^{1}\ kg\text{-}day/mg) = \boxed{7.23 \times 10^{-9}}$$

$$ICR_{RME} = (9.58 \times 10^{-10}\ mg/kg\text{-}day)(1.51 \times 10^{1}\ kg\text{-}day/mg) = \boxed{1.45 \times 10^{-8}}$$

REFERENCES:

USEPA (U.S. Environmental Protection Agency), December 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (PART A). EPA 540/1-89/002.

USEPA (U.S. Environmental Protection Agency), May 1989. Exposure Factors Handbook. EPA/600/8-89/043.

USEPA (U.S. Environmental Protection Agency), March 25, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH GROUNDWATER	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

OBJECTIVE: To calculate estimated intakes and risks (noncarcinogenic and carcinogenic) associated with the dermal contact with contaminated groundwater. Central Tendency (CTE) and Reasonable Maximum Exposures (RME) are calculated.

RELEVANT EQUATIONS:

$$DEX = \frac{C \times SA \times PC \times ET \times EF \times ED}{BW \times AT \times CF}$$

where: DEX = estimated dermal exposure intake (mg/kg-day)
C = contaminant concentration in groundwater (mg/L)
SA = skin surface area available for contact (cm^2)
PC = dermal permeability constant (cm/hr)
ET = exposure time (hours/day)
ED = exposure duration (yrs)
BW = body weight (kg)
AT = averaging time (days)
CF = conversion factor (10^3 cm^3/L)
EF = exposure frequency (days/yr)

$$HQ = DEX_n / RfD$$

$$ICR = DEX_c \times CSF$$

where: HQ = chemical-specific Hazard Quotient (unitless)
DEX_n = estimated dermal exposure intake for noncarcinogenic effects (mg/kg-day)
RfD = chemical-specific Reference Dose (mg/kg-day)
ICR = chemical-specific Incremental Cancer Risk (unitless)
DEX_c = estimated dermal exposure intake for carcinogenic effects (mg/kg-day)
CSF = chemical-specific Cancer Slope Factor (kg-day/mg)

CLIENT	JOB NUMBER		
NSB-NLON, GROTON, CONNECTICUT	9594		
SUBJECT: SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH GROUNDWATER			
BASED ON: USEPA, DECEMBER 1989	DRAWING NUMBER		
BY: KMO	CHECKED BY: KAJ	APPROVED BY	DATE: 01/07/95

SAMPLE CALCULATIONS:

For a construction worker, the following exposure assumptions are made:

Parameter	CTE	RME
C (mg/L)	95% UCL	95% UCL
SA (cm^2)(1)	20,000 × 0.11	20,000 × 0.11
PC (cm/hr)	chemical-specific	chemical-specific
ET (hrs/day)	8	8
EF (days/yr)	80	120
ED (yrs)	1	1
BW (kg)	70	70
AT_n (days)	ED × 365 days/yr	ED × 365 days/yr
AT_c (days)	70 yrs × 365 days/yr	70 yrs × 365 days/yr

(1) Body surface area × fraction of area exposed = SA

For arsenic @ a concentration of 0.0151 mg/L (for Site 8 - Goss Cove Landfill):
(PC = 1×10^{-3} cm/hr for arsenic)

$$DEX_{n\text{-}CTE} = \frac{(0.0151\ \frac{mg}{L})(20{,}000\ cm^2 \times 0.11)(1\times10^{-3}\ \frac{cm}{hr})(8\ \frac{hrs}{day})(80\ \frac{days}{yr})(1\ yr)}{(70\ kg)(1\ yr \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{8.32 \times 10^{-7}\ mg/kg\text{-}day}$$

$$DEX_{c\text{-}CTE} = \frac{(0.0151\ \frac{mg}{L})(20{,}000\ cm^2 \times 0.11)(1\times10^{-3}\ \frac{cm}{hr})(8\ \frac{hrs}{day})(80\ \frac{days}{yr})(1\ yr)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{1.19 \times 10^{-8}\ mg/kg\text{-}day}$$

$$DEX_{n\text{-}RME} = \frac{(0.0151\ \frac{mg}{L})(20{,}000\ cm^2 \times 0.11)(1\times10^{-3}\ \frac{cm}{hr})(8\ \frac{hrs}{day})(120\ \frac{days}{yr})(1\ yr)}{(70\ kg)(1\ yr \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{1.25 \times 10^{-6}\ mg/kg\text{-}day}$$

$$DEX_{c\text{-}RME} = \frac{(0.0151\ \frac{mg}{L})(20{,}000\ cm^2 \times 0.11)(1\times10^{-3}\ \frac{cm}{hr})(8\ \frac{hrs}{day})(120\ \frac{days}{yr})(1\ yr)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{1.78 \times 10^{-8}\ mg/kg\text{-}day}$$

CLIENT	JOB NUMBER
NSB-NLON, GROTON, CONNECTICUT	9594

SUBJECT: SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH GROUNDWATER

BASED ON	DRAWING NUMBER
USEPA, DECEMBER 1989	

BY	CHECKED BY	APPROVED BY	DATE
KMS	KAJ		01/07/95

Risks are the calculated in the following manner. (The dermal RfD = 2.80×10^{-4} mg/kg-day and the dermal CSF = 1.80×10^{0} kg-day/mg for arsenic.)

$$HQ_{CTE} = (8.32 \times 10^{-7}\ mg/kg\text{-}day) / (2.80 \times 10^{-4}\ mg/kg\text{-}day) = \boxed{2.97 \times 10^{-3}}$$

$$ICR_{CTE} = (1.19 \times 10^{-8}\ mg/kg\text{-}day)(1.80 \times 10^{0}\ kg\text{-}day/mg) = \boxed{2.14 \times 10^{-8}}$$

$$HQ_{RME} = (1.25 \times 10^{-6}\ mg/kg\text{-}day) / (2.80 \times 10^{-4}\ mg/kg\text{-}day) = \boxed{4.46 \times 10^{-3}}$$

$$ICR_{RME} = (1.78 \times 10^{-8}\ mg/kg\text{-}day)(1.80 \times 10^{0}\ kg\text{-}day/mg) = \boxed{3.20 \times 10^{-8}}$$

REFERENCES:

USEPA (U.S. Environmental Protection Agency), December 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (PART A). EPA 540/1-89/002.

USEPA (U.S. Environmental Protection Agency), May 1989. Exposure Factors Handbook. EPA/600/8-89/043.

USEPA (U.S. Environmental Protection Agency), March 25, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA (U.S. Environmental Protection Agency), January 1992. Dermal Exposure Assessment: Principles and Applications: Interim Report. EPA/600/8-91/011B.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INCIDENTAL INGESTION OF SURFACE WATER	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

OBJECTIVE: To calculate estimated exposure intakes and risks (noncarcinogenic and carcinogenic) associated with the incidental ingestion of contaminated surface water. Central Tendency (CTE) and Reasonable Maximum (RME) Exposures are calculated.

RELEVANT EQUATIONS:

$$IEX = \frac{C \times CR \times ET \times EF \times ED}{BW \times AT}$$

where:
- IEX = estimated exposure intake (mg/kg-day)
- C = contaminant concentration in surface water (mg/L)
- CR = contact rate (L/hr)
- ET = exposure time (hrs/day)
- ED = exposure duration (yrs)
- EF = exposure frequency (days/yr)
- BW = body weight (kg)
- AT = averaging time (days)

$$HQ = IEX_n / RfD$$

$$ICR = IEX_c \times CSF$$

where:
- HQ = chemical-specific Hazard Quotient (unitless)
- IEX_n = estimated exposure intake for noncarcinogenic effects (mg/kg-day)
- RfD = chemical-specific Reference Dose (mg/kg-day)
- ICR = chemical-specific Incremental Cancer Risk (unitless)
- IEX_c = estimated exposure intake for carcinogenic effects (mg/kg-day)
- CSF = chemical-specific Cancer Slope Factor (kg-day/mg)

CLIENT: NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER: 9594
SUBJECT: SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INCIDENTAL INGESTION OF SURFACE WATER	
BASED ON: USEPA, DECEMBER 1989	DRAWING NUMBER:
BY: KMS / CHECKED BY: KAJ	APPROVED BY: / DATE: 01/07/95

SAMPLE CALCULATIONS:

For a recreational child user, the following exposure assumptions are made:

Parameter	CTE	RME
C (mg/L)	95% UCL	95% UCL
CR (L/hr)	0.05	0.05
ET (hrs/day)	2	4
EF (days/yr)	55	55
ED (yrs)	6	6
BW (kg)	40	40
AT_n (days)	ED x 365 days/yr	ED x 365 days/yr
AT_c (days)	70yrs x 365 days/yr	70yrs x 365 days/yr

For trichloroethene @ a concentration of 0.003 mg/L (for Site 8 - Goss Cove landfill):

$$IEX_{n-CTE} = \frac{(0.003\ \frac{mg}{L})(0.05\ \frac{L}{hr})(2\ \frac{hrs}{day})(55\ \frac{days}{yr})(6\ yrs)}{(40kg)(6yrs \times 365\ \frac{days}{yr})} = \boxed{1.13 \times 10^{-6}\ mg/kg\text{-}day}$$

$$IEX_{c-CTE} = \frac{(0.003\ \frac{mg}{L})(0.05\ \frac{L}{hr})(2\ \frac{hrs}{day})(55\ \frac{days}{yr})(6yrs)}{(40kg)(70yrs \times 365\ \frac{days}{yr})} = \boxed{9.69 \times 10^{-8}\ mg/kg\text{-}day}$$

$$IEX_{n-RME} = \frac{(0.003\ \frac{mg}{L})(0.05\ \frac{L}{hr})(4\ \frac{hrs}{day})(55\ \frac{days}{yr})(6yrs)}{(40kg)(6\ yrs \times 365\ \frac{days}{yr})} = \boxed{2.26 \times 10^{-6}\ mg/kg\text{-}day}$$

$$IEX_{c-RME} = \frac{(0.003\ \frac{mg}{L})(0.05\ \frac{L}{hr})(4\ \frac{hrs}{day})(55\ \frac{days}{yr})(6yrs)}{(40kg)(70yrs \times 365\ \frac{days}{yr})} = \boxed{1.94 \times 10^{-7}\ mg/kg\text{-}day}$$

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INCIDENTAL INGESTION OF SURFACE WATER	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

Risks are then calculated in the following manner. (The oral RfD = 6.0×10^{-3} mg/kg-day and the oral CSF = 1.1×10^{-2} kg-day/mg for trichloroethene.)

$HQ_{CTE} = (1.13 \times 10^{-6}\ mg/kg\text{-}day)/(6.0 \times 10^{-3}\ mg/kg\text{-}day) = \boxed{1.88 \times 10^{-4}}$

$ICR_{CTE} = (9.69 \times 10^{-8}\ mg/kg\text{-}day)(1.1 \times 10^{-2}\ kg\text{-}day/mg) = \boxed{1.07 \times 10^{-9}}$

$HQ_{RME} = (2.26 \times 10^{-6}\ mg/kg\text{-}day)/(6.0 \times 10^{-3}\ mg/kg\text{-}day) = \boxed{3.77 \times 10^{-4}}$

$ICR_{RME} = (1.94 \times 10^{-7}\ mg/kg\text{-}day)(1.1 \times 10^{-2}\ kg\text{-}day/mg) = \boxed{2.13 \times 10^{-9}}$

REFERENCES:

USEPA (U.S. Environmental Protection Agency), December 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (PART A). EPA 540/1-89/002.

USEPA (U.S. Environmental Protection Agency), May 1989. Exposure Factors Handbook. EPA/600/8-89/043.

USEPA (U.S. Environmental Protection Agency), March 25, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH SURFACE WATER	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

OBJECTIVE: To calculate estimated intakes and risks (noncarcinogenic and carcinogenic) associated with the dermal contact with contaminated surface water. Central Tendency (CTE) and Reasonable Maximum (RME) exposures are calculated.

RELEVANT EQUATIONS:

$$DEX = \frac{C \times SA \times PC \times ET \times EF \times ED}{BW \times AT \times CF}$$

where:
DEX = estimated dermal exposure intake (mg/kg-day)
C = contaminant concentration in surface water (mg/L)
SA = skin surface area available for contact (cm^2)
PC = chemical specific permeability constant (cm/hr)
ET = exposure time (hrs/day)
EF = exposure frequency (days/yr)
ED = exposure duration (yrs)
BW = body weight (kg)
AT = averaging time (days)
CF = conversion factor (10^3 cm^3/L)

$$HQ = DEX_n / RfD$$

$$ICR = DEX_c \times CSF$$

where:
HQ = chemical-specific Hazard Quotient (unitless)
DEX_n = estimated exposure intake for noncarcinogenic effects (mg/kg-day)
RfD = chemical-specific Reference Dose (mg/kg-day)
ICR = chemical-specific Incremental Cancer Risk (unitless)
DEX_c = estimated exposure intake for carcinogenic effects (mg/kg-day)
CSF = chemical-specific Cancer Slope Factor (kg-day/mg)

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH SURFACE WATER	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

SAMPLE CALCULATIONS:

For a child recreational user, the following exposure assumptions are made:

Parameter	CTE	RME
C_w (mg/L)	95% UCL	95% UCL
SA (cm^2)(1)	10,500 x 1.0	10,500 x 1.0
PC (cm/hr)	chemical-specific	chemical-specific
ET (hrs/day)	2	4
EF (days/yr)	55	55
ED (yrs)	6	6
BW (kg)	40	40
AT_n (days)	ED x 365 days/yr	ED x 365 days/yr
AT_c (days)	70yrs x 365 days/yr	70yrs x 365 days/yr

(1) SA = Body surface area x fraction of area exposed.

For heptachlor @ a concentration of 0.00005 mg/L (Site 8-Goss Cove landfill):
(The PC = 1.1×10^{-2} cm/hr for heptachlor)

$$DEX_{n\text{-}CTE} = \frac{(0.00005\ \frac{mg}{L})(10{,}500\ cm^2)(1.1 \times 10^{-2}\ \frac{cm}{hr})(2\ \frac{hrs}{day})(55\ \frac{days}{yr})(6\ yrs)}{(40\ kg)(6\ yrs \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{4.35 \times 10^{-8}\ mg/kg\text{-}day}$$

$$DEX_{c\text{-}CTE} = \frac{(0.00005\ \frac{mg}{L})(10{,}500\ cm^2)(1.1 \times 10^{-2}\ \frac{cm}{hr})(2\ \frac{hrs}{day})(55\ \frac{days}{yr})(6\ yrs)}{(40\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{3.73 \times 10^{-9}\ mg/kg\text{-}day}$$

$$DEX_{n\text{-}RME} = \frac{(0.00005\ \frac{mg}{L})(10{,}500\ cm^2)(1.1 \times 10^{-2}\ \frac{cm}{hr})(4\ \frac{hrs}{day})(55\ \frac{days}{yr})(6\ yrs)}{(40\ kg)(6\ yrs \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{8.70 \times 10^{-8}\ mg/kg\text{-}day}$$

$$DEX_{c\text{-}RME} = \frac{(0.00005\ \frac{mg}{L})(10{,}500\ cm^2)(1.1 \times 10^{-2}\ \frac{cm}{hr})(4\ \frac{hrs}{day})(55\ \frac{days}{yr})(6\ yrs)}{(40\ kg)(70\ yrs \times 365\ \frac{days}{yr})(10^3\ \frac{cm^3}{L})} = \boxed{7.46 \times 10^{-9}\ mg/kg\text{-}day}$$

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA DERMAL CONTACT WITH SURFACE WATER	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

Risks are then calculated in the following manner. (The dermal RfD = 5.0×10^{-4} mg/kg-day and the dermal CSF = 4.5×10^{0} kg-day/mg for heptachlor.)

$HQ_{CTE} = (4.35 \times 10^{-8}\ mg/kg\text{-}day)/(5.0 \times 10^{-4}\ mg/kg\text{-}day) = \boxed{8.70 \times 10^{-5}}$

$ICR_{CTE} = (3.73 \times 10^{-9}\ mg/kg\text{-}day)(4.5 \times 10^{0}\ kg\text{-}day/mg) = \boxed{1.68 \times 10^{-8}}$

$HQ_{RME} = (8.70 \times 10^{-8}\ mg/kg\text{-}day)/(5.0 \times 10^{-4}\ mg/kg\text{-}day) = \boxed{1.74 \times 10^{-4}}$

$ICR_{RME} = (7.46 \times 10^{-9}\ mg/kg\text{-}day)(4.5 \times 10^{0}\ kg\text{-}day/mg) = \boxed{3.36 \times 10^{-8}}$

REFERENCES:

USEPA (U.S. Environmental Protection Agency), December 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (PART A). EPA 540/1-89/002.

USEPA (U.S. Environmental Protection Agency), May 1989. Exposure Factors Handbook. EPA/600/8-89/043.

USEPA (U.S. Environmental Protection Agency), March 25, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA (U.S. Environmental Protection Agency), January 1992. Dermal Exposure Assessment: Principles and Applications: Interim Report. EPA/600/8-91/011B.

CLIENT	JOB NUMBER
NSB-NLON, GROTON, CONNECTICUT	9594

SUBJECT: SAMPLE CALCULATIONS FOR INTAKES / RISKS VIA INGESTION OF SHELLFISH

BASED ON	DRAWING NUMBER
USEPA, December 1989	

BY	CHECKED BY	APPROVED BY	DATE
KMS	KAJ		01/07/95

OBJECTIVE: To calculate estimated intakes and risks (noncarcinogenic and carcinogenic) associated with the ingestion of contaminated shellfish. Central tendency (CTE) and Reasonable Maximum (RME) Exposures are calculated.

RELEVANT EQUATIONS:

$$IEX = \frac{C \times IR \times FI \times EF \times ED}{BW \times AT}$$

where: IEX = estimated exposure intake (mg/kg-day)
C = contaminant concentration in shellfish (mg/kg)
IR = shellfish ingestion rate (kg/meal)
FI = fraction ingested from contaminated source (unitless)
EF = exposure frequency (meals/yr)
ED = exposure duration (yrs)
BW = body weight (kg)
AT = Averaging time (days)

$$HQ = IEX_n / RfD$$

$$ICR = IEX_c \times CSF$$

where: HQ = chemical-specific Hazard Quotient (unitless)
IEX_n = estimated exposure intake for noncarcinogenic effects (mg/kg-day)
RfD = chemical-specific Reference Dose (mg/kg-day)
ICR = Incremental cancer risk (unitless)
IEX_c = estimated exposure intake for carcinogenic effects (mg/kg-day)
CSF = chemical-specific Cancer Slope Factor (kg-day/mg)

CLIENT NSB-NLON, GROTON, CONNECTICUT	JOB NUMBER 9594
SUBJECT SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INGESTION OF SHELLFISH	
BASED ON USEPA, DECEMBER 1989	DRAWING NUMBER
BY KMS / CHECKED BY KAJ	APPROVED BY / DATE 01/07/95

SAMPLE CALCULATIONS:

For an offsite adult resident, the following exposure assumptions are made:

Parameter	CTE	RME
C (mg/kg)	95% UCL	95% UCL
IR (kg/meal)	0.003	0.055
FI (unitless)	1	1
EF (meals/yr)	234	350
ED (yrs)	9	30
BW (kg)	70	70
AT_n (days)	ED × 365 days/yr	ED × 365 days/yr
AT_c (days)	70 yrs × 365 days/yr	70 yrs × 365 days/yr

For bis(2-ethylhexyl)phthalate @ a concentration of 0.160 mg/kg (for oysters obtained from the Thames River):

$$IEX_{n-CTE} = \frac{(0.160\ \frac{mg}{kg})(0.003\ \frac{kg}{meal})(1)(234\ \frac{days}{yr})(9\ yrs)}{(70\ kg)(9\ yrs \times 365\ \frac{days}{yr})} = \boxed{4.40 \times 10^{-6}\ mg/kg\text{-}day}$$

$$IEX_{c-CTE} = \frac{(0.160\ \frac{mg}{kg})(0.003\ \frac{kg}{meal})(1)(234\ \frac{days}{yr})(9\ yrs)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})} = \boxed{5.65 \times 10^{-7}\ mg/kg\text{-}day}$$

$$IEX_{n-RME} = \frac{(0.160\ \frac{mg}{kg})(0.055\ \frac{kg}{meal})(1)(350\ \frac{days}{yr})(30\ yrs)}{(70\ kg)(30\ yrs \times 365\ \frac{days}{yr})} = \boxed{1.21 \times 10^{-4}\ mg/kg\text{-}day}$$

$$IEX_{c\ RME} = \frac{(0.160\ \frac{mg}{kg})(0.055\ \frac{kg}{meal})(1)(350\ \frac{days}{yr})(30\ yrs)}{(70\ kg)(70\ yrs \times 365\ \frac{days}{yr})} = \boxed{5.17 \times 10^{-5}\ mg/kg\text{-}day}$$

CLIENT	JOB NUMBER		
NSB-NLON, GROTON, CONNECTICUT	9594		
SUBJECT: SAMPLE CALCULATIONS FOR INTAKES/RISKS VIA INGESTION OF SHELLFISH			
BASED ON: USEPA, DECEMBER 1989	DRAWING NUMBER		
BY: KMS	CHECKED BY: KAJ	APPROVED BY	DATE: 01/07/95

Risks are then calculated in the following manner. (The oral RfD = 2.0×10^{-2} mg/kg-day and the oral CSF = 1.4×10^{-2} kg-day/mg for bis(2-ethylhexyl)phthalate.)

$$HQ_{CTE} = (4.40 \times 10^{-6}\ mg/kg\text{-}day)/(2.0 \times 10^{-2}\ mg/kg\text{-}day) = \boxed{2.20 \times 10^{-4}}$$

$$ICR_{CTE} = (5.65 \times 10^{-7}\ mg/kg\text{-}day)(1.4 \times 10^{-2}\ kg\text{-}day/mg) = \boxed{7.91 \times 10^{-9}}$$

$$HQ_{RME} = (1.21 \times 10^{-4}\ mg/kg\text{-}day)/(2.0 \times 10^{-2}\ mg/kg\text{-}day) = \boxed{6.05 \times 10^{-3}}$$

$$ICR_{RME} = (5.17 \times 10^{-5}\ mg/kg\text{-}day)(1.4 \times 10^{-2}\ kg\text{-}day/mg) = \boxed{7.24 \times 10^{-7}}$$

REFERENCES:

USEPA (U.S. Environmental Protection Agency), December 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (PART A). EPA 540/1-89/002.

USEPA (U.S. Environmental Protection Agency), May 1989. Exposure Factors Handbook. EPA/600/8-89/043.

USEPA (U.S. Environmental Protection Agency), March 25, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

APPENDIX F.4

SITE 1 - CBU DRUM STORAGE AREA

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 1 – CBU DRUM STORAGE AREA
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/20/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	50	IR:	0
EF:	12	EF:	350
FI:	1	FI:	1
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.35E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.01E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 1 – CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.68	1	0.00E+00	1.60E–08	1.37E–09		7.30E–01
Benzo(b)fluoranthene	0.63	1	0.00E+00	1.48E–08	1.27E–09		7.30E–01
Benzo(a)pyrene	0.38	1	0.00E+00	8.92E–09	7.65E–10		7.30E+00
Dibez(a,h)anthracene	0.059	1	0.00E+00	1.39E–09	1.19E–10		7.30E+00
4,4'–DDD	3.9	0.03	0.00E+00	2.75E–09	2.36E–10		2.40E–01
Dieldrin	0.029	1	0.00E+00	6.81E–10	5.84E–11	5.00E–05	1.60E+01
Aroclor	0.42	0.03	0.00E+00	2.96E–10	2.54E–11	2.00E–05	7.70E+00
Antimony	6.8	1	0.00E+00	1.60E–07	1.37E–08	4.00E–04	
Arsenic	4.8	1	0.00E+00	1.13E–07	9.66E–09	3.00E–04	1.75E+00
Beryllium	1	1	0.00E+00	2.35E–08	2.01E–09	5.00E–03	4.30E+00
Manganese	228	1	0.00E+00	5.35E–06	4.59E–07	5.00E–03	
Vanadium	186	1	0.00E+00	4.37E–06	3.74E–07	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 1 – CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	9.99E−10
Benzo(b)fluoranthene	0.00E+00	0.00E+00	9.26E−10
Benzo(a)pyrene	0.00E+00	0.00E+00	5.58E−09
Dibez(a,h)anthracene	0.00E+00	0.00E+00	8.67E−10
4,4'−DDD	0.00E+00	0.00E+00	5.65E−11
Dieldrin	0.00E+00	1.36E−05	9.34E−10
Aroclor	0.00E+00	1.48E−05	1.95E−10
Antimony	0.00E+00	3.99E−04	0.00E+00
Arsenic	0.00E+00	3.76E−04	1.69E−08
Beryllium	0.00E+00	4.70E−06	8.66E−09
Manganese	0.00E+00	1.07E−03	0.00E+00
Vanadium	0.00E+00	6.24E−04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**2.50E−03**	**3.51E−08**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 1 – CBU DRUM STORAGE AREA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 12/20/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	100	IR:	0
EF:	24	EF:	350
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	9.39E–08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.35E–08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 1 – CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.68	1	0.00E+00	6.39E–08	2.28E–08		7.30E–01
Benzo(b)fluoranthene	0.63	1	0.00E+00	5.92E–08	2.11E–08		7.30E–01
Benzo(a)pyrene	0.38	1	0.00E+00	3.57E–08	1.27E–08		7.30E+00
Dibez(a,h)anthracene	0.059	1	0.00E+00	5.54E–09	1.98E–09		7.30E+00
4,4'–DDD	3.9	0.03	0.00E+00	1.10E–08	3.93E–09		2.40E–01
Dieldrin	0.029	1	0.00E+00	2.72E–09	9.73E–10	5.00E–05	1.60E+01
Aroclor	0.42	0.03	0.00E+00	1.18E–09	4.23E–10	2.00E–05	7.70E+00
Antimony	6.8	1	0.00E+00	6.39E–07	2.28E–07	4.00E–04	
Arsenic	4.8	1	0.00E+00	4.51E–07	1.61E–07	3.00E–04	1.75E+00
Beryllium	1	1	0.00E+00	9.39E–08	3.35E–08	5.00E–03	4.30E+00
Manganese	228	1	0.00E+00	2.14E–05	7.65E–06	5.00E–03	
Vanadium	186	1	0.00E+00	1.75E–05	6.24E–06	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 1 – CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.67E−08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.54E−08
Benzo(a)pyrene	0.00E+00	0.00E+00	9.31E−08
Dibez(a,h)anthracene	0.00E+00	0.00E+00	1.44E−08
4,4'−DDD	0.00E+00	0.00E+00	9.42E−10
Dieldrin	0.00E+00	5.45E−05	1.56E−08
Aroclor	0.00E+00	5.92E−05	3.25E−09
Antimony	0.00E+00	1.60E−03	0.00E+00
Arsenic	0.00E+00	1.50E−03	2.82E−07
Beryllium	0.00E+00	1.88E−05	1.44E−07
Manganese	0.00E+00	4.28E−03	0.00E+00
Vanadium	0.00E+00	2.50E−03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.00E−02**	**5.85E−07**

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 1 – CBU SRUM STORAGE AREA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 12/20/94

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		12
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		6
BW1	= BODY WEIGHT ADOLESCENT (KG):		15
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		2190
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 1 – CBU SRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.68	0.05	0.00E+00	1.21E–08	1.04E–09		
Benzo(b)fluoranthene	0.63	0.05	0.00E+00	1.12E–08	9.64E–10		
Benzo(a)pyrene	0.38	0.05	0.00E+00	6.78E–09	5.81E–10		
Dibenz(a,h)anthracene	0.059	0.05	0.00E+00	1.05E–09	9.03E–11		
4,4'–DDD	3.9	0.05	0.00E+00	6.96E–08	5.97E–09		3.00E–01
Dieldrin	0.029	0.05	0.00E+00	5.18E–10	4.44E–11	5.00E–05	1.60E+01
Aroclor	0.42	0.05	0.00E+00	7.50E–09	6.43E–10	2.00E–05	7.70E+00
Antimony	6.8	0.01	0.00E+00	2.43E–08	2.08E–09	4.00E–04	
Arsenic	4.8	0.01	0.00E+00	1.71E–08	1.47E–09	2.80E–04	1.80E+00
Beryllium	1	0.01	0.00E+00	3.57E–09	3.06E–10	2.50E–04	8.60E+01
Manganese	228	0.01	0.00E+00	8.14E–07	6.98E–08	1.50E–04	
Vanadium	186	0.01	0.00E+00	6.64E–07	5.69E–08	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 1 – CBU SRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	1.79E-09
Dieldrin	0.00E+00	1.04E-05	7.10E-10
Aroclor	0.00E+00	3.75E-04	4.95E-09
Antimony	0.00E+00	6.07E-05	0.00E+00
Arsenic	0.00E+00	6.12E-05	2.64E-09
Beryllium	0.00E+00	1.43E-05	2.63E-08
Manganese	0.00E+00	5.43E-03	0.00E+00
Vanadium	0.00E+00	1.90E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	7.84E-03	3.64E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 1 – CBU SRUM STORAGE AREA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 12/20/94

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		24
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		15
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.27E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 1 – CBU SRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.68	0.05	0.00E+00	1.21E–07	4.33E–08		
Benzo(b)fluoranthene	0.63	0.05	0.00E+00	1.12E–07	4.02E–08		
Benzo(a)pyrene	0.38	0.05	0.00E+00	6.78E–08	2.42E–08		
Dibenz(a,h)anthracene	0.059	0.05	0.00E+00	1.05E–08	3.76E–09		
4,4'–DDD	3.9	0.05	0.00E+00	6.96E–07	2.49E–07		3.00E–01
Dieldrin	0.029	0.05	0.00E+00	5.18E–09	1.85E–09	5.00E–05	1.60E+01
Aroclor	0.42	0.05	0.00E+00	7.50E–08	2.68E–08	2.00E–05	7.70E+00
Antimony	6.8	0.01	0.00E+00	2.43E–07	8.67E–08	4.00E–04	
Arsenic	4.8	0.01	0.00E+00	1.71E–07	6.12E–08	2.80E–04	1.80E+00
Beryllium	1	0.01	0.00E+00	3.57E–08	1.27E–08	2.50E–04	8.60E+01
Manganese	228	0.01	0.00E+00	8.14E–06	2.91E–06	1.50E–04	
Vanadium	186	0.01	0.00E+00	6.64E–06	2.37E–06	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 1 – CBU SRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	7.46E-08
Dieldrin	0.00E+00	1.04E-04	2.96E-08
Aroclor	0.00E+00	3.75E-03	2.06E-07
Antimony	0.00E+00	6.07E-04	0.00E+00
Arsenic	0.00E+00	6.12E-04	1.10E-07
Beryllium	0.00E+00	1.43E-04	1.10E-06
Manganese	0.00E+00	5.43E-02	0.00E+00
Vanadium	0.00E+00	1.90E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	7.84E-02	1.52E-06

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 1 – CBU DRUM STORAGE AREA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 12/22/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	12	EF:	350
ET:	8	ET:	24
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	3.01E–03	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	2.58E–04	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 1 – CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.2E–08	0.00E+00	3.68E–11	3.15E–12		
Benzo(b)fluoranthene	1.1E–08	0.00E+00	3.41E–11	2.92E–12		
Benzo(a)pyrene	6.8E–09	0.00E+00	2.06E–11	1.76E–12		
Dibenz(a,h)anthracene	1.1E–09	0.00E+00	3.19E–12	2.74E–13		
4,4'–DDD	7.0E–08	0.00E+00	2.11E–10	1.81E–11		
Dieldrin	5.2E–10	0.00E+00	1.57E–12	1.34E–13		1.61E+01
Aroclor	7.6E–09	0.00E+00	2.27E–11	1.95E–12		
Antimony	1.2E–07	0.00E+00	3.68E–10	3.15E–11		
Arsenic	8.6E–08	0.00E+00	2.60E–10	2.23E–11		1.51E+01
Beryllium	1.8E–08	0.00E+00	5.41E–11	4.64E–12		
Manganese	4.1E–06	0.00E+00	1.23E–08	1.06E–09	1.43E–05	
Vanadium	3.3E–06	0.00E+00	1.01E–08	8.63E–10		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 1 – CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	0.00E+00
Dieldrin	0.00E+00	0.00E+00	2.17E-12
Aroclor	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	3.36E-10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	8.63E-04	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**8.63E-04**	**3.38E-10**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 1 – CBU DRUM STORAGE AREA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 12/22/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	24	EF:	350
ET:	8	ET:	24
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	6.01E–03	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	2.15E–03	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 1 - CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.2E-08	0.00E+00	7.36E-11	2.63E-11		
Benzo(b)fluoranthene	1.1E-08	0.00E+00	6.82E-11	2.43E-11		
Benzo(a)pyrene	6.8E-09	0.00E+00	4.11E-11	1.47E-11		
Dibenz(a,h)anthracene	1.1E-09	0.00E+00	6.38E-12	2.28E-12		
4,4'-DDD	7.0E-08	0.00E+00	4.22E-10	1.51E-10		
Dieldrin	5.2E-10	0.00E+00	3.14E-12	1.12E-12		1.61E+01
Aroclor	7.6E-09	0.00E+00	4.54E-11	1.62E-11		
Antimony	1.2E-07	0.00E+00	7.36E-10	2.63E-10		
Arsenic	8.6E-08	0.00E+00	5.19E-10	1.86E-10		1.51E+01
Beryllium	1.8E-08	0.00E+00	1.08E-10	3.86E-11		
Manganese	4.1E-06	0.00E+00	2.47E-08	8.81E-09	1.43E-05	
Vanadium	3.3E-06	0.00E+00	2.01E-08	7.19E-09		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 1 – CBU DRUM STORAGE AREA
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	0.00E+00
Dieldrin	0.00E+00	0.00E+00	1.80E-11
Aroclor	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	2.80E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	1.73E-03	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.73E-03**	**2.82E-09**

APPENDIX F.5

SITE 2 - AREA A LANDFILL

SUMMARY OF STATISTICALLY DERIVED EXPOSURE CONCENTRATIONS
SITE 2 - AREA A LANDFILL
ALL SOIL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Concern	Distribution of Data Set[1]	Exposure Concentration[2] (mg/kg)
Benzo(a)anthracene	Undefined	0.320
Benzo(b)fluoranthene	Undefined	0.210
Benzo(a)pyrene	Undefined	0.220
Aroclor-1260	Undefined	3.50
Arsenic	Lognormal	4.3
Beryllium	Undefined	1.7
Boron	Undefined	1200
Manganese	Undefined	214
Mercury	Undefined	0.82

(1) Distribution determined using the Shapiro-Wilk "W-Test" (Gilbert, 1987).

(2) Exposure concentration is the 95% upper confidence limit (UCL) of the arithmetic mean or the mean of the transformed data, unless otherwise noted. 95% UCL is based on the distribution of the data set. Sample and duplicate results are averaged for the calculation of the 95% UCL; one-half of the nondetected values are used. When the distribution of the data set is undefined the most conservative 95% UCL was used as the exposure concentration.

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)anthracene (ug/kg); Site 2 Landfill; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	97	4.574711	17329.84	.4956618
2	99	4.595120	16807.27	.4673413
3	130	4.867534	9730.413	.1690929
4	165	5.105945	4050.413	.0298592
5	165	5.105945	4050.413	.0298592
6	165	5.105945	4050.413	.0298592
7	165	5.105945	4050.413	.0298592
8	165	5.105945	4050.413	.0298592
9	165	5.105945	4050.413	.0298592
10	165	5.105945	4050.413	.0298592
11	290	5.669881	3764.699	.1529885
12	370	5.913503	19981.84	.4029196
13	490	6.194405	68307.56	.8384367
14	570	6.345636	116524.7	1.138260
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	228.6429	5.278744	146.9692	.5458737
		196.1233		

Upper 95% confidence limit on arithmetic mean: 298.2063
Upper 95% confidence limit on geometric mean: 315.0557

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	97	9.409e3	4.574711	20.92798
2	99	9.801e3	4.595120	21.11513
3	130	1.69e4	4.867534	23.69289
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	290	8.41e4	5.669881	32.14755
12	370	1.369e5	5.913503	34.96952
13	490	2.401e5	6.194405	38.37066
14	570	3.249e5	6.345636	40.26710
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	3201	1012685	73.90241	393.9856

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 280799.2 (normal distribution)

d = 3.873715 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	4.73e2	2.4837e2
	.3318	3.91e2	1.2973e2
	.246	2.4e2	5.904e1
	.1802	1.25e2	2.2525e1
	.124	0	0
	.0727	0	0
	.024	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.5967e2
Summation**2:			2.1130e5

Wcalc = .7524862 Wtable = .874 Wcalc - Wtable = -.121514

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.770925	.9299129
.3318	1.599286	.5306429
.246	1.045969	.2573083
.1802	.5639354	.1016212
.124	0	0
.0727	0	0
.024	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		1.819485
Summation**2:		3.310527

Wcalc = .8546128 Wtable = .874 Wcalc - Wtable = -.019387

Arithmetic Average: 228.6429 Geometric Mean: 196.1233

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(b)fluoranthene (ug/kg); Site 2 Landfill; NSB-NL
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	70	4.248495	10950.13	.7568633
2	130	4.867534	1992.985	.0629707
3	165	5.105945	92.98469	.0001570
4	165	5.105945	92.98469	.0001570
5	165	5.105945	92.98469	.0001570
6	165	5.105945	92.98469	.0001570
7	165	5.105945	92.98469	.0001570
8	165	5.105945	92.98469	.0001570
9	165	5.105945	92.98469	.0001570
10	165	5.105945	92.98469	.0001570
11	165	5.105945	92.98469	.0001570
12	220	5.393628	2057.270	.0757094
13	260	5.560682	7285.842	.1955475
14	280	5.634790	11100.13	.2665817
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	174.6429	5.118474	51.30843	.3233342
		167.0802		

Upper 95% confidence limit on arithmetic mean: 198.9281
Upper 95% confidence limit on geometric mean: 209.0877

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	70	4.9e3	4.248495	18.04971
2	130	1.69e4	4.867534	23.69289
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	220	4.84e4	5.393628	29.09122
13	260	6.76e4	5.560682	30.92118
14	280	7.84e4	5.634790	31.75085
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	2445	461225	71.65864	368.1420

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 34223.21 (normal distribution)

d = 1.359085 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	2.1e2	1.1027e2
	.3318	1.3e2	4.3134e1
	.246	5.5e1	1.353e1
	.1802	0	0
	.124	0	0
	.0727	0	0
	.024	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.6694e2
Summation**2:			2.7867e4

Wcalc = .8142804 Wtable = .874 Wcalc - Wtable = -.059720

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.386294	.7279432
.3318	.6931472	.2299862
.246	.2876821	.0707698
.1802	0	0
.124	0	0
.0727	0	0
.024	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.028699
	Summation**2:	1.058222

Wcalc = .7786282 Wtable = .874 Wcalc - Wtable = -.095372

Arithmetic Average: 174.6429 Geometric Mean: 167.0802

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)pyrene (ug/kg); Site 2 Landfill; NSB-NL
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	46	3.828641	16110.86	1.589598
2	165	5.105945	62.86224	.0002726
3	165	5.105945	62.86224	.0002726
4	165	5.105945	62.86224	.0002726
5	165	5.105945	62.86224	.0002726
6	165	5.105945	62.86224	.0002726
7	165	5.105945	62.86224	.0002726
8	165	5.105945	62.86224	.0002726
9	165	5.105945	62.86224	.0002726
10	165	5.105945	62.86224	.0002726
11	165	5.105945	62.86224	.0002726
12	165	5.105945	62.86224	.0002726
13	250	5.521461	5940.005	.1866473
14	310	5.736572	18788.58	.4187881
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	172.9286	5.089434	56.52156	.4111926
		162.2980		

Upper 95% confidence limit on arithmetic mean: 199.6813
Upper 95% confidence limit on geometric mean: 221.8403

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	46	2.116e3	3.828641	14.65849
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	250	6.25e4	5.521461	30.48653
14	310	9.61e4	5.736572	32.90826
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	2421	460191	71.25207	364.8308

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 41530.93 (normal distribution)

d = 2.198032 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	2.64e2	1.3863e2
.3318	8.5e1	2.8203e1
.246	0	0
.1802	0	0
.124	0	0
.0727	0	0
.024	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.6683e2
	Summation**2:	2.7832e4

Wcalc = .6701523 Wtable = .874 Wcalc - Wtable = -.203848

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.907931	1.001855
.3318	.4155154	.1378680
.246	0	0
.1802	0	0
.124	0	0
.0727	0	0
.024	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.139723
Summation**2:		1.298967

Wcalc = .5909684 Wtable = .874 Wcalc - Wtable = -.283032

Arithmetic Average: 172.9286 Geometric Mean: 162.2980

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Aroclor (ug/kg); Site 2 Landfill; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 24
Degrees of Freedom: 23

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	13.4	2.595255	2804760.	6.699813
2	60	4.094345	2650845.	1.186596
3	60	4.094345	2650845.	1.186596
4	60	4.094345	2650845.	1.186596
5	60	4.094345	2650845.	1.186596
6	60	4.094345	2650845.	1.186596
7	60	4.094345	2650845.	1.186596
8	60	4.094345	2650845.	1.186596
9	60	4.094345	2650845.	1.186596
10	60	4.094345	2650845.	1.186596
11	60	4.094345	2650845.	1.186596
12	60	4.094345	2650845.	1.186596
13	60	4.094345	2650845.	1.186596
14	130	4.867534	2427805.	.0999319
15	172	5.147494	2298686.	.0013075
16	181	5.198497	2271476.	.0002203
17	294	5.683580	1943631.	.2499253
18	340	5.828946	1817486.	.4164006
19	350	5.857933	1790623.	.4546517
20	685	6.529419	1006293.	1.811082
21	780	6.659294	824721.3	2.177512
22	1750	7.467371	3826.453	5.215361
23	12000	9.392662	1.0633e8	17.71574
24	23100	10.04759	4.5847e8	23.65785
25		0	0	0
Mean:	1688.142	5.183654	5165.949	1.778360
		178.3333		

Upper 95% confidence limit on arithmetic mean: 3495.546
Upper 95% confidence limit on geometric mean: 3394.050

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 24 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	13.4	1.7956e2	2.595255	6.735347
2	60	3.6e3	4.094345	16.76366
3	60	3.6e3	4.094345	16.76366
4	60	3.6e3	4.094345	16.76366
5	60	3.6e3	4.094345	16.76366
6	60	3.6e3	4.094345	16.76366
7	60	3.6e3	4.094345	16.76366
8	60	3.6e3	4.094345	16.76366
9	60	3.6e3	4.094345	16.76366
10	60	3.6e3	4.094345	16.76366
11	60	3.6e3	4.094345	16.76366
12	60	3.6e3	4.094345	16.76366
13	60	3.6e3	4.094345	16.76366
14	130	1.69e4	4.867534	23.69289
15	172	2.9584e4	5.147494	26.49670
16	181	3.2761e4	5.198497	27.02437
17	294	8.6436e4	5.683580	32.30308
18	340	1.156e5	5.828946	33.97661
19	350	1.225e5	5.857933	34.31538
20	685	4.6923e5	6.529419	42.63331
21	780	6.084e5	6.659294	44.34620
22	1750	3.0625e6	7.467371	55.76163
23	12000	1.44e8	9.392662	88.22210
24	23100	5.3361e8	10.04759	100.9540
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	40515.4	6.8220e8	124.4077	717.6255

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 6.1380e8 (normal distribution)

d = 72.73895 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4493	2.3087e4	1.0373e4
	.3098	1.194e4	3.6990e3
	.2554	1.69e3	4.3163e2
	.2145	7.2e2	1.5444e2
	.1807	6.25e2	1.1294e2
	.1512	2.9e2	4.3848e1
	.1245	2.8e2	3.486e1
	.0997	2.34e2	2.3330e1
	.0764	1.21e2	9.2444e0
	.0539	1.12e2	6.0368e0
	.0321	7e1	2.247e0
	.0107	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.4890e4
Summation**2:			2.2172e8

Wcalc = .3612303 Wtable = .916 Wcalc - Wtable = -.554770

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4493	7.452333	3.348333
.3098	5.298317	1.641419
.2554	3.373027	.8614710
.2145	2.564949	.5501816
.1807	2.435074	.4400179
.1512	1.763589	.2666546
.1245	1.734601	.2159578
.0997	1.589235	.1584467
.0764	1.104152	.0843572
.0539	1.053150	.0567648
.0321	.7731899	.0248194
.0107	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		7.648423
Summation**2:		58.49838

Wcalc = .8042235 Wtable = .916 Wcalc - Wtable = -.111776

Arithmetic Average: 1688.142 Geometric Mean: 178.3333

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Arsenic (mg/kg); Site 2 Landfill; NSB-NL
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.1	.0953102	3.830408	.7671817
2	1.2	.1823216	3.448980	.6223280
3	1.8	.5877867	1.580408	.1470052
4	1.9	.6418539	1.338980	.1084684
5	1.9	.6418539	1.338980	.1084684
6	2	.6931472	1.117551	.0773130
7	2.2	.7884574	.7346939	.0333946
8	2.7	.9932518	.1275510	.0004863
9	3.3	1.193922	.0589796	.0496056
10	3.7	1.308333	.4132653	.1136590
11	3.9	1.360977	.7104082	.1519263
12	4.5	1.504077	2.081837	.2839591
13	4.6	1.526056	2.380408	.3078663
14	8	2.079442	24.43184	1.228201
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	3.057143	.9711993	1.831231	.5546907
		2.641110		

Upper 95% confidence limit on arithmetic mean: 3.923900
Upper 95% confidence limit on geometric mean: 4.292702

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.1	1.21e0	.0953102	.0090840
2	1.2	1.44e0	.1823216	.0332412
3	1.8	3.24e0	.5877867	.3454932
4	1.9	3.61e0	.6418539	.4119764
5	1.9	3.61e0	.6418539	.4119764
6	2	4e0	.6931472	.4804530
7	2.2	4.84e0	.7884574	.6216650
8	2.7	7.29e0	.9932518	.9865491
9	3.3	1.089e1	1.193922	1.425451
10	3.7	1.369e1	1.308333	1.711735
11	3.9	1.521e1	1.360977	1.852257
12	4.5	2.025e1	1.504077	2.262249
13	4.6	2.116e1	1.526056	2.328848
14	8	6.4e1	2.079442	4.324077
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	42.8	174.44	13.59679	17.20505

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 43.59429 (normal distribution)

d = 3.999863 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	6.9e0	3.6232e0
.3318	3.4e0	1.1281e0
.246	2.7e0	6.642e-1
.1802	2e0	3.604e-1
.124	1.8e0	2.232e-1
.0727	1.3e0	9.451e-2
.024	5e-1	1.2e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	6.1056e0
	Summation**2:	3.7279e1

Wcalc = .8551257 Wtable = .874 Wcalc - Wtable = -.018874

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.984131	1.041867
.3318	1.343735	.4458512
.246	.9162907	.2254075
.1802	.7191227	.1295859
.124	.6664789	.0826434
.0727	.5007753	.0364064
.024	.2047944	.0049151
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.966677
	Summation**2:	3.867818

Wcalc = .9669875 Wtable = .874 Wcalc - Wtable = .0929875

Arithmetic Average: 3.057143 Geometric Mean: 2.641110

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Beryllium (mg/kg); Site 2 Landfill; NSB-NL
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.25	-1.38629	.6218449	1.162998
2	.4	-.916291	.4077735	.3701752
3	.42	-.867501	.3826306	.3131859
4	.46	-.776529	.3347449	.2196406
5	.53	-.634878	.2586449	.1069341
6	.53	-.634878	.2586449	.1069341
7	.54	-.616186	.2485735	.0950586
8	.54	-.616186	.2485735	.0950586
9	.62	-.478036	.1752020	.0289562
10	.65	-.430783	.1509878	.0151075
11	1.2	.1823216	.0260592	.2402882
12	1.5	.4054651	.2129163	.5088476
13	3	1.098612	3.847202	1.978194
14	3.9	1.360977	8.187773	2.785050
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	1.038571	-.307870	1.087042	.7857593
		.7350105		

Upper 95% confidence limit on arithmetic mean: 1.553090
Upper 95% confidence limit on geometric mean: 1.712612

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.25	6.25e-2	-1.38629	1.921812
2	.4	1.6e-1	-.916291	.8395887
3	.42	1.764e-1	-.867501	.7525572
4	.46	2.116e-1	-.776529	.6029970
5	.53	2.809e-1	-.634878	.4030704
6	.53	2.809e-1	-.634878	.4030704
7	.54	2.916e-1	-.616186	.3796854
8	.54	2.916e-1	-.616186	.3796854
9	.62	3.844e-1	-.478036	.2285182
10	.65	4.225e-1	-.430783	.1855739
11	1.2	1.44e0	.1823216	.0332412
12	1.5	2.25e0	.4054651	.1644020
13	3	9e0	1.098612	1.206949
14	3.9	1.521e1	1.360977	1.852257
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	14.54	30.4624	-4.31019	9.353408

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 15.36157 (normal distribution)

d = 8.026429 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	3.65e0	1.9166e0
	.3318	2.6e0	8.627e-1
	.246	1.08e0	2.657e-1
	.1802	7.4e-1	1.333e-1
	.124	1.2e-1	1.488e-2
	.0727	9e-2	6.543e-3
	.024	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			3.1997e0
Summation**2:			1.0238e1

Wcalc = .6664927 Wtable = .874 Wcalc - Wtable = -.207507

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	2.747271	1.442592
.3318	2.014903	.6685448
.246	1.272966	.3131496
.1802	.9588503	.1727848
.124	.2040954	.0253078
.0727	.1568425	.0114024
.024	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.633781
Summation**2:		6.936805

Wcalc = .8642455 Wtable = .874 Wcalc - Wtable = -.009755

Arithmetic Average: 1.038571 Geometric Mean: .7350105

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Boron (mg/kg); Site 2 Landfill; NSB-NL
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.5	.9162907	29645.46	6.985205
2	2.5	.9162907	29645.46	6.985205
3	2.5	.9162907	29645.46	6.985205
4	41	3.713572	17869.96	.0238169
5	43	3.761200	17339.25	.0407860
6	44	3.784190	17076.89	.0506002
7	45	3.806662	16816.53	.0612156
8	45	3.806662	16816.53	.0612156
9	50	3.912023	15544.75	.1244526
10	50	3.912023	15544.75	.1244526
11	52	3.951244	15050.03	.1536633
12	56	4.025352	14084.60	.2172558
13	130	4.867534	1996.175	1.711622
14	1882	7.540090	2914946.	15.84713
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	174.6786	3.559245	492.4056	1.740288
		35.13665		

Upper 95% confidence limit on arithmetic mean: 407.7438
Upper 95% confidence limit on geometric mean: 1198.746

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.5	6.25e0	.9162907	.8395887
2	2.5	6.25e0	.9162907	.8395887
3	2.5	6.25e0	.9162907	.8395887
4	41	1.681e3	3.713572	13.79062
5	43	1.849e3	3.761200	14.14663
6	44	1.936e3	3.784190	14.32009
7	45	2.025e3	3.806662	14.49068
8	45	2.025e3	3.806662	14.49068
9	50	2.5e3	3.912023	15.30392
10	50	2.5e3	3.912023	15.30392
11	52	2.704e3	3.951244	15.61233
12	56	3.136e3	4.025352	16.20346
13	130	1.69e4	4.867534	23.69289
14	1882	3.5419e6	7.540090	56.85296
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	2445.5	3579199.	49.82943	216.7269

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 3152022. (normal distribution)

d = 39.37183 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	1.8795e3	9.8693e2
	.3318	1.275e2	4.2305e1
	.246	5.35e1	1.3161e1
	.1802	1.1e1	1.9822e0
	.124	7e0	8.68e-1
	.0727	6e0	4.362e-1
	.024	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.0457e3
Summation**2:			1.0934e6

Wcalc = .3469015 Wtable = .874 Wcalc - Wtable = -.527099

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	6.623800	3.478157
.3318	3.951244	1.311023
.246	3.109061	.7648290
.1802	.2376717	.0428284
.124	.1508229	.0187020
.0727	.1278334	.0092935
.024	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		5.624833
Summation**2:		31.63874

Wcalc = .8035884 Wtable = .874 Wcalc - Wtable = -.070412

Arithmetic Average: 174.6786 Geometric Mean: 35.13665

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Manganese (mg/kg); Site 2 Landfill; NSB-NL
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	74	4.304065	9147.556	.5591783
2	101	4.615121	4711.842	.1907303
3	109	4.691348	3677.556	.1299599
4	132	4.882802	1416.985	.0285764
5	133	4.890349	1342.699	.0260817
6	136	4.912655	1131.842	.0193745
7	144	4.969813	657.5561	.0067296
8	149	5.003946	426.1276	.0022945
9	151	5.017280	347.5561	.0011949
10	157	5.056246	159.8418	.0000193
11	228	5.429346	3405.556	.1425050
12	241	5.484797	5091.842	.1874454
13	288	5.662960	14008.41	.3734593
14	332	5.805135	26359.84	.5674423
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	169.6429	5.051847	74.36149	.4146353
		156.3110		

Upper 95% confidence limit on arithmetic mean: 204.8396
Upper 95% confidence limit on geometric mean: 214.4587

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	74	5.476e3	4.304065	18.52498
2	101	1.0201e4	4.615121	21.29934
3	109	1.1881e4	4.691348	22.00874
4	132	1.7424e4	4.882802	23.84175
5	133	1.7689e4	4.890349	23.91551
6	136	1.8496e4	4.912655	24.13418
7	144	2.0736e4	4.969813	24.69904
8	149	2.2201e4	5.003946	25.03948
9	151	2.2801e4	5.017280	25.17310
10	157	2.4649e4	5.056246	25.56562
11	228	5.1984e4	5.429346	29.47779
12	241	5.8081e4	5.484797	30.08300
13	288	8.2944e4	5.662960	32.06912
14	332	1.1022e5	5.805135	33.69959
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	2375	474787	70.72586	359.5313

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 71885.21 (normal distribution)

d = 2.234991 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	2.58e2	1.3548e2
	.3318	1.87e2	6.2047e1
	.246	1.32e2	3.2472e1
	.1802	9.6e1	1.7299e1
	.124	2.4e1	2.976e0
	.0727	1.5e1	1.0905e0
	.024	5e0	1.2e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.5148e2
Summation**2:			6.3242e4

Wcalc = .8797670 Wtable = .874 Wcalc - Wtable = .0057670

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	1.501070	.7882118
	.3318	1.047840	.3476733
	.246	.7934491	.1951885
	.1802	.5465437	.0984872
	.124	.1658967	.0205712
	.0727	.1046250	.0076062
	.024	.0341330	.0008192
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.458557
Summation**2:			2.127390

Wcalc = .9518559 Wtable = .874 Wcalc - Wtable = .0778559

Arithmetic Average: 169.6429 Geometric Mean: 156.3110

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Mercury (mg/kg); Site 2 Landfill; NSB-NL
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.1	-2.30259	.0764128	.1343265
2	.1	-2.30259	.0764128	.1343265
3	.1	-2.30259	.0764128	.1343265
4	.1	-2.30259	.0764128	.1343265
5	.1	-2.30259	.0764128	.1343265
6	.1	-2.30259	.0764128	.1343265
7	.1	-2.30259	.0764128	.1343265
8	.1	-2.30259	.0764128	.1343265
9	.1	-2.30259	.0764128	.1343265
10	.1	-2.30259	.0764128	.1343265
11	.1	-2.30259	.0764128	.1343265
12	.1	-2.30259	.0764128	.1343265
13	.47	-.755023	.0087556	1.394895
14	3.6	1.280934	10.39141	10.34917
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	.3764286	-1.93608	.9330315	1.013599
		.1442685		

Upper 95% confidence limit on arithmetic mean: .8180507
Upper 95% confidence limit on geometric mean: .5335101

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Mercury (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.1	1e-2	-2.30259	5.301898
2	.1	1e-2	-2.30259	5.301898
3	.1	1e-2	-2.30259	5.301898
4	.1	1e-2	-2.30259	5.301898
5	.1	1e-2	-2.30259	5.301898
6	.1	1e-2	-2.30259	5.301898
7	.1	1e-2	-2.30259	5.301898
8	.1	1e-2	-2.30259	5.301898
9	.1	1e-2	-2.30259	5.301898
10	.1	1e-2	-2.30259	5.301898
11	.1	1e-2	-2.30259	5.301898
12	.1	1e-2	-2.30259	5.301898
13	.47	2.209e-1	-.755023	.5700591
14	3.6	1.296e1	1.280934	1.640792
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	5.27	13.3009	-27.1051	65.83363

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 11.31712 (normal distribution)

d = 13.35599 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Mercury (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	3.5e0	1.8379e0
	.3318	3.7e-1	1.228e-1
	.246	0	0
	.1802	0	0
	.124	0	0
	.0727	0	0
	.024	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.9606e0
Summation**2:			3.8440e0

Wcalc = .3396637 Wtable = .874 Wcalc - Wtable = -.534336

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Landfill	Date:	01/11/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Mercury (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	3.583519	1.881706
	.3318	1.547563	.5134812
	.246	0	0
	.1802	0	0
	.124	0	0
	.0727	0	0
	.024	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0

Summation:			2.395187
Summation**2:			5.736921

Wcalc = .4295393 Wtable = .874 Wcalc - Wtable = -.444461

Arithmetic Average: .3764286 Geometric Mean: .1442685

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	50	IR:	0
EF:	12	EF:	350
Fi:	1	Fi:	1
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.35E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.01E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	0.00E+00	1.34E−08	1.15E−09		7.30E−01
Benzo(b)fluoranthene	0.22	1	0.00E+00	5.17E−09	4.43E−10		7.30E−01
Benzo(a)pyrene	0.046	1	0.00E+00	1.08E−09	9.26E−11		7.30E+00
Aroclor	12	0.3	0.00E+00	8.45E−08	7.25E−09	2.00E−05	7.70E+00
OCDD	0.0025	1	0.00E+00	5.87E−11	5.03E−12		1.50E+03
Arsenic	3.7	1	0.00E+00	8.69E−08	7.45E−09	3.00E−04	1.75E+00
Beryllium	3	1	0.00E+00	7.05E−08	6.04E−09	5.00E−03	4.30E+00
Boron	50	1	0.00E+00	1.17E−06	1.01E−07	9.00E−02	
Manganese	228	1	0.00E+00	5.35E−06	4.59E−07	5.00E−03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	8.38E-10
Benzo(b)fluoranthene	0.00E+00	0.00E+00	3.23E-10
Benzo(a)pyrene	0.00E+00	0.00E+00	6.76E-10
Aroclor	0.00E+00	4.23E-03	5.58E-08
OCDD	0.00E+00	0.00E+00	7.55E-09
Arsenic	0.00E+00	2.90E-04	1.30E-08
Beryllium	0.00E+00	1.41E-05	2.60E-08
Boron	0.00E+00	1.30E-05	0.00E+00
Manganese	0.00E+00	1.07E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**5.61E-03**	**1.04E-07**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	100	IR:	0
EF:	24	EF:	350
Fi:	1	Fi:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	9.39E–08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.35E–08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	0.00E+00	5.35E–08	1.91E–08		7.30E–01
Benzo(b)fluoranthene	0.22	1	0.00E+00	2.07E–08	7.38E–09		7.30E–01
Benzo(a)pyrene	0.046	1	0.00E+00	4.32E–09	1.54E–09		7.30E+00
Aroclor	12	0.3	0.00E+00	3.38E–07	1.21E–07	2.00E–05	7.70E+00
OCDD	0.0025	1	0.00E+00	2.35E–10	8.39E–11		1.50E+03
Arsenic	3.7	1	0.00E+00	3.48E–07	1.24E–07	3.00E–04	1.75E+00
Beryllium	3	1	0.00E+00	2.82E–07	1.01E–07	5.00E–03	4.30E+00
Boron	50	1	0.00E+00	4.70E–06	1.68E–06	9.00E–02	
Manganese	228	1	0.00E+00	2.14E–05	7.65E–06	5.00E–03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.40E−08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	5.39E−09
Benzo(a)pyrene	0.00E+00	0.00E+00	1.13E−08
Aroclor	0.00E+00	1.69E−02	9.30E−07
OCDD	0.00E+00	0.00E+00	1.26E−07
Arsenic	0.00E+00	1.16E−03	2.17E−07
Beryllium	0.00E+00	5.64E−05	4.33E−07
Boron	0.00E+00	5.22E−05	0.00E+00
Manganese	0.00E+00	4.28E−03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**2.25E−02**	**1.74E−06**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	50	IR:	0
EF:	26	EF:	350
Fi:	1	Fi:	1
ED:	9	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	3285	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	5.09E–08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	6.54E–09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	0.00E+00	2.90E−08	3.73E−09		7.30E−01
Benzo(b)fluoranthene	0.22	1	0.00E+00	1.12E−08	1.44E−09		7.30E−01
Benzo(a)pyrene	0.046	1	0.00E+00	2.34E−09	3.01E−10		7.30E+00
Aroclor	12	0.3	0.00E+00	1.83E−07	2.36E−08	2.00E−05	7.70E+00
OCDD	0.0025	1	0.00E+00	1.27E−10	1.64E−11		1.50E+03
Arsenic	3.7	1	0.00E+00	1.88E−07	2.42E−08	3.00E−04	1.75E+00
Beryllium	3	1	0.00E+00	1.53E−07	1.96E−08	5.00E−03	4.30E+00
Boron	50	1	0.00E+00	2.54E−06	3.27E−07	9.00E−02	
Manganese	228	1	0.00E+00	1.16E−05	1.49E−06	5.00E−03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	2.72E−09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.05E−09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.20E−09
Aroclor	0.00E+00	9.16E−03	1.81E−07
OCDD	0.00E+00	0.00E+00	2.45E−08
Arsenic	0.00E+00	6.28E−04	4.24E−08
Beryllium	0.00E+00	3.05E−05	8.44E−08
Boron	0.00E+00	2.83E−05	0.00E+00
Manganese	0.00E+00	2.32E−03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.22E−02	3.39E−07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	100	IR:	0
EF:	26	EF:	350
Fi:	1	Fi:	1
ED:	30	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	10950	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.02E-07	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	4.36E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	0.00E+00	5.80E−08	2.49E−08		7.30E−01
Benzo(b)fluoranthene	0.22	1	0.00E+00	2.24E−08	9.59E−09		7.30E−01
Benzo(a)pyrene	0.046	1	0.00E+00	4.68E−09	2.01E−09		7.30E+00
Aroclor	12	0.3	0.00E+00	3.66E−07	1.57E−07	2.00E−05	7.70E+00
OCDD	0.0025	1	0.00E+00	2.54E−10	1.09E−10		1.50E+03
Arsenic	3.7	1	0.00E+00	3.77E−07	1.61E−07	3.00E−04	1.75E+00
Beryllium	3	1	0.00E+00	3.05E−07	1.31E−07	5.00E−03	4.30E+00
Boron	50	1	0.00E+00	5.09E−06	2.18E−06	9.00E−02	
Manganese	228	1	0.00E+00	2.32E−05	9.94E−06	5.00E−03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.81E−08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	7.00E−09
Benzo(a)pyrene	0.00E+00	0.00E+00	1.46E−08
Aroclor	0.00E+00	1.83E−02	1.21E−06
OCDD	0.00E+00	0.00E+00	1.64E−07
Arsenic	0.00E+00	1.26E−03	2.82E−07
Beryllium	0.00E+00	6.11E−05	5.63E−07
Boron	0.00E+00	5.65E−05	0.00E+00
Manganese	0.00E+00	4.64E−03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**2.43E−02**	**2.26E−06**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	50	IR:	0
EF:	52	EF:	350
Fi:	1	Fi:	1
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.02E–07	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	8.72E–09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	0.00E+00	5.80E–08	4.97E–09		7.30E–01
Benzo(b)fluoranthene	0.22	1	0.00E+00	2.24E–08	1.92E–09		7.30E–01
Benzo(a)pyrene	0.046	1	0.00E+00	4.68E–09	4.01E–10		7.30E+00
Aroclor	12	0.3	0.00E+00	3.66E–07	3.14E–08	2.00E–05	7.70E+00
OCDD	0.0025	1	0.00E+00	2.54E–10	2.18E–11		1.50E+03
Arsenic	3.7	1	0.00E+00	3.77E–07	3.23E–08	3.00E–04	1.75E+00
Beryllium	3	1	0.00E+00	3.05E–07	2.62E–08	5.00E–03	4.30E+00
Boron	50	1	0.00E+00	5.09E–06	4.36E–07	9.00E–02	
Manganese	228	1	0.00E+00	2.32E–05	1.99E–06	5.00E–03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	3.63E−09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.40E−09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.93E−09
Aroclor	0.00E+00	1.83E−02	2.42E−07
OCDD	0.00E+00	0.00E+00	3.27E−08
Arsenic	0.00E+00	1.26E−03	5.65E−08
Beryllium	0.00E+00	6.11E−05	1.13E−07
Boron	0.00E+00	5.65E−05	0.00E+00
Manganese	0.00E+00	4.64E−03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**2.43E−02**	**4.51E−07**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	100	IR:	0
EF:	120	EF:	350
Fi:	1	Fi:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	4.70E–07	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	1.68E–07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	0.00E+00	2.68E–07	9.56E–08		7.30E–01
Benzo(b)fluoranthene	0.22	1	0.00E+00	1.03E–07	3.69E–08		7.30E–01
Benzo(a)pyrene	0.046	1	0.00E+00	2.16E–08	7.72E–09		7.30E+00
Aroclor	12	0.3	0.00E+00	1.69E–06	6.04E–07	2.00E–05	7.70E+00
OCDD	0.0025	1	0.00E+00	1.17E–09	4.19E–10		1.50E+03
Arsenic	3.7	1	0.00E+00	1.74E–06	6.21E–07	3.00E–04	1.75E+00
Beryllium	3	1	0.00E+00	1.41E–06	5.03E–07	5.00E–03	4.30E+00
Boron	50	1	0.00E+00	2.35E–05	8.39E–06	9.00E–02	
Manganese	228	1	0.00E+00	1.07E–04	3.82E–05	5.00E–03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	6.98E−08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	2.69E−08
Benzo(a)pyrene	0.00E+00	0.00E+00	5.63E−08
Aroclor	0.00E+00	8.45E−02	4.65E−06
OCDD	0.00E+00	0.00E+00	6.29E−07
Arsenic	0.00E+00	5.79E−03	1.09E−06
Beryllium	0.00E+00	2.82E−04	2.16E−06
Boron	0.00E+00	2.61E−04	0.00E+00
Manganese	0.00E+00	2.14E−02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.12E−01**	**8.68E−06**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	50
EF:	56	EF:	56
Fi:	1	Fi:	1
ED:	6	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	1.92E–07	(AVG ANNUAL DOSE)	CF:	1.64E–08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	1.09E–07	0.00E+00	9.37E–09		7.30E–01
Benzo(b)fluoranthene	0.22	1	4.22E–08	0.00E+00	3.62E–09		7.30E–01
Benzo(a)pyrene	0.046	1	8.82E–09	0.00E+00	7.56E–10		7.30E+00
Aroclor	12	0.3	6.90E–07	0.00E+00	5.92E–08	2.00E–05	7.70E+00
OCDD	0.0025	1	4.79E–10	0.00E+00	4.11E–11		1.50E+03
Arsenic	3.7	1	7.10E–07	0.00E+00	6.08E–08	3.00E–04	1.75E+00
Beryllium	3	1	5.75E–07	0.00E+00	4.93E–08	5.00E–03	4.30E+00
Boron	50	1	9.59E–06	0.00E+00	8.22E–07	9.00E–02	
Manganese	228	1	4.37E–05	0.00E+00	3.75E–06	5.00E–03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	6.84E−09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	2.64E−09
Benzo(a)pyrene	0.00E+00	0.00E+00	5.52E−09
Aroclor	3.45E−02	0.00E+00	4.56E−07
OCDD	0.00E+00	0.00E+00	6.16E−08
Arsenic	2.37E−03	0.00E+00	1.06E−07
Beryllium	1.15E−04	0.00E+00	2.12E−07
Boron	1.07E−04	0.00E+00	0.00E+00
Manganese	8.75E−03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**4.59E−02**	**0.00E+00**	**8.51E−07**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE – AREA A LANDFILL
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	100
EF:	56	EF:	56
Fi:	1	Fi:	1
ED:	6	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.84E-07	(AVG ANNUAL DOSE)	CF:	3.29E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	1	2.19E−07	0.00E+00	1.87E−08		7.30E−01
Benzo(b)fluoranthene	0.22	1	8.44E−08	0.00E+00	7.23E−09		7.30E−01
Benzo(a)pyrene	0.046	1	1.76E−08	0.00E+00	1.51E−09		7.30E+00
Aroclor	12	0.3	1.38E−06	0.00E+00	1.18E−07	2.00E−05	7.70E+00
OCDD	0.0025	1	9.59E−10	0.00E+00	8.22E−11		1.50E+03
Arsenic	3.7	1	1.42E−06	0.00E+00	1.22E−07	3.00E−04	1.75E+00
Beryllium	3	1	1.15E−06	0.00E+00	9.86E−08	5.00E−03	4.30E+00
Boron	50	1	1.92E−05	0.00E+00	1.64E−06	9.00E−02	
Manganese	228	1	8.75E−05	0.00E+00	7.50E−06	5.00E−03	
		1	0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.37E−08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	5.28E−09
Benzo(a)pyrene	0.00E+00	0.00E+00	1.10E−08
Aroclor	6.90E−02	0.00E+00	9.11E−07
OCDD	0.00E+00	0.00E+00	1.23E−07
Arsenic	4.73E−03	0.00E+00	2.13E−07
Beryllium	2.30E−04	0.00E+00	4.24E−07
Boron	2.13E−04	0.00E+00	0.00E+00
Manganese	1.75E−02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	9.17E−02	0.00E+00	1.70E−06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS)	CF1 =	0.00E+00	CANCER RISK = (CF3)*(C)*(ABS)	CF3 =	1.06E–08
DOSEadult = (CF2)*(C)*(ABS)	CF2 =	2.97E–08			

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.32	0.05	0.00E+00	4.76E−10	1.70E−10		
Benzo(b)fluoranthene	0.21	0.05	0.00E+00	3.12E−10	1.12E−10		
Benzo(a)pyrene	0.22	0.05	0.00E+00	3.27E−10	1.17E−10		
Aroclor	3.5	0.05	0.00E+00	5.21E−09	1.86E−09	2.00E−05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	3.72E−12	1.33E−12		1.70E+03
Arsenic	4.3	0.01	0.00E+00	1.28E−09	4.57E−10	2.80E−04	1.80E+00
Beryllium	1.7	0.01	0.00E+00	5.06E−10	1.81E−10	2.50E−04	8.60E+01
Boron	1200	0.01	0.00E+00	3.57E−07	1.27E−07	4.50E−03	
Manganese	214	0.01	0.00E+00	6.37E−08	2.27E−08	1.50E−04	
Mercury	0.82	0.01	0.00E+00	2.44E−10	8.71E−11	1.50E−05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	2.60E-04	1.43E-08
OCDD	0.00E+00	0.00E+00	2.26E-09
Arsenic	0.00E+00	4.57E-06	8.22E-10
Beryllium	0.00E+00	2.02E-06	1.55E-08
Boron	0.00E+00	7.93E-05	0.00E+00
Manganese	0.00E+00	4.24E-04	0.00E+00
Mercury	0.00E+00	1.63E-05	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	7.87E-04	3.29E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		3.5
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.86E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 5.21E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.32	0.05	0.00E+00	8.33E–09	2.97E–09		
Benzo(b)fluoranthene	0.21	0.05	0.00E+00	5.47E–09	1.95E–09		
Benzo(a)pyrene	0.22	0.05	0.00E+00	5.73E–09	2.05E–09		
Aroclor	3.5	0.05	0.00E+00	9.11E–08	3.25E–08	2.00E–05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	6.51E–11	2.32E–11		1.70E+03
Arsenic	4.3	0.01	0.00E+00	2.24E–08	7.99E–09	2.80E–04	1.80E+00
Beryllium	1.7	0.01	0.00E+00	8.85E–09	3.16E–09	2.50E–04	8.60E+01
Boron	1200	0.01	0.00E+00	6.25E–06	2.23E–06	4.50E–03	
Manganese	214	0.01	0.00E+00	1.11E–06	3.98E–07	1.50E–04	
Mercury	0.82	0.01	0.00E+00	4.27E–09	1.52E–09	1.50E–05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	4.55E-03	2.51E-07
OCDD	0.00E+00	0.00E+00	3.95E-08
Arsenic	0.00E+00	7.99E-05	1.44E-08
Beryllium	0.00E+00	3.54E-05	2.72E-07
Boron	0.00E+00	1.39E-03	0.00E+00
Manganese	0.00E+00	7.43E-03	0.00E+00
Mercury	0.00E+00	2.85E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.38E-02	5.76E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		12
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		6
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		2190
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	0.05	0.00E+00	1.02E−08	8.72E−10		
Benzo(b)fluoranthene	0.22	0.05	0.00E+00	3.93E−09	3.37E−10		
Benzo(a)pyrene	0.046	0.05	0.00E+00	8.21E−10	7.04E−11		
Aroclor	12	0.05	0.00E+00	2.14E−07	1.84E−08	2.00E−05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	4.46E−11	3.82E−12		1.70E+03
Arsenic	3.7	0.01	0.00E+00	1.32E−08	1.13E−09	2.80E−04	1.80E+00
Beryllium	3	0.01	0.00E+00	1.07E−08	9.18E−10	2.50E−04	8.60E+01
Boron	50	0.01	0.00E+00	1.78E−07	1.53E−08	4.50E−03	
Manganese	228	0.01	0.00E+00	8.14E−07	6.98E−08	1.50E−04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	1.07E-02	1.41E-07
OCDD	0.00E+00	0.00E+00	6.50E-09
Arsenic	0.00E+00	4.72E-05	2.04E-09
Beryllium	0.00E+00	4.28E-05	7.89E-08
Boron	0.00E+00	3.97E-05	0.00E+00
Manganese	0.00E+00	5.43E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.63E-02	2.29E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		24
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.27E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	0.05	0.00E+00	1.02E–07	3.63E–08		
Benzo(b)fluoranthene	0.22	0.05	0.00E+00	3.93E–08	1.40E–08		
Benzo(a)pyrene	0.046	0.05	0.00E+00	8.21E–09	2.93E–09		
Aroclor	12	0.05	0.00E+00	2.14E–06	7.65E–07	2.00E–05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	4.46E–10	1.59E–10		1.70E+03
Arsenic	3.7	0.01	0.00E+00	1.32E–07	4.72E–08	2.80E–04	1.80E+00
Beryllium	3	0.01	0.00E+00	1.07E–07	3.82E–08	2.50E–04	8.60E+01
Boron	50	0.01	0.00E+00	1.78E–06	6.37E–07	4.50E–03	
Manganese	228	0.01	0.00E+00	8.14E–06	2.91E–06	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	1.07E-01	5.89E-06
OCDD	0.00E+00	0.00E+00	2.71E-07
Arsenic	0.00E+00	4.72E-04	8.49E-08
Beryllium	0.00E+00	4.28E-04	3.29E-06
Boron	0.00E+00	3.97E-04	0.00E+00
Manganese	0.00E+00	5.43E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.63E-01**	**9.53E-06**

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		26
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		9
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		3285
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS)	CF1 =	0.00E+00	CANCER RISK = (CF3)*(C)*(ABS)	CF3 =	9.94E–08
DOSEadult = (CF2)*(C)*(ABS)	CF2 =	7.73E–07			

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.57	0.05	0.00E+00	2.20E-08	2.83E-09		
Benzo(b)fluoranthene	0.22	0.05	0.00E+00	8.51E-09	1.09E-09		
Benzo(a)pyrene	0.046	0.05	0.00E+00	1.78E-09	2.29E-10		
Aroclor	12	0.05	0.00E+00	4.64E-07	5.97E-08	2.00E-05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	9.67E-11	1.24E-11		1.70E+03
Arsenic	3.7	0.01	0.00E+00	2.86E-08	3.68E-09	2.80E-04	1.80E+00
Beryllium	3	0.01	0.00E+00	2.32E-08	2.98E-09	2.50E-04	8.60E+01
Boron	50	0.01	0.00E+00	3.87E-07	4.97E-08	4.50E-03	
Manganese	228	0.01	0.00E+00	1.76E-06	2.27E-07	1.50E-04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	2.32E-02	4.59E-07
OCDD	0.00E+00	0.00E+00	2.11E-08
Arsenic	0.00E+00	1.02E-04	6.62E-09
Beryllium	0.00E+00	9.28E-05	2.57E-07
Boron	0.00E+00	8.59E-05	0.00E+00
Manganese	0.00E+00	1.18E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.52E-02	7.44E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		26
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		30
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		10950
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS)	CF1 =	0.00E+00	CANCER RISK = (CF3)*(C)*(ABS)	CF3 =	1.66E-06
DOSEadult = (CF2)*(C)*(ABS)	CF2 =	3.87E-06			

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	0.05	0.00E+00	1.10E−07	4.72E−08		
Benzo(b)fluoranthene	0.22	0.05	0.00E+00	4.25E−08	1.82E−08		
Benzo(a)pyrene	0.046	0.05	0.00E+00	8.89E−09	3.81E−09		
Aroclor	12	0.05	0.00E+00	2.32E−06	9.94E−07	2.00E−05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	4.83E−10	2.07E−10		1.70E+03
Arsenic	3.7	0.01	0.00E+00	1.43E−07	6.13E−08	2.80E−04	1.80E+00
Beryllium	3	0.01	0.00E+00	1.16E−07	4.97E−08	2.50E−04	8.60E+01
Boron	50	0.01	0.00E+00	1.93E−06	8.29E−07	4.50E−03	
Manganese	228	0.01	0.00E+00	8.82E−06	3.78E−06	1.50E−04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	1.16E-01	7.66E-06
OCDD	0.00E+00	0.00E+00	3.52E-07
Arsenic	0.00E+00	5.11E-04	1.10E-07
Beryllium	0.00E+00	4.64E-04	4.28E-06
Boron	0.00E+00	4.30E-04	0.00E+00
Manganese	0.00E+00	5.88E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.76E-01	1.24E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		52
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		6
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		2190
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.33E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.55E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	0.05	0.00E+00	4.41E−08	3.78E−09		
Benzo(b)fluoranthene	0.22	0.05	0.00E+00	1.70E−08	1.46E−09		
Benzo(a)pyrene	0.046	0.05	0.00E+00	3.56E−09	3.05E−10		
Aroclor	12	0.05	0.00E+00	9.28E−07	7.95E−08	2.00E−05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	1.93E−10	1.66E−11		1.70E+03
Arsenic	3.7	0.01	0.00E+00	5.72E−08	4.91E−09	2.80E−04	1.80E+00
Beryllium	3	0.01	0.00E+00	4.64E−08	3.98E−09	2.50E−04	8.60E+01
Boron	50	0.01	0.00E+00	7.73E−07	6.63E−08	4.50E−03	
Manganese	228	0.01	0.00E+00	3.53E−06	3.02E−07	1.50E−04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	4.64E-02	6.13E-07
OCDD	0.00E+00	0.00E+00	2.82E-08
Arsenic	0.00E+00	2.04E-04	8.83E-09
Beryllium	0.00E+00	1.86E-04	3.42E-07
Boron	0.00E+00	1.72E-04	0.00E+00
Manganese	0.00E+00	2.35E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**7.05E-02**	**9.92E-07**

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		120
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 6.37E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.78E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	0.05	0.00E+00	5.09E−07	1.82E−07		
Benzo(b)fluoranthene	0.22	0.05	0.00E+00	1.96E−07	7.01E−08		
Benzo(a)pyrene	0.046	0.05	0.00E+00	4.10E−08	1.47E−08		
Aroclor	12	0.05	0.00E+00	1.07E−05	3.82E−06	2.00E−05	7.70E+00
OCDD	0.0025	0.05	0.00E+00	2.23E−09	7.97E−10		1.70E+03
Arsenic	3.7	0.01	0.00E+00	6.60E−07	2.36E−07	2.80E−04	1.80E+00
Beryllium	3	0.01	0.00E+00	5.35E−07	1.91E−07	2.50E−04	8.60E+01
Boron	50	0.01	0.00E+00	8.92E−06	3.19E−06	4.50E−03	
Manganese	228	0.01	0.00E+00	4.07E−05	1.45E−05	1.50E−04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	5.35E-01	2.94E-05
OCDD	0.00E+00	0.00E+00	1.35E-06
Arsenic	0.00E+00	2.36E-03	4.25E-07
Beryllium	0.00E+00	2.14E-03	1.64E-05
Boron	0.00E+00	1.98E-03	0.00E+00
Manganese	0.00E+00	2.71E-01	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**8.13E-01**	**4.77E-05**

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		56
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		1
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		1
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.42E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 2.07E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	0.05	6.89E–08	0.00E+00	5.90E–09		
Benzo(b)fluoranthene	0.22	0.05	2.66E–08	0.00E+00	2.28E–09		
Benzo(a)pyrene	0.046	0.05	5.56E–09	0.00E+00	4.76E–10		
Aroclor	12	0.05	1.45E–06	0.00E+00	1.24E–07	2.00E–05	7.70E+00
OCDD	0.0025	0.05	3.02E–10	0.00E+00	2.59E–11		1.70E+03
Arsenic	3.7	0.01	8.94E–08	0.00E+00	7.66E–09	2.80E–04	1.80E+00
Beryllium	3	0.01	7.25E–08	0.00E+00	6.21E–09	2.50E–04	8.60E+01
Boron	50	0.01	1.21E–06	0.00E+00	1.04E–07	4.50E–03	
Manganese	228	0.01	5.51E–06	0.00E+00	4.72E–07	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	7.25E-02	0.00E+00	9.57E-07
OCDD	0.00E+00	0.00E+00	4.40E-08
Arsenic	3.19E-04	0.00E+00	1.38E-08
Beryllium	2.90E-04	0.00E+00	5.34E-07
Boron	2.68E-04	0.00E+00	0.00E+00
Manganese	3.67E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.10E-01	0.00E+00	1.55E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		56
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		1
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		1
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.21E–05 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.04E–06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.57	0.05	3.44E–07	0.00E+00	2.95E–08		
Benzo(b)fluoranthene	0.22	0.05	1.33E–07	0.00E+00	1.14E–08		
Benzo(a)pyrene	0.046	0.05	2.78E–08	0.00E+00	2.38E–09		
Aroclor	12	0.05	7.25E–06	0.00E+00	6.21E–07	2.00E–05	7.70E+00
OCDD	0.0025	0.05	1.51E–09	0.00E+00	1.29E–10		1.70E+03
Arsenic	3.7	0.01	4.47E–07	0.00E+00	3.83E–08	2.80E–04	1.80E+00
Beryllium	3	0.01	3.62E–07	0.00E+00	3.11E–08	2.50E–04	8.60E+01
Boron	50	0.01	6.04E–06	0.00E+00	5.18E–07	4.50E–03	
Manganese	228	0.01	2.75E–05	0.00E+00	2.36E–06	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	3.62E-01	0.00E+00	4.78E-06
OCDD	0.00E+00	0.00E+00	2.20E-07
Arsenic	1.60E-03	0.00E+00	6.90E-08
Beryllium	1.45E-03	0.00E+00	2.67E-06
Boron	1.34E-03	0.00E+00	0.00E+00
Manganese	1.84E-01	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	5.51E-01	0.00E+00	7.75E-06

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	3.9	IR:	0
EF:	1	EF:	1
ET:	8	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.22E–03 (AVG ANNUAL DOSE)
CF: 4.36E–04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.9E–08	0.00E+00	3.52E–11	1.26E–11		
Benzo(b)fluoranthene	1.9E–08	0.00E+00	2.31E–11	8.24E–12		
Benzo(a)pyrene	2.0E–08	0.00E+00	2.42E–11	8.64E–12		
Aroclor	3.2E–07	0.00E+00	3.85E–10	1.37E–10		
OCDD	2.3E–10	0.00E+00	2.75E–13	9.81E–14		
Arsenic	3.9E–07	0.00E+00	4.73E–10	1.69E–10		1.51E+01
Beryllium	1.5E–07	0.00E+00	1.87E–10	6.67E–11		
Boron	1.1E–04	0.00E+00	1.32E–07	4.71E–08	5.71E–03	
Manganese	1.9E–05	0.00E+00	2.35E–08	8.40E–09	1.43E–05	
Mercury	7.4E–08	0.00E+00	9.01E–11	3.22E–11	8.57E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	2.55E−09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	2.31E−05	0.00E+00
Manganese	0.00E+00	1.64E−03	0.00E+00
Mercury	0.00E+00	1.05E−06	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.67E−03**	**2.55E−09**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	3.9	IR:	0
EF:	3.5	EF:	1
ET:	8	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 4.27E-03 (AVG ANNUAL DOSE)
CF: 1.53E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.9E–08	0.00E+00	1.23E–10	4.40E–11		
Benzo(b)fluoranthene	1.9E–08	0.00E+00	8.08E–11	2.88E–11		
Benzo(a)pyrene	2.0E–08	0.00E+00	8.46E–11	3.02E–11		
Aroclor	3.2E–07	0.00E+00	1.35E–09	4.81E–10		
OCDD	2.3E–10	0.00E+00	9.62E–13	3.43E–13		
Arsenic	3.9E–07	0.00E+00	1.65E–09	5.91E–10		1.51E+01
Beryllium	1.5E–07	0.00E+00	6.54E–10	2.34E–10		
Boron	1.1E–04	0.00E+00	4.62E–07	1.65E–07	5.71E–03	
Manganese	1.9E–05	0.00E+00	8.23E–08	2.94E–08	1.43E–05	
Mercury	7.4E–08	0.00E+00	3.15E–10	1.13E–10	8.57E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	8.92E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	8.08E-05	0.00E+00
Manganese	0.00E+00	5.76E-03	0.00E+00
Mercury	0.00E+00	3.68E-06	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**5.84E-03**	**8.92E-09**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	12	EF:	1
ET:	8	ET:	1
ED:	6	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 3.01E-03 (AVG ANNUAL DOSE)
CF: 2.58E-04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.0E–08	0.00E+00	3.08E–11	2.64E–12		
Benzo(b)fluoranthene	4.0E–09	0.00E+00	1.19E–11	1.02E–12		
Benzo(a)pyrene	8.3E–10	0.00E+00	2.49E–12	2.13E–13		
Aroclor	2.2E–07	0.00E+00	6.49E–10	5.57E–11		
OCDD	4.5E–11	0.00E+00	1.35E–13	1.16E–14		
Arsenic	6.7E–08	0.00E+00	2.00E–10	1.72E–11		1.51E+01
Beryllium	5.4E–08	0.00E+00	1.62E–10	1.39E–11		
Boron	9.0E–07	0.00E+00	2.71E–09	2.32E–10	5.71E–03	
Manganese	4.1E–06	0.00E+00	1.23E–08	1.06E–09	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	2.59E−10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	4.74E−07	0.00E+00
Manganese	0.00E+00	8.63E−04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**8.63E−04**	**2.59E−10**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	24	EF:	1
ET:	8	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	6.01E-03	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	2.15E-03	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.0E–08	0.00E+00	6.17E–11	2.20E–11		
Benzo(b)fluoranthene	4.0E–09	0.00E+00	2.38E–11	8.50E–12		
Benzo(a)pyrene	8.3E–10	0.00E+00	4.98E–12	1.78E–12		
Aroclor	2.2E–07	0.00E+00	1.30E–09	4.64E–10		
OCDD	4.5E–11	0.00E+00	2.71E–13	9.66E–14		
Arsenic	6.7E–08	0.00E+00	4.00E–10	1.43E–10		1.51E+01
Beryllium	5.4E–08	0.00E+00	3.25E–10	1.16E–10		
Boron	9.0E–07	0.00E+00	5.41E–09	1.93E–09	5.71E–03	
Manganese	4.1E–06	0.00E+00	2.47E–08	8.81E–09	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	2.16E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	9.48E-07	0.00E+00
Manganese	0.00E+00	1.73E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.73E-03**	**2.16E-09**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	26	EF:	1
ET:	2.5	ET:	1
ED:	9	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	3285	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	2.04E–03	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	2.62E–04	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.0E–08	0.00E+00	2.09E–11	2.68E–12		
Benzo(b)fluoranthene	4.0E–09	0.00E+00	8.06E–12	1.04E–12		
Benzo(a)pyrene	8.3E–10	0.00E+00	1.69E–12	2.17E–13		
Aroclor	2.2E–07	0.00E+00	4.40E–10	5.65E–11		
OCDD	4.5E–11	0.00E+00	9.16E–14	1.18E–14		
Arsenic	6.7E–08	0.00E+00	1.36E–10	1.74E–11		1.51E+01
Beryllium	5.4E–08	0.00E+00	1.10E–10	1.41E–11		
Boron	9.0E–07	0.00E+00	1.83E–09	2.36E–10	5.71E–03	
Manganese	4.1E–06	0.00E+00	8.35E–09	1.07E–09	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	2.63E-10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	3.21E-07	0.00E+00
Manganese	0.00E+00	5.84E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**5.84E-04**	**2.63E-10**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	26	EF:	1
ET:	2.5	ET:	1
ED:	30	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	10950	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	2.04E–03	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	8.72E–04	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.0E–08	0.00E+00	2.09E–11	8.95E–12		
Benzo(b)fluoranthene	4.0E–09	0.00E+00	8.06E–12	3.45E–12		
Benzo(a)pyrene	8.3E–10	0.00E+00	1.69E–12	7.22E–13		
Aroclor	2.2E–07	0.00E+00	4.40E–10	1.88E–10		
OCDD	4.5E–11	0.00E+00	9.16E–14	3.93E–14		
Arsenic	6.7E–08	0.00E+00	1.36E–10	5.81E–11		1.51E+01
Beryllium	5.4E–08	0.00E+00	1.10E–10	4.71E–11		
Boron	9.0E–07	0.00E+00	1.83E–09	7.85E–10	5.71E–03	
Manganese	4.1E–06	0.00E+00	8.35E–09	3.58E–09	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	8.77E-10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	3.21E-07	0.00E+00
Manganese	0.00E+00	5.84E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**5.84E-04**	**8.77E-10**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	234	EF:	1
ET:	24	ET:	1
ED:	9	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	3285	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.76E–01 (AVG ANNUAL DOSE)
CF: 2.26E–02 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3E–09	0.00E+00	4.01E–10	5.15E–11		
Benzo(b)fluoranthene	8.8E–10	0.00E+00	1.55E–10	1.99E–11		
Benzo(a)pyrene	1.8E–10	0.00E+00	3.24E–11	4.16E–12		
Aroclor	4.8E–08	0.00E+00	8.44E–09	1.09E–09		
OCDD	1.0E–11	0.00E+00	1.76E–12	2.26E–13		
Arsenic	1.5E–08	0.00E+00	2.60E–09	3.35E–10		1.51E+01
Beryllium	1.2E–08	0.00E+00	2.11E–09	2.71E–10		
Boron	2.0E–07	0.00E+00	3.52E–08	4.52E–09	5.71E–03	
Manganese	9.1E–07	0.00E+00	1.60E–07	2.06E–08	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	5.05E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	6.16E-06	0.00E+00
Manganese	0.00E+00	1.12E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.12E-02**	**5.05E-09**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	350	EF:	1
ET:	24	ET:	1
ED:	30	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	10950	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 2.63E–01 (AVG ANNUAL DOSE)
CF: 1.13E–01 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3E–09	0.00E+00	6.00E–10	2.57E–10		
Benzo(b)fluoranthene	8.8E–10	0.00E+00	2.31E–10	9.92E–11		
Benzo(a)pyrene	1.8E–10	0.00E+00	4.84E–11	2.07E–11		
Aroclor	4.8E–08	0.00E+00	1.26E–08	5.41E–09		
OCDD	1.0E–11	0.00E+00	2.63E–12	1.13E–12		
Arsenic	1.5E–08	0.00E+00	3.89E–09	1.67E–09		1.51E+01
Beryllium	1.2E–08	0.00E+00	3.16E–09	1.35E–09		
Boron	2.0E–07	0.00E+00	5.26E–08	2.25E–08	5.71E–03	
Manganese	9.1E–07	0.00E+00	2.40E–07	1.03E–07	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	2.52E−08
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	9.21E−06	0.00E+00
Manganese	0.00E+00	1.68E−02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.68E−02	2.52E−08

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	2.5	IR:	0
EF:	52	EF:	1
ET:	1	ET:	1
ED:	6	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	5.09E–03	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	4.36E–04	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3E–09	0.00E+00	1.16E–11	9.94E–13		
Benzo(b)fluoranthene	8.8E–10	0.00E+00	4.48E–12	3.84E–13		
Benzo(a)pyrene	1.8E–10	0.00E+00	9.36E–13	8.02E–14		
Aroclor	4.8E–08	0.00E+00	2.44E–10	2.09E–11		
OCDD	1.0E–11	0.00E+00	5.09E–14	4.36E–15		
Arsenic	1.5E–08	0.00E+00	7.53E–11	6.45E–12		1.51E+01
Beryllium	1.2E–08	0.00E+00	6.11E–11	5.23E–12		
Boron	2.0E–07	0.00E+00	1.02E–09	8.72E–11	5.71E–03	
Manganese	9.1E–07	0.00E+00	4.64E–09	3.98E–10	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	9.75E−11
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	1.78E−07	0.00E+00
Manganese	0.00E+00	3.24E−04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**3.25E−04**	**9.75E−11**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	2.5	IR:	0
EF:	120	EF:	1
ET:	1	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.17E–02 (AVG ANNUAL DOSE)
CF: 4.19E–03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3E–09	0.00E+00	2.68E–11	9.56E–12		
Benzo(b)fluoranthene	8.8E–10	0.00E+00	1.03E–11	3.69E–12		
Benzo(a)pyrene	1.8E–10	0.00E+00	2.16E–12	7.72E–13		
Aroclor	4.8E–08	0.00E+00	5.64E–10	2.01E–10		
OCDD	1.0E–11	0.00E+00	1.17E–13	4.19E–14		
Arsenic	1.5E–08	0.00E+00	1.74E–10	6.21E–11		1.51E+01
Beryllium	1.2E–08	0.00E+00	1.41E–10	5.03E–11		
Boron	2.0E–07	0.00E+00	2.35E–09	8.39E–10	5.71E–03	
Manganese	9.1E–07	0.00E+00	1.07E–08	3.82E–09	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: ADULT RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	9.37E-10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	4.11E-07	0.00E+00
Manganese	0.00E+00	7.49E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**7.49E-04**	**9.37E-10**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

YOUTH:		ADULT:	
IR:	3.2	IR:	0
EF:	56	EF:	1
ET:	1	ET:	1
ED:	6	ED:	1
BW:	40	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	365

DETERMINE CONVERSION FACTORS:

YOUTH:			ADULT:		
CF:	1.23E–02	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	1.05E–03	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	ADULT ANNUAL DOSE (MG/KG/DAY)	YOUTH ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.0E–08	0.00E+00	1.26E–10	1.08E–11		
Benzo(b)fluoranthene	4.0E–09	0.00E+00	4.86E–11	4.17E–12		
Benzo(a)pyrene	8.3E–10	0.00E+00	1.02E–11	8.71E–13		
Aroclor	2.2E–07	0.00E+00	2.65E–09	2.27E–10		
OCDD	4.5E–11	0.00E+00	5.52E–13	4.73E–14		
Arsenic	6.7E–08	0.00E+00	8.17E–10	7.01E–11		1.51E+01
Beryllium	5.4E–08	0.00E+00	6.63E–10	5.68E–11		
Boron	9.0E–07	0.00E+00	1.10E–08	9.47E–10	5.71E–03	
Manganese	4.1E–06	0.00E+00	5.04E–08	4.32E–09	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX ADULT	HAZARD INDEX YOUTH	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	1.06E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	1.93E-06	0.00E+00
Manganese	0.00E+00	3.52E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**3.52E-03**	**1.06E-09**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

YOUTH:		ADULT:	
IR:	3.2	IR:	0
EF:	56	EF:	1
ET:	2	ET:	1
ED:	6	ED:	1
BW:	40	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	365

DETERMINE CONVERSION FACTORS:

YOUTH:			ADULT:		
CF:	2.45E–02	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	2.10E–03	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	ADULT ANNUAL DOSE (MG/KG/DAY)	YOUTH ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.0E–08	0.00E+00	2.52E–10	2.16E–11		
Benzo(b)fluoranthene	4.0E–09	0.00E+00	9.72E–11	8.33E–12		
Benzo(a)pyrene	8.3E–10	0.00E+00	2.03E–11	1.74E–12		
Aroclor	2.2E–07	0.00E+00	5.30E–09	4.54E–10		
OCDD	4.5E–11	0.00E+00	1.10E–12	9.47E–14		
Arsenic	6.7E–08	0.00E+00	1.63E–09	1.40E–10		1.51E+01
Beryllium	5.4E–08	0.00E+00	1.33E–09	1.14E–10		
Boron	9.0E–07	0.00E+00	2.21E–08	1.89E–09	5.71E–03	
Manganese	4.1E–06	0.00E+00	1.01E–07	8.64E–09	1.43E–05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX ADULT	HAZARD INDEX YOUTH	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor	0.00E+00	0.00E+00	0.00E+00
OCDD	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	2.12E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	3.87E-06	0.00E+00
Manganese	0.00E+00	7.05E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**7.05E-03**	**2.12E-09**

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x CF)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 6.89E–04
EF:	1	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 2.46E–04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Benzene	0.006	4.50E-02	1.86E-07		0.00E+00
Chlorobenzene	0.34	4.10E-02	9.60E-06	6.00E-03	1.60E-03
1,4-Dichlorobenzene	0.014	6.20E-02	5.98E-07		0.00E+00
1,2,4-Trichlorobenzene	0.007	1.00E-01	4.82E-07	1.00E-02	4.82E-05
Bis(2-ethylhexyl)phthalate	0.054	3.30E-02	1.23E-06	1.10E-02	1.12E-04
Carbazole	0.002	1.00E-01	1.38E-07		0.00E+00
Aroclor	0.71	1.15E+00	5.62E-04	2.00E-05	2.81E+01
Aluminum	89.3	1.00E-03	6.15E-05	5.00E-02	1.23E-03
Arsenic	0.0196	1.00E-03	1.35E-08	2.80E-04	4.82E-05
Barium	0.418	1.00E-03	2.88E-07	3.50E-03	8.23E-05
Beryllium	0.0042	1.00E-03	2.89E-09	2.50E-04	1.16E-05
Boron	0.36	1.00E-03	2.48E-07	4.50E-03	5.51E-05
Manganese	2.57	1.00E-03	1.77E-06	1.50E-04	1.18E-02
Nickel	0.0795	1.00E-04	5.48E-09	2.00E-03	2.74E-06
Vanadium	0.182	1.00E-03	1.25E-07	3.50E-04	3.58E-04
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					2.81E+01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK
Benzene	0.006	6.64E–08	2.90E–02	1.93E–09
Chlorobenzene	0.34	3.43E–06		0.00E+00
1,4–Dichlorobenzene	0.014	2.14E–07	2.40E–02	5.13E–09
1,2,4–Trichlorobenzene	0.007	1.72E–07		0.00E+00
Bis(2–ethylhexyl)phthalate	0.054	4.38E–07	2.50E–02	1.10E–08
Carbazole	0.002	4.92E–08	2.00E–02	9.84E–10
Aroclor	0.71	2.01E–04	7.70E+00	1.55E–03
Aluminum	89.3	2.20E–05		0.00E+00
Arsenic	0.0196	4.82E–09	1.80E+00	8.68E–09
Barium	0.418	1.03E–07		0.00E+00
Beryllium	0.0042	1.03E–09	8.60E+01	8.89E–08
Boron	0.36	8.86E–08		0.00E+00
Manganese	2.57	6.32E–07		0.00E+00
Nickel	0.0795	1.96E–09		0.00E+00
Vanadium	0.182	4.48E–08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				**1.55E–03**

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 2 – AREA A LANDFILL
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/11/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x CF)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 2.41E–03
EF:	3.5	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 8.61E–04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Benzene	0.006	4.50E-02	6.51E-07		0.00E+00
Chlorobenzene	0.34	4.10E-02	3.36E-05	6.00E-03	5.60E-03
1,4-Dichlorobenzene	0.014	6.20E-02	2.09E-06		0.00E+00
1,2,4-Trichlorobenzene	0.007	1.00E-01	1.69E-06	1.00E-02	1.69E-04
Bis(2-ethylhexyl)phthalate	0.054	3.30E-02	4.30E-06	1.10E-02	3.91E-04
Carbazole	0.002	1.00E-01	4.82E-07		0.00E+00
Aroclor	0.71	1.15E+00	1.97E-03	2.00E-05	9.84E+01
Aluminum	89.3	1.00E-03	2.15E-04	5.00E-02	4.31E-03
Arsenic	0.0196	1.00E-03	4.73E-08	2.80E-04	1.69E-04
Barium	0.418	1.00E-03	1.01E-06	3.50E-03	2.88E-04
Beryllium	0.0042	1.00E-03	1.01E-08	2.50E-04	4.05E-05
Boron	0.36	1.00E-03	8.68E-07	4.50E-03	1.93E-04
Manganese	2.57	1.00E-03	6.20E-06	1.50E-04	4.13E-02
Nickel	0.0795	1.00E-04	1.92E-08	2.00E-03	9.58E-06
Vanadium	0.182	1.00E-03	4.39E-07	3.50E-04	1.25E-03
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					9.85E+01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 2 – AREA A LANDFILL
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK
Benzene	0.006	2.32E–07	2.90E–02	6.74E–09
Chlorobenzene	0.34	1.20E–05		0.00E+00
1,4–Dichlorobenzene	0.014	7.47E–07	2.40E–02	1.79E–08
1,2,4–Trichlorobenzene	0.007	6.03E–07		0.00E+00
Bis(2–ethylhexyl)phthalate	0.054	1.53E–06	2.50E–02	3.84E–08
Carbazole	0.002	1.72E–07	2.00E–02	3.44E–09
Aroclor	0.71	7.03E–04	7.70E+00	5.41E–03
Aluminum	89.3	7.69E–05		0.00E+00
Arsenic	0.0196	1.69E–08	1.80E+00	3.04E–08
Barium	0.418	3.60E–07		0.00E+00
Beryllium	0.0042	3.62E–09	8.60E+01	3.11E–07
Boron	0.36	3.10E–07		0.00E+00
Manganese	2.57	2.21E–06		0.00E+00
Nickel	0.0795	6.85E–09		0.00E+00
Vanadium	0.182	1.57E–07		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				5.41E–03

APPENDIX F.6

SITE 2 - AREA A WETLANDS

SUMMARY OF STATISTICALLY DERIVED EXPOSURE CONCENTRATIONS
SITE 2 - AREA A WETLANDS
SEDIMENT/SOIL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Concern	Distribution of Data Set[1]	Exposure Concentration[2] (mg/kg)
Benzo(a)anthracene	Undefined	4.80
Benzo(b)fluoranthene	Undefined	9.60
Benzo(k)fluoranthene	Undefined	7.90
Benzo(a)pyrene	Undefined	6.20
Chrysene	Undefined	7.40
Indeno(1,2,3-cd)pyrene	Undefined	4.20
Aroclor-1260	Undefined	0.130
Arsenic	Normal	9.7
Beryllium	Undefined	1.3
Boron	Undefined	4400[3]
Cadmium	Undefined	5.6
Manganese	Lognormal	282
Vanadium	Undefined	57.9[3]

(1) Distribution determined using the Shapiro-Wilk "W-Test" (Gilbert, 1987).

(2) Exposure concentration is the 95% upper confidence limit (UCL) of the arithmetic mean or the mean of the transformed data, unless otherwise noted. 95% UCL is based on the distribution of the data set. Sample and duplicate results are averaged for the calculation of the 95% UCL; one-half of the nondetected values are used. When the distribution of the data set is undefined the most conservative 95% UCL was used as the exposure concentration.

(3) The maximum detected concentration is used as the exposure concentration because the calculated 95% UCL exceeds the maximum reported concentration.

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)anthracene (ug/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	83	4.418841	3260282.	1.285439
2	160	5.075174	2988144.	.2279479
3	165	5.105945	2970883.	.1995116
4	165	5.105945	2970883.	.1995116
5	165	5.105945	2970883.	.1995116
6	165	5.105945	2970883.	.1995116
7	165	5.105945	2970883.	.1995116
8	165	5.105945	2970883.	.1995116
9	165	5.105945	2970883.	.1995116
10	165	5.105945	2970883.	.1995116
11	165	5.105945	2970883.	.1995116
12	200	5.298317	2851454.	.0646661
13	220	5.393628	2784309.	.0252763
14	400	5.991465	2216004.	.1925910
15	670	6.507278	1485047.	.9113853
16	27000	10.20359	6.3058e8	21.63161
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	1888.625	5.552613	6697.782	1.319963
		257.9105		

Upper 95% confidence limit on arithmetic mean: 4823.928
Upper 95% confidence limit on geometric mean: 1863.062

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	83	6.889e3	4.418841	19.52615
2	160	2.56e4	5.075174	25.75739
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	200	4e4	5.298317	28.07217
13	220	4.84e4	5.393628	29.09122
14	400	1.6e5	5.991465	35.89765
15	670	4.489e5	6.507278	42.34466
16	27000	7.29e8	10.20359	104.1133
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	30210	7.2997e8	88.84180	519.4386

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 6.7290e8 (normal distribution)

d = 26.13452 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	2.6917e4	1.3609e4
	.329	5.1e2	1.6779e2
	.2521	2.35e2	5.9244e1
	.1939	5.5e1	1.0665e1
	.1447	3.5e1	5.0645e0
	.1005	0	0
	.0593	0	0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.3852e4
Summation**2:			1.9188e8

Wcalc = .2851488 Wtable = .887 Wcalc - Wtable = -.601851

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	5.784752	2.924770
.329	1.432104	.4711622
.2521	.8855191	.2232394
.1939	.2876821	.0557816
.1447	.1923719	.0278362
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		3.702790
Summation**2:		13.71065

Wcalc = .5246185 Wtable = .887 Wcalc - Wtable = -.362382

Arithmetic Average: 1888.625 Geometric Mean: 257.9105

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(b)fluoranthene (ug/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	74	4.304065	12595845	1.597339
2	165	5.105945	11958196	.2134240
3	165	5.105945	11958196	.2134240
4	165	5.105945	11958196	.2134240
5	165	5.105945	11958196	.2134240
6	165	5.105945	11958196	.2134240
7	165	5.105945	11958196	.2134240
8	165	5.105945	11958196	.2134240
9	165	5.105945	11958196	.2134240
10	165	5.105945	11958196	.2134240
11	180	5.192957	11854679	.1406002
12	210	5.347108	11648996	.0487598
13	220	5.393628	11580834	.0303792
14	380	5.940171	10517454	.1385682
15	420	6.040255	10259609	.2230965
16	55000	10.91509	2.6396e9	28.59217
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	3623.063	5.567924	13700.78	1.476296
		261.8898		

Upper 95% confidence limit on arithmetic mean: 9627.430
Upper 95% confidence limit on geometric mean: 2979.407

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	74	5.476e3	4.304065	18.52498
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	180	3.24e4	5.192957	26.96680
12	210	4.41e4	5.347108	28.59156
13	220	4.84e4	5.393628	29.09122
14	380	1.444e5	5.940171	35.28563
15	420	1.764e5	6.040255	36.48468
16	55000	3.025e9	10.91509	119.1392
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	57969	3.0257e9	89.08678	528.7201

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2.8157e9 (normal distribution)

d = 32.69173 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	5.4926e4	2.7771e4
.329	2.55e2	8.3895e1
.2521	2.15e2	5.4202e1
.1939	5.5e1	1.0665e1
.1447	4.5e1	6.5115e0
.1005	1.5e1	1.5075e0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.7927e4
	Summation**2:	7.7994e8

Wcalc = .2769989 Wtable = .887 Wcalc - Wtable = -.610001

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	6.611023	3.342533
	.329	.9343092	.3073877
	.2521	.8342258	.2103083
	.1939	.2876821	.0557816
	.1447	.2411621	.0348961
	.1005	.0870114	.0087446
	.0593	0	0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			3.959652
Summation**2:			15.67884

Wcalc = .4795966 Wtable = .887 Wcalc - Wtable = -.407403

Arithmetic Average: 3623.063 Geometric Mean: 261.8898

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(k)fluoranthene (ug/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	71	4.262680	8720947.	1.797999
2	120	4.787492	8433942.	.6659914
3	165	5.105945	8174596.	.2476349
4	165	5.105945	8174596.	.2476349
5	165	5.105945	8174596.	.2476349
6	165	5.105945	8174596.	.2476349
7	165	5.105945	8174596.	.2476349
8	165	5.105945	8174596.	.2476349
9	165	5.105945	8174596.	.2476349
10	165	5.105945	8174596.	.2476349
11	165	5.105945	8174596.	.2476349
12	250	5.521461	7695770.	.0067427
13	310	5.736572	7366475.	.0176884
14	480	6.173786	6472572.	.3251410
15	670	6.507278	5541905.	.8166791
16	45000	10.71442	1.7620e9	26.12072
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	3024.125	5.603575	11194.57	1.460129
		271.3948		

Upper 95% confidence limit on arithmetic mean: 7930.147
Upper 95% confidence limit on geometric mean: 2939.526

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	71	5.041e3	4.262680	18.17044
2	120	1.44e4	4.787492	22.92008
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	250	6.25e4	5.521461	30.48653
13	310	9.61e4	5.736572	32.90826
14	480	2.304e5	6.173786	38.11563
15	670	4.489e5	6.507278	42.34466
16	45000	2.025e9	10.71442	114.7987
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	48386	2.0261e9	89.65720	534.3805

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 1.8798e9 (normal distribution)

d = 31.97967 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.4929e4	2.2716e4
.329	5.5e2	1.8095e2
.2521	3.15e2	7.9412e1
.1939	1.45e2	2.8116e1
.1447	8.5e1	1.2300e1
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.3017e4
	Summation**2:	5.2978e8

Wcalc = .2818295 Wtable = .887 Wcalc - Wtable = -.605170

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	6.451738	3.261999
.329	1.719786	.5658096
.2521	1.067841	.2692026
.1939	.6306268	.1222785
.1447	.4155154	.0601251
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		4.279415
Summation**2:		18.31339

Wcalc = .5726572 Wtable = .887 Wcalc - Wtable = -.314343

Arithmetic Average: 3024.125 Geometric Mean: 271.3948

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)pyrene (ug/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	81	4.394449	5114665.	1.063839
2	165	5.105945	4741778.	.1023550
3	165	5.105945	4741778.	.1023550
4	165	5.105945	4741778.	.1023550
5	165	5.105945	4741778.	.1023550
6	165	5.105945	4741778.	.1023550
7	165	5.105945	4741778.	.1023550
8	165	5.105945	4741778.	.1023550
9	165	5.105945	4741778.	.1023550
10	165	5.105945	4741778.	.1023550
11	165	5.105945	4741778.	.1023550
12	165	5.105945	4741778.	.1023550
13	165	5.105945	4741778.	.1023550
14	190	5.247024	4633525.	.0319877
15	230	5.438079	4462920.	.0001489
16	35000	10.46310	1.0665e9	25.37367
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	2342.563	5.425875	8708.696	1.358870
		227.2101		

Upper 95% confidence limit on arithmetic mean: 6159.148
Upper 95% confidence limit on geometric mean: 1829.724

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	81	6.561e3	4.394449	19.31118
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	190	3.61e4	5.247024	27.53126
15	230	5.29e4	5.438079	29.57271
16	35000	1.225e9	10.46310	109.4765
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	37681	1.2254e9	86.81400	498.7398

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 1.1376e9 (normal distribution)

d = 27.69790 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	3.4919e4	1.7655e4
.329	6.5e1	2.1385e1
.2521	2.5e1	6.3025e0
.1939	0	0
.1447	0	0
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.7683e4
Summation**2:		3.1268e8

Wcalc = .2748535 Wtable = .887 Wcalc - Wtable = -.612146

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	6.068654	3.068312
.329	.3321338	.1092720
.2521	.1410786	.0355659
.1939	0	0
.1447	0	0
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.213150
Summation**2:		10.32433

Wcalc = .3727477 Wtable = .887 Wcalc - Wtable = -.514252

Arithmetic Average: 2342.563 Geometric Mean: 227.2101

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Chrysene (ug/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	110	4.700480	7519592.	.9602492
2	165	5.105945	7220977.	.3300019
3	165	5.105945	7220977.	.3300019
4	165	5.105945	7220977.	.3300019
5	165	5.105945	7220977.	.3300019
6	165	5.105945	7220977.	.3300019
7	165	5.105945	7220977.	.3300019
8	165	5.105945	7220977.	.3300019
9	165	5.105945	7220977.	.3300019
10	165	5.105945	7220977.	.3300019
11	230	5.438079	6875867.	.0587210
12	250	5.521461	6771380.	.0252627
13	320	5.768321	6411974.	.0077295
14	610	6.413459	5027405.	.5373704
15	630	6.445720	4938117.	.5857092
16	42000	10.64542	1.5326e9	24.65144
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	2852.188	5.680403	10440.58	1.409409
		293.0676		

Upper 95% confidence limit on arithmetic mean: 7427.770
Upper 95% confidence limit on geometric mean: 2729.657

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Chrysene (ug/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	110	1.21e4	4.700480	22.09452
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	230	5.29e4	5.438079	29.57271
12	250	6.25e4	5.521461	30.48653
13	320	1.024e5	5.768321	33.27353
14	610	3.721e5	6.413459	41.13246
15	630	3.969e5	6.445720	41.54730
16	42000	1.764e9	10.64542	113.3251
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	45635	1.7652e9	90.88645	546.0682

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 1.6351e9 (normal distribution)

d = 29.79650 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Chrysene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.189e4	2.1180e4
.329	4.65e2	1.5299e2
.2521	4.45e2	1.1218e2
.1939	1.55e2	3.0055e1
.1447	8.5e1	1.2300e1
.1005	6.5e1	6.5325e0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.1494e4
	Summation**2:	4.6198e8

Wcalc = .2825399 Wtable = .887 Wcalc - Wtable = -.604460

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Chrysene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	5.944945	3.005764
.329	1.339774	.4407858
.2521	1.307513	.3296241
.1939	.6623755	.1284346
.1447	.4155154	.0601251
.1005	.3321338	.0333795
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		3.998113
Summation**2:		15.98491

Wcalc = .5364693 Wtable = .887 Wcalc - Wtable = -.350531

Arithmetic Average: 2852.188 Geometric Mean: 293.0676

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Indeno(1,2,3-cd)pyrene (ug/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	165	5.105945	2468827.	.3739412
2	165	5.105945	2468827.	.3739412
3	165	5.105945	2468827.	.3739412
4	165	5.105945	2468827.	.3739412
5	165	5.105945	2468827.	.3739412
6	165	5.105945	2468827.	.3739412
7	165	5.105945	2468827.	.3739412
8	165	5.105945	2468827.	.3739412
9	165	5.105945	2468827.	.3739412
10	165	5.105945	2468827.	.3739412
11	165	5.105945	2468827.	.3739412
12	165	5.105945	2468827.	.3739412
13	400	5.991465	1785564.	.0750824
14	1100	7.003065	404814.1	1.652800
15	1300	7.170120	190314.1	2.110241
16	23000	10.04325	4.5215e8	18.71252
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	1736.25	5.717453	5681.277	1.342583
		304.1293		

Upper 95% confidence limit on arithmetic mean: 4226.070
Upper 95% confidence limit on geometric mean: 2339.405

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	165	2.7225e4	5.105945	26.07068
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	400	1.6e5	5.991465	35.89765
14	1100	1.21e6	7.003065	49.04293
15	1300	1.69e6	7.170120	51.41061
16	23000	5.29e8	10.04325	100.8669
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	27780	5.3239e8	91.47924	550.0662

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 4.8415e8 (normal distribution)

d = 27.03793 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	2.2835e4	1.1545e4
	.329	1.135e3	3.7342e2
	.2521	9.35e2	2.3571e2
	.1939	2.35e2	4.5567e1
	.1447	0	0
	.1005	0	0
	.0593	0	0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.2200e4
Summation**2:			1.4884e8

Wcalc = .3074266 Wtable = .887 Wcalc - Wtable = -.579573

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.937304	2.496301
.329	2.064174	.6791133
.2521	1.897120	.4782639
.1939	.8855191	.1717021
.1447	0	0
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		3.825380
Summation**2:		14.63353

Wcalc = .5412223 Wtable = .887 Wcalc - Wtable = -.345778

Arithmetic Average: 1736.25 Geometric Mean: 304.1293

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Aroclor-1260 (ug/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	50	3.912023	2139.063	.2876667
2	80	4.382027	264.0625	.0044013
3	80	4.382027	264.0625	.0044013
4	80	4.382027	264.0625	.0044013
5	80	4.382027	264.0625	.0044013
6	80	4.382027	264.0625	.0044013
7	80	4.382027	264.0625	.0044013
8	80	4.382027	264.0625	.0044013
9	80	4.382027	264.0625	.0044013
10	80	4.382027	264.0625	.0044013
11	80	4.382027	264.0625	.0044013
12	80	4.382027	264.0625	.0044013
13	80	4.382027	264.0625	.0044013
14	80	4.382027	264.0625	.0044013
15	80	4.382027	264.0625	.0044013
16	370	5.913503	74939.06	2.146619
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	96.25	4.448369	73.38256	.4079136
		85.48737		

Upper 95% confidence limit on arithmetic mean: 128.4099
Upper 95% confidence limit on geometric mean: 114.2680

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	50	2.5e3	3.912023	15.30392
2	80	6.4e3	4.382027	19.20216
3	80	6.4e3	4.382027	19.20216
4	80	6.4e3	4.382027	19.20216
5	80	6.4e3	4.382027	19.20216
6	80	6.4e3	4.382027	19.20216
7	80	6.4e3	4.382027	19.20216
8	80	6.4e3	4.382027	19.20216
9	80	6.4e3	4.382027	19.20216
10	80	6.4e3	4.382027	19.20216
11	80	6.4e3	4.382027	19.20216
12	80	6.4e3	4.382027	19.20216
13	80	6.4e3	4.382027	19.20216
14	80	6.4e3	4.382027	19.20216
15	80	6.4e3	4.382027	19.20216
16	370	1.369e5	5.913503	34.96952
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	1940	229000	71.17390	319.1036

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 80775 (normal distribution)

d = 2.495903 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	3.2e2	1.6179e2
	.329	0	0
	.2521	0	0
	.1939	0	0
	.1447	0	0
	.1005	0	0
	.0593	0	0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.6179e2
Summation**2:			2.6177e4

Wcalc = .3240687 Wtable = .887 Wcalc - Wtable = -.562931

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/94
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	2.001480	1.011948
	.329	0	0
	.2521	0	0
	.1939	0	0
	.1447	0	0
	.1005	0	0
	.0593	0	0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.011948
Summation**2:			1.024039

Wcalc = .4102881 Wtable = .887 Wcalc - Wtable = -.476712

Arithmetic Average: 96.25 Geometric Mean: 85.48737

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Arsenic (mg/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.77	-.261365	56.20313	4.966792
2	2.5	.9162907	33.25685	1.104548
3	6.7	1.902108	2.455097	.0042455
4	7	1.945910	1.604972	.0004560
5	7.2	1.974081	1.138222	.0000465
6	8.1	2.091864	.0278473	.0155248
7	8.4	2.128232	.0177223	.0259102
8	8.5	2.140066	.0543473	.0298601
9	8.7	2.163323	.1875973	.0384386
10	9.2	2.219203	.8707223	.0634728
11	9.5	2.251292	1.520597	.0806710
12	9.5	2.251292	1.520597	.0806710
13	10	2.302585	3.003722	.1124393
14	10.5	2.351375	4.986847	.1475404
15	11.8	2.468100	12.48297	.2508349
16	13.9	2.631889	31.73210	.4417244
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	8.266875	1.967265	3.173466	.7006271
		7.151094		

Upper 95% confidence limit on arithmetic mean: 9.657647
Upper 95% confidence limit on geometric mean: 13.82594

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.77	5.929e-1	-.261365	.0683115
2	2.5	6.25e0	.9162907	.8395887
3	6.7	4.489e1	1.902108	3.618013
4	7	4.9e1	1.945910	3.786566
5	7.2	5.184e1	1.974081	3.896996
6	8.1	6.561e1	2.091864	4.375895
7	8.4	7.056e1	2.128232	4.529370
8	8.5	7.225e1	2.140066	4.579883
9	8.7	7.569e1	2.163323	4.679967
10	9.2	8.464e1	2.219203	4.924864
11	9.5	9.025e1	2.251292	5.068315
12	9.5	9.025e1	2.251292	5.068315
13	10	1e2	2.302585	5.301898
14	10.5	1.1025e2	2.351375	5.528966
15	11.8	1.3924e2	2.468100	6.091515
16	13.9	1.9321e2	2.631889	6.926839
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	132.27	1244.523	31.47625	69.28530

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 151.0633 (normal distribution)

d = 7.363175 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	1.313e1	6.6385e0
	.329	9.3e0	3.0597e0
	.2521	3.8e0	9.580e-1
	.1939	3e0	5.817e-1
	.1447	2.3e0	3.328e-1
	.1005	1.4e0	1.407e-1
	.0593	8e-1	4.744e-2
	.0196	2e-1	3.92e-3
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.1763e1
Summation**2:			1.3836e2

Wcalc = .9159267 Wtable = .887 Wcalc - Wtable = .0289267

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	2.893254	1.462829
	.329	1.551809	.5105451
	.2521	.4492677	.1132604
	.1939	.3566749	.0691593
	.1447	.2772108	.0401124
	.1005	.1594277	.0160225
	.0593	.0909718	.0053946
	.0196	.0232569	.0004558
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.217779
Summation**2:			4.918544

Wcalc = .6679923 Wtable = .887 Wcalc - Wtable = -.219008

Arithmetic Average: 8.266875 Geometric Mean: 7.151094

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Beryllium (mg/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.15	-1.89712	.4233129	2.196388
2	.15	-1.89712	.4233129	2.196388
3	.39	-.941609	.1686129	.2772129
4	.44	-.820981	.1300504	.1647403
5	.51	-.673345	.0844629	.0666910
6	.55	-.597837	.0628129	.0333934
7	.73	-.314711	.0049879	.0100777
8	.81	-.210721	.0000879	.0417701
9	.84	-.174353	.0015504	.0579582
10	.85	-.162519	.0024379	.0637964
11	.88	-.127833	.0063004	.0825212
12	.91	-.094311	.0119629	.1029048
13	1.1	.0953102	.0896254	.2605170
14	1.2	.1823216	.1595004	.3569107
15	1.5	.4054651	.4891254	.6733246
16	1.8	.5877867	.9987504	1.005779
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	.800625	-.415098	.4514343	.7113542
		.6602753		

Upper 95% confidence limit on arithmetic mean: .9984661
Upper 95% confidence limit on geometric mean: 1.297868

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.15	2.25e-2	-1.89712	3.599064
2	.15	2.25e-2	-1.89712	3.599064
3	.39	1.521e-1	-.941609	.8866266
4	.44	1.936e-1	-.820981	.6740091
5	.51	2.601e-1	-.673345	.4533929
6	.55	3.025e-1	-.597837	.3574091
7	.73	5.329e-1	-.314711	.0990429
8	.81	6.561e-1	-.210721	.0444034
9	.84	7.056e-1	-.174353	.0303991
10	.85	7.225e-1	-.162519	.0264124
11	.88	7.744e-1	-.127833	.0163414
12	.91	8.281e-1	-.094311	.0088945
13	1.1	1.21e0	.0953102	.0090840
14	1.2	1.44e0	.1823216	.0332412
15	1.5	2.25e0	.4054651	.1644020
16	1.8	3.24e0	.5877867	.3454932
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	12.81	13.3129	-6.64158	10.34728

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 3.056894 (normal distribution)

d = 7.590372 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	1.65e0	8.342e-1
	.329	1.35e0	4.442e-1
	.2521	8.1e-1	2.042e-1
	.1939	6.6e-1	1.280e-1
	.1447	4e-1	5.788e-2
	.1005	3.3e-1	3.317e-2
	.0593	1.2e-1	7.116e-3
	.0196	3e-2	5.88e-4
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.7093e0
Summation**2:			2.9218e0

Wcalc = .9557919 Wtable = .887 Wcalc - Wtable = .0687919

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	2.484907	1.256369
	.329	2.302585	.7575505
	.2521	1.123930	.2833428
	.1939	.9162907	.1776688
	.1447	.5790339	.0837862
	.1005	.4700036	.0472354
	.0593	.1521918	.0090250
	.0196	.0363676	.0007128
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.615690
Summation**2:			6.841835

Wcalc = .9013833 Wtable = .887 Wcalc - Wtable = .0143833

Arithmetic Average: .800625 Geometric Mean: .6602753

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Boron (mg/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.5	.9162907	2219821.	30.59198
2	71	4.262680	2020396.	4.772532
3	170	5.135798	1748758.	1.720016
4	450	6.109248	1086611.	.1142743
5	490	6.194405	1004818.	.0639518
6	530	6.272877	926225.8	.0304207
7	563	6.333280	863796.0	.0129989
8	672	6.510258	673066.4	.0039647
9	730	6.593045	581263.3	.0212437
10	1200	7.090077	85501.42	.4131719
11	1300	7.170120	37020.17	.5224791
12	1600	7.377759	11576.42	.8657680
13	3600	8.188689	4441951.	3.032463
14	4000	8.294050	6288026.	3.410512
15	4100	8.318742	6799545.	3.502325
16	4400	8.389360	8454101.	3.771626
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	1492.406	6.447292	1575.700	1.877050
		630.9915		

Upper 95% confidence limit on arithmetic mean: 2182.957
Upper 95% confidence limit on geometric mean: 28970.49

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.5	6.25e0	.9162907	.8395887
2	71	5.041e3	4.262680	18.17044
3	170	2.89e4	5.135798	26.37643
4	450	2.025e5	6.109248	37.32291
5	490	2.401e5	6.194405	38.37066
6	530	2.809e5	6.272877	39.34899
7	563	3.1697e5	6.333280	40.11043
8	672	4.5158e5	6.510258	42.38346
9	730	5.329e5	6.593045	43.46824
10	1200	1.44e6	7.090077	50.26919
11	1300	1.69e6	7.170120	51.41061
12	1600	2.56e6	7.377759	54.43133
13	3600	1.296e7	8.188689	67.05463
14	4000	1.6e7	8.294050	68.79126
15	4100	1.681e7	8.318742	69.20147
16	4400	1.936e7	8.389360	70.38136
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	23878.5	72878900	103.1567	717.9310

Calculate d: d = Sum(X[i]**2) - (1/n)*(Sum(X[i]))**2) d = 37242478 (normal distribution)

d = 52.84973 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.3975e3	2.2234e3
.329	4.029e3	1.3255e3
.2521	3.83e3	9.6554e2
.1939	3.15e3	6.1079e2
.1447	1.11e3	1.6062e2
.1005	7.7e2	7.7385e1
.0593	6.37e2	3.7774e1
.0196	5.8e1	1.1368e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	5.4022e3
	Summation**2:	2.9183e7

Wcalc = .7836028 Wtable = .887 Wcalc - Wtable = -.103397

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	7.473069	3.778384
	.329	4.056062	1.334445
	.2521	3.158251	.7961951
	.1939	2.079442	.4032037
	.1447	1.183354	.1712313
	.1005	.8972425	.0901729
	.0593	.7567972	.0448781
	.0196	.0827862	.0016226
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			6.620132
Summation**2:			43.82615

Wcalc = .8292597 Wtable = .887 Wcalc - Wtable = -.057740

Arithmetic Average: 1492.406 Geometric Mean: 630.9915

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Cadmium (mg/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.2	.1823216	9.3025	1.373709
2	1.9	.6418539	5.5225	.5076863
3	2	.6931472	5.0625	.4372222
4	3.5	1.252763	.5625	.0103250
5	3.5	1.252763	.5625	.0103250
6	3.7	1.308333	.3025	.0021199
7	3.8	1.335001	.2025	.0003753
8	4.2	1.435085	.0025	.0065140
9	4.5	1.504077	.0625	.0224108
10	4.7	1.547563	.2025	.0373214
11	4.8	1.568616	.3025	.0458992
12	5	1.609438	.5625	.0650571
13	5.3	1.667707	1.1025	.0981769
14	6.1	1.808289	3.4225	.2060378
15	6.9	1.931521	7.0225	.3330980
16	6.9	1.931521	7.0225	.3330980
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	4.25	1.354375	1.657709	.4823122
		3.874339		

Upper 95% confidence limit on arithmetic mean: 4.976491
Upper 95% confidence limit on geometric mean: 5.609362

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.2	1.44e0	.1823216	.0332412
2	1.9	3.61e0	.6418539	.4119764
3	2	4e0	.6931472	.4804530
4	3.5	1.225e1	1.252763	1.569415
5	3.5	1.225e1	1.252763	1.569415
6	3.7	1.369e1	1.308333	1.711735
7	3.8	1.444e1	1.335001	1.782228
8	4.2	1.764e1	1.435085	2.059468
9	4.5	2.025e1	1.504077	2.262249
10	4.7	2.209e1	1.547563	2.394950
11	4.8	2.304e1	1.568616	2.460556
12	5	2.5e1	1.609438	2.590290
13	5.3	2.809e1	1.667707	2.781246
14	6.1	3.721e1	1.808289	3.269908
15	6.9	4.761e1	1.931521	3.730775
16	6.9	4.761e1	1.931521	3.730775
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	68	330.22	21.67000	32.83868

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 41.22 (normal distribution)

d = 3.489376 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	5.7e0	2.8819e0
	.329	5e0	1.645e0
	.2521	4.1e0	1.0336e0
	.1939	1.8e0	3.490e-1
	.1447	1.5e0	2.171e-1
	.1005	1.1e0	1.106e-1
	.0593	9e-1	5.337e-2
	.0196	3e-1	5.88e-3
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			6.2964e0
Summation**2:			3.9645e1

Wcalc = .9617820 Wtable = .887 Wcalc - Wtable = .0747820

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	1.749200	.8843954
	.329	1.289668	.4243006
	.2521	1.115142	.2811272
	.1939	.4149439	.0804576
	.1447	.3566749	.0516109
	.1005	.2602831	.0261585
	.0593	.2125614	.0126049
	.0196	.0689929	.0013523
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.762007
Summation**2:			3.104670

Wcalc = .8897493 Wtable = .887 Wcalc - Wtable = .0027493

Arithmetic Average: 4.25 Geometric Mean: 3.874339

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Manganese (mg/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	121	4.795791	13806.25	.3911408
2	160	5.075174	6162.25	.1197363
3	166	5.111988	5256.25	.0956141
4	188	5.236442	2550.25	.0341367
5	189	5.241747	2450.25	.0322045
6	193	5.262690	2070.25	.0251263
7	193	5.262690	2070.25	.0251263
8	195	5.273000	1892.25	.0219643
9	202	5.308268	1332.25	.0127544
10	210	5.347108	812.25	.0054902
11	278	5.627621	1560.25	.0426084
12	306	5.723585	4556.25	.0914349
13	341	5.831882	10506.25	.1686576
14	352	5.863631	12882.25	.1957426
15	357	5.877736	14042.25	.2084221
16	365	5.899897	16002.25	.2291482
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	238.5	5.421203	80.80924	.3365816
		226.1510		

Upper 95% confidence limit on arithmetic mean: 273.9146
Upper 95% confidence limit on geometric mean: 282.4078

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN(X)	LN(X)**2
1	121	1.4641e4	4.795791	22.99961
2	160	2.56e4	5.075174	25.75739
3	166	2.7556e4	5.111988	26.13242
4	188	3.5344e4	5.236442	27.42032
5	189	3.5721e4	5.241747	27.47591
6	193	3.7249e4	5.262690	27.69591
7	193	3.7249e4	5.262690	27.69591
8	195	3.8025e4	5.273000	27.80452
9	202	4.0804e4	5.308268	28.17771
10	210	4.41e4	5.347108	28.59156
11	278	7.7284e4	5.627621	31.67012
12	306	9.3636e4	5.723585	32.75943
13	341	1.1628e5	5.831882	34.01085
14	352	1.2390e5	5.863631	34.38217
15	357	1.2745e5	5.877736	34.54778
16	365	1.3323e5	5.899897	34.80879
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	3816	1008068	86.73925	471.9304

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 97952 (normal distribution)

d = 1.699308 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	2.44e2	1.2337e2
.329	1.97e2	6.4813e1
.2521	1.86e2	4.6891e1
.1939	1.53e2	2.9667e1
.1447	1.17e2	1.6930e1
.1005	8.5e1	8.5425e0
.0593	1.7e1	1.0081e0
.0196	7e0	1.372e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.9135e2
	Summation**2:	8.4887e4

Wcalc = .8666223 Wtable = .887 Wcalc - Wtable = -.020378

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.104107	.5582364
.329	.8025620	.2640429
.2521	.7516434	.1894893
.1939	.5954405	.1154559
.1447	.4818381	.0697220
.1005	.3649309	.0366756
.0593	.0844173	.0050059
.0196	.0352681	.0006913
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.239319
Summation**2:		1.535912

Wcalc = .9038459 Wtable = .887 Wcalc - Wtable = .0168459

Arithmetic Average: 238.5 Geometric Mean: 226.1510

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Vanadium (mg/kg); Site 2 Wetlands; NSB-NLON
Enter Matrix: Sediment/Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	9.8	2.282382	1281.193	2.192521
2	33.2	3.502550	153.6050	.0678857
3	41	3.713572	21.10254	.0024529
4	44.5	3.795489	1.196289	.0010491
5	44.6	3.797734	.9875391	.0011996
6	44.8	3.802208	.6300391	.0015295
7	45.4	3.815512	.0375391	.0027472
8	45.5	3.817712	.0087891	.0029826
9	48.9	3.889777	10.93129	.0160475
10	49.3	3.897924	13.73629	.0181779
11	49.3	3.897924	13.73629	.0181779
12	50.5	3.921973	24.07129	.0252411
13	52	3.951244	41.04004	.0353985
14	55.9	4.023564	106.2188	.0678424
15	56.9	4.041295	127.8313	.0773934
16	57.9	4.058717	151.4438	.0873904
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	45.59375	3.763099	11.39523	.4177748
		43.08172		

Upper 95% confidence limit on arithmetic mean: 50.58771
Upper 95% confidence limit on geometric mean: 58.17097

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Sediment/Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	9.8	9.604e1	2.282382	5.209269
2	33.2	1.1022e3	3.502550	12.26786
3	41	1.681e3	3.713572	13.79062
4	44.5	1.9803e3	3.795489	14.40574
5	44.6	1.9892e3	3.797734	14.42278
6	44.8	2.0070e3	3.802208	14.45679
7	45.4	2.0612e3	3.815512	14.55813
8	45.5	2.0703e3	3.817712	14.57493
9	48.9	2.3912e3	3.889777	15.13037
10	49.3	2.4305e3	3.897924	15.19381
11	49.3	2.4305e3	3.897924	15.19381
12	50.5	2.5503e3	3.921973	15.38187
13	52	2.704e3	3.951244	15.61233
14	55.9	3.1248e3	4.023564	16.18907
15	56.9	3.2376e3	4.041295	16.33207
16	57.9	3.3524e3	4.058717	16.47319
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	779.5	35208.41	60.20958	229.1926

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 1947.769 (normal distribution)

d = 2.618037 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.81e1	2.4319e1
.329	2.37e1	7.7973e0
.2521	1.49e1	3.7563e0
.1939	7.5e0	1.4543e0
.1447	5.9e0	8.537e-1
.1005	4.5e0	4.523e-1
.0593	3.9e0	2.313e-1
.0196	3.4e0	6.664e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.8931e1
Summation**2:		1.5156e3

Wcalc = .7781362 Wtable = .887 Wcalc - Wtable = -.108864

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Wetlands	Date:	01/10/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Sediment/Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	1.776335	.8981150
	.329	.5387455	.1772473
	.2521	.3099923	.0781491
	.1939	.1557545	.0302008
	.1447	.1242395	.0179775
	.1005	.0957159	.0096195
	.0593	.0824120	.0048870
	.0196	.0720651	.0014125
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.217609
Summation**2:			1.482570

Wcalc = .5662910 Wtable = .887 Wcalc - Wtable = -.320709

Arithmetic Average: 45.59375 Geometric Mean: 43.08172

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A WETLANDS
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET. TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

REFERENCE: EPA, DECEMBER 1989

INGESTION

IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS

INGESTION

CR	0.05	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 3.77E-04
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 3.23E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	10500	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 7.91E-02
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 6.78E-03
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Tetrachloroethene	0.002	7.53E-07	1.00E-02	7.53E-05
Aluminum	20.9	7.87E-03	1.00E+00	7.87E-03
Arsenic	0.0029	1.09E-06	3.00E-04	3.64E-03
Boron	0.369	1.39E-04	9.00E-02	1.54E-03
Manganese	1.86	7.01E-04	5.00E-03	1.40E-01
Nickel	0.0847	3.19E-05	2.00E-02	1.60E-03
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				1.55E-01

RISK ASSESSMENT SPREADSHEET - SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 - AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX-DERMAL	TOTAL HAZARD INDEX
Tetrachloroethene	0.002	4.80E-02	7.59E-06	1.00E-02	7.59E-04	8.35E-04
Aluminum	20.9	1.00E-03	1.65E-03	5.00E-02	3.31E-02	4.09E-02
Arsenic	0.0029	1.00E-03	2.29E-07	2.80E-04	8.19E-04	4.46E-03
Boron	0.369	1.00E-03	2.92E-05	4.50E-03	6.49E-03	8.03E-03
Manganese	1.86	1.00E-03	1.47E-04	1.50E-04	9.81E-01	1.12E+00
Nickel	0.0847	1.00E-04	6.70E-07	2.00E-03	3.35E-04	1.93E-03
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					1.02E+00	1.18E+00

RISK ASSESSMENT SPREADSHEET - SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 - AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF - INGESTION (KG-DAY/MG)	CSF - DERMAL (KG-DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Tetrachloroethene	6.46E-06	6.51E-07	5.20E-02	5.20E-02	3.36E-09	3.38E-08	3.72E-08
Aluminum	6.75E-04	1.42E-04			0.00E+00	0.00E+00	0.00E+00
Arsenic	9.36E-08	1.97E-08	1.75E+00	1.80E+00	1.64E-07	3.54E-08	1.99E-07
Boron	1.19E-05	2.50E-06			0.00E+00	0.00E+00	0.00E+00
Manganese	6.01E-05	1.26E-05			0.00E+00	0.00E+00	0.00E+00
Nickel	2.73E-06	5.74E-08			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					1.67E-07	6.92E-08	2.36E-07

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A WETLANDS
L CATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND
ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

REFERENCE: EPA, DECEMBER 1989

INGESTION IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION

CR	0.05	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 7.53E-04
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 6.46E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	10500	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 1.58E-01
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 1.36E-02
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Tetrachloroethene	0.002	1.51E–06	1.00E–02	1.51E–04
Aluminum	20.9	1.57E–02	1.00E+00	1.57E–02
Arsenic	0.0029	2.18E–06	3.00E–04	7.28E–03
Boron	0.369	2.78E–04	9.00E–02	3.09E–03
Manganese	1.86	1.40E–03	5.00E–03	2.80E–01
Nickel	0.0847	6.38E–05	2.00E–02	3.19E–03
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				**3.10E–01**

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Tetrachloroethene	0.002	4.80E–02	1.52E–05	1.00E–02	1.52E–03	1.67E–03
Aluminum	20.9	1.00E–03	3.31E–03	5.00E–02	6.61E–02	8.19E–02
Arsenic	0.0029	1.00E–03	4.59E–07	2.80E–04	1.64E–03	8.92E–03
Boron	0.369	1.00E–03	5.84E–05	4.50E–03	1.30E–02	1.61E–02
Manganese	1.86	1.00E–03	2.94E–04	1.50E–04	1.96E+00	2.24E+00
Nickel	0.0847	1.00E–04	1.34E–06	2.00E–03	6.70E–04	3.86E–03
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					2.04E+00	2.35E+00

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Tetrachloroethene	1.29E–07	1.30E–06	5.20E–02	5.20E–02	6.72E–09	6.77E–08	7.44E–08
Aluminum	1.35E–03	2.83E–04			0.00E+00	0.00E+00	0.00E+00
Arsenic	1.87E–07	3.93E–08	1.75E+00	1.80E+00	3.28E–07	7.08E–08	3.99E–07
Boron	2.38E–05	5.00E–06			0.00E+00	0.00E+00	0.00E+00
Manganese	1.20E–04	2.52E–05			0.00E+00	0.00E+00	0.00E+00
Nickel	5.47E–06	1.15E–07			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					3.34E–07	1.38E–07	4.73E–07

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 - AREA A WETLANDS
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: RECREATIONAL CHILD USER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	50
EF:	28	EF:	28
FI:	1	FI:	1
ED:	6	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	9.59E-08	(AVG ANNUAL DOSE)	CF:	8.22E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARI : RECREATIONAL CHILD USER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	4.6	1	4.60E–07	0.00E+00	3.95E–08		7.30E–01
Benzo(b)fluoranthene	9.6	1	9.21E–07	0.00E+00	7.89E–08		7.30E–01
Benzo(k)fluoranthene	7.9	1	7.58E–07	0.00E+00	6.49E–08		7.30E–02
Benzo(a)pyrene	6.2	1	5.95E–07	0.00E+00	5.10E–08		7.30E+00
Chysene	7.4	1	7.10E–07	0.00E+00	6.08E–08		7.30E–03
Indeno(1,2,3–cd)pyrene	4.2	1	4.03E–07	0.00E+00	3.45E–08		7.30E–01
Aroclor–1260	0.13	0.3	3.74E–09	0.00E+00	3.21E–10	2.00E–05	7.70E+00
Arsenic	9.7	1	9.30E–07	0.00E+00	7.97E–08	3.00E–04	1.75E+00
Beryllium	1.3	1	1.25E–07	0.00E+00	1.07E–08	5.00E–03	4.30E+00
Boron	4400	1	4.22E–04	0.00E+00	3.62E–05	9.00E+02	
Cadmium	5.6	1	5.37E–07	0.00E+00	4.60E–08	5.00E–04	
Manganese	282	1	2.70E–05	0.00E+00	2.32E–06	5.00E–03	
Vanadium	57.9	1	5.55E–06	0.00E+00	4.76E–07	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: RECREATIONAL CHILD USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	2.88E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	5.76E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	4.74E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	3.72E-07
Chysene	0.00E+00	0.00E+00	4.44E-10
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	2.52E-08
Aroclor-1260	1.87E-04	0.00E+00	2.47E-09
Arsenic	3.10E-03	0.00E+00	1.40E-07
Beryllium	2.49E-05	0.00E+00	4.59E-08
Boron	4.69E-07	0.00E+00	0.00E+00
Cadmium	1.07E-03	0.00E+00	0.00E+00
Manganese	5.41E-03	0.00E+00	0.00E+00
Vanadium	7.93E-04	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.06E-02	0.00E+00	6.77E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A WETLANDS
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: RECREATIONAL CHILD USER; RME

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	0	IR	100
EF	26	EF	26
FI	1	FI	1
ED:	6	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	1.92E-07	(AVG ANNUAL DOSE)	CF:	1.64E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: RECREATIONAL CHILD USER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	4.8	1	9.21E–07	0.00E+00	7.89E–08		7.30E–01
Benzo(b)fluoranthene	9.6	1	1.84E–06	0.00E+00	1.58E–07		7.30E–01
Benzo(k)fluoranthene	7.9	1	1.52E–06	0.00E+00	1.30E–07		7.30E–02
Benzo(a)pyrene	6.2	1	1.19E–06	0.00E+00	1.02E–07		7.30E+00
Chysene	7.4	1	1.42E–06	0.00E+00	1.22E–07		7.30E–03
Indeno(1,2,3–cd)pyrene	4.2	1	8.05E–07	0.00E+00	6.90E–08		7.30E–01
Aroclor–1260	0.13	0.3	7.48E–09	0.00E+00	6.41E–10	2.00E–05	7.70E+00
Arsenic	9.7	1	1.86E–06	0.00E+00	1.59E–07	3.00E–04	1.75E+00
Beryllium	1.3	1	2.49E–07	0.00E+00	2.14E–08	5.00E–03	4.30E+00
Boron	4400	1	8.44E–04	0.00E+00	7.23E–05	9.00E+02	
Cadmium	5.6	1	1.07E–06	0.00E+00	9.21E–08	5.00E–04	
Manganese	282	1	5.41E–05	0.00E+00	4.64E–06	5.00E–03	
Vanadium	57.9	1	1.11E–05	0.00E+00	9.52E–07	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 - AREA A WETLANDS
EXPOSURE SCENARIO: RECREATIONAL CHILD USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	5.76E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.15E-07
Benzo(k)fluoranthene	0.00E+00	0.00E+00	9.48E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	7.44E-07
Chysene	0.00E+00	0.00E+00	8.88E-10
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	5.04E-08
Aroclor-1260	3.74E-04	0.00E+00	4.94E-09
Arsenic	6.20E-03	0.00E+00	2.79E-07
Beryllium	4.99E-05	0.00E+00	9.19E-08
Boron	9.38E-07	0.00E+00	0.00E+00
Cadmium	2.15E-03	0.00E+00	0.00E+00
Manganese	1.08E-02	0.00E+00	0.00E+00
Vanadium	1.59E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	2.12E-02	0.00E+00	1.35E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A WETLANDS
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		3150
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		0
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		1
BW1	= BODY WEIGHT ADOLESCENT (KG):		40
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.21E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.04E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	4.8	0.05	2.90E–07	0.00E+00	2.49E–08		
Benzo(b)fluoranthene	9.6	0.05	5.80E–07	0.00E+00	4.97E–08		
Benzo(k)fluoranthene	7.9	0.05	4.77E–07	0.00E+00	4.09E–08		
Benzo(a)pyrene	6.2	0.05	3.75E–07	0.00E+00	3.21E–08		
Chrysene	7.4	0.05	4.47E–07	0.00E+00	3.83E–08		
Indeno(1,2,3–cd)pyrene	4.2	0.05	2.54E–07	0.00E+00	2.17E–08		
Aroclor–1260	0.13	0.05	7.85E–09	0.00E+00	6.73E–10	2.00E–05	7.70E+00
Arsenic	9.7	0.01	1.17E–07	0.00E+00	1.00E–08	2.80E–04	1.80E+00
Beryllium	1.3	0.01	1.57E–08	0.00E+00	1.35E–09	2.50E–04	8.60E+01
Boron	4400	0.01	5.32E–05	0.00E+00	4.56E–06	4.50E–03	
Cadmium	5.6	0.01	6.77E–08	0.00E+00	5.80E–09	1.50E–05	
Manganese	282	0.01	3.41E–06	0.00E+00	2.92E–07	1.50E–04	
Vanadium	57.9	0.01	7.00E–07	0.00E+00	6.00E–08	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Chrysene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	3.93E-04	0.00E+00	5.18E-09
Arsenic	4.19E-04	0.00E+00	1.81E-08
Beryllium	8.26E-06	0.00E+00	1.16E-07
Boron	1.18E-02	0.00E+00	0.00E+00
Cadmium	4.81E-03	0.00E+00	0.00E+00
Manganese	2.27E-02	0.00E+00	0.00E+00
Vanadium	2.00E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	4.19E-02	0.00E+00	1.39E-07

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 - AREA A WETLANDS
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF	= ADHERENCE FACTOR (MG/SQ CM):		1
ABS	= ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		1
BW1	= BODY WEIGHT ADOLESCENT (KG):		40
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 6.04E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 5.18E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	4.8	0.05	1.45E–06	0.00E+00	1.24E–07		
Benzo(b)fluoranthene	9.6	0.05	2.90E–06	0.00E+00	2.49E–07		
Benzo(k)fluoranthene	7.9	0.05	2.39E–06	0.00E+00	2.05E–07		
Benzo(a)pyrene	6.2	0.05	1.87E–06	0.00E+00	1.61E–07		
Chrysene	7.4	0.05	2.24E–06	0.00E+00	1.92E–07		
Indeno(1,2,3–cd)pyrene	4.2	0.05	1.27E–06	0.00E+00	1.09E–07		
Aroclor–1260	0.13	0.05	3.93E–08	0.00E+00	3.37E–09	2.00E–05	7.70E+00
Arsenic	9.7	0.01	5.86E–07	0.00E+00	5.02E–08	2.80E–04	1.80E+00
Beryllium	1.3	0.01	7.85E–08	0.00E+00	6.73E–09	2.50E–04	8.60E+01
Boron	4400	0.01	2.66E–04	0.00E+00	2.28E–05	4.50E–03	
Chromium	5.8	0.01	3.38E–07	0.00E+00	2.90E–08	1.50E–05	
Manganese	292	0.01	1.70E–06	0.00E+00	1.46E–06	1.50E–04	
Vanadium	61.9	0.01	3.60E–06	0.00E+00	3.00E–07	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A WETLANDS
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Chrysene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	1.96E-03	0.00E+00	2.59E-08
Arsenic	2.09E-03	0.00E+00	9.04E-08
Beryllium	3.14E-04	0.00E+00	5.79E-07
Boron	5.91E-02	0.00E+00	0.00E+00
Cadmium	2.26E-02	0.00E+00	0.00E+00
Manganese	1.14E-01	0.00E+00	0.00E+00
Vanadium	9.99E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	2.10E-01	0.00E+00	6.95E-07

APPENDIX F.7

SITE 2 - AREA A WEAPONS CENTER

SUMMARY OF STATISTICALLY DERIVED EXPOSURE CONCENTRATIONS
SITE 2 - AREA A WEAPONS CENTER
SEDIMENT
NSB-NLON, GROTON, CONNECTICUT

Chemical of Concern	Distribution of Data Set[1]	Exposure Concentration[2] (mg/kg)
Benzo(a)anthracene	Lognormal	2.30
Benzo(b)fluoranthene	Undefined	3.70
Benzo(k)fluoranthene	Undefined	1.80
Benzo(a)pyrene	Lognormal	2.70
Dibenz(a,h)anthracene	Undefined	0.410
Indeno(1,2,3-cd)pyrene	Lognormal	1.90
Antimony	Undefined	8.1
Arsenic	Normal	8.2
Beryllium	Undefined	0.79
Cadmium	Undefined	5.8
Manganese	Undefined	763
Vanadium	Undefined	50.3

(1) Distribution determined using the Shapiro-Wilk "W-Test" (Gilbert, 1987).

(2) Exposure concentration is the 95% upper confidence limit (UCL) of the arithmetic mean or the mean of the transformed data, unless otherwise noted. 95% UCL is based on the distribution of the data set. Sample and duplicate results are averaged for the calculation of the 95% UCL; one-half of the nondetected values are used. When the distribution of the data set is undefined the most conservative 95% UCL was used as the exposure concentration.

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)anthracene (ug/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	63	4.143135	437185.4	2.457120
2	70	4.248495	427977.6	2.137911
3	95	4.553877	395892.6	1.338136
4	110	4.700480	377241.6	1.020453
5	120	4.787492	365057.6	.8522305
6	160	5.075174	318321.6	.4038364
7	180	5.192957	296153.6	.2680114
8	205	5.323010	269568.6	.1502687
9	250	5.521461	224865.6	.0357944
10	250	5.521461	224865.6	.0357944
11	510	6.234411	45881.64	.2743200
12	900	6.802395	30905.64	1.191896
13	1850	7.522941	1267426.	3.284380
14	2700	7.901007	3903786.	4.797642
15	3400	8.131531	7159906.	5.860639
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	724.2	5.710655	1060.493	1.312262
		302.0689		

Upper 95% confidence limit on arithmetic mean: 1206.394
Upper 95% confidence limit on geometric mean: 2253.422

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	63	3.969e3	4.143135	17.16557
2	70	4.9e3	4.248495	18.04971
3	95	9.025e3	4.553877	20.73779
4	110	1.21e4	4.700480	22.09452
5	120	1.44e4	4.787492	22.92008
6	160	2.56e4	5.075174	25.75739
7	180	3.24e4	5.192957	26.96680
8	205	4.2025e4	5.323010	28.33444
9	250	6.25e4	5.521461	30.48653
10	250	6.25e4	5.521461	30.48653
11	510	2.601e5	6.234411	38.86788
12	900	8.1e5	6.802395	46.27257
13	1850	3.4225e6	7.522941	56.59464
14	2700	7.29e6	7.901007	62.42591
15	3400	1.156e7	8.131531	66.12179
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	10863	23612019	85.65983	513.2821

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 15745034 (normal distribution)

d = 24.10843 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.515	3.337e3	1.7186e3
	.3306	2.63e3	8.6948e2
	.2495	1.755e3	4.3787e2
	.1878	7.9e2	1.4836e2
	.1353	3.9e2	5.2767e1
	.088	9e1	7.92e0
	.0433	7e1	3.031e0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			3.2380e3
Summation**2:			1.0485e7

Wcalc = .6658957 Wtable = .881 Wcalc - Wtable = -.215104

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	3.988396	2.054024
.3306	3.652512	1.207520
.2495	2.969064	.7407815
.1878	2.101914	.3947395
.1353	1.446919	.1957681
.088	.4462871	.0392733
.0433	.3285041	.0142242
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	4.646331
	Summation**2:	21.58839

Wcalc = .8954706 Wtable = .881 Wcalc - Wtable = .0144706

Arithmetic Average: 724.2 Geometric Mean: 302.0689

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(b)fluoranthene (ug/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	140	4.941642	1132805.	1.820140
2	150	5.010635	1111619.	1.638740
3	160	5.075174	1090632.	1.477669
4	160	5.075174	1090632.	1.477669
5	205	5.323010	998667.1	.9365556
6	220	5.393628	968912.1	.8048610
7	320	5.768321	782045.4	.2729509
8	350	5.857933	729885.4	.1873460
9	350	5.857933	729885.4	.1873460
10	820	6.709304	147712.1	.1751727
11	990	6.897705	45938.78	.3683724
12	2200	7.696213	991352.1	1.975275
13	2500	7.824046	1678752.	2.350941
14	4600	8.433812	11530552	4.592636
15	4900	8.496990	13657952	4.867418
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	1204.333	6.290768	1618.803	1.285443
		539.5676		

Upper 95% confidence limit on arithmetic mean: 1940.384
Upper 95% confidence limit on geometric mean: 3734.856

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	140	1.96e4	4.941642	24.41983
2	150	2.25e4	5.010635	25.10647
3	160	2.56e4	5.075174	25.75739
4	160	2.56e4	5.075174	25.75739
5	205	4.2025e4	5.323010	28.33444
6	220	4.84e4	5.393628	29.09122
7	320	1.024e5	5.768321	33.27353
8	350	1.225e5	5.857933	34.31538
9	350	1.225e5	5.857933	34.31538
10	820	6.724e5	6.709304	45.01476
11	990	9.801e5	6.897705	47.57833
12	2200	4.84e6	7.696213	59.23169
13	2500	6.25e6	7.824046	61.21570
14	4600	2.116e7	8.433812	71.12918
15	4900	2.401e7	8.496990	72.19885
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	[illegible]	[illegible]3625	94.36152	616.7395

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 36687343 (normal distribution)

d = 23.13309 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	4.76e3	2.4514e3
.3306	4.45e3	1.4712e3
.2495	2.34e3	5.8383e2
.1878	2.04e3	3.8311e2
.1353	7.85e2	1.0621e2
.088	6e2	5.28e1
.0433	3e1	1.299e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	5.0498e3
	Summation**2:	2.5501e7

Wcalc = .6950816 Wtable = .881 Wcalc - Wtable = -.185918

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	3.555348	1.831004
.3306	3.423176	1.131702
.2495	2.748872	.6858436
.1878	2.621039	.4922311
.1353	1.574695	.2130562
.088	1.315677	.1157796
.0433	.0896122	.0038802
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		4.473497
Summation**2:		20.01218

Wcalc = .8650887 Wtable = .881 Wcalc - Wtable = -.015911

Arithmetic Average: 1204.333 Geometric Mean: 539.5676

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(k)fluoranthene (ug/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	120	4.787492	531441	1.578175
2	120	4.787492	531441	1.578175
3	205	5.323010	414736	.5194605
4	215	5.370638	401956	.4530744
5	240	5.480639	370881	.3170897
6	255	5.541264	352836	.2524887
7	265	5.579730	341056	.2153111
8	280	5.634790	323761	.1672454
9	290	5.669881	312481	.1397752
10	345	5.843544	254016	.0400807
11	620	6.429719	52441	.1489755
12	630	6.445720	47961	.1615829
13	1950	7.575585	1212201	2.346529
14	2100	7.649693	1565001	2.579064
15	5100	8.536996	18071001	6.216294
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	849	6.043746	1330.500	1.092616
		421.4689		

Upper 95% confidence limit on arithmetic mean: 1453.963
Upper 95% confidence limit on geometric mean: 1785.161

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	120	1.44e4	4.787492	22.92008
2	120	1.44e4	4.787492	22.92008
3	205	4.2025e4	5.323010	28.33444
4	215	4.6225e4	5.370638	28.84375
5	240	5.76e4	5.480639	30.03740
6	255	6.5025e4	5.541264	30.70560
7	265	7.0225e4	5.579730	31.13338
8	280	7.84e4	5.634790	31.75085
9	290	8.41e4	5.669881	32.14755
10	345	1.1903e5	5.843544	34.14701
11	620	3.844e5	6.429719	41.34129
12	630	3.969e5	6.445720	41.54730
13	1950	3.8025e6	7.575585	57.38948
14	2100	4.41e6	7.649693	58.51780
15	5100	2.601e7	8.536996	72.88030
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	12735	35595225	90.65619	564.6163

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 24783210 (normal distribution)

d = 16.71332 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	4.98e3	2.5647e3
.3306	1.98e3	6.5459e2
.2495	1.745e3	4.3538e2
.1878	4.15e2	7.7937e1
.1353	3.8e2	5.1414e1
.088	9e1	7.92e0
.0433	2.5e1	1.0825e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	3.7930e3
	Summation**2:	1.4387e7

Wcalc = .5805137 Wtable = .881 Wcalc - Wtable = -.300486

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.515	3.749504	1.930995
	.3306	2.862201	.9462436
	.2495	2.252575	.5620174
	.1878	1.075082	.2019004
	.1353	.9490806	.1284106
	.088	.3022809	.0266007
	.0433	.0901511	.0039035
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			3.800071
Summation**2:			14.44054

Wcalc = .8640136 Wtable = .881 Wcalc - Wtable = -.016986

Arithmetic Average: 849 Geometric Mean: 421.4689

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)pyrene (ug/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	73	4.290459	585327.0	2.370151
2	78	4.356709	577701.3	2.170554
3	110	4.700480	530081.1	1.275790
4	120	4.787492	515619.7	1.086800
5	130	4.867534	501358.4	.9263186
6	140	4.941642	487297.1	.7891595
7	205	5.323010	400773.4	.2570276
8	210	5.347108	394467.7	.2331744
9	345	5.843544	243114.7	.0001838
10	350	5.857933	238209.1	.0007809
11	610	6.413459	52014.40	.3404373
12	800	6.684612	1449.071	.7303802
13	2400	7.783224	2439636.	3.815127
14	2600	7.863267	3104409.	4.134219
15	4400	8.389360	12687369	6.550379
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	838.0667	5.829989	1275.002	1.327739
		340.3549		

Upper 95% confidence limit on arithmetic mean: 1417.795
Upper 95% confidence limit on geometric mean: 2652.824

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	73	5.329e3	4.290459	18.40804
2	78	6.084e3	4.356709	18.98091
3	110	1.21e4	4.700480	22.09452
4	120	1.44e4	4.787492	22.92008
5	130	1.69e4	4.867534	23.69289
6	140	1.96e4	4.941642	24.41983
7	205	4.2025e4	5.323010	28.33444
8	210	4.41e4	5.347108	28.59156
9	345	1.1903e5	5.843544	34.14701
10	350	1.225e5	5.857933	34.31538
11	610	3.721e5	6.413459	41.13246
12	800	6.4e5	6.684612	44.68403
13	2400	5.76e6	7.783224	60.57858
14	2600	6.76e6	7.863267	61.83096
15	4400	1.936e7	8.389360	70.38136
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	12571	33294163	87.44983	534.5120

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 22758827 (normal distribution)

d = 24.68048 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	4.327e3	2.2284e3
.3306	2.522e3	8.3377e2
.2495	2.29e3	5.7136e2
.1878	6.8e2	1.2770e2
.1353	4.8e2	6.4944e1
.088	2.1e2	1.848e1
.0433	1.4e2	6.062e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	3.8507e3
	Summation**2:	1.4828e7

Wcalc = .6515305 Wtable = .881 Wcalc - Wtable = -.229470

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	4.098900	2.110934
.3306	3.506558	1.159268
.2495	3.082744	.7691445
.1878	1.897120	.3562791
.1353	1.545925	.2091636
.088	.9162907	.0806336
.0433	.5205344	.0225391
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	4.707962
	Summation**2:	22.16490

Wcalc = .8980741 Wtable = .881 Wcalc - Wtable = .0170741

Arithmetic Average: 838.0667 Geometric Mean: 340.3549

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Dibenz(a,h)anthracene (ug/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	52	3.951244	57344.28	2.525207
2	160	5.075174	17283.48	.2163738
3	205	5.323010	7476.484	.0472296
4	215	5.370638	5847.151	.0287966
5	240	5.480639	2648.818	.0035635
6	255	5.541264	1329.818	.0000009
7	265	5.579730	700.4844	.0015521
8	275	5.616771	271.1511	.0058427
9	280	5.634790	131.4844	.0089219
10	285	5.652489	41.81778	.0125788
11	300	5.703782	72.81778	.0267155
12	315	5.752573	553.8178	.0450454
13	345	5.843544	2865.818	.0919367
14	350	5.857933	3426.151	.1008694
15	830	6.721426	290018.2	1.394978
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	291.4667	5.540334	166.9071	.5675519
		254.7630		

Upper 95% confidence limit on arithmetic mean: 367.3574
Upper 95% confidence limit on geometric mean: 414.3263

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	52	2.704e3	3.951244	15.61233
2	160	2.56e4	5.075174	25.75739
3	205	4.2025e4	5.323010	28.33444
4	215	4.6225e4	5.370638	28.84375
5	240	5.76e4	5.480639	30.03740
6	255	6.5025e4	5.541264	30.70560
7	265	7.0225e4	5.579730	31.13338
8	275	7.5625e4	5.616771	31.54812
9	280	7.84e4	5.634790	31.75085
10	285	8.1225e4	5.652489	31.95063
11	300	9e4	5.703782	32.53313
12	315	9.9225e4	5.752573	33.09209
13	345	1.1903e5	5.843544	34.14701
14	350	1.225e5	5.857933	34.31538
15	830	6.889e5	6.721426	45.17756
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	4377	1664304	83.10501	464.9391

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 390011.7 (normal distribution)

d = 4.509612 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.515	7.78e2	4.0067e2
	.3306	1.9e2	6.2814e1
	.2495	1.4e2	3.493e1
	.1878	1e2	1.878e1
	.1353	6e1	8.118e0
	.088	3e1	2.64e0
	.0433	1.5e1	6.495e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.2860e2
Summation**2:			2.7942e5

Wcalc = .7164388 Wtable = .881 Wcalc - Wtable = -.164561

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.515	2.770182	1.426644
	.3306	.7827593	.2587802
	.2495	.5205344	.1298733
	.1878	.3819346	.0717273
	.1353	.2231436	.0301913
	.088	.1112256	.0097879
	.0433	.0550598	.0023841
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.929388
Summation**2:			3.722538

Wcalc = .8254674 Wtable = .881 Wcalc - Wtable = -.055533

Arithmetic Average: 291.4667 Geometric Mean: 254.7630

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Indeno(1,2,3-cd)pyrene (ug/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	49	3.891820	295211.1	2.313465
2	51	3.931826	293041.8	2.193368
3	71	4.262680	271788.4	1.322841
4	86	4.454347	256373.4	.9186855
5	86	4.454347	256373.4	.9186855
6	98	4.584967	244365.4	.6853533
7	99	4.595120	243377.8	.6686468
8	160	5.075174	186912.1	.1140104
9	200	5.298317	153925.4	.0131127
10	205	5.323010	150027.1	.0080673
11	480	6.173786	12618.78	.5790570
12	500	6.214608	8525.444	.6428511
13	1200	7.090077	369258.8	2.813163
14	2300	7.740664	2916125.	5.418822
15	3300	8.101678	7331459.	7.229912
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	592.3333	5.412828	963.2306	1.358572
		224.2649		

Upper 95% confidence limit on arithmetic mean: 1030.303
Upper 95% confidence limit on geometric mean: 1910.181

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	49	2.401e3	3.891820	15.14627
2	51	2.601e3	3.931826	15.45925
3	71	5.041e3	4.262680	18.17044
4	86	7.396e3	4.454347	19.84121
5	86	7.396e3	4.454347	19.84121
6	98	9.604e3	4.584967	21.02193
7	99	9.801e3	4.595120	21.11513
8	160	2.56e4	5.075174	25.75739
9	200	4e4	5.298317	28.07217
10	205	4.2025e4	5.323010	28.33444
11	480	2.304e5	6.173786	38.11563
12	500	2.5e5	6.214608	38.62135
13	1200	1.44e6	7.090077	50.26919
14	2300	5.29e6	7.740664	59.91789
15	3300	1.089e7	8.101678	65.63718
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	8885	18252265	81.19242	465.3207

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 12989383 (normal distribution)

d = 25.84004 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	3.251e3	1.6743e3
.3306	2.249e3	7.4352e2
.2495	1.129e3	2.8169e2
.1878	4.14e2	7.7749e1
.1353	3.94e2	5.3308e1
.088	1.07e2	9.416e0
.0433	1.01e2	4.3733e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.8443e3
Summation**2:		8.0901e6

Wcalc = .6228269 Wtable = .881 Wcalc - Wtable = -.258173

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	4.209857	2.168077
.3306	3.808839	1.259202
.2495	2.827397	.7054355
.1878	1.760261	.3305770
.1353	1.719439	.2326401
.088	.7380425	.0649477
.0433	.7031975	.0304485
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	4.791327
	Summation**2:	22.95682

Wcalc = .8884204 Wtable = .881 Wcalc - Wtable = .0074204

Arithmetic Average: 592.3333 Geometric Mean: 224.2649

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Antimony (mg/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.6	.4700036	13.1769	.9164416
2	1.85	.6151856	11.4244	.6595512
3	1.95	.6678294	10.7584	.5768157
4	2.45	.8960880	7.7284	.2822002
5	2.55	.9360934	7.1824	.2412969
6	2.95	1.081805	5.1984	.1193758
7	3.2	1.163151	4.1209	.0697818
8	3.25	1.178655	3.9204	.0618309
9	4.7	1.547563	.2809	.0144599
10	5.1	1.629241	.0169	.0407746
11	7.3	1.987874	4.2849	.3142288
12	7.8	2.054124	6.6049	.3928914
13	8.95	2.191654	13.8384	.5842161
14	9.8	2.282382	20.8849	.7311433
15	15	2.708050	95.4529	1.640287
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	5.23	1.427313	3.825422	.6889586
		4.167487		

Upper 95% confidence limit on arithmetic mean: 6.969375
Upper 95% confidence limit on geometric mean: 8.058376

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Antimony (mg/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.6	2.56e0	.4700036	.2209034
2	1.85	3.4225e0	.6151856	.3784534
3	1.95	3.8025e0	.6678294	.4459961
4	2.45	6.0025e0	.8960880	.8029737
5	2.55	6.5025e0	.9360934	.8762708
6	2.95	8.7025e0	1.081805	1.170302
7	3.2	1.024e1	1.163151	1.352920
8	3.25	1.0563e1	1.178655	1.389228
9	4.7	2.209e1	1.547563	2.394950
10	5.1	2.601e1	1.629241	2.654425
11	7.3	5.329e1	1.987874	3.951644
12	7.8	6.084e1	2.054124	4.219424
13	8.95	8.0103e1	2.191654	4.803345
14	9.8	9.604e1	2.282382	5.209269
15	15	2.25e2	2.708050	7.333536
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	78.45	615.1675	21.40970	37.20364

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 204.874 (normal distribution)

d = 6.645296 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Antimony (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	1.34e1	6.901e0
.3306	7.95e0	2.6283e0
.2495	7e0	1.7465e0
.1878	5.35e0	1.0047e0
.1353	4.75e0	6.427e-1
.088	2.15e0	1.892e-1
.0433	1.5e0	6.495e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.3177e1
Summation**2:		1.7364e2

Wcalc = .8475546 Wtable = .881 Wcalc - Wtable = -.033445

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Antimony (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	2.238047	1.152594
.3306	1.667197	.5511752
.2495	1.523824	.3801941
.1878	1.158036	.2174791
.1353	1.051781	.1423060
.088	.5474354	.0481743
.0433	.3844117	.0166450
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.508568
Summation**2:		6.292912

Wcalc = .9469725 Wtable = .881 Wcalc - Wtable = .0659725

Arithmetic Average: 5.23 Geometric Mean: 4.167487

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Arsenic (mg/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.2	.1823216	29.0521	2.230062
2	1.4	.3364722	26.9361	1.793426
3	1.6	.4700036	24.9001	1.453609
4	4.6	1.526056	3.9601	.0223815
5	5.1	1.629241	2.2201	.0021548
6	5.6	1.722767	.9801	.0022190
7	6.2	1.824549	.1521	.0221678
8	6.4	1.856298	.0361	.0326298
9	6.7	1.902108	.0121	.0512781
10	6.9	1.931521	.0961	.0654646
11	8.4	2.128232	3.2761	.2048204
12	9.6	2.261763	9.0601	.3435159
13	10.25	2.327278	13.3956	.4246045
14	11.4	2.433613	23.1361	.5744920
15	13.5	2.602690	47.7481	.8593825
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	6.59	1.675661	3.634763	.7598030
		5.342324		

Upper 95% confidence limit on arithmetic mean: 8.242684
Upper 95% confidence limit on geometric mean: 11.57929

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.2	1.44e0	.1823216	.0332412
2	1.4	1.96e0	.3364722	.1132136
3	1.6	2.56e0	.4700036	.2209034
4	4.6	2.116e1	1.526056	2.328848
5	5.1	2.601e1	1.629241	2.654425
6	5.6	3.136e1	1.722767	2.967925
7	6.2	3.844e1	1.824549	3.328980
8	6.4	4.096e1	1.856298	3.445842
9	6.7	4.489e1	1.902108	3.618013
10	6.9	4.761e1	1.931521	3.730775
11	8.4	7.056e1	2.128232	4.529370
12	9.6	9.216e1	2.261763	5.115572
13	10.25	1.0506e2	2.327278	5.416222
14	11.4	1.2996e2	2.433613	5.922474
15	13.5	1.8225e2	2.602690	6.773994
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	98.85	836.3825	25.13491	50.19980

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 184.961 (normal distribution)

d = 8.082209 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	1.23e1	6.3345e0
.3306	1e1	3.306e0
.2495	8.65e0	2.1582e0
.1878	5e0	9.39e-1
.1353	3.3e0	4.465e-1
.088	1.3e0	1.144e-1
.0433	5e-1	2.165e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		1.3320e1
Summation**2:		1.7743e2

Wcalc = .9592732 Wtable = .881 Wcalc - Wtable = .0782732

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	2.420368	1.246490
.3306	2.097141	.6933149
.2495	1.857274	.4633899
.1878	.7357068	.1381657
.1353	.4989912	.0675135
.088	.2087548	.0183704
.0433	.0775582	.0033583
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.630602
	Summation**2:	6.920068

Wcalc = .8562101 Wtable = .881 Wcalc - Wtable = -.024790

Arithmetic Average: 6.59 Geometric Mean: 5.342324

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Beryllium (mg/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.275	-1.29098	.1320111	.5851821
2	.285	-1.25527	.1248444	.5318112
3	.315	-1.15518	.1045444	.3958554
4	.5	-.693147	.0191361	.0279341
5	.53	-.634878	.0117361	.0118518
6	.6	-.510826	.0014694	.0002306
7	.6	-.510826	.0014694	.0002306
8	.62	-.478036	.0003361	.0023017
9	.65	-.430783	.0001361	.0090686
10	.75	-.287682	.0124694	.0568013
11	.75	-.287682	.0124694	.0568013
12	.75	-.287682	.0124694	.0568013
13	.85	-.162519	.0448028	.1321274
14	1	0	.1308028	0
15	1.1	.0953102	.2131361	.3860415
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	.6383333	-.526012	.2422857	.4011625
		.5909569		

Upper 95% confidence limit on arithmetic mean: .7484978
Upper 95% confidence limit on geometric mean: .7910276

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.275	7.563e-2	-1.29098	1.666640
2	.285	8.123e-2	-1.25527	1.575693
3	.315	9.923e-2	-1.15518	1.334447
4	.5	2.5e-1	-.693147	.4804530
5	.53	2.809e-1	-.634878	.4030704
6	.6	3.6e-1	-.510826	.2609428
7	.6	3.6e-1	-.510826	.2609428
8	.62	3.844e-1	-.478036	.2285182
9	.65	4.225e-1	-.430783	.1855739
10	.75	5.625e-1	-.287682	.0827610
11	.75	5.625e-1	-.287682	.0827610
12	.75	5.625e-1	-.287682	.0827610
13	.85	7.225e-1	-.162519	.0264124
14	1	1e0	0	0
15	1.1	1.21e0	.0953102	.0090840
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	9.575	6.933875	-7.89018	6.680061

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = .8218333 (normal distribution)

d = 2.529728 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.515	8.25e-1	4.249e-1
	.3306	7.15e-1	2.364e-1
	.2495	5.35e-1	1.335e-1
	.1878	2.5e-1	4.695e-2
	.1353	2.2e-1	2.977e-2
	.088	1.5e-1	1.32e-2
	.0433	5e-2	2.165e-3
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			8.868e-1
Summation**2:			7.864e-1

Wcalc = .9569401 Wtable = .881 Wcalc - Wtable = .0759401

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	1.386294	.7139416
.3306	1.255266	.4149910
.2495	.9926637	.2476696
.1878	.4054651	.0761463
.1353	.3471962	.0469756
.088	.2231436	.0196366
.0433	.0800427	.0034658
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.522827
Summation**2:		2.319001

Wcalc = .9166998 Wtable = .881 Wcalc - Wtable = .0356998

Arithmetic Average: .6383333 Geometric Mean: .5909569

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Cadmium (mg/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.215	-1.53712	4.710347	.8109937
2	.245	-1.40650	4.581027	.5927948
3	.255	-1.36649	4.538320	.5327925
4	.315	-1.15518	4.286280	.2689639
5	.32	-1.13943	4.265602	.2528771
6	.33	-1.10866	4.224395	.2228758
7	.365	-1.00786	4.081747	.1378582
8	.37	-.994252	4.061568	.1279399
9	.38	-.967584	4.021362	.1095733
10	.41	-.891598	3.901942	.0650417
11	.425	-.855666	3.842907	.0480051
12	.55	-.597837	3.368448	.0014999
13	1	0	1.919148	0
14	1.1	.0953102	1.652082	.5356418
15	29.5	3.384390	735.2051	16.16808
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	2.385333	-.636565	7.505523	1.191486
		.5291066		

Upper 95% confidence limit on arithmetic mean: 5.798007
Upper 95% confidence limit on geometric mean: 2.855492

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.215	4.623e-2	-1.53712	2.362729
2	.245	6.003e-2	-1.40650	1.978234
3	.255	6.503e-2	-1.36649	1.867300
4	.315	9.923e-2	-1.15518	1.334447
5	.32	1.024e-1	-1.13943	1.298310
6	.33	1.089e-1	-1.10866	1.229133
7	.365	1.332e-1	-1.00786	1.015778
8	.37	1.369e-1	-.994252	.9885376
9	.38	1.444e-1	-.967584	.9362188
10	.41	1.681e-1	-.891598	.7949472
11	.425	1.806e-1	-.855666	.7321645
12	.55	3.025e-1	-.597837	.3574091
13	1	1e0	0	0
14	1.1	1.21e0	.0953102	.0090840
15	29.5	8.7025e2	3.384390	11.45410
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	35.78	874.0076	-9.54848	26.35839

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 788.6603 (normal distribution)

d = 20.28016 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.515	2.9285e1	1.5082e1
	.3306	8.55e-1	2.827e-1
	.2495	7.45e-1	1.859e-1
	.1878	2.35e-1	4.413e-2
	.1353	1.05e-1	1.421e-2
	.088	8e-2	7.04e-3
	.0433	1.5e-2	6.495e-4
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.5616e1
Summation**2:			2.4387e2

Wcalc = .3092209 Wtable = .881 Wcalc - Wtable = -.571779

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	4.921508	2.534576
.3306	1.501807	.4964975
.2495	1.366492	.3409397
.1878	.5573456	.1046695
.1353	.2837682	.0383938
.088	.2170645	.0191017
.0433	.0402739	.0017439
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	3.535922
	Summation**2:	12.50275

Wcalc = .6165015 Wtable = .881 Wcalc - Wtable = -.264499

Arithmetic Average: 2.385333 Geometric Mean: .5291066

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Manganese (mg/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	79.8	4.379524	130648.5	1.325974
2	101	4.615121	115772.3	.8388952
3	141	4.948760	90152.06	.3390417
4	150	5.010635	84828.50	.2708135
5	153	5.030438	83089.98	.2505952
6	160	5.075174	79103.44	.2078074
7	168	5.123964	74667.38	.1657050
8	172	5.147494	72497.36	.1471016
9	196	5.278115	60149.20	.0639676
10	220	5.393628	48953.04	.0188802
11	315	5.752573	15939.90	.0490799
12	423	6.047372	333.1842	.2666064
13	483	6.180017	1742.784	.4211801
14	1217	7.104144	601782.9	2.474679
15	2640	7.878534	4834487.	5.510763
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	441.2533	5.531033	670.5087	.9392660
		252.4044		

Upper 95% confidence limit on arithmetic mean: 746.1258
Upper 95% confidence limit on geometric mean: 763.0599

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	79.8	6.3680e3	4.379524	19.18023
2	101	1.0201e4	4.615121	21.29934
3	141	1.9881e4	4.948760	24.49022
4	150	2.25e4	5.010635	25.10647
5	153	2.3409e4	5.030438	25.30531
6	160	2.56e4	5.075174	25.75739
7	168	2.8224e4	5.123964	26.25501
8	172	2.9584e4	5.147494	26.49670
9	196	3.8416e4	5.278115	27.85849
10	220	4.84e4	5.393628	29.09122
11	315	9.9225e4	5.752573	33.09209
12	423	1.7893e5	6.047372	36.57071
13	483	2.3329e5	6.180017	38.19261
14	1217	1.4811e6	7.104144	50.46886
15	2640	6.9696e6	7.878534	62.07130
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	6618.8	9214715.	82.96549	471.2359

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 6294147. (normal distribution)

d = 12.35109 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.515	2.5602e3	1.3185e3
	.3306	1.116e3	3.6895e2
	.2495	3.42e2	8.5329e1
	.1878	2.73e2	5.1269e1
	.1353	1.62e2	2.1919e1
	.088	6e1	5.28e0
	.0433	2.8e1	1.2124e0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.8525e3
Summation**2:			3.4316e6

Wcalc = .5452073 Wtable = .881 Wcalc - Wtable = -.335793

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	3.499011	1.801991
.3306	2.489024	.8228712
.2495	1.231257	.3071986
.1878	1.036737	.1946992
.1353	.7221347	.0977048
.088	.3184537	.0280239
.0433	.1541507	.0066747
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	3.259163
	Summation**2:	10.62214

Wcalc = .8600167 Wtable = .881 Wcalc - Wtable = -.020983

Arithmetic Average: 441.2533 Geometric Mean: 252.4044

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Vanadium (mg/kg); Site 2 Weapons Area; NSB-NLON
Enter Matrix: Sediment

Enter number of samples: 15
Degrees of Freedom: 14

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	8	2.079442	712.0003	1.787185
2	12.8	2.549445	478.8803	.7514335
3	17.5	2.862201	295.2669	.3070234
4	18.9	2.939162	249.1136	.2276586
5	24.8	3.210844	97.68028	.0422114
6	31.1	3.437208	12.84028	.0004372
7	33.4	3.508556	1.646944	.0085116
8	37.2	3.616309	6.333611	.0400044
9	38.1	3.640214	11.67361	.0501386
10	41.5	3.725693	46.46694	.0957257
11	44.5	3.795489	96.36694	.1437861
12	47.1	3.852273	154.1736	.1900744
13	53.75	3.984344	363.5378	.3226761
14	54.9	4.005513	408.7136	.3471750
15	56.7	4.037774	484.7336	.3862329
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	34.68333	3.416298	15.62834	.5794254
		30.45645		

Upper 95% confidence limit on arithmetic mean: 41.78935
Upper 95% confidence limit on geometric mean: 50.31532

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Sediment	Operator:	kms

Enter Number of Occurrences (n): 15 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	8	6.4e1	2.079442	4.324077
2	12.8	1.6384e2	2.549445	6.499671
3	17.5	3.0625e2	2.862201	8.192194
4	18.9	3.5721e2	2.939162	8.638673
5	24.8	6.1504e2	3.210844	10.30952
6	31.1	9.6721e2	3.437208	11.81440
7	33.4	1.1156e3	3.508556	12.30996
8	37.2	1.3838e3	3.616309	13.07769
9	38.1	1.4516e3	3.640214	13.25116
10	41.5	1.7223e3	3.725693	13.88079
11	44.5	1.9803e3	3.795489	14.40574
12	47.1	2.2184e3	3.852273	14.84001
13	53.75	2.8891e3	3.984344	15.87499
14	54.9	3.0140e3	4.005513	16.04414
15	56.7	3.2149e3	4.037774	16.30362
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	520.25	21463.43	51.24447	179.7666

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 3419.428 (normal distribution)

d = 4.700273 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	4.87e1	2.5081e1
.3306	4.21e1	1.3918e1
.2495	3.625e1	9.0444e0
.1878	2.82e1	5.2960e0
.1353	1.97e1	2.6654e0
.088	1.04e1	9.152e-1
.0433	4.7e0	2.035e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	5.7123e1
	Summation**2:	3.2631e3

Wcalc = .9542711 Wtable = .881 Wcalc - Wtable = .0732711

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 2 - Area A Weapons Center	Date:	01/05/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Sediment	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.515	1.958333	1.008541
.3306	1.456068	.4813761
.2495	1.122143	.2799746
.1878	.9131111	.1714823
.1353	.5846455	.0791025
.088	.2884856	.0253867
.0433	.1316584	.0057008
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.051564
	Summation**2:	4.208917

Wcalc = .8954621 Wtable = .881 Wcalc - Wtable = .0144621

Arithmetic Average: 34.68333 Geometric Mean: 30.45645

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 2 - AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/15/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	50	IR:	0
EF:	150	EF:	350
FI:	1	FI:	1
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.94E-07	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.52E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.7	1	0.00E+00	4.99E-07	4.28E-08		7.30E-01
Benzo(b)fluoranthene	2.75	1	0.00E+00	8.07E-07	6.92E-08		7.30E-01
Benzo(k)fluoranthene	0.22	1	0.00E+00	6.46E-08	5.54E-09		7.30E-02
Benzo(a)pyrene	1.55	1	0.00E+00	4.55E-07	3.90E-08		7.30E+00
Dibenz(a,h)anthracene	0.51	1	0.00E+00	1.50E-07	1.28E-08		7.30E+00
Indeno(1,2,3-cd)pyrene	0.88	1	0.00E+00	2.58E-07	2.21E-08		7.30E-01
Antimony	5.4	1	0.00E+00	1.59E-06	1.36E-07	4.00E-04	
Arsenic	3.25	1	0.00E+00	9.54E-07	8.18E-08	3.00E-04	1.75E+00
Beryllium	0.45	1	0.00E+00	1.32E-07	1.13E-08	5.00E-03	4.30E+00
Manganese	257	1	0.00E+00	7.54E-05	6.47E-06	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPL YEE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	3.12E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	5.05E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	4.04E-10
Benzo(a)pyrene	0.00E+00	0.00E+00	2.85E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	9.37E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.62E-08
Antimony	0.00E+00	3.96E-03	0.00E+00
Arsenic	0.00E+00	3.18E-03	1.43E-07
Beryllium	0.00E+00	2.64E-05	4.87E-08
Manganese	0.00E+00	1.51E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.23E-02	6.68E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
L CATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/15/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	100	IR	0
EF	250	EF	350
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 9.78E-07 (AVG ANNUAL DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

ADULT/YOUTH (CANCER RISK):
CF: 3.49E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.7	1	0.00E+00	1.66E-06	5.94E-07		7.30E-01
Benzo(b)fluoranthene	2.75	1	0.00E+00	2.69E-06	9.61E-07		7.30E-01
Benzo(k)fluoranthene	0.22	1	0.00E+00	2.15E-07	7.69E-08		7.30E-02
Benzo(a)pyrene	1.55	1	0.00E+00	1.52E-06	5.42E-07		7.30E+00
Dibenz(a,h)anthracene	0.51	1	0.00E+00	4.99E-07	1.78E-07		7.30E+00
Indeno(1,2,3-cd)pyrene	0.88	1	0.00E+00	8.61E-07	3.08E-07		7.30E-01
Antimony	5.4	1	0.00E+00	5.28E-06	1.89E-06	4.00E-04	
Arsenic	3.25	1	0.00E+00	3.18E-06	1.14E-06	3.00E-04	1.75E+00
Beryllium	0.45	1	0.00E+00	4.40E-07	1.57E-07	5.00E-03	4.30E+00
Manganese	257	1	0.00E+00	2.51E-04	8.98E-05	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	4.34E-07
Benzo(b)fluoranthene	0.00E+00	0.00E+00	7.02E-07
Benzo(k)fluoranthene	0.00E+00	0.00E+00	5.61E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	3.95E-06
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	1.30E-06
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	2.24E-07
Antimony	0.00E+00	1.32E-02	0.00E+00
Arsenic	0.00E+00	1.06E-02	1.99E-06
Beryllium	0.00E+00	8.81E-05	6.76E-07
Manganese	0.00E+00	5.03E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	7.42E-02	9.28E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/15/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR	480	IR	0
EF	90	EF	350
FI:	1	FI:	1
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.50E-06	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.15E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARI : CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.7	1	0.00E+00	2.55E–06	3.65E–08		7.30E–01
Benzo(b)fluoranthene	2.75	1	0.00E+00	4.13E–06	5.90E–08		7.30E–01
Benzo(k)fluoranthene	0.26	1	0.00E+00	3.91E–07	5.58E–09		7.30E–02
Benzo(a)pyrene	1.55	1	0.00E+00	2.33E–06	3.33E–08		7.30E+00
Dibenz(a,h)anthracene	0.51	1	0.00E+00	7.66E–07	1.09E–08		7.30E+00
Indeno(1,2,3–cd)pyrene	0.88	1	0.00E+00	1.32E–06	1.89E–08		7.30E–01
Antimony	5.4	1	0.00E+00	8.12E–06	1.16E–07	4.00E–04	
Arsenic	10.8	1	0.00E+00	1.62E–05	2.32E–07	3.00E–04	1.75E+00
Beryllium	0.84	1	0.00E+00	1.26E–06	1.80E–08	5.00E–03	4.30E+00
Manganese	390	1	0.00E+00	5.86E–04	8.37E–06	5.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	2.66E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	4.31E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	4.08E-10
Benzo(a)pyrene	0.00E+00	0.00E+00	2.43E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	7.99E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.38E-08
Antimony	0.00E+00	2.03E-02	0.00E+00
Arsenic	0.00E+00	5.41E-02	4.06E-07
Beryllium	0.00E+00	2.52E-04	7.76E-08
Manganese	0.00E+00	1.17E-01	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.92E-01	8.90E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/15/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	480	IR:	0
EF:	120	EF:	350
FI:	1	FI:	1
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.25E-06	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.22E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.7	1	0.00E+00	3.83E–06	5.47E–08		7.30E–01
Benzo(b)fluoranthene	2.75	1	0.00E+00	6.20E–06	8.86E–08		7.30E–01
Benzo(k)fluoranthene	0.26	1	0.00E+00	5.86E–07	8.37E–09		7.30E–02
Benzo(a)pyrene	1.55	1	0.00E+00	3.49E–06	4.99E–08		7.30E+00
Dibenz(a,h)anthracene	0.51	1	0.00E+00	1.15E–06	1.64E–08		7.30E+00
Indeno(1,2,3–cd)pyrene	0.88	1	0.00E+00	1.98E–06	2.83E–08		7.30E–01
Antimony	5.4	1	0.00E+00	1.22E–05	1.74E–07	4.00E–04	
Arsenic	10.8	1	0.00E+00	2.43E–05	3.48E–07	3.00E–04	1.75E+00
Beryllium	0.84	1	0.00E+00	1.89E–06	2.71E–08	5.00E–03	4.30E+00
Manganese	390	1	0.00E+00	8.79E–04	1.26E–05	5.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	4.00E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	6.47E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	6.11E-10
Benzo(a)pyrene	0.00E+00	0.00E+00	3.64E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	1.20E-07
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	2.07E-08
Antimony	0.00E+00	3.04E-02	0.00E+00
Arsenic	0.00E+00	8.12E-02	6.09E-07
Beryllium	0.00E+00	3.79E-04	1.16E-07
Manganese	0.00E+00	1.76E-01	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**2.88E-01**	**1.34E-06**

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/05/95

EXPOSURE SCENARIO: FULL–TIME EMPLOYEE; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		150
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		6
BW1	= BODY WEIGHT ADOLESCENT (KG)		15
BW2	= BODY WEIGHT ADULT (KG)		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		2190
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.82E–07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 4.46E–06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.7	0.05	0.00E+00	3.79E-07	3.25E-08		
Benzo(b)fluoranthene	2.75	0.05	0.00E+00	6.14E-07	5.26E-08		
Benzo(k)fluoranthene	0.22	0.05	0.00E+00	4.91E-08	4.21E-09		
Benzo(a)pyrene	1.55	0.05	0.00E+00	3.46E-07	2.96E-08		
Dibenz(a,h)anthracene	0.51	0.05	0.00E+00	1.14E-07	9.75E-09		
Indeno(1,2,3-cd)pyrene	0.88	0.05	0.00E+00	1.96E-07	1.68E-08		
Antimony	5.4	0.01	0.00E+00	2.41E-07	2.07E-08	4.00E-04	
Arsenic	3.25	0.01	0.00E+00	1.45E-07	1.24E-08	2.80E-04	1.80E+00
Beryllium	0.45	0.01	0.00E+00	2.01E-08	1.72E-09	2.50E-04	8.60E+01
Manganese	257	0.01	0.00E+00	1.15E-05	9.83E-07	1.50E-04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	6.02E-04	0.00E+00
Arsenic	0.00E+00	5.18E-04	2.24E-08
Beryllium	0.00E+00	8.03E-05	1.48E-07
Manganese	0.00E+00	7.64E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	7.76E-02	1.70E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/05/95

EXPOSURE SCENARIO: FULL–TIME EMPLOYEE; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF = ADHERENCE FACTOR (MG/SQ CM)		1
ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		250
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		15
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.33E–05
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.72E–05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.7	0.05	0.00E+00	3.16E-06	1.13E-06		
Benzo(b)fluoranthene	2.75	0.05	0.00E+00	5.11E-06	1.83E-06		
Benzo(k)fluoranthene	0.22	0.05	0.00E+00	4.09E-07	1.46E-07		
Benzo(a)pyrene	1.55	0.05	0.00E+00	2.88E-06	1.03E-06		
Dibenz(a,h)anthracene	0.51	0.05	0.00E+00	9.48E-07	3.39E-07		
Indeno(1,2,3-cd)pyrene	0.88	0.05	0.00E+00	1.64E-06	5.84E-07		
Antimony	5.4	0.01	0.00E+00	2.01E-06	7.17E-07	4.00E-04	
Arsenic	3.25	0.01	0.00E+00	1.21E-06	4.32E-07	2.80E-04	1.80E+00
Beryllium	0.45	0.01	0.00E+00	1.67E-07	5.98E-08	2.50E-04	8.60E+01
Manganese	257	0.01	0.00E+00	9.56E-05	3.41E-05	1.50E-04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	5.02E-03	0.00E+00
Arsenic	0.00E+00	4.32E-03	7.77E-07
Beryllium	0.00E+00	8.69E-04	5.14E-06
Manganese	0.00E+00	6.37E-01	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	6.47E-01	5.92E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/05/95

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		1
BW1 = BODY WEIGHT ADOLESCENT (KG):		15
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS)	CF1 =	0.00E+00	CANCER RISK = (CF3)*(C)*(ABS)	CF3 =	3.40E-08
DOSEadult = (CF2)*(C)*(ABS)	CF2 =	2.38E-06			

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.7	0.05	0.00E+00	2.02E–07	2.89E–09		
Benzo(b)fluoranthene	2.75	0.05	0.00E+00	3.27E–07	4.67E–09		
Benzo(k)fluoranthene	0.26	0.05	0.00E+00	3.09E–08	4.42E–10		
Benzo(a)pyrene	1.55	0.05	0.00E+00	1.84E–07	2.63E–09		
Dibenz(a,h)anthracene	0.51	0.05	0.00E+00	6.07E–08	8.67E–10		
Indeno(1,2,3–cd)pyrene	0.88	0.05	0.00E+00	1.05E–07	1.50E–09		
Antimony	5.4	0.01	0.00E+00	1.29E–07	1.84E–09	4.00E–04	
Arsenic	10.8	0.01	0.00E+00	2.57E–07	3.67E–09	2.80E–04	1.80E+00
Beryllium	0.84	0.01	0.00E+00	2.00E–08	2.86E–10	2.50E–04	8.60E+01
Manganese	390	0.01	0.00E+00	9.28E–06	1.33E–07	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	3.21E-04	0.00E+00
Arsenic	0.00E+00	9.18E-04	6.61E-09
Beryllium	0.00E+00	8.00E-05	2.46E-08
Manganese	0.00E+00	6.19E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	6.32E-02	3.12E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE	C = CONCENTRATION IN SOIL (MG/KG)		
	SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
	SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
	AF = ADHERENCE FACTOR (MG/SQ CM)		1
	ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
	EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
	EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		120
	ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
	ED2 = ADULT EXPOSURE DURATION (YEARS)		1
	BW1 = BODY WEIGHT ADOLESCENT (KG)		15
	BW2 = BODY WEIGHT ADULT (KG)		70
	AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
	AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
	AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS)	CF1 =	0.00E+00	CANCER RISK = (CF3)*(C)*(ABS)	CF3 =	2.55E-07
DOSEadult = (CF2)*(C)*(ABS)	CF2 =	1.78E-05			

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.7	0.05	0.00E+00	1.52E–06	2.17E–08		
Benzo(b)fluoranthene	2.75	0.05	0.00E+00	2.45E–06	3.51E–08		
Benzo(k)fluoranthene	0.26	0.05	0.00E+00	2.32E–07	3.31E–09		
Benzo(a)pyrene	1.55	0.05	0.00E+00	1.38E–06	1.98E–08		
Dibenz(a,h)anthracene	0.51	0.05	0.00E+00	4.55E–07	6.50E–09		
Indeno(1,2,3–cd)pyrene	0.88	0.05	0.00E+00	7.85E–07	1.12E–08		
Antimony	5.4	0.01	0.00E+00	9.64E–07	1.38E–08	4.00E–04	
Arsenic	10.8	0.01	0.00E+00	1.93E–06	2.75E–08	2.80E–04	1.80E+00
Beryllium	0.84	0.01	0.00E+00	1.50E–07	2.14E–09	2.50E–04	8.60E+01
Manganese	390	0.01	0.00E+00	6.96E–05	9.94E–07	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	2.41E-03	0.00E+00
Arsenic	0.00E+00	6.88E-03	4.96E-08
Beryllium	0.00E+00	6.00E-04	1.84E-07
Manganese	0.00E+00	4.64E-01	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	4.74E-01	2.34E-07

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT:		YOUTH:	
IR:	2.5	IR:	0
EF:	150	EF:	350
ET:	8	ET:	24
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	1.17E-01	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	1.01E-02	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	3.1E-08	0.00E+00	3.59E-09	3.08E-10		
Benzo(b)fluoranthene	5.0E-08	0.00E+00	5.81E-09	4.98E-10		
Benzo(k)fluoranthene	4.0E-09	0.00E+00	4.65E-10	3.99E-11		
Benzo(a)pyrene	2.8E-08	0.00E+00	3.28E-09	2.81E-10		
Dibenz(a,h)anthracene	9.2E-09	0.00E+00	1.08E-09	9.24E-11		
Indeno(a,2,3-cd)pyrene	1.6E-08	0.00E+00	1.86E-09	1.59E-10		
Antimony	9.7E-08	0.00E+00	1.14E-08	9.78E-10		
Arsenic	5.9E-08	0.00E+00	6.87E-09	5.89E-10		1.51E+01
Beryllium	8.1E-09	0.00E+00	9.51E-10	8.15E-11		
Manganese	4.6E-06	0.00E+00	5.43E-07	4.66E-08	1.43E-05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(a,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	8.89E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	3.80E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.80E-02	8.89E-09

RISK ASSESSMENT SPREADSHEET - INHALATION

SITE NAME: SITE 2 - AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	2.5	IR:	0
EF:	250	EF:	350
ET:	8	ET:	24
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:		
CF:	1.96E-01	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)
CF:	6.99E-02	(LIFETIME DOSE)			

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	3.1E-08	0.00E+00	5.99E-09	2.14E-09		
Benzo(b)fluoranthene	5.0E-08	0.00E+00	9.69E-09	3.46E-09		
Benzo(k)fluoranthene	4.0E-09	0.00E+00	7.75E-10	2.77E-10		
Benzo(a)pyrene	2.8E-08	0.00E+00	5.46E-09	1.95E-09		
Dibenz(a,h)anthracene	9.2E-09	0.00E+00	1.80E-09	6.42E-10		
Indeno(a,2,3-cd)pyrene	1.6E-08	0.00E+00	3.10E-09	1.11E-09		
Antimony	9.7E-08	0.00E+00	1.90E-08	6.79E-09		
Arsenic	5.9E-08	0.00E+00	1.14E-08	4.09E-09		1.51E+01
Beryllium	8.1E-09	0.00E+00	1.59E-09	5.66E-10		
Manganese	4.6E-08	0.00E+00	9.05E-07	3.23E-07	1.43E-05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(a,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	6.17E-08
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	6.33E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	6.33E-02	6.17E-08

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C * IR * ET * EF * ED)/(BW * AT)

WHERE
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR:	3.9	IR:	0
EF:	80	EF:	350
ET:	8	ET:	24
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 9.77E-02 (AVG ANNUAL DOSE)
CF: 1.40E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	3.1E-08	0.00E+00	2.99E-09	4.27E-11		
Benzo(b)fluoranthene	5.0E-08	0.00E+00	4.84E-09	6.91E-11		
Benzo(k)fluoranthene	4.7E-09	0.00E+00	4.57E-10	6.53E-12		
Benzo(a)pyrene	2.8E-08	0.00E+00	2.73E-09	3.89E-11		
Dibenz(a,h)anthracene	9.2E-09	0.00E+00	8.97E-10	1.28E-11		
Indeno(a,2,3-cd)pyrene	1.6E-08	0.00E+00	1.55E-09	2.21E-11		
Antimony	9.7E-08	0.00E+00	9.50E-09	1.36E-10		
Arsenic	1.9E-07	0.00E+00	1.90E-08	2.71E-10		1.51E+01
Beryllium	1.5E-08	0.00E+00	1.48E-09	2.11E-11		
Manganese	7.0E-06	0.00E+00	6.86E-07	9.80E-09	1.43E-05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(a,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	4.10E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	4.80E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	4.80E-02	4.10E-09

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT:		YOUTH:	
IR:	3.9	IR:	0
EF:	120	EF:	350
ET:	8	ET:	24
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.47E-01 (AVG ANNUAL DOSE)
CF: 2.09E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	3.1E-08	0.00E+00	4.48E-09	6.41E-11		
Benzo(b)fluoranthene	5.0E-08	0.00E+00	7.25E-09	1.04E-10		
Benzo(k)fluoranthene	4.7E-09	0.00E+00	6.86E-10	9.80E-12		
Benzo(a)pyrene	2.8E-08	0.00E+00	4.09E-09	5.84E-11		
Dibenz(a,h)anthracene	9.2E-09	0.00E+00	1.35E-09	1.92E-11		
Indeno(a,2,3-cd)pyrene	1.6E-08	0.00E+00	2.32E-09	3.32E-11		
Antimony	9.7E-08	0.00E+00	1.42E-08	2.03E-10		
Arsenic	1.9E-07	0.00E+00	2.85E-08	4.07E-10		1.51E+01
Beryllium	1.5E-08	0.00E+00	2.22E-09	3.17E-11		
Manganese	7.0E-06	0.00E+00	1.03E-06	1.47E-08	1.43E-05	
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(a,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	6.14E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	7.19E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	7.19E-02	6.14E-09

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 2 - AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x CF)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 5.51E-02
EF:	80	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 7.87E-04
AT(NONCAR):	365	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Antimony	0.0152	1.00E-03	8.38E-07	4.00E-04	2.09E-03
Arsenic	0.0119	1.00E-03	6.56E-07	2.80E-04	2.34E-03
Beryllium	0.0013	1.00E-03	7.16E-08	2.50E-04	2.87E-04
Boron	1.37	1.00E-03	7.55E-05	4.50E-03	1.68E-02
Manganese	4.555	1.00E-03	2.51E-04	1.50E-04	1.67E+00
Thallium	0.0138	1.00E-03	7.60E-07	4.00E-06	1.90E-01
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					1.89E+00

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK
Antimony	0.0152	1.20E–08		0.00E+00
Arsenic	0.0119	9.37E–09	1.80E+00	1.69E–08
Beryllium	0.0013	1.02E–09	8.60E+01	8.80E–08
Boron	1.37	1.08E–06		0.00E+00
Manganese	4.555	3.59E–06		0.00E+00
Thallium	0.0138	1.09E–08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				1.05E–07

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

REFERENCE EPA, DECEMBER 1989

DERMAL CONTACT DFX = (C * SA * PC * ET * EF * ED)/(BW * AT * CF)

WHERE
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 8.27E-02
EF:	120	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 1.18E-03
AT(NONCAR):	365	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Antimony	0.0152	1.00E-03	1.26E-06	4.00E-04	3.14E-03
Arsenic	0.0119	1.00E-03	9.84E-07	2.80E-04	3.51E-03
Beryllium	0.0013	1.00E-03	1.07E-07	2.50E-04	4.30E-04
Boron	1.37	1.00E-03	1.13E-04	4.50E-03	2.52E-02
Manganese	4.555	1.00E-03	3.77E-04	1.50E-04	2.51E+00
Thallium	0.0138	1.00E-03	1.14E-06	4.00E-06	2.85E-01
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					2.83E+00

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 2 - AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF - DERMAL (KG-DAY/MG)	INCREMENTAL CANCER RISK
Antimony	0.0152	1.79E-08		0.00E+00
Arsenic	0.0119	1.41E-08	1.80E+00	2.53E-08
Beryllium	0.0013	1.54E-09	8.60E+01	1.32E-07
Boron	1.37	1.62E-06		0.00E+00
Manganese	4.555	5.38E-06		0.00E+00
Thallium	0.0138	1.63E-08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				1.57E-07

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND
ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

INGESTION

IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT:

DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS

INGESTION

CR:	0.08	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 3.13E-04
EF:	80	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 4.47E-06
AT(NONCAR):	365	
AT(CAR):	25550	

DERMAL:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 1.38E-02
EF:	80	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 1.97E-04
AT(NONCAR):	365	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX – INGESTION
Arsenic	0.0026	8.14E–07	3.00E–04	2.71E–03
Cadmium	0.0066	2.07E–06	5.00E–04	4.13E–03
Manganese	0.0281	8.80E–06	5.00E–03	1.76E–03
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				8.61E–03

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Arsenic	0.0026	1.00E–03	3.58E–08	2.80E–04	1.28E–04	2.84E–03
Cadmium	0.0066	1.00E–03	9.09E–08	1.50E–05	6.06E–03	1.02E–02
Manganese	0.0261	1.00E–03	3.87E–07	1.50E–04	2.58E–03	4.34E–03
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					8.77E–03	1.74E–02

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Arsenic	1.16E–08	5.12E–10	1.75E+00	1.80E+00	2.04E–08	9.21E–10	2.13E–08
Cadmium	2.95E–08	1.30E–09			0.00E+00	0.00E+00	0.00E+00
Manganese	1.26E–07	5.53E–09			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
T TAL RISK					2.04E–08	9.21E–10	2.13E–08

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 9.39E-04
EF:	120	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 1.34E-05
AT(NONCAR):	365	
AT(CAR):	25550	

DERMAL:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 4.13E-02
EF:	120	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 5.90E-04
AT(NONCAR):	365	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX – INGESTION
Arsenic	0.0026	2.44E–06	3.00E–04	8.14E–03
Cadmium	0.0066	6.20E–06	5.00E–04	1.24E–02
Manganese	0.0281	2.64E–05	5.00E–03	5.28E–03
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				2.56E–02

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXP SURES (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Arsenic	0.0026	1.00E–03	1.07E–07	2.80E–04	3.84E–04	8.52E–03
Cadmium	0.0066	1.00E–03	2.73E–07	1.50E–05	1.82E–02	3.06E–02
Manganese	0.0281	1.00E–03	1.16E–06	1.50E–04	7.74E–03	1.30E–02
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
T TAL HAZARD INDEX					2.63E–02	5.21E–02

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Arsenic	3.49E–08	1.54E–09	1.75E+00	1.80E+00	6.11E–08	2.76E–09	6.38E–08
Cadmium	8.86E–08	3.90E–09			0.00E+00	0.00E+00	0.00E+00
Manganese	3.77E–07	1.66E–08			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					6.11E–08	2.76E–09	6.38E–08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 - AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/15/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

RELEVANT EQUATION IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	480	IR	0
EF	60	EF	350
Fi:	1	Fi:	1
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.50E-06	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.15E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3	1	0.00E+00	3.46E–06	4.94E–08		7.30E–01
Benzo(b)fluoranthene	3.7	1	0.00E+00	5.56E–06	7.94E–08		7.30E–01
Benzo(k)fluoranthene	1.8	1	0.00E+00	2.71E–06	3.86E–08		7.30E–02
Benzo(a)pyrene	2.7	1	0.00E+00	4.06E–06	5.80E–08		7.30E+00
Dibenz(a,h)anthracene	0.41	1	0.00E+00	6.16E–07	8.80E–09		7.30E+00
Indeno(1,2,3–cd)pyrene	1.9	1	0.00E+00	2.86E–06	4.08E–08		7.30E–01
Antimony	8.1	1	0.00E+00	1.22E–05	1.74E–07	4.00E–04	
Arsenic	8.2	1	0.00E+00	1.23E–05	1.76E–07	3.00E–04	1.75E+00
Beryllium	0.79	1	0.00E+00	1.19E–06	1.70E–08	5.00E–03	4.30E+00
Manganese	763	1	0.00E+00	1.15E–03	1.64E–05	5.00E–03	
Cadmium	5.8	1	0.00E+00	8.72E–06	1.25E–07	5.00E–04	
Vanadium	50.3	1	0.00E+00	7.56E–05	1.08E–06	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 - AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	3.60E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	5.80E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	2.82E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	4.23E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	6.43E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	2.98E-08
Antimony	0.00E+00	3.04E-02	0.00E+00
Arsenic	0.00E+00	4.11E-02	3.08E-07
Beryllium	0.00E+00	2.37E-04	7.29E-08
Manganese	0.00E+00	2.29E-01	0.00E+00
Cadmium	0.00E+00	1.74E-02	0.00E+00
Vanadium	0.00E+00	1.08E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.29E-01	9.95E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/15/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH:	
IR	480	IR	0
EF	120	EF	350
FI:	1	FI:	1
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.25E-06	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.22E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3	1	0.00E+00	5.19E–06	7.41E–08		7.30E–01
Benzo(b)fluoranthene	3.7	1	0.00E+00	8.34E–06	1.19E–07		7.30E–01
Benzo(k)fluoranthene	1.8	1	0.00E+00	4.06E–06	5.80E–08		7.30E–02
Benzo(a)pyrene	2.7	1	0.00E+00	6.09E–06	8.70E–08		7.30E+00
Dibenz(a,h)anthracene	0.41	1	0.00E+00	9.24E–07	1.32E–08		7.30E+00
Indeno(1,2,3–cd)pyrene	1.9	1	0.00E+00	4.28E–06	6.12E–08		7.30E–01
Antimony	8.1	1	0.00E+00	1.83E–05	2.61E–07	4.00E–04	
Arsenic	8.2	1	0.00E+00	1.85E–05	2.64E–07	3.00E–04	1.75E+00
Beryllium	0.79	1	0.00E+00	1.78E–06	2.54E–08	5.00E–03	4.30E+00
Manganese	763	1	0.00E+00	1.72E–03	2.46E–05	5.00E–03	
Cadmium	5.8	1	0.00E+00	1.31E–05	1.87E–07	5.00E–04	
Vanadium	50.3	1	0.00E+00	1.13E–04	1.62E–06	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	5.41E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	8.70E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	4.23E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	6.35E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	9.64E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	4.47E-08
Antimony	0.00E+00	4.57E-02	0.00E+00
Arsenic	0.00E+00	6.16E-02	4.62E-07
Beryllium	0.00E+00	3.56E-04	1.09E-07
Manganese	0.00E+00	3.44E-01	0.00E+00
Cadmium	0.00E+00	2.62E-02	0.00E+00
Vanadium	0.00E+00	1.62E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	4.94E-01	1.49E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/05/95

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)			
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):			0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):			3800
AF = ADHERENCE FACTOR (MG/SQ CM):			0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:		0.5
	BNAS/PESTICIDES:		0.05
	PCBS:		0.05
	METALS:		0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):			24
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):			80
ED1 = YOUTH EXPOSURE DURATION (YEARS):			6
ED2 = ADULT EXPOSURE DURATION (YEARS):			1
BW1 = BODY WEIGHT ADOLESCENT (KG):			15
BW2 = BODY WEIGHT ADULT (KG):			70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):			2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):			365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:			25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.40E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.38E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3	0.05	0.00E+00	2.74E−07	3.91E−09		
Benzo(b)fluoranthene	3.7	0.05	0.00E+00	4.40E−07	6.29E−09		
Benzo(k)fluoranthene	1.8	0.05	0.00E+00	2.14E−07	3.06E−09		
Benzo(a)pyrene	2.7	0.05	0.00E+00	3.21E−07	4.59E−09		
Dibenz(a,h)anthracene	0.41	0.05	0.00E+00	4.88E−08	6.97E−10		
Indeno(1,2,3-cd)pyrene	1.9	0.05	0.00E+00	2.26E−07	3.23E−09		
Antimony	8.1	0.01	0.00E+00	1.93E−07	2.75E−09	4.00E−04	
Arsenic	8.2	0.01	0.00E+00	1.95E−07	2.79E−09	2.80E−04	1.80E+00
Beryllium	0.79	0.01	0.00E+00	1.88E−08	2.69E−10	2.50E−04	8.60E+01
Manganese	763	0.01	0.00E+00	1.82E−05	2.59E−07	1.50E−04	
Cadmium	5.8	0.01	0.00E+00	1.38E−07	1.97E−09	1.50E−05	
Vanadium	50.3	0.01	0.00E+00	1.20E−06	1.71E−08	3.50E−04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	4.82E-04	0.00E+00
Arsenic	0.00E+00	6.97E-04	5.02E-09
Beryllium	0.00E+00	7.52E-05	2.31E-08
Manganese	0.00E+00	1.21E-01	0.00E+00
Cadmium	0.00E+00	9.20E-03	0.00E+00
Vanadium	0.00E+00	3.42E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.35E-01	2.81E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A WEAPONS CENTER
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/05/95

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C = CONCENTRATION IN SOIL (MG/KG)			
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY)			0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY)			3800
AF = ADHERENCE FACTOR (MG/SQ CM)			1
ABS = ABSORPTION FRACTION (DECIMAL FRACTION)		VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR)			24
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):			120
ED1 = YOUTH EXPOSURE DURATION (YEARS):			6
ED2 = ADULT EXPOSURE DURATION (YEARS)			1
BW1 = BODY WEIGHT ADOLESCENT (KG)			15
BW2 = BODY WEIGHT ADULT (KG)			70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):			2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):			365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:			25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS)	CF1 =	0.00E+00	CANCER RISK = (CF3)*(C)*(ABS)	CF3 =	2.55E-07
DOSEadult = (CF2)*(C)*(ABS)	CF2 =	1.78E-05			

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.3	0.05	0.00E+00	2.05E–06	2.93E–08		
Benzo(b)fluoranthene	3.7	0.05	0.00E+00	3.30E–06	4.72E–08		
Benzo(k)fluoranthene	1.8	0.05	0.00E+00	1.61E–06	2.29E–08		
Benzo(a)pyrene	2.7	0.05	0.00E+00	2.41E–06	3.44E–08		
Dibenz(a,h)anthracene	0.41	0.05	0.00E+00	3.66E–07	5.23E–09		
Indeno(1,2,3–cd)pyrene	1.9	0.05	0.00E+00	1.70E–06	2.42E–08		
Antimony	8.1	0.01	0.00E+00	1.45E–06	2.07E–08	4.00E–04	
Arsenic	8.2	0.01	0.00E+00	1.46E–06	2.09E–08	2.80E–04	1.80E+00
Beryllium	0.79	0.01	0.00E+00	1.41E–07	2.01E–09	2.50E–04	8.60E+01
Manganese	763	0.01	0.00E+00	1.36E–04	1.95E–06	1.50E–04	
Cadmium	5.8	0.01	0.00E+00	1.04E–06	1.48E–08	1.50E–05	
Vanadium	50.3	0.01	0.00E+00	8.98E–06	1.28E–07	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A WEAPONS CENTER
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	3.61E-03	0.00E+00
Arsenic	0.00E+00	5.23E-03	3.76E-08
Beryllium	0.00E+00	5.64E-04	1.73E-07
Manganese	0.00E+00	9.08E-01	0.00E+00
Cadmium	0.00E+00	6.90E-02	0.00E+00
Vanadium	0.00E+00	2.56E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.01E+00	2.11E-07

APPENDIX F.8

SITE 2 - AREA A DOWNSTREAM

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET. TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 3.91E–06
EF:	1	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 1.40E–06
AT(NONCAR):	9125	
AT(CAR):	25550	

DERMAL:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 1.72E–04
EF:	1	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 6.15E–05
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET - SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 - AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	0.533	2.09E-06	5.00E-03	4.17E-04
4,4'-DDD	0.00015	5.87E-10		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				4.17E-04

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXP SURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	0.533	1.00E–03	9.18E–08	1.50E–04	6.12E–04	1.03E–03
4,4'–DDD	0.00015	2.80E–01	7.23E–09		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					6.12E–04	1.03E–03

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXP SURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	7.45E–07	3.28E–08			0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	2.10E–10	2.58E–09	2.40E–01	3.00E–01	5.03E–11	7.75E–10	8.25E–10
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					5.03E–11	7.75E–10	8.25E–10

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET. TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 2.74E-05
EF:	3.5	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 9.78E-06
AT(NONCAR):	9125	
AT(CAR):	25550	

DERMAL:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 1.21E-03
EF:	3.5	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 4.31E-04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	0.533	1.46E-05	5.00E-03	2.92E-03
4,4'-DDD	0.00015	4.11E-09		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				2.92E-03

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	0.533	1.00E–03	6.43E–07	1.50E–04	4.28E–03	7.20E–03
4,4'-DDD	0.00015	2.80E–01	5.06E–08		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					4.28E–03	7.20E–03

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	5.22E–06	2.29E–07			0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	1.47E–09	1.81E–08	2.40E–01	3.00E–01	3.52E–10	5.42E–09	5.78E–09
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					3.52E–10	5.42E–09	5.78E–09

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET. TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 3.91E-06
EF:	1	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 1.40E-06
AT(NONCAR):	9125	
AT(CAR):	25550	

DERMAL:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 1.72E-04
EF:	1	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 6.15E-05
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	1.72	6.73E-06	5.00E-03	1.35E-03
4,4'-DDD	0.0013	5.09E-09		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				**1.35E-03**

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	1.72	1.00E–03	2.96E–07	1.50E–04	1.97E–03	3.32E–03
4,4'-DDD	0.0013	2.80E–01	6.27E–08		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					1.97E–03	3.32E–03

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	2.40E–06	1.06E–07			0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	1.82E–09	2.24E–08	2.40E–01	3.00E–01	4.36E–10	6.72E–09	7.15E–09
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					4.36E–10	6.72E–09	7.15E–09

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 2.74E–05
EF:	3.5	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 9.78E–06
AT(NONCAR):	9125	
AT(CAR):	25550	

DERMAL:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 1.21E–03
EF:	3.5	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 4.31E–04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET - SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 - AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	1.72	4.71E-05	5.00E-03	9.42E-03
4,4'-DDD	0.0013	3.56E-08		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				9.42E-03

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	1.72	1.00E–03	2.07E–06	1.50E–04	1.38E–02	2.32E–02
4,4'-DDD	0.0013	2.80E–01	4.39E–07		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					1.38E–02	2.32E–02

RISK ASSESSMENT SPREADSHEET - SURFACE WATER EXP SURES (PAGE FOUR)
SITE 2 - AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF - INGESTION (KG-DAY/MG)	CSF - DERMAL (KG-DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	1.68E-05	7.41E-07			0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	1.27E-08	1.57E-07	2.40E-01	3.00E-01	3.05E-09	4.70E-08	5.01E-08
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					3.05E-09	4.70E-08	5.01E-08

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET. TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 3.77E-04
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 3.23E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	10500	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 7.91E-02
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 6.78E-03
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	0.0642	2.42E-05	5.00E-03	4.84E-03
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				**4.84E-03**

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	0.0642	1.00E–03	5.08E–06	1.50E–04	3.39E–02	3.87E–02
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					3.39E–02	3.87E–02

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXP SURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	2.07E–06	4.35E–07			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					0.00E+00	0.00E+00	0.00E+00

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND
ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 7.53E-04
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 6.46E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	10500	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 1.58E-01
EF:	55	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 1.36E-02
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	0.0642	4.84E-05	5.00E-03	9.67E-03
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				9.67E-03

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	0.0642	1.00E–03	1.02E–05	1.50E–04	6.77E–02	7.74E–02
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					6.77E–02	7.74E–02

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	4.15E–06	8.71E–07			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					0.00E+00	0.00E+00	0.00E+00

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND
ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 1.92E-04
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 1.64E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	3150	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 1.21E-02
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 1.04E-03
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	0.533	1.02E-04	5.00E-03	2.04E-02
4,4'-DDD	0.00015	2.88E-08		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				**2.04E-02**

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	0.533	1.00E–03	6.44E–06	1.50E–04	4.29E–02	6.34E–02
4,4'–DDD	0.00015	2.80E–01	5.07E–07		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					4.29E–02	6.34E–02

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	8.76E–06	5.52E–07			0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	2.47E–09	4.35E–08	2.40E–01	3.00E–01	5.92E–10	1.30E–08	1.36E–08
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					5.92E–10	1.30E–08	1.36E–08

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET. TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

REFERENCE: EPA, DECEMBER 1989

INGESTION IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 3.84E-04
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 3.29E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	3150	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 2.42E-02
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 2.07E-03
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	0.533	2.04E–04	5.00E–03	4.09E–02
4,4'–DDD	0.00015	5.75E–08		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				4.09E–02

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	0.533	1.00E–03	1.29E–05	1.50E–04	8.59E–02	1.27E–01
4,4'–DDD	0.00015	2.80E–01	1.01E–06		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					8.59E–02	1.27E–01

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	1.75E–05	1.10E–06			0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	4.93E–09	8.70E–08	2.40E–01	3.00E–01	1.18E–09	2.61E–08	2.73E–08
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
T TAL RISK					1.18E–09	2.61E–08	2.73E–08

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER: CTE

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 1.92E-04
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 1.64E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	3150	AVERAGE ANNUAL DOSE
ET:	2	CONVERSION FACTOR 1.21E-02
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 1.04E-03
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER: CTE
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	1.72	3.30E–04	5.00E–03	6.60E–02
4,4'–DDD	0.0013	2.49E–07		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				**6.60E–02**

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER: CTE
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	1.72	1.00E–03	2.08E–05	1.50E–04	1.39E–01	2.05E–01
4,4'–DDD	0.0013	2.80E–01	4.40E–06		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					1.39E–01	2.05E–01

RISK ASSESSMENT SPREADSHEET - SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 - AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER: CTE
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF - INGESTION (KG-DAY/MG)	CSF - DERMAL (KG-DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	2.83E-05	1.78E-06			0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	2.14E-08	3.77E-07	2.40E-01	3.00E-01	5.13E-09	1.13E-07	1.18E-07
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					5.13E-09	1.13E-07	1.18E-07

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET. TWO EXPOSURE SCENARIOS ARE CONSIDERED: DERMAL CONTACT WITH WATER AND ACCIDENTAL INGESTION OF WATER. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER: RME

REFERENCE: EPA, DECEMBER 1989

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (LITERS/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x 1000)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INPUT PARAMETERS:

INGESTION:

CR:	0.05	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 3.84E-04
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 3.29E-05
AT(NONCAR):	2190	
AT(CAR):	25550	

DERMAL:

SA:	3150	AVERAGE ANNUAL DOSE
ET:	4	CONVERSION FACTOR 2.42E-02
EF:	28	
ED:	6	LIFETIME ANNUAL DOSE
BW:	40	CONVERSION FACTOR 2.07E-03
AT(NONCAR):	2190	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET - SURFACE WATER EXPOSURES (PAGE TWO)
SITE 2 - AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER: RME
CALCULATE HAZARD INDICES (INGESTION):

CHEMICAL	CONCENTRATION (MG/L)	AVERAGE ANNUAL DOSE (MG/KG/DAY)	INGESTION REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Manganese	1.72	6.60E-04	5.00E-03	1.32E-01
4,4'-DDD	0.0013	4.99E-07		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0 00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0 00E+00		0.00E+00
		0 00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
		0.00E+00		0.00E+00
TOTAL HAZARD INDEX				**1.32E-01**

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER: RME
CALCULATE HAZARD INDICES (DERMAL):

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX–DERMAL	TOTAL HAZARD INDEX
Manganese	1.72	1.00E–03	4.16E–05	1.50E–04	2.77E–01	4.09E–01
4,4'-DDD	0.0013	2.80E–01	8.80E–06		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
0	0		0.00E+00		0.00E+00	0.00E+00
TOTAL HAZARD INDEX					2.77E–01	4.09E–01

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER: RME
CALCULATE INCREMENTAL CANCER RISK

CHEMICAL	LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – INGESTION (KG–DAY/MG)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK INGESTION	INCREMENTAL CANCER RISK DERMAL	TOTAL INCREMENTAL CANCER RISK
Manganese	5.65E–05	3.56E–06			0.00E+00	0.00E+00	0.00E+00
4,4'–DDD	4.27E–08	7.54E–07	2.40E–01	3.00E–01	1.03E–08	2.26E–07	2.36E–07
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00
TOTAL RISK					1.03E–08	2.26E–07	2.36E–07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	480	IR:	0
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.88E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	6.71E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
2-Nitroaniline	3.1	1	0.00E+00	5.82E-08	2.08E-08	6.00E-05	
Benzo(a)anthracene	0.7	1	0.00E+00	1.32E-08	4.70E-09		7.30E-01
Benzo(b)fluoranthene	0.5	1	0.00E+00	9.39E-09	3.35E-09		7.30E-01
Benzo(a)pyrene	0.41	1	0.00E+00	7.70E-09	2.75E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.75	1	0.00E+00	1.41E-08	5.03E-09		7.30E-01
4,4'-DDD	90	0.3	0.00E+00	5.07E-07	1.81E-07		2.40E-01
4,4'-DDE	6.3	0.3	0.00E+00	3.55E-08	1.27E-08		3.40E-01
4,4'-DDT	7	0.3	0.00E+00	3.95E-08	1.41E-08	5.00E-04	3.40E-01
Aroclor-1260	0.28	0.3	0.00E+00	1.58E-09	5.64E-10	2.00E-05	7.70E+00
Arsenic	7.5	1	0.00E+00	1.41E-07	5.03E-08	3.00E-04	1.75E+00
Beryllium	5.4	1	0.00E+00	1.01E-07	3.62E-08	5.00E-03	4.30E+00
Boron	870	1	0.00E+00	1.63E-05	5.84E-06	9.00E-02	
Cadmium	13.8	1	0.00E+00	2.59E-07	9.26E-08	5.00E-04	
Manganese	236	1	0.00E+00	4.43E-06	1.58E-06	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
2-Nitroaniline	0.00E+00	9.71E-04	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	3.43E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	2.45E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.01E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	3.67E-09
4,4'-DDD	0.00E+00	0.00E+00	4.35E-08
4,4'-DDE	0.00E+00	0.00E+00	4.31E-09
4,4'-DDT	0.00E+00	7.89E-05	4.79E-09
Aroclor-1260	0.00E+00	7.89E-05	4.34E-09
Arsenic	0.00E+00	4.70E-04	8.81E-08
Beryllium	0.00E+00	2.03E-05	1.56E-07
Boron	0.00E+00	1.82E-04	0.00E+00
Cadmium	0.00E+00	5.19E-04	0.00E+00
Manganese	0.00E+00	8.87E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.21E-03	3.30E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	480	IR:	0
EF:	3.5	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	6.58E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.35E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
2-Nitroaniline	3.1	1	0.00E+00	2.04E-07	7.28E-08	6.00E-05	
Benzo(a)anthracene	0.7	1	0.00E+00	4.60E-08	1.64E-08		7.30E-01
Benzo(b)fluoranthene	0.5	1	0.00E+00	3.29E-08	1.17E-08		7.30E-01
Benzo(a)pyrene	0.41	1	0.00E+00	2.70E-08	9.63E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.75	1	0.00E+00	4.93E-08	1.76E-08		7.30E-01
4,4'-DDD	90	0.3	0.00E+00	1.78E-06	6.34E-07		2.40E-01
4,4'-DDE	6.3	0.3	0.00E+00	1.24E-07	4.44E-08		3.40E-01
4,4'-DDT	7	0.3	0.00E+00	1.38E-07	4.93E-08	5.00E-04	3.40E-01
Aroclor-1260	0.28	0.3	0.00E+00	5.52E-09	1.97E-09	2.00E-05	7.70E+00
Arsenic	7.5	1	0.00E+00	4.93E-07	1.76E-07	3.00E-04	1.75E+00
Beryllium	5.4	1	0.00E+00	3.55E-07	1.27E-07	5.00E-03	4.30E+00
Boron	870	1	0.00E+00	5.72E-05	2.04E-05	9.00E-02	
Cadmium	13.8	1	0.00E+00	9.07E-07	3.24E-07	5.00E-04	
Manganese	236	1	0.00E+00	1.55E-05	5.54E-06	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
2-Nitroaniline	0.00E+00	3.40E-03	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	1.20E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	8.57E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	7.03E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.29E-08
4,4'-DDD	0.00E+00	0.00E+00	1.52E-07
4,4'-DDE	0.00E+00	0.00E+00	1.51E-08
4,4'-DDT	0.00E+00	2.76E-04	1.68E-08
Aroclor-1260	0.00E+00	2.76E-04	1.52E-08
Arsenic	0.00E+00	1.64E-03	3.08E-07
Beryllium	0.00E+00	7.10E-05	5.45E-07
Boron	0.00E+00	6.36E-04	0.00E+00
Cadmium	0.00E+00	1.81E-03	0.00E+00
Manganese	0.00E+00	3.10E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.12E-02	1.16E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	480	IR:	0
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.88E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	6.71E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	1	0.00E+00	1.47E-08	5.23E-09		7.30E-01
Benzo(b)fluoranthene	0.52	1	0.00E+00	9.77E-09	3.49E-09		7.30E-01
Benzo(a)pyrene	0.64	1	0.00E+00	1.20E-08	4.29E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	1.2	1	0.00E+00	2.25E-08	8.05E-09		7.30E-01
4,4'-DDD	1700	0.3	0.00E+00	9.58E-06	3.42E-06		2.40E-01
4,4'-DDE	28	0.3	0.00E+00	1.58E-07	5.64E-08		3.40E-01
4,4'-DDT	240	0.3	0.00E+00	1.35E-06	4.83E-07	5.00E-04	3.40E-01
Arsenic	4.2	1	0.00E+00	7.89E-08	2.82E-08	3.00E-04	1.75E+00
Beryllium	0.58	1	0.00E+00	1.09E-08	3.89E-09	5.00E-03	4.30E+00
Boron	4100	1	0.00E+00	7.70E-05	2.75E-05	9.00E-02	
Manganese	657	1	0.00E+00	1.23E-05	4.41E-06	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	3.82E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	2.55E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	3.13E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	5.88E-09
4,4'-DDD	0.00E+00	0.00E+00	8.21E-07
4,4'-DDE	0.00E+00	0.00E+00	1.92E-08
4,4'-DDT	0.00E+00	2.71E-03	1.64E-07
Arsenic	0.00E+00	2.63E-04	4.93E-08
Beryllium	0.00E+00	2.18E-06	1.67E-08
Boron	0.00E+00	8.56E-04	0.00E+00
Manganese	0.00E+00	2.47E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	6.29E-03	1.11E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	480	IR:	0
EF:	3.5	EF:	26
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	6.58E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.35E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARI : UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	1	0.00E+00	5.13E-08	1.83E-08		7.30E-01
Benzo(b)fluoranthene	0.52	1	0.00E+00	3.42E-08	1.22E-08		7.30E-01
Benzo(a)pyrene	0.64	1	0.00E+00	4.21E-08	1.50E-08		7.30E+00
Indeno(1,2,3-cd)pyrene	1.2	1	0.00E+00	7.89E-08	2.82E-08		7.30E-01
4,4'-DDD	1700	0.3	0.00E+00	3.35E-05	1.20E-05		2.40E-01
4,4'-DDE	28	0.3	0.00E+00	5.52E-07	1.97E-07		3.40E-01
4,4'-DDT	240	0.3	0.00E+00	4.73E-06	1.69E-06	5.00E-04	3.40E-01
Arsenic	4.2	1	0.00E+00	2.76E-07	9.86E-08	3.00E-04	1.75E+00
Beryllium	0.58	1	0.00E+00	3.81E-08	1.36E-08	5.00E-03	4.30E+00
Boron	4100	1	0.00E+00	2.70E-04	9.63E-05	9.00E-02	
Manganese	657	1	0.00E+00	4.32E-05	1.54E-05	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.34E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	8.91E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	1.10E-07
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	2.06E-08
4,4'-DDD	0.00E+00	0.00E+00	2.87E-06
4,4'-DDE	0.00E+00	0.00E+00	6.71E-08
4,4'-DDT	0.00E+00	9.47E-03	5.75E-07
Arsenic	0.00E+00	9.21E-04	1.73E-07
Beryllium	0.00E+00	7.63E-06	5.86E-08
Boron	0.00E+00	3.00E-03	0.00E+00
Manganese	0.00E+00	8.64E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.20E-02	3.90E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	480	IR:	0
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.88E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	6.71E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.85	1	0.00E+00	1.60E-08	5.70E-09		7.30E-01
Benzo(b)fluoranthene	0.75	1	0.00E+00	1.41E-08	5.03E-09		7.30E-01
Benzo(a)pyrene	0.59	1	0.00E+00	1.11E-08	3.96E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.36	1	0.00E+00	6.76E-09	2.42E-09		7.30E-01
4,4'-DDD	300	0.3	0.00E+00	1.69E-06	6.04E-07		2.40E-01
4,4'-DDE	15	0.3	0.00E+00	8.45E-08	3.02E-08		3.40E-01
4,4'-DDT	37	0.3	0.00E+00	2.09E-07	7.45E-08	5.00E-04	3.40E-01
Arsenic	39.9	1	0.00E+00	7.50E-07	2.68E-07	3.00E-04	1.75E+00
Beryllium	1.8	1	0.00E+00	3.38E-08	1.21E-08	5.00E-03	4.30E+00
Boron	6300	1	0.00E+00	1.56E-04	5.57E-05	9.00E-02	
Cadmium	30.1	1	0.00E+00	5.65E-07	2.02E-07	5.00E-04	
Manganese	1020	1	0.00E+00	1.92E-05	6.84E-06	5.00E-03	
Vanadium	64.9	1	0.00E+00	1.22E-06	4.35E-07	7.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	4.16E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	3.67E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.89E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.76E-09
4,4'-DDD	0.00E+00	0.00E+00	1.45E-07
4,4'-DDE	0.00E+00	0.00E+00	1.03E-08
4,4'-DDT	0.00E+00	4.17E-04	2.53E-08
Arsenic	0.00E+00	2.50E-03	4.68E-07
Beryllium	0.00E+00	6.76E-06	5.19E-08
Boron	0.00E+00	1.73E-03	0.00E+00
Cadmium	0.00E+00	1.13E-03	0.00E+00
Manganese	0.00E+00	3.63E-03	0.00E+00
Vanadium	0.00E+00	1.74E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	9.79E-03	7.39E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	480	IR:	0
EF:	3.5	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	6.58E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.35E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.85	1	0.00E+00	5.59E-08	2.00E-08		7.30E-01
Benzo(b)fluoranthene	0.75	1	0.00E+00	4.93E-08	1.76E-08		7.30E-01
Benzo(a)pyrene	0.59	1	0.00E+00	3.88E-08	1.39E-08		7.30E+00
Indeno(1,2,3-cd)pyrene	0.36	1	0.00E+00	2.37E-08	8.45E-09		7.30E-01
4,4'-DDD	300	0.3	0.00E+00	5.92E-06	2.11E-06		2.40E-01
4,4'-DDE	15	0.3	0.00E+00	2.96E-07	1.06E-07		3.40E-01
4,4'-DDT	37	0.3	0.00E+00	7.30E-07	2.61E-07	5.00E-04	3.40E-01
Arsenic	39.9	1	0.00E+00	2.62E-06	9.37E-07	3.00E-04	1.75E+00
Beryllium	1.8	1	0.00E+00	1.18E-07	4.23E-08	5.00E-03	4.30E+00
Boron	8300	1	0.00E+00	5.46E-04	1.95E-04	9.00E-02	
Cadmium	30.1	1	0.00E+00	1.98E-06	7.07E-07	5.00E-04	
Manganese	1020	1	0.00E+00	6.71E-05	2.40E-05	5.00E-03	
Vanadium	64.9	1	0.00E+00	4.27E-06	1.52E-06	7.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.46E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.29E-08
Benzo(a)pyrene	0.00E+00	0.00E+00	1.01E-07
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	6.17E-09
4,4'-DDD	0.00E+00	0.00E+00	5.07E-07
4,4'-DDE	0.00E+00	0.00E+00	3.59E-08
4,4'-DDT	0.00E+00	1.46E-03	8.86E-08
Arsenic	0.00E+00	8.75E-03	1.64E-06
Beryllium	0.00E+00	2.37E-05	1.82E-07
Boron	0.00E+00	6.06E-03	0.00E+00
Cadmium	0.00E+00	3.96E-03	0.00E+00
Manganese	0.00E+00	1.34E-02	0.00E+00
Vanadium	0.00E+00	6.10E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.43E-02	2.59E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: RECREATIONAL CHILD USER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	50
EF:	3.5	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	9.59E-08	(AVG ANNUAL DOSE)	CF:	8.22E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: RECREATIONAL CHILD USER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Arsenic	4.5	1	4.32E–07	0.00E+00	3.70E–08	3.00E–04	1.75E+00
Beryllium	0.36	1	3.45E–08	0.00E+00	2.96E–09	5.00E–03	4.30E+00
Manganese	177	1	1.70E–05	0.00E+00	1.45E–06	5.00E–03	
Mercury	7	1	6.71E–07	0.00E+00	5.75E–08	3.00E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: RECREATIONAL CHILD USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Arsenic	1.44E-03	0.00E+00	6.47E-08
Beryllium	6.90E-06	0.00E+00	1.27E-08
Manganese	3.39E-03	0.00E+00	0.00E+00
Mercury	2.24E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	7.08E-03	0.00E+00	7.74E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 - AREA A DOWNSTREAM; NORTH LAKE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: RECREATIONAL CHILD USER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	100
EF:	35	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	1.92E-07	(AVG ANNUAL DOSE)	CF:	1.64E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: RECREATIONAL CHILD USER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	C F (KG–DAY/MG)
Arsenic	4.5	1	8.63E–07	0.00E+00	7.40E–08	3.00E–04	1.75E+00
Beryllium	0.36	1	6.90E–08	0.00E+00	5.92E–09	5.00E–03	4.30E+00
Manganese	177	1	3.39E–05	0.00E+00	2.91E–06	5.00E–03	
Mercury	7	1	1.34E–06	0.00E+00	1.15E–07	3.00E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: RECREATIONAL CHILD USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Arsenic	2.88E-03	0.00E+00	1.29E-07
Beryllium	1.38E-05	0.00E+00	2.54E-08
Manganese	6.79E-03	0.00E+00	0.00E+00
Mercury	4.47E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**1.42E-02**	**0.00E+00**	**1.55E-07**

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	50
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	9.59E-08	(AVG ANNUAL DOSE)	CF:	8.22E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
2-Nitroaniline	3.1	1	2.97E-07	0.00E+00	2.55E-08	6.00E-05	
Benzo(a)anthracene	0.7	1	6.71E-08	0.00E+00	5.75E-09		7.30E-01
Benzo(b)fluoranthene	0.5	1	4.79E-08	0.00E+00	4.11E-09		7.30E-01
Benzo(a)pyrene	0.41	1	3.93E-08	0.00E+00	3.37E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.75	1	7.19E-08	0.00E+00	6.16E-09		7.30E-01
4,4'-DDD	90	0.3	2.59E-06	0.00E+00	2.22E-07		2.40E-01
4,4'-DDE	6.3	0.3	1.81E-07	0.00E+00	1.55E-08		3.40E-01
4,4'-DDT	7	0.3	2.01E-07	0.00E+00	1.73E-08	5.00E-04	3.40E-01
Aroclor-1260	0.28	0.3	8.05E-09	0.00E+00	6.90E-10	2.00E-05	7.70E+00
Arsenic	7.5	1	7.19E-07	0.00E+00	6.16E-08	3.00E-04	1.75E+00
Beryllium	5.4	1	5.18E-07	0.00E+00	4.44E-08	5.00E-03	4.30E+00
Boron	870	1	8.34E-05	0.00E+00	7.15E-06	9.00E-02	
Cadmium	13.8	1	1.32E-06	0.00E+00	1.13E-07	5.00E-04	
Manganese	236	1	2.26E-05	0.00E+00	1.94E-06	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 - AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
2-Nitroaniline	4.95E-03	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	4.20E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	3.00E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.46E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	4.50E-09
4,4'-DDD	0.00E+00	0.00E+00	5.33E-08
4,4'-DDE	0.00E+00	0.00E+00	5.28E-09
4,4'-DDT	4.03E-04	0.00E+00	5.87E-09
Aroclor-1260	4.03E-04	0.00E+00	5.32E-09
Arsenic	2.40E-03	0.00E+00	1.08E-07
Beryllium	1.04E-04	0.00E+00	1.91E-07
Boron	9.27E-04	0.00E+00	0.00E+00
Cadmium	2.65E-03	0.00E+00	0.00E+00
Manganese	4.53E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.64E-02	0.00E+00	4.05E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	100
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	1.92E–07	(AVG ANNUAL DOSE)	CF:	1.64E–08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
2-Nitroaniline	3.1	1	5.95E-07	0.00E+00	5.10E-08	6.00E-05	
Benzo(a)anthracene	0.7	1	1.34E-07	0.00E+00	1.15E-08		7.30E-01
Benzo(b)fluoranthene	0.5	1	9.59E-08	0.00E+00	8.22E-09		7.30E-01
Benzo(a)pyrene	0.41	1	7.86E-08	0.00E+00	6.74E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.75	1	1.44E-07	0.00E+00	1.23E-08		7.30E-01
4,4'-DDD	90	0.3	5.18E-06	0.00E+00	4.44E-07		2.40E-01
4,4'-DDE	6.3	0.3	3.62E-07	0.00E+00	3.11E-08		3.40E-01
4,4'-DDT	7	0.3	4.03E-07	0.00E+00	3.45E-08	5.00E-04	3.40E-01
Aroclor-1260	0.28	0.3	1.61E-08	0.00E+00	1.38E-09	2.00E-05	7.70E+00
Arsenic	7.5	1	1.44E-06	0.00E+00	1.23E-07	3.00E-04	1.75E+00
Beryllium	5.4	1	1.04E-06	0.00E+00	8.88E-08	5.00E-03	4.30E+00
Boron	870	1	1.67E-04	0.00E+00	1.43E-05	9.00E-02	
Cadmium	13.8	1	2.65E-06	0.00E+00	2.27E-07	5.00E-04	
Manganese	236	1	4.53E-05	0.00E+00	3.88E-06	5.00E-03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
2-Nitroaniline	9.91E-03	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	8.40E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	6.00E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	4.92E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	9.00E-09
4,4'-DDD	0.00E+00	0.00E+00	1.07E-07
4,4'-DDE	0.00E+00	0.00E+00	1.06E-08
4,4'-DDT	8.05E-04	0.00E+00	1.17E-08
Aroclor-1260	8.05E-04	0.00E+00	1.06E-08
Arsenic	4.79E-03	0.00E+00	2.16E-07
Beryllium	2.07E-04	0.00E+00	3.82E-07
Boron	1.85E-03	0.00E+00	0.00E+00
Cadmium	5.29E-03	0.00E+00	0.00E+00
Manganese	9.05E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	3.27E-02	0.00E+00	8.10E-07

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 - AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	50
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	9.59E-08	(AVG ANNUAL DOSE)	CF:	8.22E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	1	7.48E–08	0.00E+00	6.41E–09		7.30E–01
Benzo(b)fluoranthene	0.52	1	4.99E–08	0.00E+00	4.27E–09		7.30E–01
Benzo(a)pyrene	0.64	1	6.14E–08	0.00E+00	5.26E–09		7.30E+00
Indeno(1,2,3–cd)pyrene	1.2	1	1.15E–07	0.00E+00	9.86E–09		7.30E–01
4,4'–DDD	1700	0.3	4.89E–05	0.00E+00	4.19E–06		2.40E–01
4,4'–DDE	28	0.3	8.05E–07	0.00E+00	6.90E–08		3.40E–01
4,4'–DDT	240	0.3	6.90E–06	0.00E+00	5.92E–07	5.00E–04	3.40E–01
Arsenic	4.2	1	4.03E–07	0.00E+00	3.45E–08	3.00E–04	1.75E+00
Beryllium	0.58	1	5.56E–08	0.00E+00	4.77E–09	5.00E–03	4.30E+00
Boron	4100	1	3.93E–04	0.00E+00	3.37E–05	9.00E–02	
Manganese	657	1	6.30E–05	0.00E+00	5.40E–06	5.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	4.68E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	3.12E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	3.84E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	7.20E-09
4,4'-DDD	0.00E+00	0.00E+00	1.01E-06
4,4'-DDE	0.00E+00	0.00E+00	2.35E-08
4,4'-DDT	1.38E-02	0.00E+00	2.01E-07
Arsenic	1.34E-03	0.00E+00	6.04E-08
Beryllium	1.11E-05	0.00E+00	2.05E-08
Boron	4.37E-03	0.00E+00	0.00E+00
Manganese	1.26E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	3.21E-02	0.00E+00	1.37E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	100
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	1.92E-07	(AVG ANNUAL DOSE)	CF:	1.64E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	1	1.50E–07	0.00E+00	1.28E–08		7.30E–01
Benzo(b)fluoranthene	0.52	1	9.97E–08	0.00E+00	8.55E–09		7.30E–01
Benzo(a)pyrene	0.64	1	1.23E–07	0.00E+00	1.05E–08		7.30E+00
Indeno(1,2,3–cd)pyrene	1.2	1	2.30E–07	0.00E+00	1.97E–08		7.30E–01
4,4'–DDD	1700	0.3	9.78E–05	0.00E+00	8.38E–06		2.40E–01
4,4'–DDE	28	0.3	1.61E–06	0.00E+00	1.38E–07		3.40E–01
4,4'–DDT	240	0.3	1.38E–05	0.00E+00	1.18E–06	5.00E–04	3.40E–01
Arsenic	4.2	1	8.05E–07	0.00E+00	6.90E–08	3.00E–04	1.75E+00
Beryllium	0.58	1	1.11E–07	0.00E+00	9.53E–09	5.00E–03	4.30E+00
Boron	4100	1	7.86E–04	0.00E+00	6.74E–05	9.00E–02	
Manganese	657	1	1.26E–04	0.00E+00	1.08E–05	5.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	9.36E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	6.24E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	7.68E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.44E-08
4,4'-DDD	0.00E+00	0.00E+00	2.01E-06
4,4'-DDE	0.00E+00	0.00E+00	4.69E-08
4,4'-DDT	2.76E-02	0.00E+00	4.02E-07
Arsenic	2.68E-03	0.00E+00	1.21E-07
Beryllium	2.22E-05	0.00E+00	4.10E-08
Boron	8.74E-03	0.00E+00	0.00E+00
Manganese	2.52E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.43E-02	0.00E+00	2.73E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	50
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	9.59E-08	(AVG ANNUAL DOSE)	CF:	8.22E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.85	1	8.15E–08	0.00E+00	6.99E–09		7.30E–01
Benzo(b)fluoranthene	0.75	1	7.19E–08	0.00E+00	6.16E–09		7.30E–01
Benzo(a)pyrene	0.59	1	5.66E–08	0.00E+00	4.85E–09		7.30E+00
Indeno(1,2,3–cd)pyrene	0.36	1	3.45E–08	0.00E+00	2.96E–09		7.30E–01
4,4'–DDD	300	0.3	8.63E–06	0.00E+00	7.40E–07		2.40E–01
4,4'–DDE	15	0.3	4.32E–07	0.00E+00	3.70E–08		3.40E–01
4,4'–DDT	37	0.3	1.06E–06	0.00E+00	9.12E–08	5.00E–04	3.40E–01
Arsenic	39.9	1	3.83E–06	0.00E+00	3.28E–07	3.00E–04	1.75E+00
Beryllium	1.8	1	1.73E–07	0.00E+00	1.48E–08	5.00E–03	4.30E+00
Boron	8300	1	7.96E–04	0.00E+00	6.82E–05	9.00E–02	
Cadmium	30.1	1	2.89E–06	0.00E+00	2.47E–07	5.00E–04	
Manganese	1020	1	9.78E–05	0.00E+00	8.38E–06	5.00E–03	
Vanadium	64.9	1	6.22E–06	0.00E+00	5.33E–07	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	5.10E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	4.50E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	3.54E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	2.16E-09
4,4'-DDD	0.00E+00	0.00E+00	1.78E-07
4,4'-DDE	0.00E+00	0.00E+00	1.26E-08
4,4'-DDT	2.13E-03	0.00E+00	3.10E-08
Arsenic	1.28E-02	0.00E+00	5.74E-07
Beryllium	3.45E-05	0.00E+00	6.36E-08
Boron	8.84E-03	0.00E+00	0.00E+00
Cadmium	5.77E-03	0.00E+00	0.00E+00
Manganese	1.96E-02	0.00E+00	0.00E+00
Vanadium	8.89E-04	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	5.00E-02	0.00E+00	9.06E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR:	0	IR:	100
EF:	1	EF:	28
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	40
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	1.92E-07	(AVG ANNUAL DOSE)	CF:	1.64E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.85	1	1.63E–07	0.00E+00	1.40E–08		7.30E–01
Benzo(b)fluoranthene	0.75	1	1.44E–07	0.00E+00	1.23E–08		7.30E–01
Benzo(a)pyrene	0.59	1	1.13E–07	0.00E+00	9.70E–09		7.30E+00
Indeno(1,2,3–cd)pyrene	0.36	1	6.90E–08	0.00E+00	5.92E–09		7.30E–01
4,4'–DDD	300	0.3	1.73E–05	0.00E+00	1.48E–06		2.40E–01
4,4'–DDE	15	0.3	8.63E–07	0.00E+00	7.40E–08		3.40E–01
4,4'–DDT	37	0.3	2.13E–06	0.00E+00	1.82E–07	5.00E–04	3.40E–01
Arsenic	39.9	1	7.65E–06	0.00E+00	6.56E–07	3.00E–04	1.75E+00
Beryllium	1.8	1	3.45E–07	0.00E+00	2.96E–08	5.00E–03	4.30E+00
Boron	8300	1	1.59E–03	0.00E+00	1.36E–04	9.00E–02	
Cadmium	30.1	1	5.77E–06	0.00E+00	4.95E–07	5.00E–04	
Manganese	1020	1	1.96E–04	0.00E+00	1.68E–05	5.00E–03	
Vanadium	64.9	1	1.24E–05	0.00E+00	1.07E–06	7.00E–03	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.02E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	9.00E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	7.08E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	4.32E-09
4,4'-DDD	0.00E+00	0.00E+00	3.55E-07
4,4'-DDE	0.00E+00	0.00E+00	2.52E-08
4,4'-DDT	4.26E-03	0.00E+00	6.20E-08
Arsenic	2.55E-02	0.00E+00	1.15E-06
Beryllium	6.90E-05	0.00E+00	1.27E-07
Boron	1.77E-02	0.00E+00	0.00E+00
Cadmium	1.15E-02	0.00E+00	0.00E+00
Manganese	3.91E-02	0.00E+00	0.00E+00
Vanadium	1.78E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.00E-01	0.00E+00	1.81E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		26
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.97E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.7	0.05	0.00E+00	1.04E–09	3.72E–10		
Benzo(b)fluoranthene	0.5	0.05	0.00E+00	7.44E–10	2.66E–10		
Benzo(a)pyrene	0.41	0.05	0.00E+00	6.10E–10	2.18E–10		
Indeno(1,2,3–cd)pyrene	0.75	0.05	0.00E+00	1.12E–09	3.98E–10		
4,4'–DDD	90	0.05	0.00E+00	1.34E–07	4.78E–08		3.00E–01
4,4'–DDE	6.3	0.05	0.00E+00	9.37E–09	3.35E–09		4.20E–01
4,4'–DDT	7	0.05	0.00E+00	1.04E–08	3.72E–09	4.00E–04	4.20E–01
Aroclor–1260	0.28	0.05	0.00E+00	4.16E–10	1.49E–10	2.00E–05	7.70E+00
Arsenic	7.5	0.01	0.00E+00	2.23E–09	7.97E–10	2.80E–04	1.80E+00
Beryllium	5.4	0.01	0.00E+00	1.61E–09	5.74E–10	2.50E–04	8.60E+01
Boron	870	0.01	0.00E+00	2.59E–07	9.24E–08	4.50E–03	
Cadmium	13.8	0.01	0.00E+00	4.10E–09	1.47E–09	1.50E–05	
Manganese	236	0.01	0.00E+00	7.02E–08	2.51E–08	1.50E–04	
2–Nitroaniline	3.1	0.05	0.00E+00	4.61E–09	1.65E–09	6.00E–05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	1.43E-08
4,4'-DDE	0.00E+00	0.00E+00	1.41E-09
4,4'-DDT	0.00E+00	2.60E-05	1.56E-09
Aroclor-1260	0.00E+00	2.08E-05	1.15E-09
Arsenic	0.00E+00	7.97E-06	1.43E-09
Beryllium	0.00E+00	6.43E-06	4.93E-08
Boron	0.00E+00	5.75E-05	0.00E+00
Cadmium	0.00E+00	2.74E-04	0.00E+00
Manganese	0.00E+00	4.68E-04	0.00E+00
2-Nitroaniline	0.00E+00	7.68E-05	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	9.37E-04	6.92E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG):		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		3.5
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.86E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 5.21E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.7	0.05	0.00E+00	1.82E–08	6.51E–09		
Benzo(b)fluoranthene	0.5	0.05	0.00E+00	1.30E–08	4.65E–09		
Benzo(a)pyrene	0.41	0.05	0.00E+00	1.07E–08	3.81E–09		
Indeno(1,2,3–cd)pyrene	0.75	0.05	0.00E+00	1.95E–08	6.97E–09		
4,4'–DDD	90	0.05	0.00E+00	2.34E–06	8.37E–07		3.00E–01
4,4'–DDE	6.3	0.05	0.00E+00	1.64E–07	5.86E–08		4.20E–01
4,4'–DDT	7	0.05	0.00E+00	1.82E–07	6.51E–08	4.00E–04	4.20E–01
Aroclor–1260	0.28	0.05	0.00E+00	7.29E–09	2.60E–09	2.00E–05	7.70E+00
Arsenic	7.5	0.01	0.00E+00	3.90E–08	1.39E–08	2.80E–04	1.80E+00
Beryllium	5.4	0.01	0.00E+00	2.81E–08	1.00E–08	2.50E–04	8.60E+01
Boron	870	0.01	0.00E+00	4.53E–06	1.62E–06	4.50E–03	
Cadmium	13.8	0.01	0.00E+00	7.18E–08	2.57E–08	1.50E–05	
Manganese	236	0.01	0.00E+00	1.23E–06	4.39E–07	1.50E–04	
2–Nitroaniline	3.1	0.05	0.00E+00	8.07E–08	2.88E–08	6.00E–05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	2.51E-07
4,4'-DDE	0.00E+00	0.00E+00	2.46E-08
4,4'-DDT	0.00E+00	4.55E-04	2.73E-08
Aroclor-1260	0.00E+00	3.64E-04	2.00E-08
Arsenic	0.00E+00	1.39E-04	2.51E-08
Beryllium	0.00E+00	1.12E-04	8.63E-07
Boron	0.00E+00	1.01E-03	0.00E+00
Cadmium	0.00E+00	4.79E-03	0.00E+00
Manganese	0.00E+00	8.19E-03	0.00E+00
2-Nitroaniline	0.00E+00	1.34E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.64E-02	1.21E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.97E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	1.16E-09	4.14E-10		
Benzo(b)fluoranthene	0.52	0.05	0.00E+00	7.73E-10	2.76E-10		
Benzo(a)pyrene	0.64	0.05	0.00E+00	9.52E-10	3.40E-10		
Indeno(1,2,3-cd)pyrene	1.2	0.05	0.00E+00	1.78E-09	6.37E-10		
4,4'-DDD	1700	0.05	0.00E+00	2.53E-06	9.03E-07		3.00E-01
4,4'-DDE	28	0.05	0.00E+00	4.16E-08	1.49E-08		4.20E-01
4,4'-DDT	240	0.05	0.00E+00	3.57E-07	1.27E-07	4.00E-04	4.20E-01
Arsenic	4.2	0.01	0.00E+00	1.25E-09	4.46E-10	2.80E-04	1.80E+00
Beryllium	0.58	0.01	0.00E+00	1.73E-10	6.16E-11	2.50E-04	8.60E+01
Boron	4100	0.01	0.00E+00	1.22E-06	4.36E-07	4.50E-03	
Manganese	236	0.01	0.00E+00	7.02E-08	2.51E-08	1.50E-04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	2.71E-07
4,4'-DDE	0.00E+00	0.00E+00	6.25E-09
4,4'-DDT	0.00E+00	8.92E-04	5.35E-08
Arsenic	0.00E+00	4.46E-06	8.03E-10
Beryllium	0.00E+00	6.90E-07	5.30E-09
Boron	0.00E+00	2.71E-04	0.00E+00
Manganese	0.00E+00	4.68E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.64E-03	3.37E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		3.5
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.86E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 5.21E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	2.03E–08	7.25E–09		
Benzo(b)fluoranthene	0.52	0.05	0.00E+00	1.35E–08	4.83E–09		
Benzo(a)pyrene	0.64	0.05	0.00E+00	1.67E–08	5.95E–09		
Indeno(1,2,3–cd)pyrene	1.2	0.05	0.00E+00	3.12E–08	1.12E–08		
4,4'–DDD	1700	0.05	0.00E+00	4.42E–05	1.58E–05		3.00E–01
4,4'–DDE	28	0.05	0.00E+00	7.29E–07	2.60E–07		4.20E–01
4,4'–DDT	240	0.05	0.00E+00	6.25E–06	2.23E–06	4.00E–04	4.20E–01
Arsenic	4.2	0.01	0.00E+00	2.19E–08	7.81E–09	2.80E–04	1.80E+00
Beryllium	0.58	0.01	0.00E+00	3.02E–09	1.08E–09	2.50E–04	8.60E+01
Boron	4100	0.01	0.00E+00	2.13E–05	7.62E–06	4.50E–03	
Manganese	236	0.01	0.00E+00	1.23E–06	4.39E–07	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	4.74E-06
4,4'-DDE	0.00E+00	0.00E+00	1.09E-07
4,4'-DDT	0.00E+00	1.56E-02	9.37E-07
Arsenic	0.00E+00	7.81E-05	1.41E-08
Beryllium	0.00E+00	1.21E-05	9.27E-08
Boron	0.00E+00	4.74E-03	0.00E+00
Manganese	0.00E+00	8.19E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.86E-02	5.89E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF	= ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS	= ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		25
BW1	= BODY WEIGHT ADOLESCENT (KG):		40
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.97E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.85	0.05	0.00E+00	1.26E–09	4.51E–10		
Benzo(b)fluoranthene	0.75	0.05	0.00E+00	1.12E–09	3.98E–10		
Benzo(a)pyrene	0.59	0.05	0.00E+00	8.77E–10	3.13E–10		
Indeno(1,2,3–cd)pyrene	0.36	0.05	0.00E+00	5.35E–10	1.91E–10		
4,4'–DDD	300	0.05	0.00E+00	4.46E–07	1.59E–07		3.00E–01
4,4'–DDE	15	0.05	0.00E+00	2.23E–08	7.97E–09		4.20E–01
4,4'–DDT	37	0.05	0.00E+00	5.50E–08	1.97E–08	4.00E–04	4.20E–01
Arsenic	39.9	0.01	0.00E+00	1.19E–08	4.24E–09	2.80E–04	1.80E+00
Beryllium	1.8	0.01	0.00E+00	5.35E–10	1.91E–10	2.50E–04	8.60E+01
Boron	8300	0.01	0.00E+00	2.47E–06	8.82E–07	4.50E–03	
Cadmium	30.1	0.01	0.00E+00	8.95E–09	3.20E–09	1.50E–05	
Manganese	1020	0.01	0.00E+00	3.03E–07	1.08E–07	1.50E–04	
Vanadium	64.9	0.01	0.00E+00	1.93E–08	6.89E–09	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	4.78E-08
4,4'-DDE	0.00E+00	0.00E+00	3.35E-09
4,4'-DDT	0.00E+00	1.38E-04	8.25E-09
Arsenic	0.00E+00	4.24E-05	7.63E-09
Beryllium	0.00E+00	2.14E-06	1.64E-08
Boron	0.00E+00	5.49E-04	0.00E+00
Cadmium	0.00E+00	5.97E-04	0.00E+00
Manganese	0.00E+00	2.02E-03	0.00E+00
Vanadium	0.00E+00	5.52E-05	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.41E-03	8.35E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		3.5
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.86E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 5.21E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.85	0.05	0.00E+00	2.21E–08	7.90E–09		
Benzo(b)fluoranthene	0.75	0.05	0.00E+00	1.95E–08	6.97E–09		
Benzo(a)pyrene	0.59	0.05	0.00E+00	1.54E–08	5.48E–09		
Indeno(1,2,3–cd)pyrene	0.36	0.05	0.00E+00	9.37E–09	3.35E–09		
4,4'–DDD	300	0.05	0.00E+00	7.81E–06	2.79E–06		3.00E–01
4,4'–DDE	15	0.05	0.00E+00	3.90E–07	1.39E–07		4.20E–01
4,4'–DDT	37	0.05	0.00E+00	9.63E–07	3.44E–07	4.00E–04	4.20E–01
Arsenic	39.9	0.01	0.00E+00	2.08E–07	7.42E–08	2.80E–04	1.80E+00
Beryllium	1.8	0.01	0.00E+00	9.37E–09	3.35E–09	2.50E–04	8.60E+01
Boron	8300	0.01	0.00E+00	4.32E–05	1.54E–05	4.50E–03	
Cadmium	30.1	0.01	0.00E+00	1.57E–07	5.60E–08	1.50E–05	
Manganese	1020	0.01	0.00E+00	5.31E–06	1.90E–06	1.50E–04	
Vanadium	64.9	0.01	0.00E+00	3.38E–07	1.21E–07	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	8.37E-07
4,4'-DDE	0.00E+00	0.00E+00	5.86E-08
4,4'-DDT	0.00E+00	2.41E-03	1.44E-07
Arsenic	0.00E+00	7.42E-04	1.34E-07
Beryllium	0.00E+00	3.75E-05	2.88E-07
Boron	0.00E+00	9.60E-03	0.00E+00
Cadmium	0.00E+00	1.04E-02	0.00E+00
Manganese	0.00E+00	3.54E-02	0.00E+00
Vanadium	0.00E+00	9.65E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	5.96E-02	1.46E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		3150
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		0
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		1
BW1	= BODY WEIGHT ADOLESCENT (KG):		40
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.21E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.04E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Arsenic	4.5	0.01	5.44E–08	0.00E+00	4.66E–09	2.80E–04	1.60E+00
Beryllium	0.36	0.01	4.35E–09	0.00E+00	3.73E–10	2.50E–04	8.60E+01
Manganese	177	0.01	2.14E–06	0.00E+00	1.83E–07	1.50E–04	
Mercury	7	0.01	8.46E–08	0.00E+00	7.25E–09	1.50E–05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Arsenic	1.94E-04	0.00E+00	8.39E-09
Beryllium	1.74E-05	0.00E+00	3.21E-08
Manganese	1.43E-02	0.00E+00	0.00E+00
Mercury	5.64E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	2.01E-02	0.00E+00	4.05E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		1
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 6.04E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 5.18E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Arsenic	4.5	0.01	2.72E–07	0.00E+00	2.33E–08	2.80E–04	1.80E+00
Beryllium	0.36	0.01	2.17E–08	0.00E+00	1.86E–09	2.50E–04	8.60E+01
Manganese	177	0.01	1.07E–05	0.00E+00	9.17E–07	1.50E–04	
Mercury	7	0.01	4.23E–07	0.00E+00	3.62E–08	1.50E–05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; NORTH LAKE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Arsenic	9.71E-04	0.00E+00	4.19E-08
Beryllium	8.70E-05	0.00E+00	1.60E-07
Manganese	7.13E-02	0.00E+00	0.00E+00
Mercury	2.82E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.01E-01	0.00E+00	2.02E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF = ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		1
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.21E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.04E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.7	0.05	4.23E–08	0.00E+00	3.62E–09		
Benzo(b)fluoranthene	0.5	0.05	3.02E–08	0.00E+00	2.59E–09		
Benzo(a)pyrene	0.41	0.05	2.48E–08	0.00E+00	2.12E–09		
Indeno(1,2,3–cd)pyrene	0.75	0.05	4.53E–08	0.00E+00	3.88E–09		
4,4'–DDD	90	0.05	5.44E–06	0.00E+00	4.66E–07		3.00E–01
4,4'–DDE	6.3	0.05	3.81E–07	0.00E+00	3.26E–08		4.20E–01
4,4'–DDT	7	0.05	4.23E–07	0.00E+00	3.62E–08	4.00E–04	4.20E–01
Aroclor–1260	0.28	0.05	1.69E–08	0.00E+00	1.45E–09	2.00E–05	7.70E+00
Arsenic	7.5	0.01	9.06E–08	0.00E+00	7.77E–09	2.80E–04	1.80E+00
Beryllium	5.4	0.01	6.52E–08	0.00E+00	5.59E–09	2.50E–04	8.60E+01
Boron	870	0.01	1.05E–05	0.00E+00	9.01E–07	4.50E–03	
Cadmium	13.8	0.01	1.67E–07	0.00E+00	1.43E–08	1.50E–05	
Manganese	236	0.01	2.85E–06	0.00E+00	2.44E–07	1.50E–04	
2–Nitroaniline	3.1	0.05	1.87E–07	0.00E+00	1.61E–08	6.00E–05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	1.40E-07
4,4'-DDE	0.00E+00	0.00E+00	1.37E-08
4,4'-DDT	1.06E-03	0.00E+00	1.52E-08
Aroclor-1260	6.46E-04	0.00E+00	1.12E-08
Arsenic	3.24E-04	0.00E+00	1.40E-08
Beryllium	2.61E-04	0.00E+00	4.81E-07
Boron	2.34E-03	0.00E+00	0.00E+00
Cadmium	1.11E-02	0.00E+00	0.00E+00
Manganese	1.90E-02	0.00E+00	0.00E+00
2-Nitroaniline	3.12E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	3.81E-02	0.00E+00	6.75E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY)		3150
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY)		0
AF = ADHERENCE FACTOR (MG/SQ CM)		1
ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		1
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 6.04E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 5.18E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.7	0.05	2.11E-07	0.00E+00	1.81E-08		
Benzo(b)fluoranthene	0.5	0.05	1.51E-07	0.00E+00	1.29E-08		
Benzo(a)pyrene	0.41	0.05	1.24E-07	0.00E+00	1.06E-08		
Indeno(1,2,3-cd)pyrene	0.75	0.05	2.27E-07	0.00E+00	1.94E-08		
4,4'-DDD	90	0.05	2.72E-05	0.00E+00	2.33E-06		3.00E-01
4,4'-DDE	6.3	0.05	1.90E-06	0.00E+00	1.63E-07		4.20E-01
4,4'-DDT	7	0.05	2.11E-06	0.00E+00	1.81E-07	4.00E-04	4.20E-01
Aroclor-1260	0.28	0.05	8.46E-08	0.00E+00	7.25E-09	2.00E-05	7.70E+00
Arsenic	7.5	0.01	4.53E-07	0.00E+00	3.88E-08	2.80E-04	1.80E+00
Beryllium	5.4	0.01	3.26E-07	0.00E+00	2.80E-08	2.50E-04	8.60E+01
Boron	870	0.01	5.26E-05	0.00E+00	4.50E-06	4.50E-03	
Cadmium	13.8	0.01	8.34E-07	0.00E+00	7.15E-08	1.50E-05	
Manganese	236	0.01	1.43E-05	0.00E+00	1.22E-06	1.50E-04	
2-Nitroaniline	3.1	0.05	9.36E-07	0.00E+00	8.03E-08	6.00E-05	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; TRITON ROAD
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	6.99E-07
4,4'-DDE	0.00E+00	0.00E+00	6.85E-08
4,4'-DDT	5.29E-03	0.00E+00	7.61E-08
Aroclor-1260	4.23E-03	0.00E+00	5.58E-08
Arsenic	1.62E-03	0.00E+00	6.99E-08
Beryllium	1.30E-03	0.00E+00	2.40E-06
Boron	1.17E-02	0.00E+00	0.00E+00
Cadmium	5.56E-02	0.00E+00	0.00E+00
Manganese	9.50E-02	0.00E+00	0.00E+00
2-Nitroaniline	1.56E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.90E-01	0.00E+00	3.37E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF	= ADHERENCE FACTOR (MG/SQ CM):		0.2
ABS	= ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		1
BW1	= BODY WEIGHT ADOLESCENT (KG):		40
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.21E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.04E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	0.05	4.71E–08	0.00E+00	4.04E–09		
Benzo(b)fluoranthene	0.52	0.05	3.14E–08	0.00E+00	2.69E–09		
Benzo(a)pyrene	0.64	0.05	3.87E–08	0.00E+00	3.31E–09		
Indeno(1,2,3–cd)pyrene	1.2	0.05	7.25E–08	0.00E+00	6.21E–09		
4,4'–DDD	1700	0.05	1.03E–04	0.00E+00	8.80E–06		3.00E–01
4,4'–DDE	28	0.05	1.69E–06	0.00E+00	1.45E–07		4.20E–01
4,4'–DDT	240	0.05	1.45E–05	0.00E+00	1.24E–06	4.00E–04	4.20E–01
Arsenic	4.2	0.01	5.07E–08	0.00E+00	4.35E–09	2.80E–04	1.80E+00
Beryllium	0.58	0.01	7.01E–09	0.00E+00	6.01E–10	2.50E–04	8.60E+01
Boron	4100	0.01	4.95E–05	0.00E+00	4.25E–06	4.50E–03	
Manganese	236	0.01	2.85E–06	0.00E+00	2.44E–07	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	2.64E-06
4,4'-DDE	0.00E+00	0.00E+00	6.09E-08
4,4'-DDT	3.62E-02	0.00E+00	5.22E-07
Arsenic	1.81E-04	0.00E+00	7.83E-09
Beryllium	2.80E-05	0.00E+00	5.17E-08
Boron	1.10E-02	0.00E+00	0.00E+00
Manganese	1.90E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.65E-02	0.00E+00	3.28E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF = ADHERENCE FACTOR (MG/SQ CM):		1
ABS = ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1 = YOUTH EXPOSURE DURATION (YEARS):		6
ED2 = ADULT EXPOSURE DURATION (YEARS):		1
BW1 = BODY WEIGHT ADOLESCENT (KG):		40
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 6.04E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 5.18E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	0.05	2.36E–07	0.00E+00	2.02E–08		
Benzo(b)fluoranthene	0.52	0.05	1.57E–07	0.00E+00	1.35E–08		
Benzo(a)pyrene	0.64	0.05	1.93E–07	0.00E+00	1.66E–08		
Indeno(1,2,3–cd)pyrene	1.2	0.05	3.62E–07	0.00E+00	3.11E–08		
4,4'–DDD	1700	0.05	5.13E–04	0.00E+00	4.40E–05		3.00E–01
4,4'–DDE	28	0.05	8.46E–06	0.00E+00	7.25E–07		4.20E–01
4,4'–DDT	240	0.05	7.25E–05	0.00E+00	6.21E–06	4.00E–04	4.20E–01
Arsenic	4.2	0.01	2.54E–07	0.00E+00	2.17E–08	2.80E–04	1.80E+00
Beryllium	0.58	0.01	3.50E–08	0.00E+00	3.00E–09	2.50E–04	8.60E+01
Boron	4100	0.01	2.48E–04	0.00E+00	2.12E–05	4.50E–03	
Manganese	236	0.01	1.43E–05	0.00E+00	1.22E–06	1.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; WAHOO AVENUE
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	1.32E-05
4,4'-DDE	0.00E+00	0.00E+00	3.04E-07
4,4'-DDT	1.81E-01	0.00E+00	2.61E-06
Arsenic	9.06E-04	0.00E+00	3.91E-08
Beryllium	1.40E-04	0.00E+00	2.58E-07
Boron	5.50E-02	0.00E+00	0.00E+00
Manganese	9.50E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	3.32E-01	0.00E+00	1.64E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		3150
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		0
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR)		28
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		1
BW1	= BODY WEIGHT ADOLESCENT (KG):		40
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.21E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.04E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA.
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.85	0.05	5.13E–08	0.00E+00	4.40E–09		
Benzo(b)fluoranthene	0.75	0.05	4.53E–08	0.00E+00	3.88E–09		
Benzo(a)pyrene	0.59	0.05	3.56E–08	0.00E+00	3.06E–09		
Indeno(1,2,3–cd)pyrene	0.36	0.05	2.17E–08	0.00E+00	1.86E–09		
4,4'–DDD	300	0.05	1.81E–05	0.00E+00	1.55E–06		3.00E–01
4,4'–DDE	15	0.05	9.06E–07	0.00E+00	7.77E–08		4.20E–01
4,4'–DDT	37	0.05	2.24E–06	0.00E+00	1.92E–07	4.00E–04	4.20E–01
Arsenic	39.9	0.01	4.82E–07	0.00E+00	4.13E–08	2.80E–04	1.80E+00
Beryllium	1.8	0.01	2.17E–08	0.00E+00	1.86E–09	2.50E–04	8.60E+01
Boron	8300	0.01	1.00E–04	0.00E+00	8.60E–06	4.50E–03	
Cadmium	30.1	0.01	3.64E–07	0.00E+00	3.12E–08	1.50E–05	
Manganese	1020	0.01	1.23E–05	0.00E+00	1.06E–06	1.50E–04	
Vanadium	64.9	0.01	7.84E–07	0.00E+00	6.72E–08	3.50E–04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	4.66E-07
4,4'-DDE	0.00E+00	0.00E+00	3.26E-08
4,4'-DDT	5.59E-03	0.00E+00	8.05E-08
Arsenic	1.72E-03	0.00E+00	7.44E-08
Beryllium	8.70E-05	0.00E+00	1.60E-07
Boron	2.23E-02	0.00E+00	0.00E+00
Cadmium	2.42E-02	0.00E+00	0.00E+00
Manganese	8.22E-02	0.00E+00	0.00E+00
Vanadium	2.24E-03	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.38E-01	0.00E+00	8.14E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: SITE 2 – AREA A DOWNSTREAM; OBDA
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/10/95

EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		3150
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		0
AF	= ADHERENCE FACTOR (MG/SQ CM):		1
ABS	= ABSORPTION FRACTION: (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		28
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		80
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		1
BW1	= BODY WEIGHT ADOLESCENT (KG):		40
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 6.04E–06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 5.18E–07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.85	0.05	2.57E-07	0.00E+00	2.20E-08		
Benzo(b)fluoranthene	0.75	0.05	2.27E-07	0.00E+00	1.94E-08		
Benzo(a)pyrene	0.59	0.05	1.78E-07	0.00E+00	1.53E-08		
Indeno(1,2,3-cd)pyrene	0.36	0.05	1.09E-07	0.00E+00	9.32E-09		
4,4'-DDD	300	0.05	9.06E-05	0.00E+00	7.77E-06		3.00E-01
4,4'-DDE	15	0.05	4.53E-06	0.00E+00	3.88E-07		4.20E-01
4,4'-DDT	37	0.05	1.12E-05	0.00E+00	9.58E-07	4.00E-04	4.20E-01
Arsenic	39.9	0.01	2.41E-06	0.00E+00	2.07E-07	2.80E-04	1.80E+00
Beryllium	1.8	0.01	1.09E-07	0.00E+00	9.32E-09	2.50E-04	8.60E+01
Boron	8300	0.01	5.01E-04	0.00E+00	4.30E-05	4.50E-03	
Cadmium	30.1	0.01	1.82E-06	0.00E+00	1.56E-07	1.50E-05	
Manganese	1020	0.01	6.16E-05	0.00E+00	5.28E-06	1.50E-04	
Vanadium	64.9	0.01	3.92E-06	0.00E+00	3.36E-07	3.50E-04	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM; OBDA
EXPOSURE SCENARIO: CHILD RECREATIONAL USER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	2.33E-06
4,4'-DDE	0.00E+00	0.00E+00	1.63E-07
4,4'-DDT	2.79E-02	0.00E+00	4.02E-07
Arsenic	8.61E-03	0.00E+00	3.72E-07
Beryllium	4.35E-04	0.00E+00	8.02E-07
Boron	1.11E-01	0.00E+00	0.00E+00
Cadmium	1.21E-01	0.00E+00	0.00E+00
Manganese	4.11E-01	0.00E+00	0.00E+00
Vanadium	1.12E-02	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.92E-01	0.00E+00	4.07E-06

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 2 – AREA A DOWNSTREAM
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT: DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x CF)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS:

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 6.89E-04
EF:	1	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 2.46E-04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GR UNDWATER (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
1,2-Dichloroethene	0.028	1.00E-02	1.93E-07	9.00E-03	2.14E-05
Vinyl chloride	0.13	7.30E-03	6.54E-07		0.00E+00
Aluminum	48.7	1.00E-03	3.35E-05	5.00E-02	6.71E-04
Arsenic	0.0086	1.00E-03	5.92E-09	2.80E-04	2.12E-05
Barium	0.362	1.00E-03	2.49E-07	3.50E-03	7.12E-05
Boron	0.341	1.00E-03	2.35E-07	4.50E-03	5.22E-05
Cadmium	0.0047	1.00E-03	3.24E-09	1.50E-05	2.16E-04
Manganese	6.34	1.00E-03	4.37E-06	1.50E-04	2.91E-02
Vanadium	0.0897	1.00E-03	6.18E-08	3.50E-04	1.77E-04
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					3.03E-02

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK
1,2-Dichloroethene	0.028	6.89E-08		0.00E+00
Vinyl chloride	0.13	2.33E-07	1.90E+00	4.44E-07
Aluminum	48.7	1.20E-05		0.00E+00
Arsenic	0.0086	2.12E-09	1.80E+00	3.81E-09
Barium	0.362	8.91E-08		0.00E+00
Boron	0.341	8.39E-08		0.00E+00
Cadmium	0.0047	1.16E-09		0.00E+00
Manganese	6.34	1.56E-06		0.00E+00
Vanadium	0.0897	2.21E-08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				4.47E-07

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 2 – AREA A DOWNSTREAM
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/10/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x CF)

WHERE
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 2.41E-03
EF:	3.5	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 8.61E-04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 2 – AREA A DOWNSTREAM
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
1,2-Dichloroethene	0.028	1.00E-02	6.75E-07	9.00E-03	7.50E-05
Vinyl chloride	0.13	7.30E-03	2.29E-06		0.00E+00
Aluminum	48.7	1.00E-03	1.17E-04	5.00E-02	2.35E-03
Arsenic	0.0086	1.00E-03	2.07E-08	2.80E-04	7.41E-05
Barium	0.362	1.00E-03	8.73E-07	3.50E-03	2.49E-04
Boron	0.341	1.00E-03	8.22E-07	4.50E-03	1.83E-04
Cadmium	0.0047	1.00E-03	1.13E-08	1.50E-05	7.55E-04
Manganese	6.34	1.00E-03	1.53E-05	1.50E-04	1.02E-01
Vanadium	0.0897	1.00E-03	2.16E-07	3.50E-04	6.18E-04
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					1.06E-01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 2 – AREA A DOWNSTREAM
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK
1,2-Dichloroethene	0.028	2.41E-07		0.00E+00
Vinyl chloride	0.13	8.17E-07	1.90E+00	1.55E-06
Aluminum	48.7	4.19E-05		0.00E+00
Arsenic	0.0086	7.41E-09	1.80E+00	1.33E-08
Barium	0.362	3.12E-07		0.00E+00
Boron	0.341	2.94E-07		0.00E+00
Cadmium	0.0047	4.05E-09		0.00E+00
Manganese	6.34	5.46E-06		0.00E+00
Vanadium	0.0897	7.72E-08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				1.57E-06

APPENDIX F.9

SITE 4 - RUBBLE FILL AT BUNKER A86

SUMMARY OF STATISTICALLY DERIVED EXPOSURE CONCENTRATIONS
SITE 4 - RUBBLE FILL AT BUNKER A 86
SOIL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Concern	Surface Soil		All Soil	
	Distribution of Data Set[1]	Exposure Concentration[2] (mg/kg)	Distribution of Data Set[1]	Exposure Concentration[2] (mg/kg)
Benzo(a)anthracene	Lognormal	14.0[3]	Lognormal	14.0[3]
Benzo(b)fluoranthene	Lognormal	13.0[3]	Lognormal	13.0[3]
Benzo(k)fluoranthene	Undefined	18.0[3]	Undefined	18.0[3]
Benzo(a)pyrene	Lognormal	14.0[3]	Lognormal	14.0[3]
Dibenz(a,h)anthracene	Lognormal	3.80[3]	Lognormal	3.80[3]
Indeno(1,2,3-cd)pyrene	Lognormal	6.60[3]	Undefined	6.60[3]
Dieldrin	Undefined	0.0075[3]	Undefined	0.0075[3]
Heptachlor	Undefined	0.0024[3]	Undefined	0.0024[3]
Arsenic	Lognormal	150[3]	Lognormal	150[3]
Beryllium	Undefined	0.85[3]	Undefined	0.74
Manganese	Lognormal	233	Undefined	214
Vanadium	Lognormal	51.2	Lognormal	43.4

(1) Distribution determined using the Shapiro-Wilk "W-Test" (Gilbert, 1987).

(2) Exposure concentration is the 95% upper confidence limit (UCL) of the arithmetic mean or the mean of the transformed data, unless otherwise noted. When the distribution of the data set is undefined the most conservative 95% UCL was used as the exposure concentration.

(3) The maximum detected concentration is used as the exposure concentration because the calculated 95% UCL exceeds the maximum reported concentration.

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)anthracene (ug/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	150	5.010635	14976900	4.824051
2	160	5.075174	14899600	4.544715
3	210	5.347108	14516100	3.459228
4	400	5.991465	13104400	1.477545
5	1500	7.313220	6350400	.0112812
6	800	6.684612	10368400	.2728974
7	2600	7.863267	2016400	.4306762
8	2700	7.901007	1742400	.4816354
9	8700	9.071078	21902400	3.474760
10	13000	9.472705	80640400	5.133383
11	14000	9.546813	99600400	5.474688
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	4020	7.207008	5292.616	1.720025
		1348.850		

Upper 95% confidence limit on arithmetic mean: 6911.560
Upper 95% confidence limit on geometric mean: 77342.45

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	150	2.25e4	5.010635	25.10647
2	160	2.56e4	5.075174	25.75739
3	210	4.41e4	5.347108	28.59156
4	400	1.6e5	5.991465	35.89765
5	1500	2.25e6	7.313220	53.48319
6	1800	3.24e6	7.495542	56.18315
7	2600	6.76e6	7.863267	61.83096
8	2700	7.29e6	7.901007	62.42591
9	8700	7.569e7	9.071078	82.28446
10	13000	1.69e8	9.472705	89.73213
11	14000	1.96e8	9.546813	91.14163
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	45220	4.6048e8	80.08801	612.4345

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2.7459e8 (normal distribution)

d = 29.33543 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	1.385e4	7.7574e3
	.3315	1.284e4	4.2565e3
	.226	8.49e3	1.9187e3
	.1429	2.3e3	3.2867e2
	.0695	1.1e3	7.645e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.4338e4
Summation**2:			2.0557e8

Wcalc = .7486511 Wtable = .85 Wcalc - Wtable = -.101349

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	4.536177	2.540713
.3315	4.397531	1.457781
.226	3.723971	.8416174
.1429	1.909543	.2728736
.0695	.5500463	.0382282
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		5.151214
Summation**2:		26.53500

Wcalc = .9045376 Wtable = .85 Wcalc - Wtable = .0545376

Arithmetic Average: 4110.909 Geometric Mean: 1452.045

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(b)fluoranthene (ug/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	160	5.075174	16724382	4.729200
2	165	5.105945	16683512	4.596310
3	210	5.347108	16317927	3.620415
4	370	5.913503	15050873	1.785813
5	690	6.536692	12670364	.5085895
6	1450	7.279319	7837455.	.0008686
7	2300	7.740664	3800727.	.2409025
8	5400	8.594154	1323546.	1.807164
9	10000	9.210340	33067727	3.843537
10	13000	9.472705	76570455	4.941099
11	13000	9.472705	76570455	4.941099
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	4249.545	7.249846	5259.443	1.761108
		1407.888		

Upper 95% confidence limit on arithmetic mean: 7122.982
Upper 95% confidence limit on geometric mean: 87661.44

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	160	2.56e4	5.075174	25.75739
2	165	2.7225e4	5.105945	26.07068
3	210	4.41e4	5.347108	28.59156
4	370	1.369e5	5.913503	34.96952
5	690	4.761e5	6.536692	42.72834
6	1450	2.1025e6	7.279319	52.98848
7	2300	5.29e6	7.740664	59.91789
8	5400	2.916e7	8.594154	73.85949
9	10000	1e8	9.210340	84.83037
10	13000	1.69e8	9.472705	89.73213
11	13000	1.69e8	9.472705	89.73213
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	46745	4.7526e8	79.74831	609.1780

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2.7662e8 (normal distribution)

d = 31.01500 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	1.284e4	7.1917e3
	.3315	1.2835e4	4.2548e3
	.226	9.79e3	2.2125e3
	.1429	5.03e3	7.1879e2
	.0695	1.61e3	1.1190e2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.4490e4
Summation**2:			2.0995e8

Wcalc = .7589965 Wtable = .85 Wcalc - Wtable = -.091004

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	4.397531	2.463057
	.3315	4.366759	1.447581
	.226	3.863233	.8730906
	.1429	2.680651	.3830651
	.0695	1.203973	.0836761
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.250469
Summation**2:			27.56743

Wcalc = .8888419 Wtable = .85 Wcalc - Wtable = .0388419

Arithmetic Average: 4249.545 Geometric Mean: 1407.888

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(k)fluoranthene (ug/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	165	5.105945	19600744	3.599400
2	210	5.347108	19204314	2.742490
3	210	5.347108	19204314	2.742490
4	210	5.347108	19204314	2.742490
5	220	5.393628	19116769	2.590575
6	950	6.856462	13266151	.0215185
7	1150	7.047517	11849242	.0019681
8	2400	7.783224	4806060.	.6085093
9	12000	9.392662	54874423	5.709748
10	15000	9.615805	1.0832e8	6.825948
11	18000	9.798127	1.7977e8	7.811875
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	4592.273	7.003154	6849.922	1.881409
		1100.097		

Upper 95% confidence limit on arithmetic mean: 8334.649
Upper 95% confidence limit on geometric mean: 119762.0

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	165	2.7225e4	5.105945	26.07068
2	210	4.41e4	5.347108	28.59156
3	210	4.41e4	5.347108	28.59156
4	210	4.41e4	5.347108	28.59156
5	220	4.84e4	5.393628	29.09122
6	950	9.025e5	6.856462	47.01107
7	1150	1.3225e6	7.047517	49.66750
8	2400	5.76e6	7.783224	60.57858
9	12000	1.44e8	9.392662	88.22210
10	15000	2.25e8	9.615805	92.46372
11	18000	3.24e8	9.798127	96.00329
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	50515	7.0119e8	77.03469	574.8828

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2

d = 4.6921e8 (normal distribution)

d = 35.39701 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	1.7835e4	9.9894e3
	.3315	1.479e4	4.9029e3
	.226	1.179e4	2.6645e3
	.1429	2.19e3	3.1295e2
	.0695	9.3e2	6.4635e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.7934e4
Summation**2:			3.2164e8

Wcalc = .6854917 Wtable = .85 Wcalc - Wtable = -.164508

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	4.692182	2.628091
	.3315	4.268698	1.415073
	.226	4.045554	.9142953
	.1429	2.436116	.3481210
	.0695	1.653890	.1149453
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.420526
Summation**2:			29.38210

Wcalc = .8300729 Wtable = .85 Wcalc - Wtable = -.019927

Arithmetic Average: 4592.273 Geometric Mean: 1100.097

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)pyrene (ug/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	160	5.075174	16862222	4.926218
2	190	5.247024	16616740	4.192904
3	210	5.347108	16454086	3.793048
4	420	6.040255	14794513	1.573589
5	1250	7.130899	9098450.	.0268250
6	1800	7.495542	6082950.	.0403446
7	2000	7.600902	5136404.	.0937708
8	2900	7.972466	1866950.	.4593907
9	12000	9.392662	59809131	4.401518
10	12000	9.392662	59809131	4.401518
11	14000	9.546813	94743677	5.072091
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	4266.364	7.294682	5488.846	1.702387
		1472.449		

Upper 95% confidence limit on arithmetic mean: 7265.132
Upper 95% confidence limit on geometric mean: 70797.89

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	160	2.56e4	5.075174	25.75739
2	190	3.61e4	5.247024	27.53126
3	210	4.41e4	5.347108	28.59156
4	420	1.764e5	6.040255	36.48468
5	1250	1.5625e6	7.130899	50.84972
6	1800	3.24e6	7.495542	56.18315
7	2000	4e6	7.600902	57.77372
8	2900	8.41e6	7.972466	63.56021
9	12000	1.44e8	9.392662	88.22210
10	12000	1.44e8	9.392662	88.22210
11	14000	1.96e8	9.546813	91.14163
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	46930	5.0149e8	80.24151	614.3175

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 3.0127e8 (normal distribution)

d = 28.98122 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	1.384e4	7.7518e3
	.3315	1.181e4	3.9150e3
	.226	1.179e4	2.6645e3
	.1429	2.48e3	3.5439e2
	.0695	7.5e2	5.2125e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.4738e4
Summation**2:			2.1720e8

Wcalc = .7209524 Wtable = .85 Wcalc - Wtable = -.129048

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	4.471639	2.504565
.3315	4.145638	1.374279
.226	4.045554	.9142953
.1429	1.932211	.2761130
.0695	.4700036	.0326653
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		5.101917
Summation**2:		26.02956

Wcalc = .8981528 Wtable = .85 Wcalc - Wtable = .0481528

Arithmetic Average: 4266.364 Geometric Mean: 1472.449

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Dibenz(a,h)anthracene (ug/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	36	3.583519	1300637.	6.116526
2	50	3.912023	1268900.	4.599554
3	165	5.105945	1023040.	.9038963
4	210	5.347108	934034.4	.5034932
5	210	5.347108	934034.4	.5034932
6	300	5.703782	768172.6	.1245367
7	570	6.345636	367787.1	.0834957
8	900	6.802395	76427.12	.5560904
9	3300	8.101678	4509445.	4.182015
10	3400	8.131531	4944154.	4.305005
11	3800	8.242756	6882991.	4.778929
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	1176.455	6.056680	1516.892	1.632698
		426.9556		

Upper 95% confidence limit on arithmetic mean: 2005.191
Upper 95% confidence limit on geometric mean: 15275.20

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	36	1.296e3	3.583519	12.84161
2	50	2.5e3	3.912023	15.30392
3	165	2.7225e4	5.105945	26.07068
4	210	4.41e4	5.347108	28.59156
5	210	4.41e4	5.347108	28.59156
6	300	9e4	5.703782	32.53313
7	570	3.249e5	6.345636	40.26710
8	900	8.1e5	6.802395	46.27257
9	3300	1.089e7	8.101678	65.63718
10	3400	1.156e7	8.131531	66.12179
11	3800	1.444e7	8.242756	67.94303
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	12941	38234121	66.62348	430.1741

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 23009623 (normal distribution)

d = 26.65704 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	3.764e3	2.1082e3
	.3315	3.35e3	1.1105e3
	.226	3.135e3	7.0851e2
	.1429	6.9e2	9.8601e1
	.0695	3.6e2	2.502e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.0509e3
Summation**2:			1.6410e7

Wcalc = .7131611 Wtable = .85 Wcalc - Wtable = -.136839

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	4.659237	2.609639
.3315	4.219508	1.398767
.226	2.995732	.6770355
.1429	1.455287	.2079605
.0695	.9985288	.0693978
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	4.962799
	Summation**2:	24.62938

Wcalc = .9239354 Wtable = .85 Wcalc - Wtable = .0739354

Arithmetic Average: 1176.455 Geometric Mean: 426.9556

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Indeno(1,2,3-cd)pyrene (ug/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	97	4.574711	3793642.	3.985195
2	120	4.787492	3704575.	3.180924
3	165	5.105945	3533375.	2.146403
4	210	5.347108	3366224.	1.497928
5	230	5.438079	3293235.	1.283524
6	670	6.507278	1889875.	.0040613
7	1100	7.003065	892509.6	.1866751
8	1600	7.377759	197782.3	.6508497
9	5500	8.612503	11938910	4.167710
10	6200	8.732305	17266291	4.671210
11	6600	8.794825	20750510	4.945369
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	2044.727	6.571006	2657.573	1.634621
		714.0881		

Upper 95% confidence limit on arithmetic mean: 3496.662
Upper 95% confidence limit on geometric mean: 25753.09

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	97	9.409e3	4.574711	20.92798
2	120	1.44e4	4.787492	22.92008
3	165	2.7225e4	5.105945	26.07068
4	210	4.41e4	5.347108	28.59156
5	230	5.29e4	5.438079	29.57271
6	670	4.489e5	6.507278	42.34466
7	1100	1.21e6	7.003065	49.04293
8	1600	2.56e6	7.377759	54.43133
9	5500	3.025e7	8.612503	74.17521
10	6200	3.844e7	8.732305	76.25314
11	6600	4.356e7	8.794825	77.34895
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	22492	1.1662e8	72.28107	501.6792

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 70626928 (normal distribution)

d = 26.71985 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	6.503e3	3.6423e3
	.3315	6.08e3	2.0155e3
	.226	5.335e3	1.2057e3
	.1429	1.39e3	1.9863e2
	.0695	8.7e2	6.0465e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			7.1227e3
Summation**2:			5.0732e7

Wcalc = .7183129 Wtable = .85 Wcalc - Wtable = -.131687

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	4.220114	2.363686
	.3315	3.944813	1.307705
	.226	3.506558	.7924821
	.1429	2.030651	.2901801
	.0695	1.564986	.1087665
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.862820
Summation**2:			23.64702

Wcalc = .8849982 Wtable = .85 Wcalc - Wtable = .0349982

Arithmetic Average: 2044.727 Geometric Mean: 714.0881

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Dieldrin (ug/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.1	.0953102	50.08779	2.083498
2	1.85	.6151856	40.03438	.8529578
3	1.85	.6151856	40.03438	.8529578
4	1.95	.6678294	38.77893	.7584902
5	2.2	.7884574	35.72779	.5629282
6	2.5	.9162907	32.23143	.3874466
7	7.5	2.014903	.4586983	.2267286
8	8	2.079442	.0314256	.2923551
9	21	3.044522	164.4223	2.267372
10	21	3.044522	164.4223	2.267372
11	21	3.044522	164.4223	2.267372
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	8.177273	1.538743	8.547817	1.132231
		4.658730		

Upper 95% confidence limit on arithmetic mean: 12.84727
Upper 95% confidence limit on geometric mean: 28.57991

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dieldrin (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.1	1.21e0	.0953102	.0090840
2	1.85	3.4225e0	.6151856	.3784534
3	1.85	3.4225e0	.6151856	.3784534
4	1.95	3.8025e0	.6678294	.4459961
5	2.2	4.84e0	.7884574	.6216650
6	2.5	6.25e0	.9162907	.8395887
7	7.5	5.625e1	2.014903	4.059834
8	8	6.4e1	2.079442	4.324077
9	21	4.41e2	3.044522	9.269117
10	21	4.41e2	3.044522	9.269117
11	21	4.41e2	3.044522	9.269117
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	89.95	1466.198	16.92617	38.86450

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 730.6518 (normal distribution)

d = 12.81948 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dieldrin (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	1.99e1	1.1146e1
	.3315	1.915e1	6.3482e0
	.226	1.915e1	4.3279e0
	.1429	6.05e0	8.645e-1
	.0695	5.3e0	3.684e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.3055e1
Summation**2:			5.3153e2

Wcalc = .7274785 Wtable = .85 Wcalc - Wtable = -.122522

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dieldrin (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	2.949212	1.651854
.3315	2.429337	.8053251
.226	2.429337	.5490301
.1429	1.411612	.2017194
.0695	1.226446	.0852380
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	3.293166
	Summation**2:	10.84494

Wcalc = .8459739 Wtable = .85 Wcalc - Wtable = -.004026

Arithmetic Average: 8.177273 Geometric Mean: 4.658730

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Heptachlor (ug/kg); Site 4; NSB-NLON
ter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.95	-.051293	5.331901	.5311269
2	.95	-.051293	5.331901	.5311269
3	1	0	5.103492	0
4	1	0	5.103492	0
5	1.1	.0953102	4.661674	.3389348
6	1.15	.1397619	4.448264	.2891528
7	1.3	.2623643	3.838037	.1723304
8	2.4	.8754687	.7380372	.0391951
9	4	1.386294	.5489463	.5024019
10	11	2.397895	59.92167	2.959790
11	11	2.397895	59.92167	2.959790
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	3.259091	.6774912	3.936357	.9123513
		1.968932		

pper 95% confidence limit on arithmetic mean: 5.409675
Upper 95% confidence limit on geometric mean: 6.780285

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Heptachlor (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.95	9.025e-1	-.051293	.0026310
2	.95	9.025e-1	-.051293	.0026310
3	1	1e0	0	0
4	1	1e0	0	0
5	1.1	1.21e0	.0953102	.0090840
6	1.15	1.3225e0	.1397619	.0195334
7	1.3	1.69e0	.2623643	.0688350
8	2.4	5.76e0	.8754687	.7664455
9	4	1.6e1	1.386294	1.921812
10	11	1.21e2	2.397895	5.749902
11	11	1.21e2	2.397895	5.749902
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	35.85	271.7875	7.452403	14.29078

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 154.9491 (normal distribution)

d = 9.241838 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Heptachlor (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	1.005e1	5.6290e0
.3315	1.005e1	3.3316e0
.226	3e0	6.78e-1
.1429	1.4e0	2.001e-1
.0695	2e-1	1.39e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		9.8525e0
Summation**2:		9.7073e1

Wcalc = .6264802 Wtable = .85 Wcalc - Wtable = -.223520

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Heptachlor (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	2.449189	1.371791
.3315	2.449189	.8119060
.226	1.386294	.3133025
.1429	.8754687	.1251045
.0695	.1670541	.0116103
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.633714
	Summation**2:	6.936448

Wcalc = .7505486 Wtable = .85 Wcalc - Wtable = -.099451

Arithmetic Average: 3.259091 Geometric Mean: 1.968932

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Arsenic (mg/kg); Site 4; NSB-NLON
ter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	5	1.609438	2039.754	2.905783
2	7.1	1.960095	1854.477	1.833259
3	7.2	1.974081	1845.874	1.795580
4	15.2	2.721295	1222.456	.3513859
5	15.4	2.734368	1208.510	.3360591
6	21.8	3.081910	804.4959	.0538999
7	44.5	3.795489	32.07678	.2317610
8	67.3	4.209160	293.6550	.8011801
9	91.3	4.514151	1692.200	1.440185
10	127	4.844187	5903.827	2.341247
11	150	5.010635	9967.300	2.878322
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	50.16364	3.314074	51.83110	1.223465
		27.49691		

Upper 95% confidence limit on arithmetic mean: 78.48096
Upper 95% confidence limit on geometric mean: 221.6972

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	5	2.5e1	1.609438	2.590290
2	7.1	5.041e1	1.960095	3.841972
3	7.2	5.184e1	1.974081	3.896996
4	15.2	2.3104e2	2.721295	7.405449
5	15.4	2.3716e2	2.734368	7.476766
6	21.8	4.7524e2	3.081910	9.498169
7	44.5	1.9803e3	3.795489	14.40574
8	67.3	4.5293e3	4.209160	17.71703
9	91.3	8.3357e3	4.514151	20.37756
10	127	1.6129e4	4.844187	23.46615
11	150	2.25e4	5.010635	25.10647
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	931.8	54544.92	36.45481	135.7826

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2

d = 26864.63 (normal distribution)

d = 14.96866 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	1.45e2	8.1215e1
.3315	1.199e2	3.9747e1
.226	8.41e1	1.9007e1
.1429	5.21e1	7.4451e0
.0695	2.91e1	2.0225e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.4944e2
	Summation**2:	2.2331e4

Wcalc = .8312405 Wtable = .85 Wcalc - Wtable = -.018759

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	3.401197	1.905011
.3315	2.884092	.9560766
.226	2.540070	.5740558
.1429	1.487865	.2126159
.0695	1.061122	.0737480
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.721507
Summation**2:		13.84961

Wcalc = .9252406 Wtable = .85 Wcalc - Wtable = .0752406

Arithmetic Average: 50.16364 Geometric Mean: 27.49691

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Beryllium (mg/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.14	-1.96611	.1666124	1.510267
2	.28	-1.27297	.0719215	.2870622
3	.32	-1.13943	.0520669	.1618054
4	.35	-1.04982	.0392760	.0977427
5	.35	-1.04982	.0392760	.0977427
6	.66	-.415515	.0125033	.1034705
7	.7	-.356675	.0230488	.1447870
8	.77	-.261365	.0492033	.2264038
9	.78	-.248461	.0537397	.2388496
10	.83	-.186330	.0794215	.3034404
11	.85	-.162519	.0910942	.3302397
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	.5481818	-.737184	.2604158	.5917610
		.4784594		

Upper 95% confidence limit on arithmetic mean: .6904570
Upper 95% confidence limit on geometric mean: .8779326

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.14	1.96e-2	-1.96611	3.865600
2	.28	7.84e-2	-1.27297	1.620442
3	.32	1.024e-1	-1.13943	1.298310
4	.35	1.225e-1	-1.04982	1.102126
5	.35	1.225e-1	-1.04982	1.102126
6	.66	4.356e-1	-.415515	.1726531
7	.7	4.9e-1	-.356675	.1272170
8	.77	5.929e-1	-.261365	.0683115
9	.78	6.084e-1	-.248461	.0617330
10	.83	6.889e-1	-.186330	.0347187
11	.85	7.225e-1	-.162519	.0264124
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	6.03	3.9837	-8.10902	9.479651

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = .6781636 (normal distribution)

d = 3.501811 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	7.1e-1	3.977e-1
	.3315	5.5e-1	1.823e-1
	.226	4.6e-1	1.040e-1
	.1429	4.2e-1	6.002e-2
	.0695	3.5e-1	2.433e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			7.683e-1
Summation**2:			5.903e-1

Wcalc = .8704143 Wtable = .85 Wcalc - Wtable = .0204143

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	1.803594	1.010193
.3315	1.086636	.3602199
.226	.8909729	.2013599
.1429	.7884574	.1126706
.0695	.6931472	.0481737
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.732617
Summation**2:		3.001962

Wcalc = .8572598 Wtable = .85 Wcalc - Wtable = .0072598

Arithmetic Average: .5481818 Geometric Mean: .4784594

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: Manganese (mg/kg); Site 4; NSB-NLON
er Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	126	4.836282	3986.200	.1246946
2	130	4.867534	3497.110	.1035995
3	133	4.890349	3151.291	.0894333
4	147	4.990433	1775.473	.0395893
5	161	5.081404	791.6550	.0116637
6	166.5	5.114995	512.4050	.0055365
7	175	5.164786	199.8368	.0006060
8	193	5.262690	14.92769	.0053710
9	208	5.337538	355.8368	.0219439
10	305	5.720312	13424.38	.2818639
11	336	5.817111	21568.93	.3940173
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	189.1364	5.189403	70.19832	.3283777
		179.3615		

per 95% confidence limit on arithmetic mean: 227.4884
Upper 95% confidence limit on geometric mean: 232.5553

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	126	1.5876e4	4.836282	23.38962
2	130	1.69e4	4.867534	23.69289
3	133	1.7689e4	4.890349	23.91551
4	147	2.1609e4	4.990433	24.90442
5	161	2.5921e4	5.081404	25.82067
6	166.5	2.7722e4	5.114995	26.16318
7	175	3.0625e4	5.164786	26.67501
8	193	3.7249e4	5.262690	27.69591
9	208	4.3264e4	5.337538	28.48931
10	305	9.3025e4	5.720312	32.72197
11	336	1.1290e5	5.817111	33.83878
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	2080.5	442776.3	57.08343	297.3073

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 49278.05 (normal distribution)

d = 1.078319 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	2.1e2	1.1762e2
	.3315	1.75e2	5.8013e1
	.226	7.5e1	1.695e1
	.1429	4.6e1	6.5734e0
	.0695	1.4e1	9.73e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.0013e2
Summation**2:			4.0052e4

Wcalc = .8127753 Wtable = .85 Wcalc - Wtable = -.037225

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5601	.9808293	.5493625
.3315	.8527773	.2826957
.226	.4471890	.1010647
.1429	.2722576	.0389056
.0695	.0833816	.0057950
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		.9778235
Summation**2:		.9561388

Wcalc = .8866936 Wtable = .85 Wcalc - Wtable = .0366936

Arithmetic Average: 189.1364 Geometric Mean: 179.3615

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Vanadium (mg/kg); Site 4; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 11
Degrees of Freedom: 10

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	15.3	2.727853	463.8150	.5899593
2	20.4	3.015535	270.1540	.2307900
3	22.2	3.100092	214.2231	.1566961
4	27.5	3.314186	87.16769	.0330349
5	28.1	3.335770	76.32405	.0256549
6	34.2	3.532226	6.950413	.0013166
7	38	3.637586	1.354050	.0200634
8	40.2	3.693867	11.31405	.0391747
9	42.1	3.740048	27.70587	.0595881
10	47.6	3.862833	115.8559	.1346096
11	89.6	4.495355	2784.001	.9988291
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
Mean:	36.83636	3.495941	20.14663	.4785098
		32.98131		

Upper 95% confidence limit on arithmetic mean: 47.84324
Upper 95% confidence limit on geometric mean: 51.23260

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 11 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	15.3	2.3409e2	2.727853	7.441181
2	20.4	4.1616e2	3.015535	9.093451
3	22.2	4.9284e2	3.100092	9.610572
4	27.5	7.5625e2	3.314186	10.98383
5	28.1	7.8961e2	3.335770	11.12736
6	34.2	1.1696e3	3.532226	12.47662
7	38	1.444e3	3.637586	13.23203
8	40.2	1.6160e3	3.693867	13.64465
9	42.1	1.7724e3	3.740048	13.98796
10	47.6	2.2658e3	3.862833	14.92148
11	89.6	8.0282e3	4.495355	20.20822
12		0	0	0
13		0	0	0
14		0	0	0
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	405.2	18984.96	38.45535	136.7273

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2

d = 4058.865 (normal distribution)

d = 2.289717 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	7.43e1	4.1615e1
	.3315	2.72e1	9.0168e0
	.226	1.99e1	4.4974e0
	.1429	1.27e1	1.8148e0
	.0695	9.9e0	6.881e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.7633e1
Summation**2:			3.3215e3

Wcalc = .8183337 Wtable = .85 Wcalc - Wtable = -.031666

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/16/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5601	1.767502	.9899781
	.3315	.8472979	.2808792
	.226	.6399555	.1446299
	.1429	.3796810	.0542564
	.0695	.3018166	.0209763
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.490720
Summation**2:			2.222246

Wcalc = .9705332 Wtable = .85 Wcalc - Wtable = .1205332

Arithmetic Average: 36.83636 Geometric Mean: 32.98131

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)anthracene (ug/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	15	2.708050	11053250	17.17137
2	160	5.075174	10110129	3.156704
3	210	5.347108	9794664.	2.264356
4	270	5.598422	9422707.	1.571170
5	300	5.703782	9239429.	1.318140
6	400	5.991465	8641500.	.7403239
7	800	6.684612	6449786.	.0279805
8	1500	7.313220	3384286.	.2128300
9	2100	7.649693	1536714.	.6364965
10	2600	7.863267	547071.6	1.022892
11	2700	7.901007	409143.0	1.100656
12	8700	9.071078	28733429	4.924817
13	13000	9.472705	93322500	6.868694
14	14000	9.546813	1.1364e8	7.262633
15		0	0	0
Mean:	3339.643	6.851885	4853.926	1.927116
		945.6621		

Upper 95% confidence limit on arithmetic mean: 5637.102
Upper 95% confidence limit on geometric mean: 68930.25

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	15	2.25e2	2.708050	7.333536
2	160	2.56e4	5.075174	25.75739
3	210	4.41e4	5.347108	28.59156
4	270	7.29e4	5.598422	31.34233
5	300	9e4	5.703782	32.53313
6	400	1.6e5	5.991465	35.89765
7	800	6.4e5	6.684612	44.68403
8	1500	2.25e6	7.313220	53.48319
9	2100	4.41e6	7.649693	58.51780
10	2600	6.76e6	7.863267	61.83096
11	2700	7.29e6	7.901007	62.42591
12	8700	7.569e7	9.071078	82.28446
13	13000	1.69e8	9.472705	89.73213
14	14000	1.96e8	9.546813	91.14163
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	46755	4.6243e8	95.92639	705.5557

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 3.0629e8 (normal distribution)

d = 48.27906 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	1.3985e4	7.3435e3
	.3318	1.284e4	4.2603e3
	.246	8.49e3	2.0885e3
	.1802	2.43e3	4.3789e2
	.124	2.3e3	2.852e2
	.0727	1.7e3	1.2359e2
	.024	7e2	1.68e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.4556e4
Summation**2:			2.1187e8

Wcalc = .6917442 Wtable = .874 Wcalc - Wtable = -.182256

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	6.838762	3.591034
.3318	4.397531	1.459101
.246	3.723971	.9160968
.1802	2.302585	.4149258
.124	2.159484	.2677760
.0727	1.658228	.1205532
.024	.6286087	.0150866
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	6.784573
	Summation**2:	46.03044

Wcalc = .9534244 Wtable = .874 Wcalc - Wtable = .0794244

Arithmetic Average: 3339.643 Geometric Mean: 945.6621

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(b)fluoranthene (ug/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	160	5.075174	11220107	3.967684
2	165	5.105945	11186636	3.846042
3	210	5.347108	10887643	2.958300
4	250	5.521461	10625272	2.388933
5	370	5.913503	9857357.	1.330736
6	540	6.291569	8818779.	.6014146
7	690	6.536692	7950386.	.2813102
8	1450	7.279319	4242129.	.0450460
9	1600	7.377759	3646736.	.0965224
10	2300	7.740664	1463236.	.4537181
11	5400	8.594154	3573450.	2.331961
12	10000	9.210340	42124736	4.593572
13	13000	9.472705	90066879	5.787038
14	13000	9.472705	90066879	5.787038
15		0	0	0
Mean:	3509.643	7.067078	4849.506	1.628338
		1172.717		

Upper 95% confidence limit on arithmetic mean: 5805.009
Upper 95% confidence limit on geometric mean: 26369.50

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	160	2.56e4	5.075174	25.75739
2	165	2.7225e4	5.105945	26.07068
3	210	4.41e4	5.347108	28.59156
4	250	6.25e4	5.521461	30.48653
5	370	1.369e5	5.913503	34.96952
6	540	2.916e5	6.291569	39.58384
7	690	4.761e5	6.536692	42.72834
8	1450	2.1025e6	7.279319	52.98848
9	1600	2.56e6	7.377759	54.43133
10	2300	5.29e6	7.740664	59.91789
11	5400	2.916e7	8.594154	73.85949
12	10000	1e8	9.210340	84.83037
13	13000	1.69e8	9.472705	89.73213
14	13000	1.69e8	9.472705	89.73213
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	49135	4.7818e8	98.93910	733.6797

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 3.0573e8 (normal distribution)

d = 34.46931 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.284e4	6.7423e3
.3318	1.2835e4	4.2587e3
.246	9.79e3	2.4083e3
.1802	5.15e3	9.2803e2
.124	1.93e3	2.3932e2
.0727	1.06e3	7.7062e1
.024	7.6e2	1.824e1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.4672e4
Summation**2:		2.1527e8

Wcalc = .7041028 Wtable = .874 Wcalc - Wtable = -.169897

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	4.397531	2.309143
	.3318	4.366759	1.448891
	.246	3.863233	.9503553
	.1802	3.072693	.5536993
	.124	1.827161	.2265680
	.0727	1.086190	.0789660
	.024	.7426272	.0178231
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.585446
Summation**2:			31.19720

Wcalc = .9050718 Wtable = .874 Wcalc - Wtable = .0310718

Arithmetic Average: 3509.643 Geometric Mean: 1172.717

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(k)fluoranthene (ug/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	165	5.105945	13366858	3.074475
2	190	5.247024	13184680	2.599638
3	210	5.347108	13039837	2.286918
4	210	5.347108	13039837	2.286918
5	210	5.347108	13039837	2.286918
6	220	5.393628	12967715	2.148382
7	390	5.966147	11772251	.7978361
8	950	6.856462	8243051.	.0000084
9	1150	7.047517	7134623.	.0354018
10	2400	7.783224	2019444.	.8535184
11	2400	7.783224	2019444.	.8535184
12	12000	9.392662	66894873	6.417601
13	15000	9.615805	1.2497e8	7.597973
14	18000	9.798127	2.0104e8	8.636332
15		0	0	0
Mean:	3821.071	6.859363	6218.662	1.751383
		952.7604		

Upper 95% confidence limit on arithmetic mean: 6764.487
Upper 95% confidence limit on geometric mean: 33925.63

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	165	2.7225e4	5.105945	26.07068
2	190	3.61e4	5.247024	27.53126
3	210	4.41e4	5.347108	28.59156
4	210	4.41e4	5.347108	28.59156
5	210	4.41e4	5.347108	28.59156
6	220	4.84e4	5.393628	29.09122
7	390	1.521e5	5.966147	35.59491
8	950	9.025e5	6.856462	47.01107
9	1150	1.3225e6	7.047517	49.66750
10	2400	5.76e6	7.783224	60.57858
11	2400	5.76e6	7.783224	60.57858
12	12000	1.44e8	9.392662	88.22210
13	15000	2.25e8	9.615805	92.46372
14	18000	3.24e8	9.798127	96.00329
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	53495	7.0714e8	96.03109	698.5876

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 5.0273e8 (normal distribution)

d = 39.87544 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	1.7835e4	9.3652e3
	.3318	1.481e4	4.9140e3
	.246	1.179e4	2.9003e3
	.1802	2.19e3	3.9464e2
	.124	2.19e3	2.7156e2
	.0727	9.3e2	6.7611e1
	.024	5.6e2	1.344e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.7927e4
Summation**2:			3.2137e8

Wcalc = .6392396 Wtable = .874 Wcalc - Wtable = -.234760

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	4.692182	2.463865
	.3318	4.368781	1.449562
	.246	4.045554	.9952064
	.1802	2.436116	.4389882
	.124	2.436116	.3020784
	.0727	1.653890	.1202378
	.024	.8903152	.0213676
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.791305
Summation**2:			33.53921

Wcalc = .8410995 Wtable = .874 Wcalc - Wtable = -.032901

Arithmetic Average: 3821.071 Geometric Mean: 952.7604

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	160	2.56e4	5.075174	25.75739
2	190	3.61e4	5.247024	27.53126
3	210	4.41e4	5.347108	28.59156
4	280	7.84e4	5.634790	31.75085
5	300	9e4	5.703782	32.53313
6	420	1.764e5	6.040255	36.48468
7	1250	1.5625e6	7.130899	50.84972
8	1800	3.24e6	7.495542	56.18315
9	1800	3.24e6	7.495542	56.18315
10	2000	4e6	7.600902	57.77372
11	2900	8.41e6	7.972466	63.56021
12	12000	1.44e8	9.392662	88.22210
13	12000	1.44e8	9.392662	88.22210
14	14000	1.96e8	9.546813	91.14163
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	69310	5.0490e8	99.07562	734.7847

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 3.3123e8 (normal distribution)

d = 33.64333 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.384e4	7.2674e3
.3318	1.181e4	3.9186e3
.246	1.179e4	2.9003e3
.1802	2.62e3	4.7212e2
.124	1.7e3	2.108e2
.0727	1.38e3	1.0033e2
.024	5.5e2	1.32e1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.4883e4
Summation**2:		2.2150e8

Wcalc = .6687143 Wtable = .874 Wcalc - Wtable = -.205286

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	4.471639	2.348058
	.3318	4.145638	1.375523
	.246	4.045554	.9952064
	.1802	2.337676	.4212493
	.124	1.897120	.2352429
	.0727	1.455287	.1057994
	.024	.3646431	.0087514
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.489830
Summation**2:			30.13823

Wcalc = .8958158 Wtable = .874 Wcalc - Wtable = .0218158

Arithmetic Average: 3522.143 Geometric Mean: 1184.209

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)pyrene (ug/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	160	5.075174	11304005	4.006627
2	190	5.247024	11103176	3.348190
3	210	5.347108	10970290	2.991940
4	280	5.634790	10511490	2.079480
5	300	5.703782	10382205	1.885259
6	420	6.040255	9623290.	1.074488
7	1250	7.130899	5162633.	.0029234
8	1800	7.495542	2965776.	.1753197
9	1800	7.495542	2965776.	.1753197
10	2000	7.600902	2316919.	.2746520
11	2900	7.972466	387061.7	.8021639
12	12000	9.392662	71874062	5.363078
13	12000	9.392662	71874062	5.363078
14	14000	9.546813	1.0979e8	6.100814
15		0	0	0
Mean:	3522.143	7.076830	5047.667	1.608710
		1184.209		

Upper 95% confidence limit on arithmetic mean: 5911.303
Upper 95% confidence limit on geometric mean: 24817.63

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Dibenz(a,h)anthracene (ug/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	30	3.401197	832395.6	4.941308
2	32	3.465736	828750.1	4.658547
3	36	3.583519	821483.3	4.163982
4	50	3.912023	796301.3	2.931217
5	165	5.105945	604284.1	.2684869
6	190	5.247024	566041.3	.1421883
7	210	5.347108	536347.0	.0767263
8	210	5.347108	536347.0	.0767263
9	300	5.703782	412622.7	.0063489
10	570	6.345636	138649.8	.5206108
11	900	6.802395	1794.128	1.388372
12	3300	8.101678	5558480.	6.138378
13	3400	8.131531	6040008.	6.287195
14	3800	8.242756	8166123.	6.857347
15		0	0	0
Mean:	942.3571	5.624103	1409.845	1.719961
		277.0236		

Upper 95% confidence limit on arithmetic mean: 1609.665
Upper 95% confidence limit on geometric mean: 8745.111

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	30	9e2	3.401197	11.56814
2	32	1.024e3	3.465736	12.01133
3	36	1.296e3	3.583519	12.84161
4	50	2.5e3	3.912023	15.30392
5	165	2.7225e4	5.105945	26.07068
6	190	3.61e4	5.247024	27.53126
7	210	4.41e4	5.347108	28.59156
8	210	4.41e4	5.347108	28.59156
9	300	9e4	5.703782	32.53313
10	570	3.249e5	6.345636	40.26710
11	900	8.1e5	6.802395	46.27257
12	3300	1.089e7	8.101678	65.63718
13	3400	1.156e7	8.131531	66.12179
14	3800	1.444e7	8.242756	67.94303
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	13193	38272145	78.73744	481.2849

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 25839627 (normal distribution)

d = 38.45743 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	3.77e3	1.9796e3
	.3318	3.368e3	1.1175e3
	.246	3.264e3	8.0294e2
	.1802	8.5e2	1.5317e2
	.124	4.05e2	5.022e1
	.0727	1.1e2	7.997e0
	.024	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.1115e3
Summation**2:			1.6904e7

Wcalc = .6541931 Wtable = .874 Wcalc - Wtable = -.219807

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	4.841559	2.542303
.3318	4.665795	1.548111
.246	4.518159	1.111467
.1802	2.890372	.5208450
.124	1.239691	.1537217
.0727	.4567584	.0332063
.024	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		5.909653
Summation**2:		34.92400

Wcalc = .9081210 Wtable = .874 Wcalc - Wtable = .0341210

Arithmetic Average: 942.3571 Geometric Mean: 277.0236

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Indeno(1,2,3-cd)pyrene (ug/kg); Site 4; NSB-NLON
ter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	97	4.574711	2517662.	3.123129
2	120	4.787492	2445202.	2.416336
3	165	5.105945	2306493.	1.527704
4	210	5.347108	2171834.	.9897089
5	230	5.438079	2113285.	.8169798
6	670	6.507278	1027617.	.0273337
7	1100	7.003065	340722.4	.4370754
8	5500	8.612503	14564037	5.155419
9	6200	8.732305	20396837	5.713801
10	6600	8.794825	24169865	6.016602
11	1600	7.377759	7008.082	1.072903
12	130	4.867534	2414028.	2.173897
13	140	4.941642	2383054.	1.960858
14	810	6.697034	763376.7	.1260858
15		0	0	0
Mean:	1683.714	6.341949	2443.532	1.558052
		567.9019		

Upper 95% confidence limit on arithmetic mean: 2840.286
Upper 95% confidence limit on geometric mean: 9960.924

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	97	9.409e3	4.574711	20.92798
2	120	1.44e4	4.787492	22.92008
3	130	1.69e4	4.867534	23.69289
4	140	1.96e4	4.941642	24.41983
5	165	2.7225e4	5.105945	26.07068
6	210	4.41e4	5.347108	28.59156
7	230	5.29e4	5.438079	29.57271
8	670	4.489e5	6.507278	42.34466
9	810	6.561e5	6.697034	44.85027
10	1100	1.21e6	7.003065	49.04293
11	1600	2.56e6	7.377759	54.43133
12	5500	3.025e7	8.612503	74.17521
13	6200	3.844e7	8.732305	76.25314
14	6600	4.356e7	8.794825	77.34895
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	23572	1.1731e8	88.78728	594.6422

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2

d = 77621021 (normal distribution)

d = 31.55783 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	6.503e3	3.4147e3
	.3318	6.08e3	2.0173e3
	.246	5.37e3	1.3210e3
	.1802	1.46e3	2.6309e2
	.124	9.35e2	1.1594e2
	.0727	6e2	4.362e1
	.024	4.4e2	1.056e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			7.1863e3
Summation**2:			5.1643e7

Wcalc = .6653214 Wtable = .874 Wcalc - Wtable = -.208679

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	4.220114	2.215982
.3318	3.944813	1.308889
.246	3.744969	.9212624
.1802	2.436116	.4389882
.124	1.897120	.2352429
.0727	1.349927	.0981397
.024	1.069198	.0256608
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	5.244165
	Summation**2:	27.50126

Wcalc = .8714560 Wtable = .874 Wcalc - Wtable = -.002544

Arithmetic Average: 1683.714 Geometric Mean: 567.9019

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Dieldrin (ug/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.1	.0953102	86.29083	3.023726
2	1.85	.6151856	72.91940	1.485988
3	1.85	.6151856	72.91940	1.485988
4	1.95	.6678294	71.22154	1.360412
5	2.2	.7884574	67.06440	1.093571
6	2.5	.9162907	62.24083	.8425512
7	7.5	2.014903	8.347972	.0326548
8	8	2.079442	5.708686	.0601451
9	18	2.890372	57.92297	1.115506
10	18.5	2.917771	65.78369	1.174133
11	19	2.944439	74.14440	1.232638
12	21	3.044522	112.5873	1.464889
13	21	3.044522	112.5873	1.464889
14	21	3.044522	112.5873	1.464889
15		0	0	0
Mean:	10.38929	1.834197	8.692729	1.153656
		6.260103		

Upper 95% confidence limit on arithmetic mean: 14.50373
Upper 95% confidence limit on geometric mean: 32.52109

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dieldrin (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.1	1.21e0	.0953102	.0090840
2	1.85	3.4225e0	.6151856	.3784534
3	1.85	3.4225e0	.6151856	.3784534
4	1.95	3.8025e0	.6678294	.4459961
5	2.2	4.84e0	.7884574	.6216650
6	2.5	6.25e0	.9162907	.8395887
7	7.5	5.625e1	2.014903	4.059834
8	8	6.4e1	2.079442	4.324077
9	18	3.24e2	2.890372	8.354249
10	18.5	3.4225e2	2.917771	8.513386
11	19	3.61e2	2.944439	8.669721
12	21	4.41e2	3.044522	9.269117
13	21	4.41e2	3.044522	9.269117
14	21	4.41e2	3.044522	9.269117
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	145.45	2493.448	25.67875	64.40186

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 982.3259 (normal distribution)

d = 17.30198 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dieldrin (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	1.99e1	1.0449e1
	.3318	1.915e1	6.3540e0
	.246	1.915e1	4.7109e0
	.1802	1.705e1	3.0724e0
	.124	1.63e1	2.0212e0
	.0727	1.55e1	1.1269e0
	.024	5e-1	1.2e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.7747e1
Summation**2:			7.6989e2

Wcalc = .7837379 Wtable = .874 Wcalc - Wtable = -.090262

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dieldrin (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	2.949212	1.548631
.3318	2.429337	.8060539
.246	2.429337	.5976169
.1802	2.276610	.4102451
.124	2.129313	.2640349
.0727	1.974081	.1435157
.024	.0645385	.0015489
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	3.771647
	Summation**2:	14.22532

Wcalc = .8221787 Wtable = .874 Wcalc - Wtable = -.051821

Arithmetic Average: 10.38929 Geometric Mean: 6.260103

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Heptachlor (ug/kg); Site 4; NSB-NLON
ter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.95	-.051293	13.29644	1.135992
2	.95	-.051293	13.29644	1.135992
3	1	0	12.93430	0
4	1	0	12.93430	0
5	1.1	.0953102	12.22501	.8449762
6	1.15	.1397619	11.87787	.7652298
7	1.3	.2623643	10.86644	.5657624
8	2.4	.8754687	4.824298	.0193397
9	4	1.386294	.3557270	.1382042
10	9	2.197225	19.39144	1.398752
11	9.5	2.251292	24.04501	1.529565
12	10	2.302585	29.19858	1.659070
13	11	2.397895	41.00573	1.913683
14	11	2.397895	41.00573	1.913683
15		0	0	0
Mean:	4.596429	1.014536	4.361169	1.000779
		2.758084		

Upper 95% confidence limit on arithmetic mean: 6.660656
Upper 95% confidence limit on geometric mean: 9.906146

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Heptachlor (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.95	9.025e-1	-.051293	.0026310
2	.95	9.025e-1	-.051293	.0026310
3	1	1e0	0	0
4	1	1e0	0	0
5	1.1	1.21e0	.0953102	.0090840
6	1.15	1.3225e0	.1397619	.0195334
7	1.3	1.69e0	.2623643	.0688350
8	2.4	5.76e0	.8754687	.7664455
9	4	1.6e1	1.386294	1.921812
10	9	8.1e1	2.197225	4.827796
11	9.5	9.025e1	2.251292	5.068315
12	10	1e2	2.302585	5.301898
13	11	1.21e2	2.397895	5.749902
14	11	1.21e2	2.397895	5.749902
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	64.35	543.0375	14.20350	29.48878

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 247.2573 (normal distribution)

d = 15.07882 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Heptachlor (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.005e1	5.2773e0
.3318	1.005e1	3.3346e0
.246	9e0	2.214e0
.1802	8.5e0	1.5317e0
.124	7.9e0	9.796e-1
.0727	2.85e0	2.072e-1
.024	1.1e0	2.64e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.3571e1
	Summation**2:	1.8416e2

Wcalc = .7448313 Wtable = .874 Wcalc - Wtable = -.129169

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Heptachlor (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	2.449189	1.286069
.3318	2.449189	.8126408
.246	2.302585	.5664359
.1802	2.251292	.4056828
.124	2.101914	.2606374
.0727	1.246532	.0906229
.024	.6131045	.0147145
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.436803
Summation**2:		11.81162

Wcalc = .7833252 Wtable = .874 Wcalc - Wtable = -.090675

Arithmetic Average: 4.596429 Geometric Mean: 2.758084

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Arsenic (mg/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.8	1.029619	1566.746	4.134822
2	5	1.609438	1397.425	2.112975
3	6.95	1.938742	1255.437	1.264059
4	7.1	1.960095	1244.830	1.216500
5	7.2	1.974081	1237.783	1.185844
6	15.2	2.721295	738.8689	.1167931
7	15.4	2.734368	728.0360	.1080292
8	21.8	3.081910	423.6246	.0003559
9	31.8	3.459466	111.9817	.1571495
10	44.5	3.795489	4.485319	.5364738
11	67.3	4.209160	620.8996	1.313579
12	91.3	4.514151	2392.957	2.105707
13	127	4.844187	7160.182	3.172465
14	150	5.010635	11581.60	3.793106
15		0	0	0
Mean:	42.38214	3.063045	48.40920	1.277553
		21.39261		

Upper 95% confidence limit on arithmetic mean: 65.29517
Upper 95% confidence limit on geometric mean: 155.2200

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.8	7.84e0	1.029619	1.060116
2	5	2.5e1	1.609438	2.590290
3	6.95	4.8303e1	1.938742	3.758719
4	7.1	5.041e1	1.960095	3.841972
5	7.2	5.184e1	1.974081	3.896996
6	15.2	2.3104e2	2.721295	7.405449
7	15.4	2.3716e2	2.734368	7.476766
8	21.8	4.7524e2	3.081910	9.498169
9	31.8	1.0112e3	3.459466	11.96791
10	44.5	1.9803e3	3.795489	14.40574
11	67.3	4.5293e3	4.209160	17.71703
12	91.3	8.3357e3	4.514151	20.37756
13	127	1.6129e4	4.844187	23.46615
14	150	2.25e4	5.010635	25.10647
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	993.35	55612.30	42.88264	152.5693

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2

d = 30464.86 (normal distribution)

d = 21.21786 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	1.472e2	7.7295e1
	.3318	1.22e2	4.0480e1
	.246	8.435e1	2.0750e1
	.1802	6.02e1	1.0848e1
	.124	3.73e1	4.6252e0
	.0727	1.66e1	1.2068e0
	.024	6.4e0	1.536e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.5536e2
Summation**2:			2.4136e4

Wcalc = .7922615 Wtable = .874 Wcalc - Wtable = -.081739

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	3.981016	2.090431
	.3318	3.234749	1.073290
	.246	2.575409	.6335506
	.1802	2.249065	.4052816
	.124	1.821408	.2258546
	.0727	.7381709	.0536650
	.024	.3475425	.0083410
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.490414
Summation**2:			20.16382

Wcalc = .9503230 Wtable = .874 Wcalc - Wtable = .0763230

Arithmetic Average: 42.38214 Geometric Mean: 21.39261

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Beryllium (mg/kg); Site 4; NSB-NLON
er Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.14	-1.96611	.1532163	1.494355
2	.28	-1.27297	.0632163	.2801488
3	.32	-1.13943	.0447020	.1566256
4	.35	-1.04982	.0329163	.0937262
5	.35	-1.04982	.0329163	.0937262
6	.38	-.967584	.0229306	.0501353
7	.47	-.755023	.0037735	.0001288
8	.56	-.579818	.0008163	.0268489
9	.66	-.415515	.0165306	.1076886
10	.7	-.356675	.0284163	.1497689
11	.77	-.261365	.0569163	.2326230
12	.78	-.248461	.0617878	.2452364
13	.83	-.186330	.0891449	.3106337
14	.85	-.162519	.1014878	.3377421
15		0	0	0
Mean:	.5314286	-.743675	.2334971	.5247261
		.4753638		

per 95% confidence limit on arithmetic mean: .6419473
Upper 95% confidence limit on geometric mean: .7428711

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.14	1.96e-2	-1.96611	3.865600
2	.28	7.84e-2	-1.27297	1.620442
3	.32	1.024e-1	-1.13943	1.298310
4	.35	1.225e-1	-1.04982	1.102126
5	.35	1.225e-1	-1.04982	1.102126
6	.38	1.444e-1	-.967584	.9362188
7	.47	2.209e-1	-.755023	.5700591
8	.56	3.136e-1	-.579818	.3361895
9	.66	4.356e-1	-.415515	.1726531
10	.7	4.9e-1	-.356675	.1272170
11	.77	5.929e-1	-.261365	.0683115
12	.78	6.084e-1	-.248461	.0617330
13	.83	6.889e-1	-.186330	.0347187
14	.85	7.225e-1	-.162519	.0264124
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	7.44	4.6626	-10.4114	11.32212

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = .7087714 (normal distribution)

d = 3.579387 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	7.1e-1	3.728e-1
	.3318	5.5e-1	1.825e-1
	.246	4.6e-1	1.132e-1
	.1802	4.2e-1	7.568e-2
	.124	3.5e-1	4.34e-2
	.0727	2.8e-1	2.036e-2
	.024	9e-2	2.16e-3
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			8.101e-1
Summation**2:			6.562e-1

Wcalc = .9258486 Wtable = .874 Wcalc - Wtable = .0518486

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.803594	.9470672
.3318	1.086636	.3605459
.246	.8909729	.2191793
.1802	.7884574	.1420800
.124	.6931472	.0859503
.0727	.5520686	.0401354
.024	.1752041	.0042049
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.799163
Summation**2:		3.236987

Wcalc = .9043412 Wtable = .874 Wcalc - Wtable = .0303412

Arithmetic Average: .5314286 Geometric Mean: .4753638

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Manganese (mg/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	126	4.836282	3310.358	.1102832
2	130	4.867534	2866.073	.0905027
3	133	4.890349	2553.858	.0772962
4	147	4.990433	1334.858	.0316621
5	147	4.990433	1334.858	.0316621
6	161	5.081404	507.8584	.0075632
7	166.5	5.114995	290.2156	.0028490
8	171	5.141664	157.1441	.0007133
9	171	5.141664	157.1441	.0007133
10	175	5.164786	72.85842	.0000129
11	193	5.262690	89.57270	.0088961
12	208	5.337538	598.5013	.0286175
13	305	5.720312	14753.57	.3046386
14	336	5.817111	23245.36	.4208637
15		0	0	0
Mean:	183.5357	5.168371	62.80142	.2930311
		175.6285		

Upper 95% confidence limit on arithmetic mean: 213.2609
Upper 95% confidence limit on geometric mean: 213.8006

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	126	1.5876e4	4.836282	23.38962
2	130	1.69e4	4.867534	23.69289
3	133	1.7689e4	4.890349	23.91551
4	147	2.1609e4	4.990433	24.90442
5	147	2.1609e4	4.990433	24.90442
6	161	2.5921e4	5.081404	25.82067
7	166.5	2.7722e4	5.114995	26.16318
8	171	2.9241e4	5.141664	26.43670
9	171	2.9241e4	5.141664	26.43670
10	175	3.0625e4	5.164786	26.67501
11	193	3.7249e4	5.262690	27.69591
12	208	4.3264e4	5.337538	28.48931
13	305	9.3025e4	5.720312	32.72197
14	336	1.1290e5	5.817111	33.83878
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	2569.5	522867.3	72.35719	375.0851

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 51272.23 (normal distribution)

d = 1.116274 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	2.1e2	1.1027e2
	.3318	1.75e2	5.8065e1
	.246	7.5e1	1.845e1
	.1802	4.6e1	8.2892e0
	.124	2.8e1	3.472e0
	.0727	1e1	7.27e-1
	.024	4.5e0	1.08e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.9938e2
Summation**2:			3.9753e4

Wcalc = .7753371 Wtable = .874 Wcalc - Wtable = -.098663

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	.9808293	.5150334
	.3318	.8527773	.2829515
	.246	.4471890	.1100085
	.1802	.2722576	.0490608
	.124	.1743534	.0216198
	.0727	.0602592	.0043808
	.024	.0266682	.0006400
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			.9836950
Summation**2:			.9676558

Wcalc = .8668624 Wtable = .874 Wcalc - Wtable = -.007138

Arithmetic Average: 183.5357 Geometric Mean: 175.6285

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Vanadium (mg/kg); Site 4; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 14
Degrees of Freedom: 13

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	15.3	2.727853	312.2794	.4191223
2	17.7	2.873565	233.2165	.2516876
3	18.8	2.933857	200.8294	.1948274
4	19.9	2.990720	170.8622	.1478631
5	20.4	3.015535	158.0408	.1293945
6	22.2	3.100092	116.0237	.0757114
7	27.5	3.314186	29.93653	.0037287
8	28.1	3.335770	23.73082	.0015587
9	34.2	3.532226	1.509388	.0246415
10	38	3.637586	25.28653	.0688206
11	40.2	3.693867	52.25224	.1015172
12	42.1	3.740048	83.33082	.1330778
13	47.6	3.862833	213.9951	.2377375
14	89.6	4.495355	3206.795	1.254637
15		0	0	0
Mean:	32.97143	3.375249	19.27152	.4839203
		29.23157		

Upper 95% confidence limit on arithmetic mean: 42.09302
Upper 95% confidence limit on geometric mean: 43.41895

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 14 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	15.3	2.3409e2	2.727853	7.441181
2	17.7	3.1329e2	2.873565	8.257374
3	18.8	3.5344e2	2.933857	8.607516
4	19.9	3.9601e2	2.990720	8.944405
5	20.4	4.1616e2	3.015535	9.093451
6	22.2	4.9284e2	3.100092	9.610572
7	27.5	7.5625e2	3.314186	10.98383
8	28.1	7.8961e2	3.335770	11.12736
9	34.2	1.1696e3	3.532226	12.47662
10	38	1.444e3	3.637586	13.23203
11	40.2	1.6160e3	3.693867	13.64465
12	42.1	1.7724e3	3.740048	13.98796
13	47.6	2.2658e3	3.862833	14.92148
14	89.6	8.0282e3	4.495355	20.20822
15		0	0	0
16		0	0	0
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	461.6	20047.7	47.25349	162.5366

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 4828.089 (normal distribution)

d = 3.044326 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5251	7.43e1	3.9015e1
	.3318	2.99e1	9.9208e0
	.246	2.33e1	5.7318e0
	.1802	2.03e1	3.6581e0
	.124	1.76e1	2.1824e0
	.0727	1.2e1	8.724e-1
	.024	6e-1	1.44e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			6.1395e1
Summation**2:			3.7693e3

Wcalc = .7807070 Wtable = .874 Wcalc - Wtable = -.093293

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 4 - Rubble Fill at Bunker A86	Date:	01/20/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5251	1.767502	.9281156
.3318	.9892681	.3282392
.246	.8061909	.1983230
.1802	.7031473	.1267071
.124	.6220513	.0771344
.0727	.4321334	.0314161
.024	.0215836	.0005180
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.690453
	Summation**2:	2.857632

Wcalc = .9386750 Wtable = .874 Wcalc - Wtable = .0646750

Arithmetic Average: 32.97143 Geometric Mean: 29.23157

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/20/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH:	
IR	480	IR	0
EF	1	EF	350
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.88E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	6.71E-09

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TW)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	14	1	0.00E+00	2.63E–07	9.39E–08		7.30E–01
Benzo(b)fluoranthene	13	1	0.00E+00	2.44E–07	8.72E–08		7.30E–01
Benzo(k)fluoranthene	18	1	0.00E+00	3.38E–07	1.21E–07		7.30E–02
Benzo(a)pyrene	14	1	0.00E+00	2.63E–07	9.39E–08		7.30E+00
Dibenz(a,h)anthracene	3.8	1	0.00E+00	7.14E–08	2.55E–08		7.30E+00
Antimony	5.9	1	0.00E+00	1.11E–07	3.96E–08	4.00E–04	
Arsenic	150	1	0.00E+00	2.82E–06	1.01E–06	3.00E–04	1.75E+00
Beryllium	0.74	1	0.00E+00	1.39E–08	4.97E–09	5.00E–03	4.30E+00
Manganese	214	1	0.00E+00	4.02E–06	1.44E–06	5.00E–03	
Vanadium	43.4	1	0.00E+00	8.15E–07	2.91E–07	7.00E–03	
Dieldrin	0.0075	1	0.00E+00	1.41E–10	5.03E–11	5.00E–05	1.60E+01
Methoxychlor	0.37	1	0.00E+00	6.95E–09	2.48E–09	5.00E–03	
Indeno(1,2,3-cd)pyrene	6.6	1	0.00E+00	1.24E–07	4.43E–08		7.30E–01
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	6.86E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	6.37E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	8.82E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	6.86E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	1.86E-07
Antimony	0.00E+00	2.77E-04	0.00E+00
Arsenic	0.00E+00	9.39E-03	1.76E-06
Beryllium	0.00E+00	2.78E-06	2.13E-08
Manganese	0.00E+00	8.04E-04	0.00E+00
Vanadium	0.00E+00	1.16E-04	0.00E+00
Dieldrin	0.00E+00	2.82E-06	8.05E-10
Methoxychlor	0.00E+00	1.39E-06	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	3.23E-08
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.06E-02	2.83E-06

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 4 - RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/20/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH	
IR:	480	IR:	0
EF:	3.5	EF:	350
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	6.58E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.35E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TW)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	14	1	0.00E+00	9.21E–07	3.29E–07		7.30E–01
Benzo(b)fluoranthene	13	1	0.00E+00	8.55E–07	3.05E–07		7.30E–01
Benzo(k)fluoranthene	18	1	0.00E+00	1.18E–06	4.23E–07		7.30E–02
Benzo(a)pyrene	14	1	0.00E+00	9.21E–07	3.29E–07		7.30E+00
Dibenz(a,h)anthracene	3.8	1	0.00E+00	2.50E–07	8.92E–08		7.30E+00
Antimony	5.9	1	0.00E+00	3.88E–07	1.39E–07	4.00E–04	
Arsenic	150	1	0.00E+00	9.86E–06	3.52E–06	3.00E–04	1.75E+00
Beryllium	0.74	1	0.00E+00	4.87E–08	1.74E–08	5.00E–03	4.30E+00
Manganese	214	1	0.00E+00	1.41E–05	5.03E–06	5.00E–03	
Vanadium	43.4	1	0.00E+00	2.85E–06	1.02E–06	7.00E–03	
Dieldrin	0.0075	1	0.00E+00	4.93E–10	1.76E–10	5.00E–05	1.60E+01
Methoxychlor	0.37	1	0.00E+00	2.43E–08	8.69E–09	5.00E–03	
Indeno(1,2,3-cd)pyrene	6.6	1	0.00E+00	4.34E–07	1.55E–07		7.30E–01
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	2.40E-07
Benzo(b)fluoranthene	0.00E+00	0.00E+00	2.23E-07
Benzo(k)fluoranthene	0.00E+00	0.00E+00	3.09E-08
Benzo(a)pyrene	0.00E+00	0.00E+00	2.40E-06
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	6.51E-07
Antimony	0.00E+00	9.70E-04	0.00E+00
Arsenic	0.00E+00	3.29E-02	6.16E-06
Beryllium	0.00E+00	9.73E-06	7.47E-08
Manganese	0.00E+00	2.81E-03	0.00E+00
Vanadium	0.00E+00	4.08E-04	0.00E+00
Dieldrin	0.00E+00	9.86E-06	2.82E-09
Methoxychlor	0.00E+00	4.87E-06	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.13E-07
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.71E-02	9.90E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/20/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE

C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	50	IR	0
EF	12	EF	350
FI	1	FI	1
ED	6	ED	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.35E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.01E-09

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 4 - RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	14	1	0.00E+00	3.29E-07	2.82E-08		7.30E-01
Benzo(b)fluoranthene	13	1	0.00E+00	3.05E-07	2.62E-08		7.30E-01
Benzo(k)fluoranthene	18	1	0.00E+00	4.23E-07	3.62E-08		7.30E-02
Benzo(a)pyrene	14	1	0.00E+00	3.29E-07	2.82E-08		7.30E+00
Dibenz(a,h)anthracene	3.8	1	0.00E+00	8.92E-08	7.65E-09		7.30E+00
Antimony	5.9	1	0.00E+00	1.39E-07	1.19E-08	4.00E-04	
Arsenic	150	1	0.00E+00	3.52E-06	3.02E-07	3.00E-04	1.75E+00
Beryllium	0.85	1	0.00E+00	2.00E-08	1.71E-09	5.00E-03	4.30E+00
Manganese	233	1	0.00E+00	5.47E-06	4.69E-07	5.00E-03	
Vanadium	51.2	1	0.00E+00	1.20E-06	1.03E-07	7.00E-03	
Dieldrin	0.0075	1	0.00E+00	1.76E-10	1.51E-11	5.00E-05	1.60E+01
Methoxychlor	0.37	1	0.00E+00	8.69E-09	7.45E-10	5.00E-03	
Indeno(1,2,3-cd)pyrene	6.6	1	0.00E+00	1.55E-07	1.33E-08		7.30E-01
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 4 - RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	2.06E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.91E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	2.64E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.06E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	5.58E-08
Antimony	0.00E+00	3.46E-04	0.00E+00
Arsenic	0.00E+00	1.17E-02	5.28E-07
Beryllium	0.00E+00	3.99E-06	7.36E-09
Manganese	0.00E+00	1.09E-03	0.00E+00
Vanadium	0.00E+00	1.72E-04	0.00E+00
Dieldrin	0.00E+00	3.52E-06	2.42E-10
Methoxychlor	0.00E+00	1.74E-06	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	9.70E-09
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.34E-02	8.50E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/20/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT		YOUTH	
IR	100	IR	0
EF	24	EF	350
FI:	1	FI.	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	9.39E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.35E-08

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	14	1	0.00E+00	1.32E−06	4.70E−07		7.30E−01
Benzo(b)fluoranthene	13	1	0.00E+00	1.22E−06	4.36E−07		7.30E−01
Benzo(k)fluoranthene	18	1	0.00E+00	1.69E−06	6.04E−07		7.30E−02
Benzo(a)pyrene	14	1	0.00E+00	1.32E−06	4.70E−07		7.30E+00
Dibenz(a,h)anthracene	3.8	1	0.00E+00	3.57E−07	1.27E−07		7.30E+00
Antimony	5.9	1	0.00E+00	5.54E−07	1.98E−07	4.00E−04	
Arsenic	150	1	0.00E+00	1.41E−05	5.03E−06	3.00E−04	1.75E+00
Beryllium	0.85	1	0.00E+00	7.98E−08	2.85E−08	5.00E−03	4.30E+00
Manganese	233	1	0.00E+00	2.19E−05	7.82E−06	5.00E−03	
Vanadium	51.2	1	0.00E+00	4.81E−06	1.72E−06	7.00E−03	
Dieldrin	0.0075	1	0.00E+00	7.05E−10	2.52E−10	5.00E−05	1.60E+01
Methoxychlor	0.37	1	0.00E+00	3.48E−08	1.24E−08	5.00E−03	
Indeno(1,2,3-cd)pyrene	6.6	1	0.00E+00	6.20E−07	2.21E−07		7.30E−01
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION F SOIL (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	3.43E-07
Benzo(b)fluoranthene	0.00E+00	0.00E+00	3.18E-07
Benzo(k)fluoranthene	0.00E+00	0.00E+00	4.41E-08
Benzo(a)pyrene	0.00E+00	0.00E+00	3.43E-06
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	9.31E-07
Antimony	0.00E+00	1.39E-03	0.00E+00
Arsenic	0.00E+00	4.70E-02	8.81E-06
Beryllium	0.00E+00	1.60E-05	1.23E-07
Manganese	0.00E+00	4.38E-03	0.00E+00
Vanadium	0.00E+00	6.87E-04	0.00E+00
Dieldrin	0.00E+00	1.41E-05	4.03E-09
Methoxychlor	0.00E+00	6.95E-06	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.62E-07
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	5.35E-02	1.42E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 12/21/94

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		25
BW1	= BODY WEIGHT ADOLESCENT (KG):		15
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.97E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	14	0.05	0.00E+00	2.08E−08	7.44E−09		
Benzo(b)fluoranthene	13	0.05	0.00E+00	1.93E−08	6.91E−09		
Benzo(k)fluoranthene	18	0.05	0.00E+00	2.68E−08	9.56E−09		
Benzo(a)pyrene	14	0.05	0.00E+00	2.08E−08	7.44E−09		
Dibenz(a,h)anthracene	3.8	0.05	0.00E+00	5.65E−09	2.02E−09		
Antimony	5.9	0.01	0.00E+00	1.75E−09	6.27E−10	4.00E−04	
Arsenic	150	0.01	0.00E+00	4.46E−08	1.59E−08	2.80E−04	1.80E+00
Beryllium	0.74	0.01	0.00E+00	2.20E−10	7.86E−11	2.50E−04	8.60E+00
Manganese	214	0.01	0.00E+00	6.37E−08	2.27E−08	1.50E−04	
Vanadium	43.4	0.01	0.00E+00	1.29E−08	4.61E−09	3.50E−04	
Dieldrin	0.0076	0.06	0.00E+00	1.12E−11	3.98E−12	5.00E−05	1.60E+01
Methoxychlor	0.37	0.06	0.00E+00	5.50E−10	1.97E−10	1.50E−04	
Indeno(1,2,3-cd)pyrene	6.6	0.06	0.00E+00	9.82E−09	3.51E−09		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	4.39E-06	0.00E+00
Arsenic	0.00E+00	1.59E-04	2.87E-08
Beryllium	0.00E+00	8.80E-07	6.76E-10
Manganese	0.00E+00	4.24E-04	0.00E+00
Vanadium	0.00E+00	3.69E-05	0.00E+00
Dieldrin	0.00E+00	2.23E-07	6.37E-11
Methoxylchlor	0.00E+00	3.67E-06	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	6.30E-04	2.94E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/21/94

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		1
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		3.5
ED1	= YOUTH EXPOSURE DURATION (YEARS)		6
ED2	= ADULT EXPOSURE DURATION (YEARS)		25
BW1	= BODY WEIGHT ADOLESCENT (KG)		15
BW2	= BODY WEIGHT ADULT (KG)		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.86E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 5.21E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A66
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	14	0.05	0.00E+00	3.64E–07	1.30E–07		
Benzo(b)fluoranthene	13	0.05	0.00E+00	3.38E–07	1.21E–07		
Benzo(k)fluoranthene	18	0.05	0.00E+00	4.68E–07	1.67E–07		
Benzo(a)pyrene	14	0.05	0.00E+00	3.64E–07	1.30E–07		
Dibenz(a,h)anthracene	3.8	0.05	0.00E+00	9.89E–08	3.53E–08		
Antimony	5.9	0.01	0.00E+00	3.07E–08	1.10E–08	4.00E–04	
Arsenic	150	0.01	0.00E+00	7.81E–07	2.79E–07	2.80E–04	1.60E+00
Beryllium	0.74	0.01	0.00E+00	3.85E–09	1.38E–09	2.50E–04	8.60E+00
Manganese	214	0.01	0.00E+00	1.11E–06	3.98E–07	1.50E–04	
Vanadium	43 4	0 01	0.00E+00	2.26E–07	8.07E–08	3.50E–04	
Dieldrin	0 0075	0 05	0.00E+00	1.95E–10	6.97E–11	5.00E–05	1.60E+01
Methoxychlor	0 37	0 05	0.00E+00	9.63E–09	3.44E–09	1.50E–04	
Indeno(1,2,3-cd)pyrene	6 6	0.05	0.00E+00	1.72E–07	6.14E–08		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	7.68E-05	0.00E+00
Arsenic	0.00E+00	2.79E-03	5.02E-07
Beryllium	0.00E+00	1.54E-05	1.18E-08
Manganese	0.00E+00	7.43E-03	0.00E+00
Vanadium	0.00E+00	6.45E-04	0.00E+00
Dieldrin	0.00E+00	3.90E-06	1.12E-09
Methoxychlor	0.00E+00	6.42E-05	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.10E-02	5.15E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 12/21/94

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		12
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		6
BW1	= BODY WEIGHT ADOLESCENT (KG):		15
BW2	= BODY WEIGHT ADULT (KG).		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		2190
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.06E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E–07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	14	0.05	0.00E+00	2.50E−07	2.14E−08		
Benzo(b)fluoranthene	13	0.05	0.00E+00	2.32E−07	1.99E−08		
Benzo(k)fluoranthene	18	0.05	0.00E+00	3.21E−07	2.75E−08		
Benzo(a)pyrene	14	0.05	0.00E+00	2.50E−07	2.14E−08		
Dibenz(a,h)anthracene	3.8	0.05	0.00E+00	6.78E−08	5.81E−09		
Antimony	5.9	0.01	0.00E+00	2.11E−08	1.81E−09	4.00E−04	
Arsenic	150	0.01	0.00E+00	5.35E−07	4.59E−08	2.80E−04	1.80E+00
Beryllium	0.85	0.01	0.00E+00	3.03E−09	2.60E−10	2.50E−04	8.60E+00
Manganese	233	0 01	0.00E+00	8.32E−07	7.13E−08	1.50E−04	
Vanadium	51 2	0 01	0.00E+00	1.83E−07	1.57E−08	3.50E−04	
Dieldrin	0 0075	0 05	0 00E+00	1.34E−10	1.15E−11	5.00E−05	1.60E+01
Methoxychlor	0 37	0 05	0.00E+00	6.60E−09	5.66E−10	1.50E−04	
Indeno(1,2,3-cd)pyrene	6 6	0 05	0.00E+00	1.18E−07	1.01E−08		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0 00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	5.26E-05	0.00E+00
Arsenic	0.00E+00	1.91E-03	8.26E-08
Beryllium	0.00E+00	1.21E-05	2.24E-09
Manganese	0.00E+00	5.54E-03	0.00E+00
Vanadium	0.00E+00	5.22E-04	0.00E+00
Dieldrin	0.00E+00	2.68E-06	1.84E-10
Methoxychlor	0.00E+00	4.40E-05	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	8.09E-03	8.50E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/21/94

EXPOSURE SCENARIO: OCCASIONAL VISITOR, RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		1
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		24
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		24
ED1	= YOUTH EXPOSURE DURATION (YEARS):		6
ED2	= ADULT EXPOSURE DURATION (YEARS):		25
BW1	= BODY WEIGHT ADOLESCENT (KG):		15
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		2190
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.27E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	14	0.05	0.00E+00	2.50E–06	8.92E–07		
Benzo(b)fluoranthene	13	0.05	0.00E+00	2.32E–06	8.29E–07		
Benzo(k)fluoranthene	18	0.05	0.00E+00	3.21E–06	1.15E–06		
Benzo(a)pyrene	14	0.05	0.00E+00	2.50E–06	8.92E–07		
Dibenz(a,h)anthracene	3.8	0.05	0.00E+00	6.78E–07	2.42E–07		
Antimony	5.9	0.01	0.00E+00	2.11E–07	7.52E–08	4.00E–04	
Arsenic	150	0.01	0.00E+00	5.35E–06	1.91E–06	2.80E–04	1.80E+00
Beryllium	0.85	0.01	0.00E+00	3.03E–08	1.08E–08	2.50E–04	8.60E+00
Manganese	233	0.01	0.00E+00	8.32E–06	2.97E–06	1.50E–04	
Vanadium	81.2	0.01	0.00E+00	1.83E–06	6.53E–07	3.50E–04	
Dieldrin	0.0075	0.06	0.00E+00	1.34E–09	4.78E–10	5.00E–05	1.60E+01
Methylene chloride	0.37	0.06	0.00E+00	6.60E–08	2.36E–08	1.50E–04	
Indeno(1,2,3-cd)pyrene	6.6	0.06	0.00E+00	1.18E–06	4.21E–07		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	5.26E-04	0.00E+00
Arsenic	0.00E+00	1.91E-02	3.44E-06
Beryllium	0.00E+00	1.21E-04	9.32E-08
Manganese	0.00E+00	5.54E-02	0.00E+00
Vanadium	0.00E+00	5.22E-03	0.00E+00
Dieldrin	0.00E+00	2.68E-05	7.65E-09
Methoxychlor	0.00E+00	4.40E-04	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	8.09E-02	3.54E-06

RISK ASSESSMENT SPREADSHEET - INHALATION

SITE NAME: SITE 4 - RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/22/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION HEX = (C * IR * ET * EF * ED)/(BW * AT)

WHERE
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR:	3.9	IR:	0
EF:	1	EF:	350
ET:	8	ET:	24
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.22E-03 (AVG ANNUAL DOSE)
CF: 4.36E-04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.3E-06	0.00E+00	1.54E-09	5.50E-10		
Benzo(b)fluoranthene	1.2E-06	0.00E+00	1.43E-09	5.10E-10		
Benzo(k)fluoranthene	1.6E-06	0.00E+00	1.98E-09	7.07E-10		
Benzo(a)pyrene	1.3E-06	0.00E+00	1.54E-09	5.50E-10		
Dibenz(a,h)anthracene	3.4E-07	0.00E+00	4.18E-10	1.49E-10		
Antimony	5.3E-07	0.00E+00	6.48E-10	2.32E-10		
Arsenic	1.4E-05	0.00E+00	1.65E-08	5.89E-09		1.51E+01
Beryllium	6.7E-08	0.00E+00	8.13E-11	2.90E-11		
Manganese	1.9E-05	0.00E+00	2.35E-08	8.40E-09	1.43E-05	
Vanadium	3.9E-06	0.00E+00	4.77E-09	1.70E-09		
Dieldrin	6.8E-10	0.00E+00	8.24E-13	2.94E-13		1.61E+01
Methoxychlor	3.3E-08	0.00E+00	4.07E-11	1.45E-11		
Indeno(1,2,3-cd)pyrene	5.9E-07	0.00E+00	7.25E-10	2.59E-10		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 4 - RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	8.89E-08
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	1.64E-03	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Dieldrin	0.00E+00	0.00E+00	4.74E-12
Methoxychlor	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.64E-03**	**8.89E-08**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/22/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C * IR * ET * EF * ED)/(BW * AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR:	3.9	IR:	0
EF:	3.5	EF:	350
ET:	8	ET:	24
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 4.27E-03 (AVG ANNUAL DOSE)
CF: 1.53E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.3E-06	0.00E+00	5.39E-09	1.92E-09		
Benzo(b)fluoranthene	1.2E-06	0.00E+00	5.00E-09	1.79E-09		
Benzo(k)fluoranthene	1.6E-06	0.00E+00	6.92E-09	2.47E-09		
Benzo(a)pyrene	1.3E-06	0.00E+00	5.39E-09	1.92E-09		
Dibenz(a,h)anthracene	3.4E-07	0.00E+00	1.46E-09	5.22E-10		
Antimony	5.3E-07	0.00E+00	2.27E-09	8.11E-10		
Arsenic	1.4E-05	0.00E+00	5.77E-08	2.06E-08		1.51E+01
Beryllium	6.7E-08	0.00E+00	2.85E-10	1.02E-10		
Manganese	1.9E-05	0.00E+00	8.23E-08	2.94E-08	1.43E-05	
Vanadium	3.9E-06	0.00E+00	1.67E-08	5.96E-09		
Dieldrin	6.8E-10	0.00E+00	2.88E-12	1.03E-12		1.61E+01
Methoxychlor	3.3E-08	0.00E+00	1.42E-10	5.08E-11		
Indeno(1,2,3-cd)pyrene	5.9E-07	0.00E+00	2.54E-09	9.07E-10		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 4 - RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	3.11E-07
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	5.76E-03	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Dieldrin	0.00E+00	0.00E+00	1.66E-11
Methoxychlor	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	5.76E-03	3.11E-07

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/22/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	12	EF:	350
ET:	8	ET:	24
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 3.01E-03 (AVG ANNUAL DOSE)
CF: 2.58E-04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.5E–07	0.00E+00	7.57E–10	6.49E–11		
Benzo(b)fluoranthene	2.3E–07	0.00E+00	7.03E–10	6.03E–11		
Benzo(k)fluoranthene	3.2E–07	0.00E+00	9.74E–10	8.35E–11		
Benzo(a)pyrene	2.5E–07	0.00E+00	7.57E–10	6.49E–11		
Dibenz(a,h)anthracene	6.8E–08	0.00E+00	2.06E–10	1.76E–11		
Antimony	1.1E–07	0.00E+00	3.19E–10	2.74E–11		
Arsenic	2.7E–06	0.00E+00	8.12E–09	6.96E–10		1.51E+01
Beryllium	1.5E–08	0.00E+00	4.60E–11	3.94E–12		
Manganese	4.2E–06	0.00E+00	1.26E–08	1.08E–09	1.43E–05	
Vanadium	9.2E–07	0.00E+00	2.77E–09	2.37E–10		
Dieldrin	1.4E–10	0.00E+00	4.06E–13	3.48E–14		1.61E+01
Methoxychlor	6.7E–09	0.00E+00	2.00E–11	1.72E–12		
Indeno(1,2,3-cd)pyrene	1.2E–07	0.00E+00	3.57E–10	3.06E–11		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	1.05E-08
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	8.82E-04	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Dieldrin	0.00E+00	0.00E+00	5.60E-13
Methoxychlor	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**8.82E-04**	**1.05E-08**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 4 – RUBBLE FILL AT BUNKER A86
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 12/22/94

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION $HEX = (C \times IR \times ET \times EF \times ED)/(BW \times AT)$

WHERE
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	0.8	IR	0
EF:	24	EF:	350
ET:	8	ET:	24
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 6.01E-03 (AVG ANNUAL DOSE)
CF: 2.15E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TW)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	2.5E-07	0.00E+00	1.51E-09	5.41E-10		
Benzo(b)fluoranthene	2.3E-07	0.00E+00	1.41E-09	5.02E-10		
Benzo(k)fluoranthene	3.2E-07	0.00E+00	1.95E-09	6.96E-10		
Benzo(a)pyrene	2.5E-07	0.00E+00	1.51E-09	5.41E-10		
Dibenz(a,h)anthracene	6.8E-08	0.00E+00	4.11E-10	1.47E-10		
Antimony	1.1E-07	0.00E+00	6.38E-10	2.28E-10		
Arsenic	2.7E-06	0.00E+00	1.62E-08	5.80E-09		1.51E+01
Beryllium	1.5E-08	0.00E+00	9.20E-11	3.28E-11		
Manganese	4.2E-06	0.00E+00	2.52E-08	9.00E-09	1.43E-05	
Vanadium	9.2E-07	0.00E+00	5.54E-09	1.98E-09		
Dieldrin	1.4E-10	0.00E+00	8.12E-13	2.90E-13		1.61E+01
Methoxychlor	6.7E-09	0.00E+00	4.00E-11	1.43E-11		
Indeno(1,2,3-cd)pyrene	1.2E-07	0.00E+00	7.14E-10	2.55E-10		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 4 – RUBBLE FILL AT BUNKER A86
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	8.75E-08
Beryllium	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	1.76E-03	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Dieldrin	0.00E+00	0.00E+00	4.67E-12
Methoxychlor	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.76E-03	8.75E-08

RESULTS OF THE USEPA BIOKINETIC UPTAKE MODEL FOR EXPOSURE TO LEAD
SITE 4 - RUBBLE FILL AT BUNKER A86; SEDIMENT
NSB-NLON, GROTON, CONNECTICUT

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	646.0	200.0
1-2	646.0	200.0
2-3	646.0	200.0
3-4	646.0	200.0
4-5	646.0	200.0
5-6	646.0	200.0
6-7	646.0	200.0

Additional Dust Sources: None DEFAULT

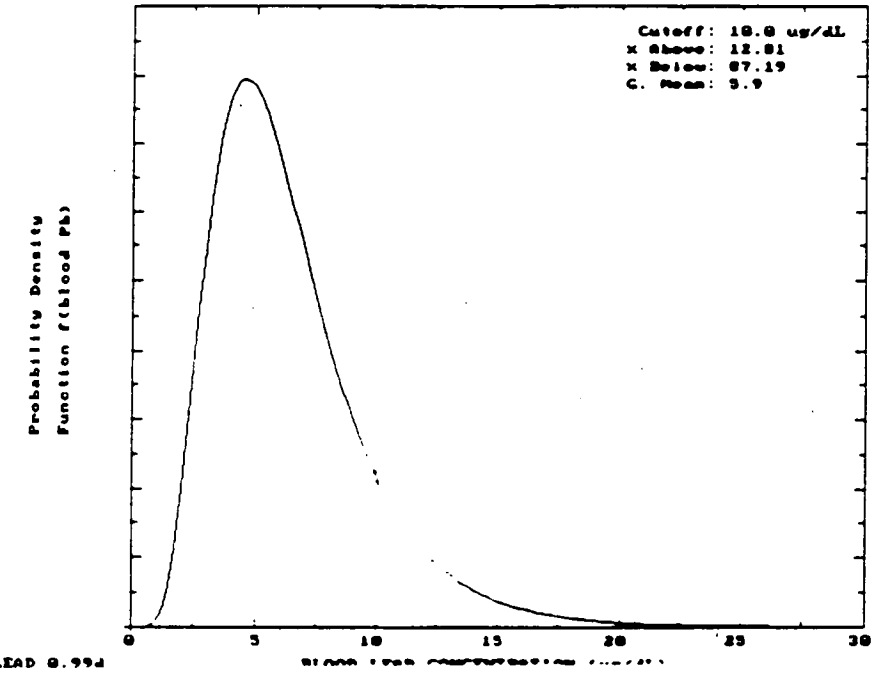
PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	6.3	11.71	8.93
1-2:	7.1	17.28	13.91
2-3:	6.6	17.98	14.17
3-4:	6.3	18.22	14.44
4-5:	5.3	14.92	11.07
5-6:	4.5	14.23	10.10
6-7:	4.0	14.09	9.60

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.42	0.35	0.00	0.02
1-2:	2.48	0.86	0.00	0.03
2-3:	2.83	0.91	0.00	0.06
3-4:	2.78	0.94	0.00	0.07
4-5:	2.77	1.01	0.00	0.07
5-6:	2.96	1.08	0.00	0.09
6-7:	3.29	1.11	0.00	0.09



LEAD 0.99d

APPENDIX F.10

SITE 6 - DRMO

SUMMARY OF STATISTICALLY DERIVED EXPOSURE CONCENTRATIONS
SITE 6 - DRMO
SOIL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Concern	Surface Soil		All Soil	
	Distribution of Data Set[1]	Exposure Concentration[2] (mg/kg)	Distribution of Data Set[1]	Exposure Concentration[2] (mg/kg)
1,1,2,2-Tetrachloroethane	NA	NA	Undefined	3.00
Trichloroethene	NA	NA	Undefined	1.70
Vinyl chloride	NA	NA	Undefined	0.120
Bis(2-ethylhexyl)phthalate	NA	NA	Undefined	1.10
Benzo(a)anthracene	Undefined	0.780	Undefined	1.00
Benzo(b)fluoranthene	Undefined	0.710	Undefined	1.00
Benzo(k)fluoranthene	Undefined	0.870	Undefined	0.960
Benzo(a)pyrene	Undefined	0.880	Undefined	1.00
Dibenz(a,h)anthracene	NA	NA	Undefined	0.220
Indeno(1,2,3-cd)pyrene	Undefined	0.760	Undefined	0.780
4,4'-DDD	NA	NA	Undefined	1.4
4,4'-DDE	NA	NA	Undefined	0.770
4,4'-DDT	NA	NA	Undefined	2.90
Aroclor-1260	Undefined	11.0[a]	Undefined	12.0[3]
Arsenic	Undefined	2.6	Lognormal	3.3
Beryllium	Lognormal	1.1	Undefined	1.2
Boron	NA	NA	Undefined	299
Cadmium	Lognormal	5.9	Undefined	7.0
Copper	Lognormal	697	Undefined	1850
Lead	Lognormal	754[a]	Lognormal	2220[3]
Manganese	Lognormal	268	Undefined	342
Nickel	NA	NA	Undefined	98.8
Vanadium	Lognormal	48.4	Lognormal	44.0
Zinc	Lognormal	1510	Undefined	2050

SUMMARY OF STATISTICALLY DERIVED EXPOSURE CONCENTRATIONS
SITE 6 - DRMO
SOIL
NSB-NLON, GROTON, CONNECTICUT

NA Not applicable; chemical not selected as a potential Chemical of Concern for this medium.

(1) Distribution determined using the Shapiro-Wilk "W-Test" (Gilbert, 1987).

(2) Exposure concentration is the 95% upper confidence limit (UCL) of the arithmetic mean or the mean of the transformed data, unless otherwise noted. 95% UCL is based on the distribution of the data set. Sample and duplicate results are averaged for the calculation of the 95% UCL; one-half of the nondetected values are used. When the distribution of the data set is undefined the most conservative 95% UCL was used as the exposure concentration.

(3) The maximum detected concentration is used as the exposure concentration because the calculated 95% UCL exceeds the maximum reported concentration.

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)anthracene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	100	4.605170	122500	.9866851
2	165	5.105945	81225	.2426005
3	165	5.105945	81225	.2426005
4	165	5.105945	81225	.2426005
5	165	5.105945	81225	.2426005
6	165	5.105945	81225	.2426005
7	165	5.105945	81225	.2426005
8	190	5.247024	67600	.1235286
9	200	5.298317	62500	.0901039
10	240	5.480639	44100	.0138890
11	240	5.480639	44100	.0138890
12	280	5.634790	28900	.0013176
13	570	6.345636	14400	.5582271
14	590	6.380123	19600	.6109488
15	600	6.396930	22500	.6375052
16	3200	8.070906	7562500	6.112839
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	450	5.598490	751.7114	.8408145
		270.0185		

Upper 95% confidence limit on arithmetic mean: 779.4375
Upper 95% confidence limit on geometric mean: 658.5560

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	100	1e4	4.605170	21.20759
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	190	3.61e4	5.247024	27.53126
9	200	4e4	5.298317	28.07217
10	240	5.76e4	5.480639	30.03740
11	240	5.76e4	5.480639	30.03740
12	280	7.84e4	5.634790	31.75085
13	570	3.249e5	6.345636	40.26710
14	590	3.481e5	6.380123	40.70596
15	600	3.6e5	6.396930	40.92071
16	3200	1.024e7	8.070906	65.13953
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	7200	11716050	89.57585	512.0941

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 8476050 (normal distribution)

d = 10.60454 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	3.1e3	1.5674e3
	.329	4.35e2	1.4312e2
	.2521	4.25e2	1.0714e2
	.1939	4.05e2	7.8530e1
	.1447	1.15e2	1.6641e1
	.1005	7.5e1	7.5375e0
	.0593	7.5e1	4.4475e0
	.0196	1e1	1.96e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.9250e3
Summation**2:			3.7055e6

Wcalc = .4371734 Wtable = .887 Wcalc - Wtable = -.449827

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	3.465736	1.752276
.329	1.290984	.4247338
.2521	1.274177	.3212200
.1939	1.239691	.2403761
.1447	.5288441	.0765237
.1005	.3746934	.0376567
.0593	.3746934	.0222193
.0196	.0512933	.0010053
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.876011
Summation**2:		8.271440

Wcalc = .7799907 Wtable = .887 Wcalc - Wtable = -.107009

Arithmetic Average: 450 Geometric Mean: 270.0185

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(b)fluoranthene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	150	5.010635	78400	.3657449
2	165	5.105945	70225	.2595478
3	165	5.105945	70225	.2595478
4	165	5.105945	70225	.2595478
5	165	5.105945	70225	.2595478
6	165	5.105945	70225	.2595478
7	165	5.105945	70225	.2595478
8	165	5.105945	70225	.2595478
9	165	5.105945	70225	.2595478
10	210	5.347108	48400	.0719829
11	290	5.669881	19600	.0029678
12	380	5.940171	2500	.1054739
13	440	6.086775	100	.2221906
14	550	6.309918	14400	.4823504
15	840	6.733402	168100	1.249920
16	2700	7.901007	5152900	5.223982
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	430	5.615404	634.8858	.8083314
		274.6242		

Upper 95% confidence limit on arithmetic mean: 708.2387
Upper 95% confidence limit on geometric mean: 632.5314

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	150	2.25e4	5.010635	25.10647
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	210	4.41e4	5.347108	28.59156
11	290	8.41e4	5.669881	32.14755
12	380	1.444e5	5.940171	35.28563
13	440	1.936e5	6.086775	37.04883
14	550	3.025e5	6.309918	39.81507
15	840	7.056e5	6.733402	45.33870
16	2700	7.29e6	7.901007	62.42591
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	6880	9004600	89.84646	514.3252

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 6046200 (normal distribution)

d = 9.800995 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	2.55e3	1.2893e3
	.329	6.75e2	2.2208e2
	.2521	3.85e2	9.7059e1
	.1939	2.75e2	5.3323e1
	.1447	2.15e2	3.1111e1
	.1005	1.25e2	1.2563e1
	.0593	4.5e1	2.6685e0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.7081e3
Summation**2:			2.9175e6

Wcalc = .4825392 Wtable = .887 Wcalc - Wtable = -.404461

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	2.890372	1.461372
.329	1.627456	.5354332
.2521	1.203973	.3035215
.1939	.9808293	.1901828
.1447	.8342258	.1207125
.1005	.5639354	.0566755
.0593	.2411621	.0143009
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.682198
	Summation**2:	7.194188

Wcalc = .7340263 Wtable = .887 Wcalc - Wtable = -.152974

Arithmetic Average: 430 Geometric Mean: 274.6242

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(k)fluoranthene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	47	3.850148	166974.4	2.411128
2	88	4.477337	135148.1	.8567195
3	165	5.105945	84462.89	.0881988
4	165	5.105945	84462.89	.0881988
5	165	5.105945	84462.89	.0881988
6	165	5.105945	84462.89	.0881988
7	165	5.105945	84462.89	.0881988
8	165	5.105945	84462.89	.0881988
9	165	5.105945	84462.89	.0881988
10	165	5.105945	84462.89	.0881988
11	165	5.105945	84462.89	.0881988
12	240	5.480639	46494.14	.0060390
13	310	5.736572	21206.64	.1113184
14	540	6.291569	7119.141	.7896827
15	580	6.363028	15469.14	.9217918
16	4000	8.294050	12562594	8.358583
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	455.625	5.402928	956.2138	.9746470
		222.0557		

Upper 95% confidence limit on arithmetic mean: 874.6857
Upper 95% confidence limit on geometric mean: 700.1100

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	47	2.209e3	3.850148	14.82364
2	88	7.744e3	4.477337	20.04654
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	240	5.76e4	5.480639	30.03740
13	310	9.61e4	5.736572	32.90826
14	540	2.916e5	6.291569	39.58384
15	580	3.364e5	6.363028	40.48813
16	4000	1.6e7	8.294050	68.79126
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation	7700	17036678	86.44685	481.3152

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 13715172 (normal distribution)

d = 14.24905 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	3.953e3	1.9986e3
	.329	4.92e2	1.6187e2
	.2521	3.75e2	9.4538e1
	.1939	1.45e2	2.8116e1
	.1447	7.5e1	1.0853e1
	.1005	0	0
	.0593	0	0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.2940e3
Summation**2:			5.2625e6

Wcalc = .3836979 Wtable = .887 Wcalc - Wtable = -.503302

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.443902	2.246837
.329	1.885691	.6203924
.2521	1.185624	.2988957
.1939	.6306268	.1222785
.1447	.3746934	.0542181
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.342622
Summation**2:		11.17312

Wcalc = .7841308 Wtable = .887 Wcalc - Wtable = -.102869

Arithmetic Average: 455.625 Geometric Mean: 222.0557

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)pyrene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	165	5.105945	88692.29	.1342001
2	165	5.105945	88692.29	.1342001
3	165	5.105945	88692.29	.1342001
4	165	5.105945	88692.29	.1342001
5	165	5.105945	88692.29	.1342001
6	165	5.105945	88692.29	.1342001
7	165	5.105945	88692.29	.1342001
8	165	5.105945	88692.29	.1342001
9	165	5.105945	88692.29	.1342001
10	165	5.105945	88692.29	.1342001
11	165	5.105945	88692.29	.1342001
12	165	5.105945	88692.29	.1342001
13	165	5.105945	88692.29	.1342001
14	580	6.363028	13732.91	.7934342
15	680	6.522093	47170.41	1.102109
16	4000	8.294050	12511695	7.962390
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	462.8125	5.472279	956.5772	.8794898
		238.0019		

Upper 95% confidence limit on arithmetic mean: 882.0324
Upper 95% confidence limit on geometric mean: 622.8899

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	165	2.7225e4	5.105945	26.07068
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	580	3.364e5	6.363028	40.48813
15	680	4.624e5	6.522093	42.53769
16	4000	1.6e7	8.294050	68.79126
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	7405	17152725	87.55646	490.7359

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 13725598 (normal distribution)

d = 11.60254 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	3.835e3	1.9390e3
.329	5.15e2	1.6944e2
.2521	4.15e2	1.0462e2
.1939	0	0
.1447	0	0
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.2130e3
Summation**2:		4.8975e6

Wcalc = .3568160 Wtable = .887 Wcalc - Wtable = -.530184

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	3.188104	1.611905
.329	1.416147	.4659125
.2521	1.257083	.3169105
.1939	0	0
.1447	0	0
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.394728
Summation**2:		5.734724

Wcalc = .4942647 Wtable = .887 Wcalc - Wtable = -.392735

Arithmetic Average: 462.8125 Geometric Mean: 238.0019

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Indeno(1,2,3-cd)pyrene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	165	5.105945	46090.72	.0371223
2	165	5.105945	46090.72	.0371223
3	165	5.105945	46090.72	.0371223
4	165	5.105945	46090.72	.0371223
5	165	5.105945	46090.72	.0371223
6	165	5.105945	46090.72	.0371223
7	165	5.105945	46090.72	.0371223
8	165	5.105945	46090.72	.0371223
9	165	5.105945	46090.72	.0371223
10	165	5.105945	46090.72	.0371223
11	165	5.105945	46090.72	.0371223
12	165	5.105945	46090.72	.0371223
13	165	5.105945	46090.72	.0371223
14	165	5.105945	46090.72	.0371223
15	165	5.105945	46090.72	.0371223
16	3600	8.188689	10370413	8.352517
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	379.6875	5.298617	858.75	.7706859
		200.0599		

Upper 95% confidence limit on arithmetic mean: 756.0347
Upper 95% confidence limit on geometric mean: 432.4344

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	165	2.7225e4	5.105945	26.07068
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	165	2.7225e4	5.105945	26.07068
15	165	2.7225e4	5.105945	26.07068
16	3600	1.296e7	8.188689	67.05463
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	6075	13368375	84.77787	458.1148

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 11061773 (normal distribution)

d = 8.909352 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	3.435e3	1.7367e3
.329	0	0
.2521	0	0
.1939	0	0
.1447	0	0
.1005	0	0
.0593	0	0
.0196	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.7367e3
Summation**2:		3.0163e6

Wcalc = .2726735 Wtable = .887 Wcalc - Wtable = -.614327

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	3.082744	1.558635
	.329	0	0
	.2521	0	0
	.1939	0	0
	.1447	0	0
	.1005	0	0
	.0593	0	0
	.0196	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.558635
Summation**2:			2.429344

Wcalc = .2726735 Wtable = .887 Wcalc - Wtable = -.614327

Arithmetic Average: 379.6875 Geometric Mean: 200.0599

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Aroclor-1260 (ug/kg); Site 6 - DRMO; NSB-NLON
ter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	80	4.382027	3422500	3.952911
2	80	4.382027	3422500	3.952911
3	80	4.382027	3422500	3.952911
4	80	4.382027	3422500	3.952911
5	80	4.382027	3422500	3.952911
6	80	4.382027	3422500	3.952911
7	250	5.521461	2822400	.7203912
8	550	6.309918	1904400	.0036362
9	1300	7.170120	396900	.6398400
10	1400	7.244228	280900	.7638900
11	2100	7.649693	28900	1.637051
12	2400	7.783224	220900	1.996582
13	3100	8.039157	1368900	2.785354
14	3200	8.070906	1612900	2.892335
15	5100	8.536996	10048900	4.694919
16	11000	9.305651	82264900	8.616755
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	1930	6.370220	2845.874	1.797558
		584.1861		

Upper 95% confidence limit on arithmetic mean: 3177.204
Upper 95% confidence limit on geometric mean: 19804.73

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	80	6.4e3	4.382027	19.20216
2	80	6.4e3	4.382027	19.20216
3	80	6.4e3	4.382027	19.20216
4	80	6.4e3	4.382027	19.20216
5	80	6.4e3	4.382027	19.20216
6	80	6.4e3	4.382027	19.20216
7	250	6.25e4	5.521461	30.48653
8	550	3.025e5	6.309918	39.81507
9	1300	1.69e6	7.170120	51.41061
10	1400	1.96e6	7.244228	52.47883
11	2100	4.41e6	7.649693	58.51780
12	2400	5.76e6	7.783224	60.57858
13	3100	9.61e6	8.039157	64.62805
14	3200	1.024e7	8.070906	65.13953
15	5100	2.601e7	8.536996	72.88030
16	11000	1.21e8	9.305651	86.59513
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	[illegible]	1.8108e8	101.9235	697.7434

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 1.2149e8 (normal distribution)

d = 48.46822 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	1.092e4	5.5212e3
	.329	5.02e3	1.6516e3
	.2521	3.12e3	7.8655e2
	.1939	3.02e3	5.8558e2
	.1447	2.32e3	3.3570e2
	.1005	2.02e3	2.0301e2
	.0593	1.15e3	6.8195e1
	.0196	7.5e2	1.47e1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			9.1665e3
Summation**2:			8.4024e7

Wcalc = .6916425 Wtable = .887 Wcalc - Wtable = -.195357

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	4.923624	2.489384
	.329	4.154969	1.366985
	.2521	3.688879	.9299665
	.1939	3.657131	.7091177
	.1447	3.401197	.4921533
	.1005	3.267666	.3284004
	.0593	1.722767	.1021601
	.0196	.8602013	.0168599
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			6.435027
Summation**2:			41.40957

Wcalc = .8543654 Wtable = .887 Wcalc - Wtable = -.032635

Arithmetic Average: 1930 Geometric Mean: 584.1861

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Arsenic (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.2	.1823216	1.012539	.3097557
2	1.4	.3364722	.6500391	.1619309
3	1.4	.3364722	.6500391	.1619309
4	1.5	.4054651	.4987891	.1111646
5	1.5	.4054651	.4987891	.1111646
6	1.8	.5877867	.1650391	.0228288
7	2	.6931472	.0425391	.0020914
8	2	.6931472	.0425391	.0020914
9	2.3	.8329091	.0087891	.0088417
10	2.3	.8329091	.0087891	.0088417
11	2.4	.8754687	.0375391	.0186569
12	2.8	1.029619	.3525391	.0845302
13	2.9	1.064711	.4812891	.1061666
14	3	1.098612	.6300391	.1294083
15	3.4	1.223775	1.425039	.2351249
16	3.4	1.223775	1.425039	.2351249
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	2.20625	.7388786	.7270660	.3376046
		2.093586		

Upper 95% confidence limit on arithmetic mean: 2.524887
Upper 95% confidence limit on geometric mean: 2.616794

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.2	1.44e0	.1823216	.0332412
2	1.4	1.96e0	.3364722	.1132136
3	1.4	1.96e0	.3364722	.1132136
4	1.5	2.25e0	.4054651	.1644020
5	1.5	2.25e0	.4054651	.1644020
6	1.8	3.24e0	.5877867	.3454932
7	2	4e0	.6931472	.4804530
8	2	4e0	.6931472	.4804530
9	2.3	5.29e0	.8329091	.6937376
10	2.3	5.29e0	.8329091	.6937376
11	2.4	5.76e0	.8754687	.7664455
12	2.8	7.84e0	1.029619	1.060116
13	2.9	8.41e0	1.064711	1.133609
14	3	9e0	1.098612	1.206949
15	3.4	1.156e1	1.223775	1.497626
16	3.4	1.156e1	1.223775	1.497626
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	35.3	85.81	11.82206	10.44472

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 7.929375 (normal distribution)

d = 1.709653 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site Ø - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	2.2e0	1.1123e0
.329	2e0	6.58e-1
.2521	1.6e0	4.034e-1
.1939	1.4e0	2.715e-1
.1447	1.3e0	1.881e-1
.1005	6e-1	6.03e-2
.0593	3e-1	1.779e-2
.0196	3e-1	5.88e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.7172e0
Summation**2:		7.3833e0

Wcalc = .9311307 Wtable = .887 Wcalc - Wtable = .0441307

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.041454	.5265591
.329	.8873032	.2919228
.2521	.7621401	.1921355
.1939	.6592456	.1278277
.1447	.6241543	.0903151
.1005	.2876821	.0289120
.0593	.1397619	.0082879
.0196	.1397619	.0027393
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.268699
	Summation**2:	1.609598

Wcalc = .9414764 Wtable = .887 Wcalc - Wtable = .0544764

Arithmetic Average: 2.20625 Geometric Mean: 2.093586

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Beryllium (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.22	-1.51413	.2525063	.6818599
2	.22	-1.51413	.2525063	.6818599
3	.23	-1.46968	.2425563	.6104240
4	.25	-1.38629	.2232563	.4870850
5	.3	-1.20397	.1785063	.2658363
6	.31	-1.17118	.1701563	.2330991
7	.38	-.967584	.1173063	.0779551
8	.39	-.941609	.1105563	.0641249
9	.41	-.891598	.0976563	.0412978
10	.45	-.798508	.0742563	.0121282
11	.54	-.616186	.0333063	.0052119
12	.79	-.235722	.0045563	.2048986
13	.87	-.139262	.0217563	.3015301
14	1	0	.0770063	0
15	1.9	.6418539	1.386506	1.769521
16	3.3	1.193922	6.643506	3.543061
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	.7225	-.688380	.8118251	.7737309
		.5023895		

Upper 95% confidence limit on arithmetic mean: 1.078282
Upper 95% confidence limit on geometric mean: 1.091409

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.22	4.84e-2	-1.51413	2.292583
2	.22	4.84e-2	-1.51413	2.292583
3	.23	5.29e-2	-1.46968	2.159947
4	.25	6.25e-2	-1.38629	1.921812
5	.3	9e-2	-1.20397	1.449551
6	.31	9.61e-2	-1.17118	1.371670
7	.38	1.444e-1	-.967584	.9362188
8	.39	1.521e-1	-.941609	.8866266
9	.41	1.681e-1	-.891598	.7949472
10	.45	2.025e-1	-.798508	.6376145
11	.54	2.916e-1	-.616186	.3796854
12	.79	6.241e-1	-.235722	.0555650
13	.87	7.569e-1	-.139262	.0193939
14	1	1e0	0	0
15	1.9	3.61e0	.6418539	.4119764
16	3.3	1.089e1	1.193922	1.425451
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	11.56	18.238	-11.0141	17.03562

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 9.8859 (normal distribution)

d = 9.453760 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	3.08e0	1.5572e0
	.329	1.68e0	5.527e-1
	.2521	7.7e-1	1.941e-1
	.1939	6.2e-1	1.202e-1
	.1447	4.9e-1	7.090e-2
	.1005	2.3e-1	2.312e-2
	.0593	7e-2	4.151e-3
	.0196	2e-2	3.92e-4
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.5229e0
Summation**2:			6.3648e0

Wcalc = .6438304 Wtable = .887 Wcalc - Wtable = -.243170

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	2.708050	1.369190
.329	2.155982	.7093180
.2521	1.469676	.3705053
.1939	1.247032	.2417996
.1447	.9682505	.1401058
.1005	.5549968	.0557772
.0593	.1690763	.0100262
.0196	.0500104	.0009802
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.897702
	Summation**2:	8.396680

Wcalc = .8881842 Wtable = .887 Wcalc - Wtable = .0011842

Arithmetic Average: .7225 Geometric Mean: .5023895

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Cadmium (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.4	.8754687	5.006406	.3115808
2	2.4	.8754687	5.006406	.3115808
3	2.5	.9162907	4.568906	.2676740
4	2.6	.9555114	4.151406	.2286289
5	2.9	1.064711	3.018906	.1361257
6	3.7	1.308333	.8789063	.0157076
7	4	1.386294	.4064063	.0022438
8	4.1	1.410987	.2889063	.0005142
9	4.9	1.589235	.0689063	.0242027
10	5.7	1.740466	1.128906	.0941282
11	5.8	1.757858	1.351406	.1051024
12	6.2	1.824549	2.441406	.1527921
13	6.6	1.887070	3.851406	.2055776
14	6.7	1.902108	4.253906	.2194403
15	10.8	2.379546	37.97641	.8946950
16	2.9	1.064711	3.018906	.1361257
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	4.6375	1.433663	2.271820	.4550546
		4.194034		

Upper 95% confidence limit on arithmetic mean: 5.633125
Upper 95% confidence limit on geometric mean: 5.891390

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.4	5.76e0	.8754687	.7664455
2	2.4	5.76e0	.8754687	.7664455
3	2.5	6.25e0	.9162907	.8395887
4	2.6	6.76e0	.9555114	.9130021
5	2.9	8.41e0	1.064711	1.133609
6	2.9	8.41e0	1.064711	1.133609
7	3.7	1.369e1	1.308333	1.711735
8	4	1.6e1	1.386294	1.921812
9	4.1	1.681e1	1.410987	1.990884
10	4.9	2.401e1	1.589235	2.525669
11	5.7	3.249e1	1.740466	3.029223
12	5.8	3.364e1	1.757858	3.090064
13	6.2	3.844e1	1.824549	3.328980
14	6.6	4.356e1	1.887070	3.561032
15	6.7	4.489e1	1.902108	3.618013
16	10.8	1.1664e2	2.379546	5.662240
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	[illegible].2	421.52	22.93861	35.99235

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 77.4175 (normal distribution)

d = 3.106120 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	8.4e0	4.2470e0
	.329	4.3e0	1.4147e0
	.2521	4.1e0	1.0336e0
	.1939	3.6e0	6.980e-1
	.1447	2.9e0	4.196e-1
	.1005	2.8e0	2.814e-1
	.0593	1.2e0	7.116e-2
	.0196	1e-1	1.96e-3
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			8.1675e0
Summation**2:			6.6709e1

Wcalc = .8616748 Wtable = .887 Wcalc - Wtable = -.025325

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.504077	.7604615
.329	1.026639	.3377642
.2521	.9707789	.2447334
.1939	.8690378	.1685064
.1447	.6931472	.1002984
.1005	.6757554	.0679134
.0593	.2809024	.0166575
.0196	.0246926	.0004840
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.696819
Summation**2:		2.879194

Wcalc = .9269423 Wtable = .887 Wcalc - Wtable = .0399423

Arithmetic Average: 4.6375 Geometric Mean: 4.194034

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Copper (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	22.6	3.117950	57855.28	3.468320
2	32.8	3.490429	53052.48	2.219695
3	33.9	3.523415	52546.97	2.122492
4	59.7	4.089332	41384.27	.7938105
5	65.6	4.183576	39018.59	.6347576
6	67.5	4.212128	38271.59	.5900772
7	105	4.653960	25005.49	.1064926
8	120	4.787492	20486.55	.0371721
9	168	5.123964	9049.955	.0206415
10	258	5.552960	26.32973	.3279477
11	261	5.564520	4.542227	.3413223
12	312	5.743003	2388.155	.5817277
13	362	5.891644	9775.030	.8305620
14	513	6.240276	62434.39	1.587558
15	599	6.395262	112807.8	2.002138
16	1230	7.114769	934835.2	4.555992
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	263.1313	4.980292	311.8699	1.161054
		145.5169		

Upper 95% confidence limit on arithmetic mean: 399.8082
Upper 95% confidence limit on geometric mean: 697.0904

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Copper (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	22.6	5.1076e2	3.117950	9.721612
2	32.8	1.0758e3	3.490429	12.18309
3	33.9	1.1492e3	3.523415	12.41445
4	59.7	3.5641e3	4.089332	16.72264
5	65.6	4.3034e3	4.183576	17.50231
6	67.5	4.5563e3	4.212128	17.74202
7	105	1.1025e4	4.653960	21.65935
8	120	1.44e4	4.787492	22.92008
9	168	2.8224e4	5.123964	26.25501
10	258	6.6564e4	5.552960	30.83536
11	261	6.8121e4	5.564520	30.96389
12	312	9.7344e4	5.743003	32.98209
13	362	1.3104e5	5.891644	34.71147
14	513	2.6317e5	6.240276	38.94104
15	599	3.5880e5	6.395262	40.89937
16	1230	1.5129e6	7.114769	50.61994
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	4210.1	2566752.	79.68468	417.0737

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 1458943. (normal distribution)

d = 20.22071 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Copper (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.2074e3	6.1046e2
.329	5.662e2	1.8628e2
.2521	4.791e2	1.2078e2
.1939	3.023e2	5.8616e1
.1447	2.464e2	3.5654e1
.1005	1.935e2	1.9447e1
.0593	1.53e2	9.0729e0
.0196	4.8e1	9.408e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.0413e3
Summation**2:		1.0842e6

Wcalc = .7431461 Wtable = .887 Wcalc - Wtable = -.143854

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Copper (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	3.996820	2.020792
	.329	2.904833	.9556901
	.2521	2.716861	.6849206
	.1939	1.802312	.3494683
	.1447	1.559427	.2256492
	.1005	1.352393	.1359155
	.0593	.8989992	.0533107
	.0196	.3364722	.0065949
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.432341
Summation**2:			19.64565

Wcalc = .9715610 Wtable = .887 Wcalc - Wtable = .0845610

Arithmetic Average: 263.1313 Geometric Mean: 145.5169

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Lead (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.9	1.064711	66538.20	13.14476
2	20.7	3.030134	57672.02	2.756089
3	27.5	3.314186	54452.22	1.893637
4	27.6	3.317816	54405.56	1.883661
5	30.3	3.411148	53153.30	1.636182
6	40.9	3.711130	48378.00	.9587365
7	63.4	4.149464	38986.50	.2924831
8	91.3	4.514151	28747.20	.0310218
9	181	5.198497	6376.023	.2582836
10	204	5.318120	3231.923	.3941819
11	390	5.966147	16679.72	1.627833
12	459	6.129050	39263.42	2.070057
13	514	6.242223	64084.92	2.408525
14	652	6.480045	152998.3	3.203254
15	715	6.572283	206252.2	3.541930
16	754	6.625392	243196.9	3.744656
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	260.85	4.690281	275.0050	1.629832
		108.8838		

Upper 95% confidence limit on arithmetic mean: 381.3710
Upper 95% confidence limit on geometric mean: 2033.729

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Lead (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.9	8.41e0	1.064711	1.133609
2	20.7	4.2849e2	3.030134	9.181710
3	27.5	7.5625e2	3.314186	10.98383
4	27.6	7.6176e2	3.317816	11.00790
5	30.3	9.1809e2	3.411148	11.63593
6	40.9	1.6728e3	3.711130	13.77249
7	63.4	4.0196e3	4.149464	17.21805
8	91.3	8.3357e3	4.514151	20.37756
9	181	3.2761e4	5.198497	27.02437
10	204	4.1616e4	5.318120	28.28240
11	390	1.521e5	5.966147	35.59491
12	459	2.1068e5	6.129050	37.56526
13	514	2.6420e5	6.242223	38.96535
14	652	4.2510e5	6.480045	41.99098
15	715	5.1123e5	6.572283	43.19490
16	754	5.6852e5	6.625392	43.89582
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	4173.6	2223100.	75.04450	391.8251

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 1134417. (normal distribution)

d = 39.84529 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Lead (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	7.511e2	3.7976e2
	.329	6.943e2	2.2842e2
	.2521	6.245e2	1.5744e2
	.1939	4.864e2	9.4313e1
	.1447	4.287e2	6.2033e1
	.1005	3.491e2	3.5085e1
	.0593	1.406e2	8.3376e0
	.0196	8.97e1	1.7581e0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			9.6714e2
Summation**2:			9.3537e5

Wcalc = .8245352 Wtable = .887 Wcalc - Wtable = -.062465

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Lead (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	5.560682	2.811481
.329	3.542149	1.165367
.2521	3.165859	.7981129
.1939	2.924407	.5670426
.1447	2.717902	.3932805
.1005	2.255017	.2266292
.0593	1.168656	.0693013
.0196	.6843462	.0134132
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		6.044627
Summation**2:		36.53752

Wcalc = .9169846 Wtable = .887 Wcalc - Wtable = .0299846

Arithmetic Average: 260.85 Geometric Mean: 108.8838

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Manganese (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	112	4.718499	12670.32	.3994258
2	132	4.882802	8567.816	.2187417
3	162	5.087596	3914.066	.0691185
4	163	5.093750	3789.941	.0659206
5	169	5.129899	3087.191	.0486650
6	181	5.198497	1897.691	.0231050
7	196	5.278115	815.8164	.0052397
8	199	5.293305	653.4414	.0032713
9	204	5.318120	422.8164	.0010485
10	220	5.393628	20.81641	.0018600
11	237	5.468060	154.6914	.0138203
12	257	5.549076	1052.191	.0394324
13	270	5.598422	2064.566	.0614652
14	272	5.605802	2250.316	.0651790
15	331	5.802118	11328.94	.2039589
16	488	6.190315	69399.32	.7052895
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	224.5625	5.350500	90.21823	.3582868
		210.7137		

Upper 95% confidence limit on arithmetic mean: 264.1006
Upper 95% confidence limit on geometric mean: 268.4174

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	112	1.2544e4	4.718499	22.26423
2	132	1.7424e4	4.882802	23.84175
3	162	2.6244e4	5.087596	25.88364
4	163	2.6569e4	5.093750	25.94629
5	169	2.8561e4	5.129899	26.31586
6	181	3.2761e4	5.198497	27.02437
7	196	3.8416e4	5.278115	27.85849
8	199	3.9601e4	5.293305	28.01908
9	204	4.1616e4	5.318120	28.28240
10	220	4.84e4	5.393628	29.09122
11	237	5.6169e4	5.468060	29.89968
12	257	6.6049e4	5.549076	30.79225
13	270	7.29e4	5.598422	31.34233
14	272	7.3984e4	5.605802	31.42502
15	331	1.0956e5	5.802118	33.66458
16	488	2.3814e5	6.190315	38.32000
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	[illegible]	[illegible]	85.60800	459.9712

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 122089.9 (normal distribution)

d = 1.925541 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	3.76e2	1.9011e2
	.329	1.99e2	6.5471e1
	.2521	1.1e2	2.7731e1
	.1939	1.07e2	2.0747e1
	.1447	8.8e1	1.2734e1
	.1005	5.6e1	5.628e0
	.0593	2.4e1	1.4232e0
	.0196	5e0	9.8e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			3.2394e2
Summation**2:			1.0494e5

Wcalc = .8594945 Wtable = .887 Wcalc - Wtable = -.027505

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	1.471817	.7441504
.329	.9193165	.3024551
.2521	.5182057	.1306397
.1939	.5046718	.0978559
.1447	.4191774	.0606550
.1005	.2695631	.0270911
.0593	.1155129	.0068499
.0196	.0248152	.0004864
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.370183
Summation**2:		1.877403

Wcalc = .9749999 Wtable = .887 Wcalc - Wtable = .0879999

Arithmetic Average: 224.5625 Geometric Mean: 210.7137

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Vandium (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	9.4	2.240710	624.6875	1.257491
2	15.9	2.766319	342.0188	.3549414
3	16.1	2.778819	334.6613	.3402032
4	17.2	2.844909	295.6250	.2674744
5	18.5	2.917771	252.6113	.1974184
6	22.4	3.109061	143.8500	.0640230
7	22.6	3.117950	139.0925	.0596037
8	25.9	3.254243	72.14379	.0116307
9	29.3	3.377588	25.94629	.0002402
10	35.5	3.569533	1.223789	.0430330
11	39.9	3.686376	30.31879	.1051625
12	42.9	3.758872	72.35629	.1574369
13	45.6	3.819908	125.5800	.2095983
14	47.7	3.864931	177.0563	.2528508
15	56.4	4.032469	484.2750	.4494100
16	105	4.653960	4985.243	1.668932
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	34.39375	3.362089	23.24749	.6021877
		28.84939		

Upper 95% confidence limit on arithmetic mean: 44.58196
Upper 95% confidence limit on geometric mean: 48.44559

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	9.4	8.836e1	2.240710	5.020780
2	15.9	2.5281e2	2.766319	7.652521
3	16.1	2.5921e2	2.778819	7.721837
4	17.2	2.9584e2	2.844909	8.093509
5	18.5	3.4225e2	2.917771	8.513386
6	22.4	5.0176e2	3.109061	9.666260
7	22.6	5.1076e2	3.117950	9.721612
8	25.9	6.7081e2	3.254243	10.59010
9	29.3	8.5849e2	3.377588	11.40810
10	35.5	1.2603e3	3.569533	12.74156
11	39.9	1.5920e3	3.686376	13.58937
12	42.9	1.8404e3	3.758872	14.12912
13	45.6	2.0794e3	3.819908	14.59169
14	47.7	2.2753e3	3.864931	14.93769
15	56.4	3.1810e3	4.032469	16.26081
16	105	1.1025e4	4.653960	21.65935
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	550.3	27033.57	53.79342	186.2977

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 8106.689 (normal distribution)

d = 5.439450 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.5056	9.56e1	4.8335e1
	.329	4.05e1	1.3325e1
	.2521	3.16e1	7.9664e0
	.1939	2.84e1	5.5068e0
	.1447	2.44e1	3.5307e0
	.1005	1.75e1	1.7588e0
	.0593	1.29e1	7.650e-1
	.0196	3.4e0	6.664e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			8.1254e1
Summation**2:			6.6022e3

Wcalc = .8144158 Wtable = .887 Wcalc - Wtable = -.072584

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	2.413251	1.220140
.329	1.266150	.4165634
.2521	1.086112	.2738089
.1939	.9749983	.1890522
.1447	.8411011	.1217073
.1005	.5773154	.0580202
.0593	.4515828	.0267789
.0196	.1233445	.0024176
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.308488
	Summation**2:	5.329116

Wcalc = .9797161 Wtable = .887 Wcalc - Wtable = .0927161

Arithmetic Average: 34.39375 Geometric Mean: 28.84939

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Zinc (mg/kg); Site 6 - DRMO; NSB-NLON
ter Matrix: Surface Soil

Enter number of samples: 16
Degrees of Freedom: 15

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	34.2	3.532226	264652.4	3.692520
2	51.7	3.945458	246953.1	2.275153
3	59.1	4.079231	239653.1	1.889492
4	83.3	4.422449	216544.8	1.063725
5	123	4.812184	181172.6	.4116948
6	133	4.890349	172759.7	.3174981
7	136	4.912655	170274.9	.2928584
8	138	4.927254	168628.3	.2772708
9	248	5.513429	90386.66	.0035533
10	283	5.645447	70566.60	.0367213
11	413	6.023448	18399.23	.3244769
12	415	6.028279	17860.65	.3300039
13	482	6.177944	4441.389	.5243574
14	839	6.732211	84306.75	1.634286
15	1640	7.402452	1191058.	3.797169
16	3700	8.216088	9931046.	7.630132
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
Mean:	548.6438	5.453819	933.4061	1.278043
		233.6487		

Upper 95% confidence limit on arithmetic mean: 957.7090
Upper 95% confidence limit on geometric mean: 1506.156

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Zinc (mg/kg); Surface Soil	Operator:	kms

Enter Number of Occurrences (n): 16 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	34.2	1.1696e3	3.532226	12.47662
2	51.7	2.6729e3	3.945458	15.56664
3	59.1	3.4928e3	4.079231	16.64012
4	83.3	6.9389e3	4.422449	19.55805
5	123	1.5129e4	4.812184	23.15712
6	133	1.7689e4	4.890349	23.91551
7	136	1.8496e4	4.912655	24.13418
8	138	1.9044e4	4.927254	24.27783
9	248	6.1504e4	5.513429	30.39790
10	283	8.0089e4	5.645447	31.87107
11	413	1.7057e5	6.023448	36.28192
12	415	1.7223e5	6.028279	36.34014
13	482	2.3232e5	6.177944	38.16699
14	839	7.0392e5	6.732211	45.32266
15	1640	2.6896e6	7.402452	54.79629
16	3700	1.369e7	8.216088	67.50410
17		0	0	0
18		0	0	0
19		0	0	0
20		0	0	0
21		0	0	0
22		0	0	0
23		0	0	0
24		0	0	0
25		0	0	0
26		0	0	0
27		0	0	0
28		0	0	0
29		0	0	0
30		0	0	0
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	8778.3	17884864	87.26110	500.4071

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 13068705 (normal distribution)

d = 24.50091 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site ϕ - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Zinc (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	3.6658e3	1.8534e3
.329	1.5883e3	5.2255e2
.2521	7.799e2	1.9661e2
.1939	3.987e2	7.7308e1
.1447	2.92e2	4.2252e1
.1005	2.8e2	2.814e1
.0593	1.47e2	8.7171e0
.0196	1.1e2	2.156e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	2.7312e3
	Summation**2:	7.4593e6

Wcalc = .5707730 Wtable = .887 Wcalc - Wtable = -.316227

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site Ø - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Zinc (mg/kg); Surface Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.5056	4.683862	2.368161
.329	3.456994	1.137351
.2521	2.652980	.6688162
.1939	1.755496	.3403906
.1447	1.216094	.1759688
.1005	1.133098	.1138764
.0593	.7327920	.0434546
.0196	.5861751	.0114890
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	4.859507
	Summation**2:	23.61481

Wcalc = .9638340 Wtable = .887 Wcalc - Wtable = .0768340

Arithmetic Average: 548.6438 Geometric Mean: 233.6487

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: 1,1,2,2-Tetrachloroethane (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.5	.9162907	1203374.	.1469411
2	2.5	.9162907	1203374.	.1469411
3	2.5	.9162907	1203374.	.1469411
4	2.5	.9162907	1203374.	.1469411
5	2.5	.9162907	1203374.	.1469411
6	2.5	.9162907	1203374.	.1469411
7	2.5	.9162907	1203374.	.1469411
8	2.5	.9162907	1203374.	.1469411
9	2.5	.9162907	1203374.	.1469411
10	2.5	.9162907	1203374.	.1469411
11	2.5	.9162907	1203374.	.1469411
12	2.5	.9162907	1203374.	.1469411
13	2.5	.9162907	1203374.	.1469411
14	2.5	.9162907	1203374.	.1469411
15	2.5	.9162907	1203374.	.1469411
16	2.5	.9162907	1203374.	.1469411
17	2.5	.9162907	1203374.	.1469411
18	2.5	.9162907	1203374.	.1469411
19	2.5	.9162907	1203374.	.1469411
20	2.5	.9162907	1203374.	.1469411
21	2.5	.9162907	1203374.	.1469411
22	2.5	.9162907	1203374.	.1469411
23	2.5	.9162907	1203374.	.1469411
24	2.5	.9162907	1203374.	.1469411
25	2.5	.9162907	1203374.	.1469411
26	2.5	.9162907	1203374.	.1469411
27	2.5	.9162907	1203374.	.1469411
28	5.5	1.704748	1196801.	.1641290
29	5.5	1.704748	1196801.	.1641290
30	5.5	1.704748	1196801.	.1641290
31	34000	10.43412	1.0824e9	83.43902
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	1099.484	1.299620	6106.077	1.711713
		3.667901		

Upper 95% confidence limit on arithmetic mean: 2960.556
Upper 95% confidence limit on geometric mean: 45.67186

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	1,1,2,2-Tetrachloroethane (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.5	6.25e0	.9162907	.8395887
2	2.5	6.25e0	.9162907	.8395887
3	2.5	6.25e0	.9162907	.8395887
4	2.5	6.25e0	.9162907	.8395887
5	2.5	6.25e0	.9162907	.8395887
6	2.5	6.25e0	.9162907	.8395887
7	2.5	6.25e0	.9162907	.8395887
8	2.5	6.25e0	.9162907	.8395887
9	2.5	6.25e0	.9162907	.8395887
10	2.5	6.25e0	.9162907	.8395887
11	2.5	6.25e0	.9162907	.8395887
12	2.5	6.25e0	.9162907	.8395887
13	2.5	6.25e0	.9162907	.8395887
14	2.5	6.25e0	.9162907	.8395887
15	2.5	6.25e0	.9162907	.8395887
16	2.5	6.25e0	.9162907	.8395887
17	2.5	6.25e0	.9162907	.8395887
18	2.5	6.25e0	.9162907	.8395887
19	2.5	6.25e0	.9162907	.8395887
20	2.5	6.25e0	.9162907	.8395887
21	2.5	6.25e0	.9162907	.8395887
22	2.5	6.25e0	.9162907	.8395887
23	2.5	6.25e0	.9162907	.8395887
24	2.5	6.25e0	.9162907	.8395887
25	2.5	6.25e0	.9162907	.8395887
26	2.5	6.25e0	.9162907	.8395887
27	2.5	6.25e0	.9162907	.8395887
28	5.5	3.025e1	1.704748	2.906166
29	5.5	3.025e1	1.704748	2.906166
30	5.5	3.025e1	1.704748	2.906166
31	34000	1.156e9	10.43412	108.8708
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation	34000	1.1960e9	40.28821	140.2582

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2) d = 1.1185e9 (normal distribution)

d = 87.89882 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	1,1,2,2-Tetrachloroethane (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	3.3998e4	1.4347e4
.2921	3e0	8.763e-1
.2475	3e0	7.425e-1
.2145	3e0	6.435e-1
.1874	0	0
.1641	0	0
.1433	0	0
.1243	0	0
.1066	0	0
.0899	0	0
.0739	0	0
.0585	0	0
.0435	0	0
.0289	0	0
.0144	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	1.4349e4
	Summation**2:	2.0590e8

Wcalc = .1840814 Wtable = .929 Wcalc - Wtable = -.744919

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	1,1,2,2-Tetrachloroethane (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	9.517825	4.016522
.2921	.7884574	.2303084
.2475	.7884574	.1951432
.2145	.7884574	.1691241
.1874	0	0
.1641	0	0
.1433	0	0
.1243	0	0
.1066	0	0
.0899	0	0
.0739	0	0
.0585	0	0
.0435	0	0
.0289	0	0
.0144	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
	Summation:	4.611098
	Summation**2:	21.26222

Wcalc = .2418943 Wtable = .929 Wcalc - Wtable = -.687106

Arithmetic Average: 1099.484 Geometric Mean: 3.667901

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Trichloroethene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1	0	421452.3	0
2	1	0	421452.3	0
3	1	0	421452.3	0
4	2	.6931472	420154.9	.6525576
5	2	.6931472	420154.9	.6525576
6	2	.6931472	420154.9	.6525576
7	2.5	.9162907	419506.9	.3418353
8	2.5	.9162907	419506.9	.3418353
9	2.5	.9162907	419506.9	.3418353
10	2.5	.9162907	419506.9	.3418353
11	2.5	.9162907	419506.9	.3418353
12	2.5	.9162907	419506.9	.3418353
13	2.5	.9162907	419506.9	.3418353
14	2.5	.9162907	419506.9	.3418353
15	2.5	.9162907	419506.9	.3418353
16	2.5	.9162907	419506.9	.3418353
17	2.5	.9162907	419506.9	.3418353
18	2.5	.9162907	419506.9	.3418353
19	3	1.098612	418859.5	.1618817
20	3	1.098612	418859.5	.1618817
21	3	1.098612	418859.5	.1618817
22	5	1.609438	416274.7	.0117680
23	5.5	1.704748	415629.8	.0415306
24	5.5	1.704748	415629.8	.0415306
25	6	1.791759	414985.3	.0845657
26	7	1.945910	413697.9	.1979828
27	8	2.079442	412412.6	.3346437
28	17	2.833213	400934.1	1.774905
29	25	3.218876	390867.0	2.951243
30	29	3.367296	385881.4	3.483218
31	20000	9.903488	3.7442e8	70.60251
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	650.1935	1.500958	3591.178	1.693805
		4.485983		

Upper 95% confidence limit on arithmetic mean: 1744.749
Upper 95% confidence limit on geometric mean: 53.15964

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Trichloroethene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1	1e0	0	0
2	1	1e0	0	0
3	1	1e0	0	0
4	2	4e0	.6931472	.4804530
5	2	4e0	.6931472	.4804530
6	2	4e0	.6931472	.4804530
7	2.5	6.25e0	.9162907	.8395887
8	2.5	6.25e0	.9162907	.8395887
9	2.5	6.25e0	.9162907	.8395887
10	2.5	6.25e0	.9162907	.8395887
11	2.5	6.25e0	.9162907	.8395887
12	2.5	6.25e0	.9162907	.8395887
13	2.5	6.25e0	.9162907	.8395887
14	2.5	6.25e0	.9162907	.8395887
15	2.5	6.25e0	.9162907	.8395887
16	2.5	6.25e0	.9162907	.8395887
17	2.5	6.25e0	.9162907	.8395887
18	2.5	6.25e0	.9162907	.8395887
19	3	9e0	1.098612	1.206949
20	3	9e0	1.098612	1.206949
21	3	9e0	1.098612	1.206949
22	5	2.5e1	1.609438	2.590290
23	5.5	3.025e1	1.704748	2.906166
24	5.5	3.025e1	1.704748	2.906166
25	6	3.6e1	1.791759	3.210402
26	7	4.9e1	1.945910	3.786566
27	8	6.4e1	2.079442	4.324077
28	17	2.89e2	2.833213	8.027098
29	25	6.25e2	3.218876	10.36116
30	29	8.41e2	3.367296	11.33868
31	20000	4e8	9.903488	98.07907
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	20156	4.0000e8	46.52968	162.6669

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 3.8690e8 (normal distribution)

d = 92.82786 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Trichloroethene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	1.9999e4	8.4396e3
	.2921	2.8e1	8.1788e0
	.2475	2.4e1	5.94e0
	.2145	1.5e1	3.2175e0
	.1874	6e0	1.1244e0
	.1641	5e0	8.205e-1
	.1433	3.5e0	5.016e-1
	.1243	3e0	3.729e-1
	.1066	3e0	3.198e-1
	.0899	2.5e0	2.248e-1
	.0739	5e-1	3.695e-2
	.0585	5e-1	2.925e-2
	.0435	5e-1	2.175e-2
	.0289	0	0
	.0144	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			8.4604e3
Summation**2:			7.1578e7

Wcalc = .1850049 Wtable = .929 Wcalc - Wtable = -.743995

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Trichloroethene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	9.903488	4.179272
.2921	3.367296	.9835871
.2475	3.218876	.7966718
.2145	2.140066	.4590442
.1874	1.386294	.2597916
.1641	1.252763	.2055784
.1433	.8754687	.1254547
.1243	.7884574	.0980052
.1066	.7884574	.0840496
.0899	.6931472	.0623139
.0739	.1823216	.0134736
.0585	.1823216	.0106658
.0435	.1823216	.0079310
.0289	0	0
.0144	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		7.277908
Summation**2:		52.96794

Wcalc = .5706039 Wtable = .929 Wcalc - Wtable = -.358396

Arithmetic Average: 650.1935 Geometric Mean: 4.485983

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Vinyl chloride (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	5	1.609438	1793.932	.0653718
2	5	1.609438	1793.932	.0653718
3	5	1.609438	1793.932	.0653718
4	5	1.609438	1793.932	.0653718
5	5	1.609438	1793.932	.0653718
6	5	1.609438	1793.932	.0653718
7	5	1.609438	1793.932	.0653718
8	5	1.609438	1793.932	.0653718
9	5	1.609438	1793.932	.0653718
10	5	1.609438	1793.932	.0653718
11	5	1.609438	1793.932	.0653718
12	5	1.609438	1793.932	.0653718
13	5	1.609438	1793.932	.0653718
14	5	1.609438	1793.932	.0653718
15	5	1.609438	1793.932	.0653718
16	5	1.609438	1793.932	.0653718
17	5	1.609438	1793.932	.0653718
18	5	1.609438	1793.932	.0653718
19	5	1.609438	1793.932	.0653718
20	5	1.609438	1793.932	.0653718
21	5	1.609438	1793.932	.0653718
22	5	1.609438	1793.932	.0653718
23	5	1.609438	1793.932	.0653718
24	5	1.609438	1793.932	.0653718
25	5	1.609438	1793.932	.0653718
26	5	1.609438	1793.932	.0653718
27	5	1.609438	1793.932	.0653718
28	11	2.397895	1321.674	.2838526
29	11	2.397895	1321.674	.2838526
30	11	2.397895	1321.674	.2838526
31	1300	7.170120	1569120.	28.14305
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	47.35484	1.865117	232.4881	1.012582
		6.456692		

Upper 95% confidence limit on arithmetic mean: 118.2149
Upper 95% confidence limit on geometric mean: 16.02247

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vinyl chloride (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	5	2.5e1	1.609438	2.590290
2	5	2.5e1	1.609438	2.590290
3	5	2.5e1	1.609438	2.590290
4	5	2.5e1	1.609438	2.590290
5	5	2.5e1	1.609438	2.590290
6	5	2.5e1	1.609438	2.590290
7	5	2.5e1	1.609438	2.590290
8	5	2.5e1	1.609438	2.590290
9	5	2.5e1	1.609438	2.590290
10	5	2.5e1	1.609438	2.590290
11	5	2.5e1	1.609438	2.590290
12	5	2.5e1	1.609438	2.590290
13	5	2.5e1	1.609438	2.590290
14	5	2.5e1	1.609438	2.590290
15	5	2.5e1	1.609438	2.590290
16	5	2.5e1	1.609438	2.590290
17	5	2.5e1	1.609438	2.590290
18	5	2.5e1	1.609438	2.590290
19	5	2.5e1	1.609438	2.590290
20	5	2.5e1	1.609438	2.590290
21	5	2.5e1	1.609438	2.590290
22	5	2.5e1	1.609438	2.590290
23	5	2.5e1	1.609438	2.590290
24	5	2.5e1	1.609438	2.590290
25	5	2.5e1	1.609438	2.590290
26	5	2.5e1	1.609438	2.590290
27	5	2.5e1	1.609438	2.590290
28	11	1.21e2	2.397895	5.749902
29	11	1.21e2	2.397895	5.749902
30	11	1.21e2	2.397895	5.749902
31	1300	1.69e6	7.170120	51.41061
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	1468	1691038	57.81863	138.5982

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 1621521. (normal distribution)

d = 30.75965 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vinyl chloride (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	1.295e3	5.4649e2
	.2921	6e0	1.7526e0
	.2475	6e0	1.485e0
	.2145	6e0	1.287e0
	.1874	0	0
	.1641	0	0
	.1433	0	0
	.1243	0	0
	.1066	0	0
	.0899	0	0
	.0739	0	0
	.0585	0	0
	.0435	0	0
	.0289	0	0
	.0144	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.5101e2
Summation**2:			3.0362e5

Wcalc = .1872421 Wtable = .929 Wcalc - Wtable = -.741758

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vinyl chloride (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	5.560682	2.346608
.2921	.7884574	.2303084
.2475	.7884574	.1951432
.2145	.7884574	.1691241
.1874	0	0
.1641	0	0
.1433	0	0
.1243	0	0
.1066	0	0
.0899	0	0
.0739	0	0
.0585	0	0
.0435	0	0
.0289	0	0
.0144	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.941183
Summation**2:		8.650559

Wcalc = .2812308 Wtable = .929 Wcalc - Wtable = -.647769

Arithmetic Average: 47.35484 Geometric Mean: 6.456692

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Bis(2-ethylhexyl)phthalate (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 30
Degrees of Freedom: 29

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	165	5.105945	207936	.2467518
2	165	5.105945	207936	.2467518
3	165	5.105945	207936	.2467518
4	165	5.105945	207936	.2467518
5	165	5.105945	207936	.2467518
6	165	5.105945	207936	.2467518
7	165	5.105945	207936	.2467518
8	165	5.105945	207936	.2467518
9	165	5.105945	207936	.2467518
10	165	5.105945	207936	.2467518
11	165	5.105945	207936	.2467518
12	165	5.105945	207936	.2467518
13	165	5.105945	207936	.2467518
14	165	5.105945	207936	.2467518
15	165	5.105945	207936	.2467518
16	165	5.105945	207936	.2467518
17	165	5.105945	207936	.2467518
18	165	5.105945	207936	.2467518
19	165	5.105945	207936	.2467518
20	185	5.220356	190096	.1461769
21	190	5.247024	185761	.1264959
22	290	5.669881	109561	.0045151
23	340	5.828946	78961	.0511931
24	400	5.991465	48841	.1511482
25	430	6.063785	36481	.2126118
26	460	6.131226	25921	.2793543
27	900	6.802395	77841	1.439299
28	1100	7.003065	229441	1.961061
29	3500	8.160518	8288641	6.542502
30	7700	8.948976	50112241	11.19765
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	621	5.602687	1477.820	.9613262
		271.1539		

Upper 95% confidence limit on arithmetic mean: 1079.410
Upper 95% confidence limit on geometric mean: 659.7653

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Bis(2-ethylhexyl)phthalate (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 30 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	165	2.7225e4	5.105945	26.07068
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	165	2.7225e4	5.105945	26.07068
15	165	2.7225e4	5.105945	26.07068
16	165	2.7225e4	5.105945	26.07068
17	165	2.7225e4	5.105945	26.07068
18	165	2.7225e4	5.105945	26.07068
19	165	2.7225e4	5.105945	26.07068
20	185	3.4225e4	5.220356	27.25211
21	190	3.61e4	5.247024	27.53126
22	290	8.41e4	5.669881	32.14755
23	340	1.156e5	5.828946	33.97661
24	400	1.6e5	5.991465	35.89765
25	430	1.849e5	6.063785	36.76949
26	460	2.116e5	6.131226	37.59194
27	900	8.1e5	6.802395	46.27257
28	1100	1.21e6	7.003065	49.04293
29	3500	1.225e7	8.160518	66.59406
30	7700	5.929e7	8.948976	80.08416
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	18630	74903800	168.0806	968.5032

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 63334570 (normal distribution)

d = 26.80029 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Bis(2-ethylhexyl)phthalate (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	7.535e3	3.2054e3
.2944	3.335e3	9.8182e2
.2487	9.35e2	2.3253e2
.2148	7.35e2	1.5788e2
.187	2.95e2	5.5165e1
.163	2.65e2	4.3195e1
.1415	2.35e2	3.3253e1
.1219	1.75e2	2.1333e1
.1036	1.25e2	1.295e1
.0862	2.5e1	2.155e0
.0697	2e1	1.394e0
.0537	0	0
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		4.7471e3
Summation**2:		2.2535e7

Wcalc = .3558036 Wtable = .927 Wcalc - Wtable = -.571196

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Bis(2-ethylhexyl)phthalate (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	3.843030	1.634825
.2944	3.054573	.8992662
.2487	1.897120	.4718137
.2148	1.696449	.3643973
.187	1.025281	.1917275
.163	.9578397	.1561279
.1415	.8855191	.1253009
.1219	.7230001	.0881337
.1036	.5639354	.0584237
.0862	.1410786	.0121610
.0697	.1144104	.0079744
.0537	0	0
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.010151
Summation**2:		16.08131

Wcalc = .6000425 Wtable = .927 Wcalc - Wtable = -.326957

Arithmetic Average: 621 Geometric Mean: 271.1539

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Benzo(a)anthracene (ug/kg); Site 6 - DRMO; NSB-NLON
ter Matrix: All Soil

Enter number of samples: 30
Degrees of Freedom: 29

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	72	4.276666	369339.8	2.314154
2	100	4.605170	336090.7	1.422606
3	110	4.700480	324596.1	1.204331
4	110	4.700480	324596.1	1.204331
5	165	5.105945	264950.4	.4788018
6	165	5.105945	264950.4	.4788018
7	165	5.105945	264950.4	.4788018
8	165	5.105945	264950.4	.4788018
9	165	5.105945	264950.4	.4788018
10	165	5.105945	264950.4	.4788018
11	165	5.105945	264950.4	.4788018
12	165	5.105945	264950.4	.4788018
13	190	5.247024	239838.7	.3034649
14	190	5.247024	239838.7	.3034649
15	200	5.298317	230144.1	.2495833
16	240	5.480639	193365.4	.1006549
17	240	5.480639	193365.4	.1006549
18	280	5.634790	159786.7	.0266052
19	400	5.991465	78250.74	.0374670
20	440	6.086775	57472.07	.0834483
21	450	6.109248	52777.40	.0969370
22	570	6.345636	12041.40	.3000145
23	590	6.380123	8052.071	.3389825
24	600	6.396930	6357.404	.3588359
25	710	6.565265	916.0711	.5888482
26	980	6.887553	90160.07	1.187342
27	1000	6.907755	102570.7	1.231778
28	3200	8.070906	6351744.	5.166554
29	3800	8.242756	9736064.	5.977320
30	4600	8.433812	15368491	6.948027
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	679.7333	5.797901	1123.349	1.072796
		329.6068		

Upper 95% confidence limit on arithmetic mean: 1028.189
Upper 95% confidence limit on geometric mean: 970.0264

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 30 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	72	5.184e3	4.276666	18.28987
2	100	1e4	4.605170	21.20759
3	110	1.21e4	4.700480	22.09452
4	110	1.21e4	4.700480	22.09452
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	190	3.61e4	5.247024	27.53126
14	190	3.61e4	5.247024	27.53126
15	200	4e4	5.298317	28.07217
16	240	5.76e4	5.480639	30.03740
17	240	5.76e4	5.480639	30.03740
18	280	7.84e4	5.634790	31.75085
19	400	1.6e5	5.991465	35.89765
20	440	1.936e5	6.086775	37.04883
21	450	2.025e5	6.109248	37.32291
22	570	3.249e5	6.345636	40.26710
23	590	3.481e5	6.380123	40.70596
24	600	3.6e5	6.396930	40.92071
25	710	5.041e5	6.565265	43.10270
26	980	9.604e5	6.887553	47.43838
27	1000	1e6	6.907755	47.71708
28	3200	1.024e7	8.070906	65.13953
29	3800	1.444e7	8.242756	67.94303
30	4600	2.116e7	8.433812	71.12918
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	20392	50456584	173.9370	1041.845

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 36595462 (normal distribution)

d = 33.37582 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4254	4.528e3	1.9262e3
	.2944	3.7e3	1.0893e3
	.2487	3.09e3	7.6848e2
	.2148	8.9e2	1.9117e2
	.187	8.15e2	1.5241e2
	.163	5.45e2	8.8835e1
	.1415	4.35e2	6.1553e1
	.1219	4.25e2	5.1808e1
	.1036	4.05e2	4.1958e1
	.0862	2.85e2	2.4567e1
	.0697	2.75e2	1.9168e1
	.0537	2.35e2	1.2620e1
	.0381	9e1	3.429e0
	.0227	5e1	1.135e0
	.0076	4e1	3.04e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.4329e3
Summation**2:			1.9651e7

Wcalc = .5369746 Wtable = .927 Wcalc - Wtable = -.390025

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4254	4.157145	1.768450
	.2944	3.637586	1.070905
	.2487	3.370426	.8382249
	.2148	2.207275	.4741227
	.187	1.781607	.3331605
	.163	1.459319	.2378691
	.1415	1.290984	.1826743
	.1219	1.274177	.1553222
	.1036	1.239691	.1284320
	.0862	1.003302	.0864846
	.0697	.9808293	.0683638
	.0537	.8855191	.0475524
	.0381	.3877655	.0147739
	.0227	.2336149	.0053031
	.0076	.1823216	.0013856
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.391561
Summation**2:			29.06893

Wcalc = .8709580 Wtable = .927 Wcalc - Wtable = -.056042

Arithmetic Average: 679.7333 Geometric Mean: 329.6068

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(b)fluoranthene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 30
Degrees of Freedom: 29

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	24	3.178054	381059.3	6.873675
2	120	4.787492	271753.7	1.024815
3	150	5.010635	241375.7	.6228176
4	160	5.075174	231649.7	.5251168
5	165	5.105945	226861.7	.4814663
6	165	5.105945	226861.7	.4814663
7	165	5.105945	226861.7	.4814663
8	165	5.105945	226861.7	.4814663
9	165	5.105945	226861.7	.4814663
10	165	5.105945	226861.7	.4814663
11	165	5.105945	226861.7	.4814663
12	165	5.105945	226861.7	.4814663
13	165	5.105945	226861.7	.4814663
14	165	5.105945	226861.7	.4814663
15	165	5.105945	226861.7	.4814663
16	210	5.347108	186019.7	.2049515
17	290	5.669881	123411.7	.0168850
18	380	5.940171	68277.69	.0196976
19	440	6.086775	40521.69	.0823412
20	480	6.173786	26017.69	.1398482
21	520	6.253829	14713.69	.2061211
22	550	6.309918	8335.69	.2601970
23	600	6.396930	1705.69	.3565361
24	840	6.733402	39481.69	.8715691
25	860	6.756932	47829.69	.9160580
26	1000	6.907755	128665.7	1.227513
27	1400	7.244228	575625.7	2.086304
28	2000	7.600902	1846066.	3.243886
29	2700	7.901007	4238246.	4.414974
30	4700	8.455318	16473046	7.051651
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	641.3	5.799823	972.7189	1.105489
		330.2412		

Upper 95% confidence limit on arithmetic mean: 943.8311
Upper 95% confidence limit on geometric mean: 1031.404

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 30 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	24	5.76e2	3.178054	10.10003
2	120	1.44e4	4.787492	22.92008
3	150	2.25e4	5.010635	25.10647
4	160	2.56e4	5.075174	25.75739
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	165	2.7225e4	5.105945	26.07068
15	165	2.7225e4	5.105945	26.07068
16	210	4.41e4	5.347108	28.59156
17	290	8.41e4	5.669881	32.14755
18	380	1.444e5	5.940171	35.28563
19	440	1.936e5	6.086775	37.04883
20	480	2.304e5	6.173786	38.11563
21	520	2.704e5	6.253829	39.11037
22	550	3.025e5	6.309918	39.81507
23	600	3.6e5	6.396930	40.92071
24	840	7.056e5	6.733402	45.33870
25	860	7.396e5	6.756932	45.65614
26	1000	1e6	6.907755	47.71708
27	1400	1.96e6	7.244228	52.47883
28	2000	4e6	7.600902	57.77372
29	2700	7.29e6	7.901007	62.42591
30	4700	2.209e7	8.455318	71.49240
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	19239	39777251	173.9947	1044.580

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 27439280 (normal distribution)

d = 35.44109 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4254	4.676e3	1.9892e3
	.2944	2.58e3	7.5955e2
	.2487	1.85e3	4.6010e2
	.2148	1.24e3	2.6635e2
	.187	8.35e2	1.5615e2
	.163	6.95e2	1.1329e2
	.1415	6.75e2	9.5513e1
	.1219	4.35e2	5.3027e1
	.1036	3.85e2	3.9886e1
	.0862	3.55e2	3.0601e1
	.0697	3.15e2	2.1956e1
	.0537	2.75e2	1.4768e1
	.0381	2.15e2	8.1915e0
	.0227	1.25e2	2.8375e0
	.0076	4.5e1	3.42e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			4.0117e3
Summation**2:			1.6094e7

Wcalc = .5865275 Wtable = .927 Wcalc - Wtable = -.340472

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(b)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4254	5.277264	2.244948
	.2944	3.113515	.9166189
	.2487	2.590267	.6441994
	.2148	2.169054	.4659127
	.187	1.801810	.3369384
	.163	1.650987	.2691109
	.1415	1.627456	.2302851
	.1219	1.290984	.1573710
	.1036	1.203973	.1247316
	.0862	1.147883	.0989475
	.0697	1.067841	.0744285
	.0537	.9808293	.0526705
	.0381	.8342258	.0317840
	.0227	.5639354	.0128013
	.0076	.2411621	.0018328
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.616163
Summation**2:			31.54128

Wcalc = .8899638 Wtable = .927 Wcalc - Wtable = -.037036

Arithmetic Average: 641.3 Geometric Mean: 330.2412

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Benzo(k)fluoranthene (ug/kg); Site 6 - DRMO; NSB-NLON
ter Matrix: All Soil

Enter number of samples: 30
Degrees of Freedom: 29

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	20	2.995732	341835.1	6.395748
2	47	3.850148	310992.1	2.804172
3	65	4.174387	291240.1	1.823382
4	88	4.477337	266944.4	1.096999
5	100	4.605170	254688.4	.8455606
6	165	5.105945	193306.8	.1753670
7	165	5.105945	193306.8	.1753670
8	165	5.105945	193306.8	.1753670
9	165	5.105945	193306.8	.1753670
10	165	5.105945	193306.8	.1753670
11	165	5.105945	193306.8	.1753670
12	165	5.105945	193306.8	.1753670
13	165	5.105945	193306.8	.1753670
14	165	5.105945	193306.8	.1753670
15	165	5.105945	193306.8	.1753670
16	165	5.105945	193306.8	.1753670
17	165	5.105945	193306.8	.1753670
18	165	5.105945	193306.8	.1753670
19	185	5.220356	176120.1	.0926338
20	240	5.480639	132981.8	.0019426
21	300	5.703782	92821.78	.0320656
22	310	5.736572	86828.44	.0448840
23	390	5.966147	46081.78	.1948630
24	540	6.291569	4181.778	.5880670
25	580	6.363028	608.4444	.7027708
26	830	6.721426	50775.11	1.432119
27	1300	7.170120	483488.4	2.707360
28	3200	8.070906	6735755.	6.483095
29	3800	8.242756	10210155	7.387755
30	4000	8.294050	11528288	7.669221
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	604.6667	5.524714	1075.219	1.211759
		250.8146		

Upper 95% confidence limit on arithmetic mean: 938.1926
Upper 95% confidence limit on geometric mean: 961.0149

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 30 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	20	4e2	2.995732	8.974412
2	47	2.209e3	3.850148	14.82364
3	65	4.225e3	4.174387	17.42551
4	88	7.744e3	4.477337	20.04654
5	100	1e4	4.605170	21.20759
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	165	2.7225e4	5.105945	26.07068
15	165	2.7225e4	5.105945	26.07068
16	165	2.7225e4	5.105945	26.07068
17	165	2.7225e4	5.105945	26.07068
18	165	2.7225e4	5.105945	26.07068
19	185	3.4225e4	5.220356	27.25211
20	240	5.76e4	5.480639	30.03740
21	300	9e4	5.703782	32.53313
22	310	9.61e4	5.736572	32.90826
23	390	1.521e5	5.966147	35.59491
24	540	2.916e5	6.291569	39.58384
25	580	3.364e5	6.363028	40.48813
26	830	6.889e5	6.721426	45.17756
27	1300	1.69e6	7.170120	51.41061
28	3200	1.024e7	8.070906	65.13953
29	3800	1.444e7	8.242756	67.94303
30	4000	1.6e7	8.294050	68.79126
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	18140	44495428	165.7414	958.2563

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2

d = 33526775 (normal distribution)

d = 42.58241 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	3.98e3	1.6931e3
.2944	3.753e3	1.1049e3
.2487	3.135e3	7.7967e2
.2148	1.212e3	2.6034e2
.187	7.3e2	1.3651e2
.163	4.15e2	6.7645e1
.1415	3.75e2	5.3063e1
.1219	2.25e2	2.7428e1
.1036	1.45e2	1.5022e1
.0862	1.35e2	1.1637e1
.0697	7.5e1	5.2275e0
.0537	2e1	1.074e0
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		4.1556e3
Summation**2:		1.7269e7

Wcalc = .5150794 Wtable = .927 Wcalc - Wtable = -.411921

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(k)fluoranthene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	5.298317	2.253904
.2944	4.392609	1.293184
.2487	3.896519	.9690642
.2148	2.692783	.5784097
.187	2.116256	.3957398
.163	1.257083	.2049045
.1415	1.185624	.1677657
.1219	.8602013	.1048585
.1036	.6306268	.0653329
.0862	.5978370	.0515335
.0697	.3746934	.0261161
.0537	.1144104	.0061438
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		6.116957
Summation**2:		37.41717

Wcalc = .8787001 Wtable = .927 Wcalc - Wtable = -.048300

Arithmetic Average: 604.6667 Geometric Mean: 250.8146

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Benzo(a)pyrene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 30
Degrees of Freedom: 29

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	74	4.304065	369826.2	2.050716
2	165	5.105945	267426.9	.3970912
3	165	5.105945	267426.9	.3970912
4	165	5.105945	267426.9	.3970912
5	165	5.105945	267426.9	.3970912
6	165	5.105945	267426.9	.3970912
7	165	5.105945	267426.9	.3970912
8	165	5.105945	267426.9	.3970912
9	165	5.105945	267426.9	.3970912
10	165	5.105945	267426.9	.3970912
11	165	5.105945	267426.9	.3970912
12	165	5.105945	267426.9	.3970912
13	165	5.105945	267426.9	.3970912
14	165	5.105945	267426.9	.3970912
15	165	5.105945	267426.9	.3970912
16	165	5.105945	267426.9	.3970912
17	165	5.105945	267426.9	.3970912
18	165	5.105945	267426.9	.3970912
19	165	5.105945	267426.9	.3970912
20	190	5.247024	242195.2	.2391925
21	320	5.768321	131140.6	.0010384
22	480	6.173786	40857.88	.1915716
23	580	6.363028	10431.22	.3930423
24	680	6.522093	4.551111	.6177891
25	780	6.659294	9577.884	.8522922
26	990	6.897705	94781.88	1.349333
27	1800	7.495542	1249626.	3.095646
28	3100	8.039157	5846079.	5.304086
29	4000	8.294050	11008239	6.543121
30	4500	8.411833	14576106	7.159560
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	682.1333	5.736097	1150.600	1.097725
		309.8528		

Upper 95% confidence limit on arithmetic mean: 1039.042
Upper 95% confidence limit on geometric mean: 954.0929

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 30 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	74	5.476e3	4.304065	18.52498
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	165	2.7225e4	5.105945	26.07068
15	165	2.7225e4	5.105945	26.07068
16	165	2.7225e4	5.105945	26.07068
17	165	2.7225e4	5.105945	26.07068
18	165	2.7225e4	5.105945	26.07068
19	165	2.7225e4	5.105945	26.07068
20	190	3.61e4	5.247024	27.53126
21	320	1.024e5	5.768321	33.27353
22	480	2.304e5	6.173786	38.11563
23	580	3.364e5	6.363028	40.48813
24	680	4.624e5	6.522093	42.53769
25	780	6.084e5	6.659294	44.34620
26	990	9.801e5	6.897705	47.57833
27	1800	3.24e6	7.495542	56.18315
28	3100	9.61e6	8.039157	64.62805
29	4000	1.6e7	8.294050	68.79126
30	4500	2.025e7	8.411833	70.75893
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	20464	52351726	172.0829	1022.029

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 38392549 (normal distribution)

d = 34.94503 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	4.426e3	1.8828e3
.2944	3.835e3	1.1290e3
.2487	2.935e3	7.2993e2
.2148	1.635e3	3.5120e2
.187	8.25e2	1.5428e2
.163	6.15e2	1.0025e2
.1415	5.15e2	7.2873e1
.1219	4.15e2	5.0589e1
.1036	3.15e2	3.2634e1
.0862	1.55e2	1.3361e1
.0697	2.5e1	1.7425e0
.0537	0	0
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

Summation:		4.5187e3
Summation**2:		2.0419e7

Wcalc = .5318378 Wtable = .927 Wcalc - Wtable = -.395162

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site G - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Benzo(a)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	4.107768	1.747444
.2944	3.188104	.9385779
.2487	2.933212	.7294898
.2148	2.389596	.5132853
.187	1.791759	.3350590
.163	1.553348	.2531958
.1415	1.416147	.2003848
.1219	1.257083	.1532384
.1036	1.067841	.1106283
.0862	.6623755	.0570968
.0697	.1410786	.0098332
.0537	0	0
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		5.048234
Summation**2:		25.48466

Wcalc = .7292786 Wtable = .927 Wcalc - Wtable = -.197721

Arithmetic Average: 682.1333 Geometric Mean: 309.8528

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Dibenz(a,h)anthracene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 30
Degrees of Freedom: 29

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	130	4.867534	3154.694	.0847877
2	165	5.105945	448.0278	.0027849
3	165	5.105945	448.0278	.0027849
4	165	5.105945	448.0278	.0027849
5	165	5.105945	448.0278	.0027849
6	165	5.105945	448.0278	.0027849
7	165	5.105945	448.0278	.0027849
8	165	5.105945	448.0278	.0027849
9	165	5.105945	448.0278	.0027849
10	165	5.105945	448.0278	.0027849
11	165	5.105945	448.0278	.0027849
12	165	5.105945	448.0278	.0027849
13	165	5.105945	448.0278	.0027849
14	165	5.105945	448.0278	.0027849
15	165	5.105945	448.0278	.0027849
16	165	5.105945	448.0278	.0027849
17	165	5.105945	448.0278	.0027849
18	165	5.105945	448.0278	.0027849
19	165	5.105945	448.0278	.0027849
20	165	5.105945	448.0278	.0027849
21	165	5.105945	448.0278	.0027849
22	165	5.105945	448.0278	.0027849
23	165	5.105945	448.0278	.0027849
24	165	5.105945	448.0278	.0027849
25	165	5.105945	448.0278	.0027849
26	165	5.105945	448.0278	.0027849
27	165	5.105945	448.0278	.0027849
28	185	5.220356	1.361111	.0037993
29	190	5.247024	14.69444	.0077980
30	790	6.672033	364614.7	2.290123
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	186.1667	5.158718	114.3850	.2911876
		173.9413		

Upper 95% confidence limit on arithmetic mean: 221.6482
Upper 95% confidence limit on geometric mean: 199.9430

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 30 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	130	1.69e4	4.867534	23.69289
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	165	2.7225e4	5.105945	26.07068
15	165	2.7225e4	5.105945	26.07068
16	165	2.7225e4	5.105945	26.07068
17	165	2.7225e4	5.105945	26.07068
18	165	2.7225e4	5.105945	26.07068
19	165	2.7225e4	5.105945	26.07068
20	165	2.7225e4	5.105945	26.07068
21	165	2.7225e4	5.105945	26.07068
22	165	2.7225e4	5.105945	26.07068
23	165	2.7225e4	5.105945	26.07068
24	165	2.7225e4	5.105945	26.07068
25	165	2.7225e4	5.105945	26.07068
26	165	2.7225e4	5.105945	26.07068
27	165	2.7225e4	5.105945	26.07068
28	185	3.4225e4	5.220356	27.25211
29	190	3.61e4	5.247024	27.53126
30	790	6.241e5	6.672033	44.51602
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	5585	1419175	154.7615	800.8300

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 379434.2 (normal distribution)

d = 2.458916 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4254	6.6e2	2.8076e2
	.2944	2.5e1	7.36e0
	.2487	2e1	4.974e0
	.2148	0	0
	.187	0	0
	.163	0	0
	.1415	0	0
	.1219	0	0
	.1036	0	0
	.0862	0	0
	.0697	0	0
	.0537	0	0
	.0381	0	0
	.0227	0	0
	.0076	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			2.9310e2
Summation**2:			8.5906e4

Wcalc = .2264067 Wtable = .927 Wcalc - Wtable = -.700593

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Dibenz(a,h)anthracene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	1.804498	.7676337
.2944	.1410786	.0415335
.2487	.1144104	.0284539
.2148	0	0
.187	0	0
.163	0	0
.1415	0	0
.1219	0	0
.1036	0	0
.0862	0	0
.0697	0	0
.0537	0	0
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		.8376211
Summation**2:		.7016090

Wcalc = .2853327 Wtable = .927 Wcalc - Wtable = -.641667

Arithmetic Average: 186.1667 Geometric Mean: 173.9413

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Indeno(1,2,3-cd)pyrene (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 30
Degrees of Freedom: 29

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	26	3.258097	216411.0	4.766313
2	165	5.105945	106406.4	.1124527
3	165	5.105945	106406.4	.1124527
4	165	5.105945	106406.4	.1124527
5	165	5.105945	106406.4	.1124527
6	165	5.105945	106406.4	.1124527
7	165	5.105945	106406.4	.1124527
8	165	5.105945	106406.4	.1124527
9	165	5.105945	106406.4	.1124527
10	165	5.105945	106406.4	.1124527
11	165	5.105945	106406.4	.1124527
12	165	5.105945	106406.4	.1124527
13	165	5.105945	106406.4	.1124527
14	165	5.105945	106406.4	.1124527
15	165	5.105945	106406.4	.1124527
16	165	5.105945	106406.4	.1124527
17	165	5.105945	106406.4	.1124527
18	165	5.105945	106406.4	.1124527
19	165	5.105945	106406.4	.1124527
20	165	5.105945	106406.4	.1124527
21	165	5.105945	106406.4	.1124527
22	165	5.105945	106406.4	.1124527
23	165	5.105945	106406.4	.1124527
24	190	5.247024	90721.44	.0377374
25	300	5.703782	36557.44	.0689048
26	410	6.016157	6593.44	.3304778
27	680	6.522093	35645.44	1.168145
28	2700	7.901007	4878797.	6.050232
29	3200	8.070906	7337597.	6.914906
30	3600	8.188689	9664637.	7.548228
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	491.2	5.441285	921.1669	1.006169
		230.7385		

Upper 95% confidence limit on arithmetic mean: 776.9400
Upper 95% confidence limit on geometric mean: 604.4334

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 30 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	26	6.76e2	3.258097	10.61519
2	165	2.7225e4	5.105945	26.07068
3	165	2.7225e4	5.105945	26.07068
4	165	2.7225e4	5.105945	26.07068
5	165	2.7225e4	5.105945	26.07068
6	165	2.7225e4	5.105945	26.07068
7	165	2.7225e4	5.105945	26.07068
8	165	2.7225e4	5.105945	26.07068
9	165	2.7225e4	5.105945	26.07068
10	165	2.7225e4	5.105945	26.07068
11	165	2.7225e4	5.105945	26.07068
12	165	2.7225e4	5.105945	26.07068
13	165	2.7225e4	5.105945	26.07068
14	165	2.7225e4	5.105945	26.07068
15	165	2.7225e4	5.105945	26.07068
16	165	2.7225e4	5.105945	26.07068
17	165	2.7225e4	5.105945	26.07068
18	165	2.7225e4	5.105945	26.07068
19	165	2.7225e4	5.105945	26.07068
20	165	2.7225e4	5.105945	26.07068
21	165	2.7225e4	5.105945	26.07068
22	165	2.7225e4	5.105945	26.07068
23	165	2.7225e4	5.105945	26.07068
24	190	3.61e4	5.247024	27.53126
25	300	9e4	5.703782	32.53313
26	410	1.681e5	6.016157	36.19415
27	680	4.624e5	6.522093	42.53769
28	2700	7.29e6	7.901007	62.42591
29	3200	1.024e7	8.070906	65.13953
30	3600	1.296e7	8.188689	67.05463
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	14736	31846226	163.2386	917.5864

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 24607903 (normal distribution)

d = 29.35890 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.4254	3.574e3	1.5204e3
	.2944	3.035e3	8.9350e2
	.2487	2.535e3	6.3045e2
	.2148	5.15e2	1.1062e2
	.187	2.45e2	4.5815e1
	.163	1.35e2	2.2005e1
	.1415	2.5e1	3.5375e0
	.1219	0	0
	.1036	0	0
	.0862	0	0
	.0697	0	0
	.0537	0	0
	.0381	0	0
	.0227	0	0
	.0076	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			3.2263e3
Summation**2:			1.0409e7

Wcalc = .4229993 Wtable = .927 Wcalc - Wtable = -.504001

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Indeno(1,2,3-cd)pyrene (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.4254	4.930593	2.097474
.2944	2.964961	.8728844
.2487	2.795062	.6951318
.2148	1.416147	.3041884
.187	.9102117	.1702096
.163	.5978370	.0974474
.1415	.1410786	.0199626
.1219	0	0
.1036	0	0
.0862	0	0
.0697	0	0
.0537	0	0
.0381	0	0
.0227	0	0
.0076	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.257298
Summation**2:		18.12459

Wcalc = .6173456 Wtable = .927 Wcalc - Wtable = -.309654

Arithmetic Average: 491.2 Geometric Mean: 230.7385

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: 4,4'-DDD (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	8	2.079442	266938.9	.0681005
2	8	2.079442	266938.9	.0681005
3	8	2.079442	266938.9	.0681005
4	8	2.079442	266938.9	.0681005
5	8	2.079442	266938.9	.0681005
6	8	2.079442	266938.9	.0681005
7	8	2.079442	266938.9	.0681005
8	8	2.079442	266938.9	.0681005
9	8	2.079442	266938.9	.0681005
10	8	2.079442	266938.9	.0681005
11	8	2.079442	266938.9	.0681005
12	8	2.079442	266938.9	.0681005
13	8	2.079442	266938.9	.0681005
14	8	2.079442	266938.9	.0681005
15	8	2.079442	266938.9	.0681005
16	8	2.079442	266938.9	.0681005
17	8	2.079442	266938.9	.0681005
18	8	2.079442	266938.9	.0681005
19	8	2.079442	266938.9	.0681005
20	8	2.079442	266938.9	.0681005
21	8	2.079442	266938.9	.0681005
22	8	2.079442	266938.9	.0681005
23	8	2.079442	266938.9	.0681005
24	8	2.079442	266938.9	.0681005
25	8	2.079442	266938.9	.0681005
26	8	2.079442	266938.9	.0681005
27	18.5	2.917771	256199.3	.3333543
28	19	2.944439	255693.3	.3648603
29	19	2.944439	255693.3	.3648603
30	16000	9.680344	2.3949e8	53.87474
31		0	0	0
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	524.6613	2.340402	2870.506	1.374875
		10.38541		

Upper 95% confidence limit on arithmetic mean: 1399.563
Upper 95% confidence limit on geometric mean: 55.43469

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDD (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	8	6.4e1	2.079442	4.324077
2	8	6.4e1	2.079442	4.324077
3	8	6.4e1	2.079442	4.324077
4	8	6.4e1	2.079442	4.324077
5	8	6.4e1	2.079442	4.324077
6	8	6.4e1	2.079442	4.324077
7	8	6.4e1	2.079442	4.324077
8	8	6.4e1	2.079442	4.324077
9	8	6.4e1	2.079442	4.324077
10	8	6.4e1	2.079442	4.324077
11	8	6.4e1	2.079442	4.324077
12	8	6.4e1	2.079442	4.324077
13	8	6.4e1	2.079442	4.324077
14	8	6.4e1	2.079442	4.324077
15	8	6.4e1	2.079442	4.324077
16	8	6.4e1	2.079442	4.324077
17	8	6.4e1	2.079442	4.324077
18	8	6.4e1	2.079442	4.324077
19	8	6.4e1	2.079442	4.324077
20	8	6.4e1	2.079442	4.324077
21	8	6.4e1	2.079442	4.324077
22	8	6.4e1	2.079442	4.324077
23	8	6.4e1	2.079442	4.324077
24	8	6.4e1	2.079442	4.324077
25	8	6.4e1	2.079442	4.324077
26	8	6.4e1	2.079442	4.324077
27	8	6.4e1	2.079442	4.324077
28	18.5	3.4225e2	2.917771	8.513386
29	19	3.61e2	2.944439	8.669721
30	19	3.61e2	2.944439	8.669721
31	16000	2.56e8	9.680344	93.70906
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	16272.5	2.5600e8	74.63191	236.3120

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2.4746e8 (normal distribution)

d = 56.63705 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDD (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	1.5992e4	6.7486e3
	.2921	1.1e1	3.2131e0
	.2475	1.1e1	2.7225e0
	.2145	1.05e1	2.2523e0
	.1874	0	0
	.1641	0	0
	.1433	0	0
	.1243	0	0
	.1066	0	0
	.0899	0	0
	.0739	0	0
	.0585	0	0
	.0435	0	0
	.0289	0	0
	.0144	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			6.7568e3
Summation**2:			4.5655e7

Wcalc = .1844917 Wtable = .929 Wcalc - Wtable = -.744508

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDD (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	7.600902	3.207581
.2921	.8649974	.2526658
.2475	.8649974	.2140869
.2145	.8383292	.1798216
.1874	0	0
.1641	0	0
.1433	0	0
.1243	0	0
.1066	0	0
.0899	0	0
.0739	0	0
.0585	0	0
.0435	0	0
.0289	0	0
.0144	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.854155
Summation**2:		14.85451

Wcalc = .2622755 Wtable = .929 Wcalc - Wtable = -.666724

Arithmetic Average: 524.9194 Geometric Mean: 11.10595

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: 4,4'-DDE (ug/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	8	2.079442	81032.05	.0953293
2	8	2.079442	81032.05	.0953293
3	8	2.079442	81032.05	.0953293
4	8	2.079442	81032.05	.0953293
5	8	2.079442	81032.05	.0953293
6	8	2.079442	81032.05	.0953293
7	8	2.079442	81032.05	.0953293
8	8	2.079442	81032.05	.0953293
9	8	2.079442	81032.05	.0953293
10	8	2.079442	81032.05	.0953293
11	8	2.079442	81032.05	.0953293
12	8	2.079442	81032.05	.0953293
13	8	2.079442	81032.05	.0953293
14	8	2.079442	81032.05	.0953293
15	8	2.079442	81032.05	.0953293
16	8	2.079442	81032.05	.0953293
17	8	2.079442	81032.05	.0953293
18	8	2.079442	81032.05	.0953293
19	8	2.079442	81032.05	.0953293
20	8	2.079442	81032.05	.0953293
21	8	2.079442	81032.05	.0953293
22	8	2.079442	81032.05	.0953293
23	8	2.079442	81032.05	.0953293
24	8	2.079442	81032.05	.0953293
25	8	2.079442	81032.05	.0953293
26	8	2.079442	81032.05	.0953293
27	18.5	2.917771	75164.41	.2804494
28	19	2.944439	74890.50	.3094062
29	19	2.944439	74890.50	.3094062
30	8800	9.082507	72374812	44.81380
31	8	2.079442	81032.05	.0953293
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	292.6613	2.388196	1578.899	1.268686
		10.89382		

Upper 95% confidence limit on arithmetic mean: 773.8941
Upper 95% confidence limit on geometric mean: 46.19330

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDE (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	8	6.4e1	2.079442	4.324077
2	8	6.4e1	2.079442	4.324077
3	8	6.4e1	2.079442	4.324077
4	8	6.4e1	2.079442	4.324077
5	8	6.4e1	2.079442	4.324077
6	8	6.4e1	2.079442	4.324077
7	8	6.4e1	2.079442	4.324077
8	8	6.4e1	2.079442	4.324077
9	8	6.4e1	2.079442	4.324077
10	8	6.4e1	2.079442	4.324077
11	8	6.4e1	2.079442	4.324077
12	8	6.4e1	2.079442	4.324077
13	8	6.4e1	2.079442	4.324077
14	8	6.4e1	2.079442	4.324077
15	8	6.4e1	2.079442	4.324077
16	8	6.4e1	2.079442	4.324077
17	8	6.4e1	2.079442	4.324077
18	8	6.4e1	2.079442	4.324077
19	8	6.4e1	2.079442	4.324077
20	8	6.4e1	2.079442	4.324077
21	8	6.4e1	2.079442	4.324077
22	8	6.4e1	2.079442	4.324077
23	8	6.4e1	2.079442	4.324077
24	8	6.4e1	2.079442	4.324077
25	8	6.4e1	2.079442	4.324077
26	8	6.4e1	2.079442	4.324077
27	8	6.4e1	2.079442	4.324077
28	18.5	3.4225e2	2.917771	8.513386
29	19	3.61e2	2.944439	8.669721
30	19	3.61e2	2.944439	8.669721
31	8800	7.744e7	9.082507	82.49193
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	9072.5	77442792	74.03408	225.0948

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 74787623 (normal distribution)

d = 48.28695 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDE (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	8.792e3	3.7102e3
	.2921	1.1e1	3.2131e0
	.2475	1.1e1	2.7225e0
	.2145	1.05e1	2.2523e0
	.1874	0	0
	.1641	0	0
	.1433	0	0
	.1243	0	0
	.1066	0	0
	.0899	0	0
	.0739	0	0
	.0585	0	0
	.0435	0	0
	.0289	0	0
	.0144	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			3.7184e3
Summation**2:			1.3827e7

Wcalc = .1848780 Wtable = .929 Wcalc - Wtable = -.744122

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDE (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	7.003065	2.955294
.2921	.8649974	.2526658
.2475	.8649974	.2140869
.2145	.8383292	.1798216
.1874	0	0
.1641	0	0
.1433	0	0
.1243	0	0
.1066	0	0
.0899	0	0
.0739	0	0
.0585	0	0
.0435	0	0
.0289	0	0
.0144	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.601868
Summation**2:		12.97345

Wcalc = .2686741 Wtable = .929 Wcalc - Wtable = -.660326

Arithmetic Average: 292.6613 Geometric Mean: 10.89382

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: 4,4'-DDT (ug/kg); Site 6 - DRMO; NSB-NLON -
ter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	8	2.079442	1134878.	.1234762
2	8	2.079442	1134878.	.1234762
3	8	2.079442	1134878.	.1234762
4	8	2.079442	1134878.	.1234762
5	8	2.079442	1134878.	.1234762
6	8	2.079442	1134878.	.1234762
7	8	2.079442	1134878.	.1234762
8	8	2.079442	1134878.	.1234762
9	8	2.079442	1134878.	.1234762
10	8	2.079442	1134878.	.1234762
11	8	2.079442	1134878.	.1234762
12	8	2.079442	1134878.	.1234762
13	8	2.079442	1134878.	.1234762
14	8	2.079442	1134878.	.1234762
15	8	2.079442	1134878.	.1234762
16	8	2.079442	1134878.	.1234762
17	8	2.079442	1134878.	.1234762
18	8	2.079442	1134878.	.1234762
19	8	2.079442	1134878.	.1234762
20	8	2.079442	1134878.	.1234762
21	8	2.079442	1134878.	.1234762
22	8	2.079442	1134878.	.1234762
23	8	2.079442	1134878.	.1234762
24	8	2.079442	1134878.	.1234762
25	8	2.079442	1134878.	.1234762
26	8	2.079442	1134878.	.1234762
27	18.5	2.917771	1112617.	.2371080
28	19	2.944439	1111562.	.2637908
29	19	2.944439	1111562.	.2637908
30	33000	10.40426	1.0193e9	63.57558
31	8	2.079442	1134878.	.1234762
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	1073.306	2.430833	5925.344	1.501933
		11.36835		

Upper 95% confidence limit on arithmetic mean: 2879.293
Upper 95% confidence limit on geometric mean: 81.71652

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDT (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	8	6.4e1	2.079442	4.324077
2	8	6.4e1	2.079442	4.324077
3	8	6.4e1	2.079442	4.324077
4	8	6.4e1	2.079442	4.324077
5	8	6.4e1	2.079442	4.324077
6	8	6.4e1	2.079442	4.324077
7	8	6.4e1	2.079442	4.324077
8	8	6.4e1	2.079442	4.324077
9	8	6.4e1	2.079442	4.324077
10	8	6.4e1	2.079442	4.324077
11	8	6.4e1	2.079442	4.324077
12	8	6.4e1	2.079442	4.324077
13	8	6.4e1	2.079442	4.324077
14	8	6.4e1	2.079442	4.324077
15	8	6.4e1	2.079442	4.324077
16	8	6.4e1	2.079442	4.324077
17	8	6.4e1	2.079442	4.324077
18	8	6.4e1	2.079442	4.324077
19	8	6.4e1	2.079442	4.324077
20	8	6.4e1	2.079442	4.324077
21	8	6.4e1	2.079442	4.324077
22	8	6.4e1	2.079442	4.324077
23	8	6.4e1	2.079442	4.324077
24	8	6.4e1	2.079442	4.324077
25	8	6.4e1	2.079442	4.324077
26	8	6.4e1	2.079442	4.324077
27	8	6.4e1	2.079442	4.324077
28	18.5	3.4225e2	2.917771	8.513386
29	19	3.61e2	2.944439	8.669721
30	19	3.61e2	2.944439	8.669721
31	33000	1.089e9	10.40426	108.2487
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	33272.5	1.0890e9	75.35583	250.8516

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 1.0533e9 (normal distribution)

d = 67.67412 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDT (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	3.2992e4	1.3923e4
	.2921	1.1e1	3.2131e0
	.2475	1.1e1	2.7225e0
	.2145	1.05e1	2.2523e0
	.1874	0	0
	.1641	0	0
	.1433	0	0
	.1243	0	0
	.1066	0	0
	.0899	0	0
	.0739	0	0
	.0585	0	0
	.0435	0	0
	.0289	0	0
	.0144	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.3931e4
Summation**2:			1.9407e8

Wcalc = .1842487 Wtable = .929 Wcalc - Wtable = -.744751

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	4,4'-DDT (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	8.324821	3.513075
.2921	.8649974	.2526658
.2475	.8649974	.2140869
.2145	.8383292	.1798216
.1874	0	0
.1641	0	0
.1433	0	0
.1243	0	0
.1066	0	0
.0899	0	0
.0739	0	0
.0585	0	0
.0435	0	0
.0289	0	0
.0144	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.159649
Summation**2:		17.30268

Wcalc = .2556764 Wtable = .929 Wcalc - Wtable = -.673324

Arithmetic Average: 1073.306 Geometric Mean: 11.36835

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Aroclor-1260 (ug/kg); Site 6 - DRMO; NSB-NLON
ter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.85	.6151856	2718276.	24.63420
2	1.9	.6418539	2718111.	24.37019
3	1.9	.6418539	2718111.	24.37019
4	52	3.951244	2555424.	2.647870
5	80	4.382027	2466688.	1.431480
6	80	4.382027	2466688.	1.431480
7	80	4.382027	2466688.	1.431480
8	80	4.382027	2466688.	1.431480
9	80	4.382027	2466688.	1.431480
10	80	4.382027	2466688.	1.431480
11	80	4.382027	2466688.	1.431480
12	80	4.382027	2466688.	1.431480
13	80	4.382027	2466688.	1.431480
14	80	4.382027	2466688.	1.431480
15	80	4.382027	2466688.	1.431480
16	80	4.382027	2466688.	1.431480
17	250	5.521461	1961595.	.0032502
18	450	6.109248	1441367.	.2817235
19	550	6.309918	1211253.	.5350147
20	1300	7.170120	122898.9	2.533344
21	1400	7.244228	62785.00	2.774744
22	2100	7.649693	201987.9	4.289958
23	2200	7.696213	301874.0	4.484828
24	2200	7.696213	301874.0	4.484828
25	2400	7.783224	561646.3	4.860935
26	2900	7.972466	1561077.	5.731211
27	3100	8.039157	2100849.	6.054976
28	3200	8.070906	2400735.	6.212231
29	5100	8.536996	11898572	8.752867
30	11000	9.305651	87411853	13.89187
31	12000	9.392662	1.0711e8	14.54805
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	1650.569	5.578471	2938.034	2.398889
		264.6667		

Upper 95% confidence limit on arithmetic mean: 2546.053
Upper 95% confidence limit on geometric mean: 32675.50

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.85	3.4225e0	.6151856	.3784534
2	1.9	3.61e0	.6418539	.4119764
3	1.9	3.61e0	.6418539	.4119764
4	52	2.704e3	3.951244	15.61233
5	80	6.4e3	4.382027	19.20216
6	80	6.4e3	4.382027	19.20216
7	80	6.4e3	4.382027	19.20216
8	80	6.4e3	4.382027	19.20216
9	80	6.4e3	4.382027	19.20216
10	80	6.4e3	4.382027	19.20216
11	80	6.4e3	4.382027	19.20216
12	80	6.4e3	4.382027	19.20216
13	80	6.4e3	4.382027	19.20216
14	80	6.4e3	4.382027	19.20216
15	80	6.4e3	4.382027	19.20216
16	80	6.4e3	4.382027	19.20216
17	250	6.25e4	5.521461	30.48653
18	450	2.025e5	6.109248	37.32291
19	550	3.025e5	6.309918	39.81507
20	1300	1.69e6	7.170120	51.41061
21	1400	1.96e6	7.244228	52.47883
22	2100	4.41e6	7.649693	58.51780
23	2200	4.84e6	7.696213	59.23169
24	2200	4.84e6	7.696213	59.23169
25	2400	5.76e6	7.783224	60.57858
26	2900	8.41e6	7.972466	63.56021
27	3100	9.61e6	8.039157	64.62805
28	3200	1.024e7	8.070906	65.13953
29	5100	2.601e7	8.536996	72.88030
30	11000	1.21e8	9.305651	86.59513
31	12000	1.44e8	9.392662	88.22210
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	51167.65	3.4342e8	172.9326	1137.340

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2.5896e8 (normal distribution)

d = 172.6400 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	1.1998e4	5.0632e3
.2921	1.0998e4	3.2125e3
.2475	5.0981e3	1.2618e3
.2145	3.148e3	6.7525e2
.1874	3.02e3	5.6595e2
.1641	2.82e3	4.6276e2
.1433	2.32e3	3.3246e2
.1243	2.12e3	2.6352e2
.1066	2.12e3	2.2599e2
.0899	2.02e3	1.8160e2
.0739	1.32e3	9.7548e1
.0585	1.22e3	7.137e1
.0435	4.7e2	2.0445e1
.0289	3.7e2	1.0693e1
.0144	1.7e2	2.448e0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.2448e4
Summation**2:		1.5494e8

Wcalc = .5983208 Wtable = .929 Wcalc - Wtable = -.330679

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Aroclor-1260 (ug/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	8.777476	3.704095
.2921	8.663797	2.530695
.2475	7.895142	1.954048
.2145	4.119662	.8836676
.1874	3.657131	.6853463
.1641	3.590439	.5891911
.1433	3.401197	.4873916
.1243	3.314186	.4119533
.1066	3.314186	.3532922
.0899	3.267666	.2937632
.0739	2.862201	.2115166
.0585	2.788093	.1631034
.0435	1.927892	.0838633
.0289	1.727221	.0499167
.0144	1.139434	.0164079
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		12.26806
Summation**2:		150.5054

Wcalc = .8717872 Wtable = .929 Wcalc - Wtable = -.057213

Arithmetic Average: 1650.569 Geometric Mean: 264.6667

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Arsenic (µg/kg); Site 6 - DRMO; NSB-NLON
ter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	1.1	.0953102	2.770614	.6411031
2	1.2	.1823216	2.447711	.5093360
3	1.4	.3364722	1.861904	.3130706
4	1.4	.3364722	1.861904	.3130706
5	1.5	.4054651	1.599001	.2406238
6	1.5	.4054651	1.599001	.2406238
7	1.5	.4054651	1.599001	.2406238
8	1.6	.4700036	1.356098	.1814724
9	1.8	.5877867	.9302914	.0949951
10	1.9	.6418539	.7473881	.0645899
11	2	.6931472	.5844849	.0411490
12	2	.6931472	.5844849	.0411490
13	2.1	.7419373	.4415817	.0237351
14	2.3	.8329091	.2157752	.0039804
15	2.3	.8329091	.2157752	.0039804
16	2.3	.8329091	.2157752	.0039804
17	2.4	.8754687	.1328720	.0004215
18	2.6	.9555114	.0270656	.0035417
19	2.6	.9555114	.0270656	.0035417
20	2.8	1.029619	.0012591	.0178543
21	2.9	1.064711	.0183559	.0284635
22	3	1.098612	.0554527	.0410520
23	3.1	1.131402	.1125494	.0554145
24	3.3	1.193922	.2867430	.0887582
25	3.4	1.223775	.4038398	.1074372
26	3.4	1.223775	.4038398	.1074372
27	3.7	1.308333	.8751301	.1700189
28	5.2	1.648659	5.931582	.5664960
29	5.4	1.686399	6.945775	.6247315
30	6.5	1.871802	13.95384	.9521912
31	7.5	2.014903	22.42481	1.251945
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	2.764516	.8959994	1.534394	.4822443
		2.449783		

Upper 95% confidence limit on arithmetic mean: 3.232184
Upper 95% confidence limit on geometric mean: 3.257321

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	1.1	1.21e0	.0953102	.0090840
2	1.2	1.44e0	.1823216	.0332412
3	1.4	1.96e0	.3364722	.1132136
4	1.4	1.96e0	.3364722	.1132136
5	1.5	2.25e0	.4054651	.1644020
6	1.5	2.25e0	.4054651	.1644020
7	1.5	2.25e0	.4054651	.1644020
8	1.6	2.56e0	.4700036	.2209034
9	1.8	3.24e0	.5877867	.3454932
10	1.9	3.61e0	.6418539	.4119764
11	2	4e0	.6931472	.4804530
12	2	4e0	.6931472	.4804530
13	2.1	4.41e0	.7419373	.5504710
14	2.3	5.29e0	.8329091	.6937376
15	2.3	5.29e0	.8329091	.6937376
16	2.3	5.29e0	.8329091	.6937376
17	2.4	5.76e0	.8754687	.7664455
18	2.6	6.76e0	.9555114	.9130021
19	2.6	6.76e0	.9555114	.9130021
20	2.8	7.84e0	1.029619	1.060116
21	2.9	8.41e0	1.064711	1.133609
22	3	9e0	1.098612	1.206949
23	3.1	9.61e0	1.131402	1.280071
24	3.3	1.089e1	1.193922	1.425451
25	3.4	1.156e1	1.223775	1.497626
26	3.4	1.156e1	1.223775	1.497626
27	3.7	1.369e1	1.308333	1.711735
28	5.2	2.704e1	1.648659	2.718075
29	5.4	2.916e1	1.686399	2.843941
30	6.5	4.225e1	1.871802	3.503643
31	7.5	5.625e1	2.014903	4.059834
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	85.7	307.55	27.77598	31.86405

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 70.63097 (normal distribution)

d = 6.976788 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	6.4e0	2.7008e0
.2921	5.3e0	1.5481e0
.2475	4e0	9.9e-1
.2145	3.8e0	8.151e-1
.1874	2.2e0	4.123e-1
.1641	1.9e0	3.118e-1
.1433	1.9e0	2.723e-1
.1243	1.7e0	2.113e-1
.1066	1.3e0	1.386e-1
.0899	1.1e0	9.889e-2
.0739	9e-1	6.651e-2
.0585	8e-1	4.68e-2
.0435	5e-1	2.175e-2
.0289	3e-1	8.67e-3
.0144	1e-1	1.44e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		7.6443e0
Summation**2:		5.8436e1

Wcalc = .8273372 Wtable = .929 Wcalc - Wtable = -.101663

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Arsenic (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	1.919593	.8100682
.2921	1.689481	.4934973
.2475	1.349927	.3341069
.2145	1.312186	.2814640
.1874	.9028677	.1691974
.1641	.8183103	.1342847
.1433	.8183103	.1172639
.1243	.7239188	.0899831
.1066	.5436154	.0579494
.0899	.4567584	.0410626
.0739	.3715636	.0274585
.0585	.3364722	.0196836
.0435	.2135741	.0092905
.0289	.1226023	.0035432
.0144	.0425596	.0006129
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		2.576020
Summation**2:		6.635877

Wcalc = .9511364 Wtable = .929 Wcalc - Wtable = .0221364

Arithmetic Average: 2.764516 Geometric Mean: 2.449783

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

ter Chemical: Beryllium (mg/kg); Site 6 - DRMO; NSB-NLON
ter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.22	-1.51413	.5318173	.9573440
2	.22	-1.51413	.5318173	.9573440
3	.22	-1.51413	.5318173	.9573440
4	.23	-1.46968	.5173322	.8723332
5	.25	-1.38629	.4889618	.7235309
6	.3	-1.20397	.4215360	.4466044
7	.31	-1.17118	.4086509	.4038537
8	.31	-1.17118	.4086509	.4038537
9	.35	-1.04982	.3591102	.2643337
10	.37	-.994252	.3355399	.2102810
11	.38	-.967584	.3240547	.1865340
12	.39	-.941609	.3127696	.1647713
13	.4	-.916291	.3016844	.1448583
14	.41	-.891598	.2907993	.1266719
15	.45	-.798508	.2492586	.0690741
16	.5	-.693147	.2018328	.0247933
17	.5	-.693147	.2018328	.0247933
18	.52	-.653926	.1842625	.0139803
19	.54	-.616186	.1674922	.0064799
20	.54	-.616186	.1674922	.0064799
21	.54	-.616186	.1674922	.0064799
22	.79	-.235722	.0253631	.0899795
23	.887	-.119910	.0038761	.1728712
24	1	0	.0025747	0
25	1.2	.1823216	.0628715	.5155380
26	1.2	.1823216	.0628715	.5155380
27	1.3	.2623643	.1230199	.6368877
28	1.8	.5877867	.7237618	1.262196
29	1.9	.6418539	.9039102	1.386605
30	3.3	1.193922	5.525988	2.991553
31	8.1	2.091864	51.13311	6.904031
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	.9492581	-.535688	1.479544	.8455164
		.5852664		

Upper 95% confidence limit on arithmetic mean: 1.400209
Upper 95% confidence limit on geometric mean: 1.184441

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.22	4.84e-2	-1.51413	2.292583
2	.22	4.84e-2	-1.51413	2.292583
3	.22	4.84e-2	-1.51413	2.292583
4	.23	5.29e-2	-1.46968	2.159947
5	.25	6.25e-2	-1.38629	1.921812
6	.3	9e-2	-1.20397	1.449551
7	.31	9.61e-2	-1.17118	1.371670
8	.31	9.61e-2	-1.17118	1.371670
9	.35	1.225e-1	-1.04982	1.102126
10	.37	1.369e-1	-.994252	.9885376
11	.38	1.444e-1	-.967584	.9362188
12	.39	1.521e-1	-.941609	.8866266
13	.4	1.6e-1	-.916291	.8395887
14	.41	1.681e-1	-.891598	.7949472
15	.45	2.025e-1	-.798508	.6376145
16	.5	2.5e-1	-.693147	.4804530
17	.5	2.5e-1	-.693147	.4804530
18	.52	2.704e-1	-.653926	.4276198
19	.54	2.916e-1	-.616186	.3796854
20	.54	2.916e-1	-.616186	.3796854
21	.54	2.916e-1	-.616186	.3796854
22	.79	6.241e-1	-.235722	.0555650
23	.887	7.868e-1	-.119910	.0143785
24	1	1e0	0	0
25	1.2	1.44e0	.1823216	.0332412
26	1.2	1.44e0	.1823216	.0332412
27	1.3	1.69e0	.2623643	.0688350
28	1.8	3.24e0	.5877867	.3454932
29	1.9	3.61e0	.6418539	.4119764
30	3.3	1.089e1	1.193922	1.425451
31	8.1	6.561e1	2.091864	4.375895
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	29.47	93.60537	-16.6063	30.62972

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 65.67155 (normal distribution)

d = 21.73390 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	7.88e0	3.3254e0
	.2921	3.08e0	8.997e-1
	.2475	1.68e0	4.158e-1
	.2145	1.57e0	3.368e-1
	.1874	1.05e0	1.968e-1
	.1641	9e-1	1.477e-1
	.1433	8.9e-1	1.275e-1
	.1243	6.9e-1	8.577e-2
	.1066	5.37e-1	5.724e-2
	.0899	4.2e-1	3.776e-2
	.0739	1.6e-1	1.182e-2
	.0585	1.5e-1	8.775e-3
	.0435	1.4e-1	6.09e-3
	.0289	1.1e-1	3.179e-3
	.0144	5e-2	7.2e-4
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			5.6609e0
Summation**2:			3.2046e1

Wcalc = .4879788 Wtable = .929 Wcalc - Wtable = -.441021

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Beryllium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	3.605992	1.521729
.2921	2.708050	.7910215
.2475	2.155982	.5336055
.2145	2.057463	.4413257
.1874	1.648659	.3089586
.1641	1.386294	.2274909
.1433	1.353505	.1939572
.1243	1.171183	.1455780
.1066	.9299118	.0991286
.0899	.7585299	.0681918
.0739	.3513979	.0259683
.0585	.3254224	.0190372
.0435	.3001046	.0130545
.0289	.2376717	.0068687
.0144	.1053605	.0015172
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.375992
Summation**2:		19.14931

Wcalc = .8810800 Wtable = .929 Wcalc - Wtable = -.047920

Arithmetic Average: .9492581 Geometric Mean: .5852664

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Boron (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	20	2.995732	16194.61	.8011958
2	20	2.995732	16194.61	.8011958
3	20	2.995732	16194.61	.8011958
4	20	2.995732	16194.61	.8011958
5	20	2.995732	16194.61	.8011958
6	20	2.995732	16194.61	.8011958
7	20	2.995732	16194.61	.8011958
8	20	2.995732	16194.61	.8011958
9	20	2.995732	16194.61	.8011958
10	20	2.995732	16194.61	.8011958
11	20	2.995732	16194.61	.8011958
12	20	2.995732	16194.61	.8011958
13	20	2.995732	16194.61	.8011958
14	41	3.713572	11290.78	.0314196
15	43	3.761200	10869.74	.0168033
16	44	3.784190	10662.23	.0113717
17	46	3.828641	10253.20	.0038671
18	48	3.871201	9852.163	.0003852
19	53	3.970292	8884.583	.0063146
20	58	4.060443	7967.002	.0287694
21	59	4.077537	7789.486	.0348605
22	73	4.290459	5514.260	.1597055
23	80	4.382027	4523.647	.2412764
24	98	4.584967	2426.357	.4818300
25	106	4.663439	1702.228	.5969284
26	112	4.718499	1243.131	.6850396
27	112	4.718499	1243.131	.6850396
28	121	4.795791	689.4860	.8189578
29	141	4.948760	39.16337	1.119221
30	260	5.560682	12710.74	2.788412
31	2810	7.940940	7090195.	16.40341
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	147.2581	3.890828	496.9368	1.072834
		48.95139		

Upper 95% confidence limit on arithmetic mean: 298.7195
Upper 95% confidence limit on geometric mean: 142.4269

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 4 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	20	4e2	2.995732	8.974412
2	20	4e2	2.995732	8.974412
3	20	4e2	2.995732	8.974412
4	20	4e2	2.995732	8.974412
5	20	4e2	2.995732	8.974412
6	20	4e2	2.995732	8.974412
7	20	4e2	2.995732	8.974412
8	20	4e2	2.995732	8.974412
9	20	4e2	2.995732	8.974412
10	20	4e2	2.995732	8.974412
11	20	4e2	2.995732	8.974412
12	20	4e2	2.995732	8.974412
13	20	4e2	2.995732	8.974412
14	41	1.681e3	3.713572	13.79062
15	43	1.849e3	3.761200	14.14663
16	44	1.936e3	3.784190	14.32009
17	46	2.116e3	3.828641	14.65849
18	48	2.304e3	3.871201	14.98620
19	53	2.809e3	3.970292	15.76322
20	58	3.364e3	4.060443	16.48720
21	59	3.481e3	4.077537	16.62631
22	73	5.329e3	4.290459	18.40804
23	80	6.4e3	4.382027	19.20216
24	98	9.604e3	4.584967	21.02193
25	106	1.1236e4	4.663439	21.74766
26	112	1.2544e4	4.718499	22.26423
27	112	1.2544e4	4.718499	22.26423
28	121	1.4641e4	4.795791	22.99961
29	141	1.9881e4	4.948760	24.49022
30	260	6.76e4	5.560682	30.92118
31	2810	7.8961e6	7.940940	63.05852
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	4565	8080619	120.6157	503.8239

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 7408386. (normal distribution)

d = 34.52915 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	2.79e3	1.1774e3
	.2921	2.4e2	7.0104e1
	.2475	1.21e2	2.9948e1
	.2145	1.01e2	2.1665e1
	.1874	9.2e1	1.7241e1
	.1641	9.2e1	1.5097e1
	.1433	8.6e1	1.2324e1
	.1243	7.8e1	9.6954e0
	.1066	6e1	6.396e0
	.0899	5.3e1	4.7647e0
	.0739	3.9e1	2.8821e0
	.0585	3.8e1	2.223e0
	.0435	3.3e1	1.4355e0
	.0289	7e0	2.023e-1
	.0144	3e0	4.32e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.3714e3
Summation**2:			1.8807e6

Wcalc = .2538661 Wtable = .929 Wcalc - Wtable = -.675134

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Boron (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	4.945207	2.086878
.2921	2.564949	.7492217
.2475	1.953028	.4833743
.2145	1.800058	.3861125
.1874	1.722767	.3228465
.1641	1.722767	.2827060
.1433	1.667707	.2389824
.1243	1.589235	.1975419
.1066	1.386294	.1477790
.0899	1.294727	.1163960
.0739	1.081805	.0799454
.0585	1.064711	.0622856
.0435	.9745596	.0423933
.0289	.1576289	.0045555
.0144	.0674413	.0009712
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		5.154069
Summation**2:		26.56443

Wcalc = .7693332 Wtable = .929 Wcalc - Wtable = -.159667

Arithmetic Average: 147.2581 Geometric Mean: 48.95139

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Cadmium (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	.225	-1.49165	20.74362	7.714147
2	.94	-.061875	14.74188	1.816176
3	1	0	14.28474	0
4	1.7	.5306283	9.483420	.5702548
5	2.2	.7884574	6.653903	.2473302
6	2.2	.7884574	6.653903	.2473302
7	2.4	.8754687	5.662097	.1683557
8	2.4	.8754687	5.662097	.1683557
9	2.5	.9162907	5.196194	.1365226
10	2.6	.9555114	4.750291	.1090776
11	2.8	1.029619	3.918484	.0656185
12	2.9	1.064711	3.532581	.0488718
13	2.9	1.064711	3.532581	.0488718
14	3.1	1.131402	2.820774	.0238327
15	3.7	1.308333	1.165355	.0005086
16	3.9	1.360977	.7735486	.0056545
17	4	1.386294	.6076454	.0101031
18	4.1	1.410987	.4617422	.0156767
19	4.9	1.589235	.0145164	.0920848
20	4.9	1.589235	.0145164	.0920848
21	5.7	1.740466	.8472906	.2067391
22	5.8	1.757858	1.041387	.2228572
23	6.2	1.824549	2.017774	.2902719
24	6.4	1.856298	2.625968	.3254903
25	6.6	1.887070	3.314162	.3615488
26	6.6	1.887070	3.314162	.3615488
27	6.7	1.902108	3.688258	.3798591
28	8.3	2.116256	12.39381	.6896889
29	10.8	2.379546	36.24623	1.196323
30	14.6	2.681022	96.44190	1.946698
31	15.1	2.714695	106.5124	2.041796
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	4.779516	1.285780	3.554890	.8083662
		3.617490		

Upper 95% confidence limit on arithmetic mean: 5.863012
Upper 95% confidence limit on geometric mean: 6.950600

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	.225	5.063e-2	-1.49165	2.225034
2	.94	8.836e-1	-.061875	.0038286
3	1	1e0	0	0
4	1.7	2.89e0	.5306283	.2815663
5	2.2	4.84e0	.7884574	.6216650
6	2.2	4.84e0	.7884574	.6216650
7	2.4	5.76e0	.8754687	.7664455
8	2.4	5.76e0	.8754687	.7664455
9	2.5	6.25e0	.9162907	.8395887
10	2.6	6.76e0	.9555114	.9130021
11	2.8	7.84e0	1.029619	1.060116
12	2.9	8.41e0	1.064711	1.133609
13	2.9	8.41e0	1.064711	1.133609
14	3.1	9.61e0	1.131402	1.280071
15	3.7	1.369e1	1.308333	1.711735
16	3.9	1.521e1	1.360977	1.852257
17	4	1.6e1	1.386294	1.921812
18	4.1	1.681e1	1.410987	1.990884
19	4.9	2.401e1	1.589235	2.525669
20	4.9	2.401e1	1.589235	2.525669
21	5.7	3.249e1	1.740466	3.029223
22	5.8	3.364e1	1.757858	3.090064
23	6.2	3.844e1	1.824549	3.328980
24	6.4	4.096e1	1.856298	3.445842
25	6.6	4.356e1	1.887070	3.561032
26	6.6	4.356e1	1.887070	3.561032
27	6.7	4.489e1	1.902108	3.618013
28	8.3	6.889e1	2.116256	4.478537
29	10.8	1.1664e2	2.379546	5.662240
30	14.6	2.1316e2	2.681022	7.187876
31	15.1	2.2801e2	2.714695	7.369568
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	148.165	1087.274	39.85919	72.50708

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 379.1172 (normal distribution)

d = 21.25691 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	1.4875e1	6.2773e0
.2921	1.366e1	3.9901e0
.2475	9.8e0	2.4255e0
.2145	6.6e0	1.4157e0
.1874	4.5e0	8.433e-1
.1641	4.4e0	7.220e-1
.1433	4.2e0	6.019e-1
.1243	4e0	4.972e-1
.1066	3.7e0	3.944e-1
.0899	3.2e0	2.877e-1
.0739	2.9e0	2.143e-1
.0585	2e0	1.17e-1
.0435	2e0	8.7e-2
.0289	1e0	2.89e-2
.0144	3e-1	4.32e-3
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		1.7907e1
Summation**2:		3.2065e2

Wcalc = .8457677 Wtable = .929 Wcalc - Wtable = -.083232

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Cadmium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	4.206350	1.775080
.2921	2.742897	.8012002
.2475	2.379546	.5889377
.2145	1.585627	.3401170
.1874	1.113650	.2086980
.1641	1.098612	.1802823
.1433	1.011601	.1449624
.1243	.9808293	.1219171
.1066	.9082586	.0968204
.0899	.8023465	.0721309
.0739	.7108468	.0525316
.0585	.5245245	.0306847
.0435	.5245245	.0228168
.0289	.2795849	.0080800
.0144	.0779615	.0011226
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.413362
Summation**2:		19.47776

Wcalc = .9163026 Wtable = .929 Wcalc - Wtable = -.012697

Arithmetic Average: 4.779516 Geometric Mean: 3.617490

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Copper (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	10.6	2.360854	616559.3	6.632677
2	20.4	3.015535	601265.2	3.689156
3	21	3.044522	600335.0	3.578642
4	22.6	3.117950	597858.2	3.306224
5	26.3	3.269569	592150.1	2.777834
6	29.5	3.384390	587235.5	2.408276
7	32	3.465736	583410.2	2.162419
8	32.8	3.490429	582188.7	2.090407
9	33.5	3.511545	581121.0	2.029790
10	33.9	3.523415	580511.3	1.996110
11	39.2	3.668677	572463.1	1.606748
12	50.6	3.923952	555342.3	1.024753
13	59.7	4.089332	541862.2	.7172742
14	65.6	4.183576	533210.9	.5665223
15	67.5	4.212128	530439.7	.5243568
16	105	4.653960	477222.5	.0796888
17	120	4.787492	456723.1	.0221297
18	168	5.123964	394149.0	.0352356
19	227	5.424950	323548.1	.2388253
20	258	5.552960	289242.7	.3803277
21	261	5.564520	286024.8	.3947206
22	312	5.743003	234074.9	.6508467
23	362	5.891644	188193.6	.9127734
24	380	5.940171	172900.4	1.007853
25	513	6.240276	79983.14	1.700477
26	599	6.395262	38735.32	2.128708
27	1040	6.946976	59627.34	4.043009
28	1230	7.114769	188518.4	4.745936
29	2730	7.912057	3741080.	8.855412
30	3020	8.013012	4947008.	9.466450
31	12800	9.457200	1.4410e8	20.43897
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	795.8129	4.936252	2342.602	1.734095
		139.2474		

Upper 95% confidence limit on arithmetic mean: 1509.815
Upper 95% confidence limit on geometric mean: 1845.861

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Copper (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	10.6	1.1236e2	2.360854	5.573632
2	20.4	4.1616e2	3.015535	9.093451
3	21	4.41e2	3.044522	9.269117
4	22.6	5.1076e2	3.117950	9.721612
5	26.3	6.9169e2	3.269569	10.69008
6	29.5	8.7025e2	3.384390	11.45410
7	32	1.024e3	3.465736	12.01133
8	32.8	1.0758e3	3.490429	12.18309
9	33.5	1.1223e3	3.511545	12.33095
10	33.9	1.1492e3	3.523415	12.41445
11	39.2	1.5366e3	3.668677	13.45919
12	50.6	2.5604e3	3.923952	15.39740
13	59.7	3.5641e3	4.089332	16.72264
14	65.6	4.3034e3	4.183576	17.50231
15	67.5	4.5563e3	4.212128	17.74202
16	105	1.1025e4	4.653960	21.65935
17	120	1.44e4	4.787492	22.92008
18	168	2.8224e4	5.123964	26.25501
19	227	5.1529e4	5.424950	29.43008
20	258	6.6564e4	5.552960	30.83536
21	261	6.8121e4	5.564520	30.96389
22	312	9.7344e4	5.743003	32.98209
23	362	1.3104e5	5.891644	34.71147
24	380	1.444e5	5.940171	35.28563
25	513	2.6317e5	6.240276	38.94104
26	599	3.5880e5	6.395262	40.89937
27	1040	1.0816e6	6.946976	48.26048
28	1230	1.5129e6	7.114769	50.61994
29	2730	7.4529e6	7.912057	62.60064
30	3020	9.1204e6	8.013012	64.20836
31	12800	1.6384e8	9.457200	89.43864
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	24670.2	1.8427e8	153.0238	845.5768

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2) d = 1.6463e8 (normal distribution)

d = 90.21255 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Copper (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	1.2789e4	5.3971e3
.2921	2.9996e3	8.7618e2
.2475	2.709e3	6.7048e2
.2145	1.2074e3	2.5899e2
.1874	1.0137e3	1.8997e2
.1641	5.695e2	9.3455e1
.1433	4.81e2	6.8927e1
.1243	3.472e2	4.3157e1
.1066	3.285e2	3.5018e1
.0899	2.781e2	2.5001e1
.0739	2.218e2	1.6391e1
.0585	2.074e2	1.2133e1
.0435	1.673e2	7.2776e0
.0289	1.024e2	2.9594e0
.0144	5.25e1	7.56e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		7.6978e3
Summation**2:		5.9256e7

Wcalc = .3599292 Wtable = .929 Wcalc - Wtable = -.569071

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Copper (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	7.096346	2.994658
.2921	4.997477	1.459763
.2475	4.867534	1.204715
.2145	3.996820	.8573178
.1874	3.677407	.6891461
.1641	3.010871	.4940840
.1433	2.774540	.3975916
.1243	2.449743	.3045030
.1066	2.380099	.2537185
.0899	2.219588	.1995410
.0739	1.895844	.1401028
.0585	1.629008	.0952970
.0435	1.335618	.0580994
.0289	.9403883	.0271772
.0144	.5753641	.0082852
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		9.090438
Summation**2:		82.63606

Wcalc = .9160151 Wtable = .929 Wcalc - Wtable = -.012985

Arithmetic Average: 795.8129 Geometric Mean: 139.2474

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Lead (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	2.3	.8329091	225474.9	12.71302
2	2.9	1.064711	224905.4	11.11376
3	5.6	1.722767	222351.8	7.159234
4	8.4	2.128232	219719.0	5.153851
5	8.8	2.174752	219344.2	4.944794
6	12.2	2.501436	216171.0	3.598628
7	13.9	2.631889	214593.1	3.120707
8	16.6	2.809403	212098.9	2.525043
9	20.7	3.030134	208339.2	1.872265
10	27.5	3.314186	202177.9	1.175609
11	27.6	3.317816	202088.0	1.167751
12	30.3	3.411148	199667.7	.9747482
13	37.3	3.618993	193460.9	.6075388
14	40.9	3.711130	190307.0	.4723964
15	50.7	3.925926	181852.7	.2232706
16	63.4	4.149464	171182.4	.0619896
17	91.3	4.514151	148874.0	.0133887
18	168	5.123964	95568.74	.5263835
19	181	5.198497	87700.05	.6400895
20	204	5.318120	74606.52	.8458093
21	245	5.501258	53889.88	1.216206
22	390	5.966147	7593.717	2.457701
23	459	6.129050	329.1298	2.995008
24	514	6.242223	1358.517	3.399533
25	545	6.300786	4604.717	3.618915
26	563	6.333280	7371.607	3.743600
27	652	6.480045	30575.34	4.333073
28	715	6.572283	56576.46	4.725587
29	754	6.625392	76650.39	4.959312
30	811	6.698268	111461.2	5.289204
31	8130	9.003316	58566237	21.20488
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	477.1419	4.398441	1444.843	1.973603
		81.32399		

Upper 95% confidence limit on arithmetic mean: 917.5159
Upper 95% confidence limit on geometric mean: 2220.089

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Lead (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	2.3	5.29e0	.8329091	.6937376
2	2.9	8.41e0	1.064711	1.133609
3	5.6	3.136e1	1.722767	2.967925
4	8.4	7.056e1	2.128232	4.529370
5	8.8	7.744e1	2.174752	4.729545
6	12.2	1.4884e2	2.501436	6.257182
7	13.9	1.9321e2	2.631889	6.926839
8	16.6	2.7556e2	2.809403	7.892744
9	20.7	4.2849e2	3.030134	9.181710
10	27.5	7.5625e2	3.314186	10.98383
11	27.6	7.6176e2	3.317816	11.00790
12	30.3	9.1809e2	3.411148	11.63593
13	37.3	1.3913e3	3.618993	13.09711
14	40.9	1.6728e3	3.711130	13.77249
15	50.7	2.5705e3	3.925926	15.41289
16	63.4	4.0196e3	4.149464	17.21805
17	91.3	8.3357e3	4.514151	20.37756
18	168	2.8224e4	5.123964	26.25501
19	181	3.2761e4	5.198497	27.02437
20	204	4.1616e4	5.318120	28.28240
21	245	6.0025e4	5.501258	30.26384
22	390	1.521e5	5.966147	35.59491
23	459	2.1068e5	6.129050	37.56526
24	514	2.6420e5	6.242223	38.96535
25	545	2.9703e5	6.300786	39.69990
26	563	3.1697e5	6.333280	40.11043
27	652	4.2510e5	6.480045	41.99098
28	715	5.1123e5	6.572283	43.19490
29	754	5.6852e5	6.625392	43.89582
30	811	6.5772e5	6.698268	44.86679
31	8130	6.6097e7	9.003316	81.05970
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	14791.4	69684728	136.3517	716.5881

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 62627131 (normal distribution)

d = 116.8533 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Lead (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	8.1277e3	3.4299e3
.2921	8.081e2	2.3605e2
.2475	7.484e2	1.8523e2
.2145	7.066e2	1.5157e2
.1874	6.432e2	1.2054e2
.1641	5.508e2	9.0386e1
.1433	5.311e2	7.6107e1
.1243	4.974e2	6.1827e1
.1066	4.383e2	4.6723e1
.0899	3.625e2	3.2589e1
.0739	2.174e2	1.6066e1
.0585	1.737e2	1.0161e1
.0435	1.437e2	6.2510e0
.0289	1.271e2	3.6732e0
.0144	4.06e1	5.846e-1
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.4676e3
Summation**2:		1.9960e7

Wcalc = .3187077 Wtable = .929 Wcalc - Wtable = -.610292

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Lead (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution: Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	8.170407	3.447912
.2921	5.633557	1.645562
.2475	4.902626	1.213400
.2145	4.444051	.9532489
.1874	4.305293	.8068119
.1641	3.831844	.6288055
.1433	3.668897	.5257529
.1243	3.432821	.4266996
.1066	3.098917	.3303445
.0899	2.651961	.2384113
.0739	2.183442	.1613564
.0585	1.906972	.1115579
.0435	1.579504	.0687084
.0289	1.412834	.0408309
.0144	.5882249	.0084704
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		10.48986
Summation**2:		110.0372

Wcalc = .9416699 Wtable = .929 Wcalc - Wtable = .0126699

Arithmetic Average: 477.1419 Geometric Mean: 81.32399

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: Manganese (mg/kg); Site 6 - DRMO; NSB-NLON
er Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	27.3	3.306887	57754.94	4.567447
2	112	4.718499	24218.39	.5264177
3	126	4.836282	20056.96	.3693764
4	132	4.882802	18393.48	.3149942
5	155	5.043425	12683.85	.1604966
6	162	5.087596	11156.13	.1270559
7	163	5.093750	10945.88	.1227067
8	169	5.129899	9726.413	.0986881
9	181	5.198497	7503.471	.0602940
10	196	5.278115	5129.794	.0275330
11	199	5.293305	4709.059	.0227227
12	204	5.318120	4047.833	.0158572
13	213	5.361292	2983.626	.0068481
14	220	5.393628	2267.910	.0025420
15	237	5.468060	937.7424	.0005767
16	238	5.472271	877.4973	.0007967
17	257	5.549076	112.8392	.0110315
18	268	5.590987	.1424454	.0215918
19	270	5.598422	5.652123	.0238321
20	272	5.605802	19.16180	.0261652
21	272	5.605802	19.16180	.0261652
22	281	5.638355	178.9553	.0377561
23	291	5.673323	546.5037	.0525684
24	312	5.743003	1969.355	.0893758
25	331	5.802118	4016.697	.1282163
26	331	5.802118	4016.697	.1282163
27	360	5.886104	8533.588	.1954159
28	488	6.190315	48566.21	.5569190
29	490	6.194405	49451.72	.5630402
30	603	6.401917	112478.0	.9175185
31	736	6.601230	219377.4	1.339077
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	267.6226	5.444045	146.3654	.5927687
		231.3763		

Upper 95% confidence limit on arithmetic mean: 312.2333
Upper 95% confidence limit on geometric mean: 342.6199

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	27.3	7.4529e2	3.306887	10.93550
2	112	1.2544e4	4.718499	22.26423
3	126	1.5876e4	4.836282	23.38962
4	132	1.7424e4	4.882802	23.84175
5	155	2.4025e4	5.043425	25.43614
6	162	2.6244e4	5.087596	25.88364
7	163	2.6569e4	5.093750	25.94629
8	169	2.8561e4	5.129899	26.31586
9	181	3.2761e4	5.198497	27.02437
10	196	3.8416e4	5.278115	27.85849
11	199	3.9601e4	5.293305	28.01908
12	204	4.1616e4	5.318120	28.28240
13	213	4.5369e4	5.361292	28.74345
14	220	4.84e4	5.393628	29.09122
15	237	5.6169e4	5.468060	29.89968
16	238	5.6644e4	5.472271	29.94575
17	257	6.6049e4	5.549076	30.79225
18	268	7.1824e4	5.590987	31.25914
19	270	7.29e4	5.598422	31.34233
20	272	7.3984e4	5.605802	31.42502
21	272	7.3984e4	5.605802	31.42502
22	281	7.8961e4	5.638355	31.79104
23	291	8.4681e4	5.673323	32.18660
24	312	9.7344e4	5.743003	32.98209
25	331	1.0956e5	5.802118	33.66458
26	331	1.0956e5	5.802118	33.66458
27	360	1.296e5	5.886104	34.64622
28	488	2.3814e5	6.190315	38.32000
29	490	2.401e5	6.194405	38.37066
30	603	3.6361e5	6.401917	40.98454
31	736	5.4170e5	6.601230	43.57624
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	8296.3	2862962.	168.7654	929.3078

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 642685.1 (normal distribution)

d = 10.54124 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	7.087e2	2.9907e2
	.2921	4.91e2	1.4342e2
	.2475	3.64e2	9.009e1
	.2145	3.56e2	7.6362e1
	.1874	2.05e2	3.8417e1
	.1641	1.69e2	2.7733e1
	.1433	1.68e2	2.4074e1
	.1243	1.43e2	1.7775e1
	.1066	1.1e2	1.1726e1
	.0899	8.5e1	7.6415e0
	.0739	7.3e1	5.3947e0
	.0585	6.8e1	3.978e0
	.0435	5.7e1	2.4795e0
	.0289	4.8e1	1.3872e0
	.0144	2e1	2.88e-1
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			7.4984e2
Summation**2:			5.6226e5

Wcalc = .8748576 Wtable = .929 Wcalc - Wtable = -.054142

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Manganese (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	3.294343	1.390213
.2921	1.683418	.4917265
.2475	1.358123	.3361356
.2145	1.307513	.2804616
.1874	.8426789	.1579180
.1641	.7145220	.1172531
.1433	.7083682	.1015092
.1243	.6131045	.0762089
.1066	.4748262	.0506165
.0899	.3602400	.0323856
.0739	.3124972	.0230935
.0585	.2876821	.0168294
.0435	.2371298	.0103151
.0289	.1973594	.0057037
.0144	.0810159	.0011666
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.074351
Summation**2:		9.451633

Wcalc = .8966337 Wtable = .929 Wcalc - Wtable = -.032366

Arithmetic Average: 267.6226 Geometric Mean: 231.3763

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

er Chemical: Nickel (mg/kg); Site 6 - DRMO; NSB-NLON
er Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	7.5	2.014903	3006.577	1.574937
2	8.5	2.140066	2897.912	1.276452
3	8.8	2.174752	2865.703	1.199279
4	10.3	2.332144	2707.356	.8793263
5	10.8	2.379546	2655.574	.7926728
6	10.8	2.379546	2655.574	.7926728
7	11.2	2.415914	2614.508	.7292376
8	12.4	2.517696	2493.230	.5657618
9	12.5	2.525729	2483.254	.5537432
10	13.2	2.580217	2413.979	.4756186
11	13.4	2.595255	2394.366	.4551029
12	14.6	2.681022	2278.368	.3467400
13	15	2.708050	2240.343	.3156391
14	15.3	2.727853	2212.033	.2937803
15	15.4	2.734368	2202.637	.2867607
16	18.1	2.895912	1956.493	.1398431
17	19.1	2.949688	1869.028	.1025149
18	19.4	2.965273	1843.179	.0927780
19	22.9	3.131137	1554.903	.0192463
20	23.6	3.161247	1500.188	.0117986
21	25.3	3.230804	1371.388	.0015260
22	30	3.401197	1045.375	.0172474
23	30.2	3.407842	1032.482	.0190368
24	30.8	3.427515	994.2833	.0248525
25	69.2	4.237001	47.16588	.9353462
26	107	4.672829	1995.207	1.968299
27	122	4.804021	3560.239	2.353626
28	123	4.812184	3680.575	2.378740
29	158	5.062595	9152.317	3.213871
30	388	5.961005	106059.5	7.242221
31	566	6.338594	253681.2	9.417080
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	62.33226	3.269868	119.6474	1.132486
		26.30786		

Upper 95% confidence limit on arithmetic mean: 98.79961
Upper 95% confidence limit on geometric mean: 85.32969

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Nickel (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	7.5	5.625e1	2.014903	4.059834
2	8.5	7.225e1	2.140066	4.579883
3	8.8	7.744e1	2.174752	4.729545
4	10.3	1.0609e2	2.332144	5.438895
5	10.8	1.1664e2	2.379546	5.662240
6	10.8	1.1664e2	2.379546	5.662240
7	11.2	1.2544e2	2.415914	5.836639
8	12.4	1.5376e2	2.517696	6.338796
9	12.5	1.5625e2	2.525729	6.379305
10	13.2	1.7424e2	2.580217	6.657519
11	13.4	1.7956e2	2.595255	6.735347
12	14.6	2.1316e2	2.681022	7.187876
13	15	2.25e2	2.708050	7.333536
14	15.3	2.3409e2	2.727853	7.441181
15	15.4	2.3716e2	2.734368	7.476766
16	18.1	3.2761e2	2.895912	8.386306
17	19.1	3.6481e2	2.949688	8.700661
18	19.4	3.7636e2	2.965273	8.792844
19	22.9	5.2441e2	3.131137	9.804018
20	23.6	5.5696e2	3.161247	9.993481
21	25.3	6.4009e2	3.230804	10.43810
22	30	9e2	3.401197	11.56814
23	30.2	9.1204e2	3.407842	11.61339
24	30.8	9.4864e2	3.427515	11.74786
25	69.2	4.7886e3	4.237001	17.95218
26	107	1.1449e4	4.672829	21.83533
27	122	1.4884e4	4.804021	23.07862
28	123	1.5129e4	4.812184	23.15712
29	158	2.4964e4	5.062595	25.62987
30	388	1.5054e5	5.961005	35.53358
31	566	3.2036e5	6.338594	40.17777
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	1952.3	149909.5	101.3659	369.9289

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi))**2)

d = 429464.9 (normal distribution)

d = 38.47575 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Nickel (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	5.585e2	2.3569e2
.2921	3.795e2	1.1085e2
.2475	1.492e2	3.6927e1
.2145	1.127e2	2.4174e1
.1874	1.112e2	2.0839e1
.1641	9.62e1	1.5786e1
.1433	5.8e1	8.3114e0
.1243	1.84e1	2.2871e0
.1066	1.77e1	1.8868e0
.0899	1.68e1	1.5103e0
.0739	1.19e1	8.794e-1
.0585	9e0	5.265e-1
.0435	7.9e0	3.437e-1
.0289	4.1e0	1.185e-1
.0144	3.7e0	5.328e-2
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		4.6018e2
Summation**2:		2.1177e5

Wcalc = .4930969 Wtable = .929 Wcalc - Wtable = -.435903

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Nickel (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	4.323691	1.824598
.2921	3.820939	1.116096
.2475	2.887843	.7147412
.2145	2.480040	.5319687
.1874	2.424475	.4543466
.1641	2.293283	.3763277
.1433	1.821087	.2609618
.1243	.9098182	.1130904
.1066	.8821133	.0940333
.0899	.8209806	.0738062
.0739	.6355497	.0469671
.0585	.4802252	.0280932
.0435	.4230867	.0184043
.0289	.2374202	.0068614
.0144	.2153208	.0031006
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		5.635030
Summation**2:		31.75356

Wcalc = .8252877 Wtable = .929 Wcalc - Wtable = -.103712

Arithmetic Average: 62.33226 Geometric Mean: 26.30786

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Vanadium (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	9	2.197225	676	1.408802
2	9.4	2.240710	655.36	1.307465
3	11.8	2.468100	538.24	.8391562
4	15.9	2.766319	364.81	.3817203
5	16.1	2.778819	357.21	.3664304
6	17.2	2.844909	316.84	.2907850
7	17.5	2.862201	306.25	.2724353
8	18.5	2.917771	272.25	.2175136
9	19.3	2.960105	246.49	.1798177
10	22.2	3.100092	163.84	.0806912
11	22.4	3.109061	158.76	.0756763
12	22.6	3.117950	153.76	.0708648
13	25.9	3.254243	82.81	.0168769
14	27.4	3.310543	57.76	.0054186
15	29.3	3.377588	32.49	.0000431
16	31.7	3.456317	10.89	.0052074
17	32.5	3.481240	6.25	.0094257
18	33.6	3.514526	1.96	.0169968
19	35.5	3.569533	.25	.0343652
20	37.9	3.634951	8.41	.0628991
21	39.8	3.683867	23.04	.0898277
22	39.9	3.686376	24.01	.0913382
23	42.9	3.758872	62.41	.1404133
24	44	3.784190	81	.1600283
25	45.6	3.819908	112.36	.1898811
26	47.7	3.864931	161.29	.2311467
27	56.2	4.028917	449.44	.4157187
28	56.4	4.032469	457.96	.4203122
29	63.8	4.155753	829.44	.5953649
30	88	4.477337	2809	1.195048
31	105	4.653960	4900	1.612408
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	35	3.384154	21.84840	.5995576
		29.49304		

Upper 95% confidence limit on arithmetic mean: 41.65918
Upper 95% confidence limit on geometric mean: 43.98599

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	9	8.1e1	2.197225	4.827796
2	9.4	8.836e1	2.240710	5.020780
3	11.8	1.3924e2	2.468100	6.091515
4	15.9	2.5281e2	2.766319	7.652521
5	16.1	2.5921e2	2.778819	7.721837
6	17.2	2.9584e2	2.844909	8.093509
7	17.5	3.0625e2	2.862201	8.192194
8	18.5	3.4225e2	2.917771	8.513386
9	19.3	3.7249e2	2.960105	8.762222
10	22.2	4.9284e2	3.100092	9.610572
11	22.4	5.0176e2	3.109061	9.666260
12	22.6	5.1076e2	3.117950	9.721612
13	25.9	6.7081e2	3.254243	10.59010
14	27.4	7.5076e2	3.310543	10.95970
15	29.3	8.5849e2	3.377588	11.40810
16	31.7	1.0049e3	3.456317	11.94612
17	32.5	1.0563e3	3.481240	12.11903
18	33.6	1.1290e3	3.514526	12.35189
19	35.5	1.2603e3	3.569533	12.74156
20	37.9	1.4364e3	3.634951	13.21287
21	39.8	1.5840e3	3.683867	13.57088
22	39.9	1.5920e3	3.686376	13.58937
23	42.9	1.8404e3	3.758872	14.12912
24	44	1.936e3	3.784190	14.32009
25	45.6	2.0794e3	3.819908	14.59169
26	47.7	2.2753e3	3.864931	14.93769
27	56.2	3.1584e3	4.028917	16.23217
28	56.4	3.1810e3	4.032469	16.26081
29	63.8	4.0704e3	4.155753	17.27028
30	88	7.744e3	4.477337	20.04654
31	105	1.1025e4	4.653960	21.65935
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	1085	52295.58	104.9088	365.8116

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 14320.58 (normal distribution)

d = 10.78408 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	9.6e1	4.0512e1
	.2921	7.86e1	2.2959e1
	.2475	5.2e1	1.287e1
	.2145	4.05e1	8.6873e0
	.1874	4.01e1	7.5147e0
	.1641	3.05e1	5.0051e0
	.1433	2.81e1	4.0267e0
	.1243	2.55e1	3.1697e0
	.1066	2.36e1	2.5158e0
	.0899	1.77e1	1.5912e0
	.0739	1.74e1	1.2859e0
	.0585	1.53e1	8.951e-1
	.0435	9.6e0	4.176e-1
	.0289	6.2e0	1.792e-1
	.0144	3.2e0	4.608e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.1168e2
Summation**2:			1.2471e4

Wcalc = .8708697 Wtable = .929 Wcalc - Wtable = -.058130

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Vanadium (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	2.456736	1.036742
.2921	2.236627	.6533188
.2475	1.687654	.4176943
.2145	1.266150	.2715892
.1874	1.250097	.2342683
.1641	1.020022	.1673856
.1433	.9577068	.1372394
.1243	.8664189	.1076959
.1066	.7987667	.0851485
.0899	.5862840	.0527069
.0739	.5748060	.0424782
.0585	.5170012	.0302446
.0435	.3152897	.0137151
.0289	.2039831	.0058951
.0144	.1036526	.0014926
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		3.236512
Summation**2:		10.47501

Wcalc = .9713404 Wtable = .929 Wcalc - Wtable = .0423404

Arithmetic Average: 35 Geometric Mean: 29.49304

UPPER 95% CONFIDENCE LIMIT ON THE ARITHMETIC MEAN

Enter Chemical: Zinc (mg/kg); Site 6 - DRMO; NSB-NLON
Enter Matrix: All Soil

Enter number of samples: 31
Degrees of Freedom: 30

Enter sample results (use 1/2 CRDL for non-detects)

No.	Conc.	log(Conc.)	(Xi-Xbar)**2	(Xi-Xbar)**2
1	25.6	3.242592	1134211.	5.137125
2	34.2	3.532226	1115967.	3.908091
3	51.7	3.945458	1079300.	2.445024
4	58.5	4.069027	1065217.	2.073854
5	59.1	4.079231	1063979.	2.044568
6	61.3	4.115780	1059445.	1.941383
7	73.1	4.291828	1035293.	1.481787
8	79.4	4.374498	1022512.	1.287355
9	83.3	4.422449	1014640.	1.180844
10	87.1	4.467057	1006999.	1.085885
11	88.1	4.478473	1004993.	1.062224
12	101	4.615121	979295.4	.7992260
13	117	4.762174	947884.4	.5579209
14	123	4.812184	936237.3	.4857123
15	133	4.890349	916985.4	.3828711
16	136	4.912655	911248.8	.3557646
17	138	4.927254	907434.5	.3385625
18	248	5.513429	709963.9	.0000186
19	283	5.645447	652207.3	.0185864
20	413	6.023448	459133.0	.2645381
21	415	6.028279	456426.6	.2695308
22	482	6.177944	370386.1	.4473324
23	573	6.350886	267903.1	.7085780
24	676	6.516193	171887.8	1.014206
25	839	6.732211	63299.31	1.495963
26	1210	7.098376	14257.90	2.525750
27	1640	7.402452	301847.4	3.584723
28	1730	7.455877	408840.6	3.789881
29	2750	7.919356	2753630.	5.809263
30	3700	8.216088	6809002.	7.327704
31	17400	9.764225	2.6600e8	18.10597
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
Mean:	1090.594	5.509115	3144.504	1.548443
		246.9325		

Upper 95% confidence limit on arithmetic mean: 2049.008
Upper 95% confidence limit on geometric mean: 1993.323

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE ONE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Zinc (mg/kg); All Soil	Operator:	kms

Enter Number of Occurrences (n): 31 (n must be >= 3)

Enter Variates (X):

Sample	X	X**2	LN[X]	LN[X]**2
1	25.6	6.5536e2	3.242592	10.51441
2	34.2	1.1696e3	3.532226	12.47662
3	51.7	2.6729e3	3.945458	15.56664
4	58.5	3.4223e3	4.069027	16.55698
5	59.1	3.4928e3	4.079231	16.64012
6	61.3	3.7577e3	4.115780	16.93964
7	73.1	5.3436e3	4.291828	18.41979
8	79.4	6.3044e3	4.374498	19.13624
9	83.3	6.9389e3	4.422449	19.55805
10	87.1	7.5864e3	4.467057	19.95460
11	88.1	7.7616e3	4.478473	20.05672
12	101	1.0201e4	4.615121	21.29934
13	117	1.3689e4	4.762174	22.67830
14	123	1.5129e4	4.812184	23.15712
15	133	1.7689e4	4.890349	23.91551
16	136	1.8496e4	4.912655	24.13418
17	138	1.9044e4	4.927254	24.27783
18	248	6.1504e4	5.513429	30.39790
19	283	8.0089e4	5.645447	31.87107
20	413	1.7057e5	6.023448	36.28192
21	415	1.7223e5	6.028279	36.34014
22	482	2.3232e5	6.177944	38.16699
23	573	3.2833e5	6.350886	40.33375
24	676	4.5698e5	6.516193	42.46077
25	839	7.0392e5	6.732211	45.32266
26	1210	1.4641e6	7.098376	50.38694
27	1640	2.6896e6	7.402452	54.79629
28	1730	2.9929e6	7.455877	55.59010
29	2750	7.5625e6	7.919356	62.71620
30	3700	1.369e7	8.216088	67.50410
31	17400	3.0276e8	9.764225	95.34010
32		0	0	0
33		0	0	0
34		0	0	0
35		0	0	0
36		0	0	0
37		0	0	0
38		0	0	0
39		0	0	0
40		0	0	0
41		0	0	0
42		0	0	0
43		0	0	0
44		0	0	0
45		0	0	0
46		0	0	0
47		0	0	0
48		0	0	0
49		0	0	0
50		0	0	0
Summation:	33808.4	3.3351e8	170.7826	1012.791

Calculate d: d = Sum(Xi**2) - (1/n)*(Sum(Xi)**2)

d = 2.9664e8 (normal distribution)

d = 71.93024 (log-normal distribution)

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE TWO OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Zinc (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Normal Distribution:	Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
	.422	1.7374e4	7.3320e3
	.2921	3.6658e3	1.0708e3
	.2475	2.6983e3	6.6783e2
	.2145	1.6715e3	3.5854e2
	.1874	1.5809e3	2.9626e2
	.1641	1.1487e3	1.8850e2
	.1433	7.659e2	1.0975e2
	.1243	5.966e2	7.4157e1
	.1066	4.897e2	5.2202e1
	.0899	3.949e2	3.5502e1
	.0739	3.269e2	2.4158e1
	.0585	3.12e2	1.8252e1
	.0435	1.66e2	7.221e0
	.0289	1.25e2	3.6125e0
	.0144	5e0	7.2e-2
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Summation:			1.0239e4
Summation**2:			1.0483e8

Wcalc = .3534073 Wtable = .929 Wcalc - Wtable = -.575593

SHAPIRO AND WILK W TEST FOR GOODNESS OF FIT - PAGE THREE OF THREE

Site:	Site 6 - DRMO	Date:	01/12/95
Location:	NSB-NLON, Groton, Connecticut	Filename:	-
Chemical:	Zinc (mg/kg); All Soil	Operator:	kms

Calculate W: W = (1/d)*(Sum(Ai*(X[n-i+1] - X[i])))**2

Log-normal Distribution:

Ai	X[n-i+1] - X[i]	Ai*(X[n-i+1] - X[i])
.422	6.521633	2.752129
.2921	4.683862	1.368156
.2475	3.973898	.9835399
.2145	3.386850	.7264793
.1874	3.323221	.6227715
.1641	2.982596	.4894440
.1433	2.440382	.3497068
.1243	2.141695	.2662127
.1066	1.928437	.2055714
.0899	1.710887	.1538088
.0739	1.549806	.1145307
.0585	1.408327	.0823871
.0435	.8832730	.0384224
.0289	.7012444	.0202660
.0144	.0369046	.0005314
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
Summation:		8.114737
Summation**2:		65.84896

Wcalc = .9154560 Wtable = .929 Wcalc - Wtable = -.013544

Arithmetic Average: 1090.594 Geometric Mean: 246.9325

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE

C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	480	IR	0
EF	1	EF	360
FI	1	FI	1
ED	25	ED	6
BW	70	BW	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.88E-08 (AVG ANNUAL DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

ADULT/YOUTH (CANCER RISK):
CF: 6.71E-09

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES.

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	3	1	0.00E+00	5.64E-08	2.01E-08		2.00E-01
Trichloroethene	1.7	1	0.00E+00	3.19E-08	1.14E-08	6.00E-03	1.10E-02
Vinyl chloride	0.12	1	0.00E+00	2.25E-09	8.05E-10		1.90E+00
Bis(2-ethylhexyl)phthalate	1.1	1	0.00E+00	2.07E-08	7.38E-09	2.00E-02	1.40E-02
Benzo(a)anthracene	1	1	0.00E+00	1.88E-08	6.71E-09		7.30E-01
Benzo(b)fluoranthene	1	1	0.00E+00	1.88E-08	6.71E-09		7.30E-01
Benzo(k)fluoranthene	0.96	1	0.00E+00	1.80E-08	6.44E-09		7.30E-02
Benzo(a)pyrene	1	1	0.00E+00	1.88E-08	6.71E-09		7.30E+00
Dibenz(a,h)anthracene	0.22	1	0.00E+00	4.13E-09	1.48E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.78	1	0.00E+00	1.47E-08	5.23E-09		7.30E-01
4,4'-DDD	1.4	0.3	0.00E+00	7.89E-09	2.82E-09		2.40E-01
4,4'-DDE	0.77	0.3	0.00E+00	4.34E-09	1.55E-09		3.40E-01
4,4'-DDT	2.9	0.3	0.00E+00	1.63E-08	5.84E-09	5.00E-04	3.40E-01
Aroclor-1260	12	0.3	0.00E+00	6.76E-08	2.42E-08	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	3.61E-07	1.29E-07	4.00E-04	
Arsenic	3.3	1	0.00E+00	6.20E-08	2.21E-08	3.00E-04	1.75E+00
Beryllium	1.2	1	0.00E+00	2.25E-08	8.05E-09	5.00E-03	4.30E+00
Boron	299	1	0.00E+00	5.62E-06	2.01E-06	9.00E-02	
Cadmium	7	1	0.00E+00	1.32E-07	4.70E-08	5.00E-04	
Copper	1850	1	0.00E+00	3.48E-05	1.24E-05	3.71E-02	
Manganese	342	1	0.00E+00	6.43E-06	2.29E-06	5.00E-03	
Nickel	98.8	1	0.00E+00	1.86E-06	6.63E-07	2.00E-02	
Vanadium	44	1	0.00E+00	8.27E-07	2.95E-07	7.00E-03	
Zinc	2050	1	0.00E+00	3.85E-05	1.38E-05	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2 – Tetrachloroethane	0.00E+00	0.00E+00	4.03E−09
Trichloroethene	0.00E+00	5.32E−06	1.25E−10
Vinyl chloride	0.00E+00	0.00E+00	1.53E−09
Bis(2 – ethylhexyl)phthalate	0.00E+00	1.03E−06	1.03E−10
Benzo(a)anthracene	0.00E+00	0.00E+00	4.90E−09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	4.90E−09
Benzo(k)fluoranthene	0.00E+00	0.00E+00	4.70E−10
Benzo(a)pyrene	0.00E+00	0.00E+00	4.90E−08
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	1.08E−08
Indeno(1,2,3 – cd)pyrene	0.00E+00	0.00E+00	3.82E−09
4,4' – DDD	0.00E+00	0.00E+00	6.76E−10
4,4' – DDE	0.00E+00	0.00E+00	5.27E−10
4,4' – DDT	0.00E+00	3.27E−05	1.98E−09
Aroclor – 1260	0.00E+00	3.38E−03	1.86E−07
Antimony	0.00E+00	9.02E−04	0.00E+00
Arsenic	0.00E+00	2.07E−04	3.87E−08
Beryllium	0.00E+00	4.51E−06	3.46E−08
Boron	0.00E+00	6.24E−05	0.00E+00
Cadmium	0.00E+00	2.63E−04	0.00E+00
Copper	0.00E+00	9.37E−04	0.00E+00
Manganese	0.00E+00	1.29E−03	0.00E+00
Nickel	0.00E+00	9.28E−05	0.00E+00
Vanadium	0.00E+00	1.18E−04	0.00E+00
Zinc	0.00E+00	1.28E−04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**7.42E−03**	**3.42E−07**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR	480	IR:	0
EF:	3.5	EF:	350
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	6.58E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.35E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRM
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	3	1	0.00E+00	1.97E-07	7.05E-08		2.00E-01
Trichloroethene	1.7	1	0.00E+00	1.12E-07	3.99E-08	6.00E-03	1.10E-02
Vinyl chloride	0.12	1	0.00E+00	7.89E-09	2.82E-09		1.90E+00
Bis(2-ethylhexyl)phthalate	1.1	1	0.00E+00	7.23E-08	2.58E-08	2.00E-02	1.40E-02
Benzo(a)anthracene	1	1	0.00E+00	6.58E-08	2.35E-08		7.30E-01
Benzo(b)fluoranthene	1	1	0.00E+00	6.58E-08	2.35E-08		7.30E-01
Benzo(k)fluoranthene	0.96	1	0.00E+00	6.31E-08	2.25E-08		7.30E-02
Benzo(a)pyrene	1	1	0.00E+00	6.58E-08	2.35E-08		7.30E+00
Dibenz(a,h)anthracene	0.22	1	0.00E+00	1.45E-08	5.17E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.78	1	0.00E+00	5.13E-08	1.83E-08		7.30E-01
4,4-DDD	1.4	0.3	0.00E+00	2.76E-08	9.86E-09		2.40E-01
4,4-DDE	0.77	0.3	0.00E+00	1.52E-08	5.42E-09		3.40E-01
4,4-DDT	2.9	0.3	0.00E+00	5.72E-08	2.04E-08	5.00E-04	3.40E-01
Aroclor-1260	12	0.3	0.00E+00	2.37E-07	8.45E-08	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	1.26E-06	4.51E-07	4.00E-04	
Arsenic	3.3	1	0.00E+00	2.17E-07	7.75E-08	3.00E-04	1.75E+00
Beryllium	1.2	1	0.00E+00	7.89E-08	2.82E-08	5.00E-03	4.30E+00
Boron	299	1	0.00E+00	1.97E-05	7.02E-06	9.00E-02	
Cadmium	7	1	0.00E+00	4.60E-07	1.64E-07	5.00E-04	
Copper	1850	1	0.00E+00	1.22E-04	4.34E-05	3.71E-02	
Manganese	342	1	0.00E+00	2.25E-05	8.03E-06	5.00E-03	
Nickel	98.8	1	0.00E+00	6.50E-06	2.32E-06	2.00E-02	
Vanadium	44	1	0.00E+00	2.89E-06	1.03E-06	7.00E-03	
Zinc	2050	1	0.00E+00	1.35E-04	4.81E-05	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	1.41E-08
Trichloroethene	0.00E+00	1.86E-05	4.39E-10
Vinyl chloride	0.00E+00	0.00E+00	5.35E-09
Bis(2-ethylhexyl)phthalate	0.00E+00	3.62E-06	3.62E-10
Benzo(a)anthracene	0.00E+00	0.00E+00	1.71E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.71E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	1.65E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	1.71E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	3.77E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.34E-08
4,4-DDD	0.00E+00	0.00E+00	2.37E-09
4,4-DDE	0.00E+00	0.00E+00	1.84E-09
4,4-DDT	0.00E+00	1.14E-04	6.95E-09
Aroclor-1260	0.00E+00	1.18E-02	6.51E-07
Antimony	0.00E+00	3.16E-03	0.00E+00
Arsenic	0.00E+00	7.23E-04	1.36E-07
Beryllium	0.00E+00	1.58E-05	1.21E-07
Boron	0.00E+00	2.18E-04	0.00E+00
Cadmium	0.00E+00	9.21E-04	0.00E+00
Copper	0.00E+00	3.28E-03	0.00E+00
Manganese	0.00E+00	4.50E-03	0.00E+00
Nickel	0.00E+00	3.25E-04	0.00E+00
Vanadium	0.00E+00	4.13E-04	0.00E+00
Zinc	0.00E+00	4.49E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.60E-02	1.20E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	50	IR	0
EF:	150	EF	350
FI:	1	FI:	1
ED:	6	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.94E-07	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.52E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	1	0.00E+00	2.29E-07	1.96E-08		7.30E-01
Benzo(b)fluoranthene	0.71	1	0.00E+00	2.08E-07	1.79E-08		7.30E-01
Benzo(k)fluoranthene	0.87	1	0.00E+00	2.55E-07	2.19E-08		7.30E-02
Benzo(a)pyrene	0.88	1	0.00E+00	2.58E-07	2.21E-08		7.30E+00
Indeno(1,2,3-cd)pyrene	0.76	1	0.00E+00	2.23E-07	1.91E-08		7.30E-01
Aroclor-1260	11	0.3	0.00E+00	9.69E-07	8.30E-08	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	5.64E-06	4.83E-07	4.00E-04	
Arsenic	2.6	1	0.00E+00	7.63E-07	6.54E-08	3.00E-04	1.75E+00
Beryllium	1.1	1	0.00E+00	3.23E-07	2.77E-08	5.00E-03	4.30E+00
Cadmium	5.9	1	0.00E+00	1.73E-06	1.48E-07	5.00E-04	
Copper	697	1	0.00E+00	2.05E-04	1.75E-05	3.71E-02	
Manganese	268	1	0.00E+00	7.87E-05	6.74E-06	5.00E-03	
Vanadium	48.4	1	0.00E+00	1.42E-05	1.22E-06	7.00E-03	
Zinc	1510	1	0.00E+00	4.43E-04	3.80E-05	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.43E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.30E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	1.60E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	1.62E-07
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.40E-08
Aroclor-1260	0.00E+00	4.84E-02	6.39E-07
Antimony	0.00E+00	1.41E-02	0.00E+00
Arsenic	0.00E+00	2.54E-03	1.14E-07
Beryllium	0.00E+00	6.46E-05	1.19E-07
Cadmium	0.00E+00	3.46E-03	0.00E+00
Copper	0.00E+00	5.51E-03	0.00E+00
Manganese	0.00E+00	1.57E-02	0.00E+00
Vanadium	0.00E+00	2.03E-03	0.00E+00
Zinc	0.00E+00	1.48E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	9.34E-02	1.08E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME

RELEVANT EQUATION HEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE

C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	100	IR	0
EF	250	EF	360
Fi	1	Fi	1
ED	25	ED	6
BW	70	BW	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 9.78E-07 (AVG ANNUAL DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

ADULT/YOUTH (CANCER RISK):
CF: 3.49E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
CALCULATE DOSES

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.76	1	0.00E+00	7.63E-07	2.73E-07		7.30E-01
Benzo(b)fluoranthene	0.71	1	0.00E+00	6.95E-07	2.48E-07		7.30E-01
Benzo(k)fluoranthene	0.87	1	0.00E+00	8.51E-07	3.04E-07		7.30E-02
Benzo(a)pyrene	0.88	1	0.00E+00	8.61E-07	3.08E-07		7.30E+00
Indeno(1,2,3-cd)pyrene	0.76	1	0.00E+00	7.44E-07	2.66E-07		7.30E-01
Aroclor-1260	11	0.3	0.00E+00	3.23E-06	1.15E-06	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	1.88E-05	6.71E-06	4.00E-04	
Arsenic	2.6	1	0.00E+00	2.54E-06	9.09E-07	3.00E-04	1.75E+00
Beryllium	1.1	1	0.00E+00	1.08E-06	3.84E-07	5.00E-03	4.30E+00
Cadmium	5.9	1	0.00E+00	5.77E-06	2.06E-06	5.00E-04	
Copper	697	1	0.00E+00	6.82E-04	2.44E-04	3.71E-02	
Manganese	268	1	0.00E+00	2.62E-04	9.37E-05	5.00E-03	
Vanadium	48.4	1	0.00E+00	4.74E-05	1.69E-05	7.00E-03	
Zinc	1510	1	0.00E+00	1.48E-03	5.28E-04	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.99E-07
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.81E-07
Benzo(k)fluoranthene	0.00E+00	0.00E+00	2.22E-08
Benzo(a)pyrene	0.00E+00	0.00E+00	2.24E-06
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.94E-07
Aroclor-1260	0.00E+00	1.61E-01	8.88E-06
Antimony	0.00E+00	4.70E-02	0.00E+00
Arsenic	0.00E+00	8.48E-03	1.59E-06
Beryllium	0.00E+00	2.15E-04	1.65E-06
Cadmium	0.00E+00	1.15E-02	0.00E+00
Copper	0.00E+00	1.84E-02	0.00E+00
Manganese	0.00E+00	5.24E-02	0.00E+00
Vanadium	0.00E+00	6.77E-03	0.00E+00
Zinc	0.00E+00	4.92E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**3.11E-01**	**1.50E-05**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

ADULT:		YOUTH:	
IR	480	IR	0
EF:	80	EF:	350
FI:	1	FI:	1
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	1.50E-06	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.15E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	3	1	0.00E+00	4.51E-06	6.44E-08		2.00E-01
Trichloroethene	1.7	1	0.00E+00	2.55E-06	3.65E-08	6.00E-03	1.10E-02
Vinyl chloride	0.12	1	0.00E+00	1.80E-07	2.58E-09		1.90E+00
Bis(2-ethylhexyl)phthalate	1.1	1	0.00E+00	1.65E-06	2.36E-08	2.00E-02	1.40E-02
Benzo(a)anthracene	1	1	0.00E+00	1.50E-06	2.15E-08		7.30E-01
Benzo(b)fluoranthene	1	1	0.00E+00	1.50E-06	2.15E-08		7.30E-01
Benzo(k)fluoranthene	0.96	1	0.00E+00	1.44E-06	2.06E-08		7.30E-02
Benzo(a)pyrene	1	1	0.00E+00	1.50E-06	2.15E-08		7.30E+00
Dibenz(a,h)anthracene	0.22	1	0.00E+00	3.31E-07	4.72E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.78	1	0.00E+00	1.17E-06	1.67E-08		7.30E-01
4,4-DDD	1.4	0.3	0.00E+00	6.31E-07	9.02E-09		2.40E-01
4,4-DDE	0.77	0.3	0.00E+00	3.47E-07	4.96E-09		3.40E-01
4,4-DDT	2.9	0.3	0.00E+00	1.31E-06	1.87E-08	5.00E-04	3.40E-01
Aroclor-1260	12	0.3	0.00E+00	5.41E-06	7.73E-08	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	2.89E-05	4.12E-07	4.00E-04	
Arsenic	3.3	1	0.00E+00	4.96E-06	7.09E-08	3.00E-04	1.75E+00
Beryllium	1.2	1	0.00E+00	1.80E-06	2.58E-08	5.00E-03	4.30E+00
Boron	299	1	0.00E+00	4.49E-04	6.42E-06	9.00E-02	
Cadmium	7	1	0.00E+00	1.05E-05	1.50E-07	5.00E-04	
Copper	1850	1	0.00E+00	2.78E-03	3.97E-05	3.71E-02	
Manganese	342	1	0.00E+00	5.14E-04	7.34E-06	5.00E-03	
Nickel	98.6	1	0.00E+00	1.48E-04	2.12E-06	2.00E-02	
Vanadium	44	1	0.00E+00	6.61E-05	9.45E-07	7.00E-03	
Zinc	2050	1	0.00E+00	3.08E-03	4.40E-05	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	1.29E-08
Trichloroethene	0.00E+00	4.26E-04	4.01E-10
Vinyl chloride	0.00E+00	0.00E+00	4.90E-09
Bis(2-ethylhexyl)phthalate	0.00E+00	8.27E-05	3.31E-10
Benzo(a)anthracene	0.00E+00	0.00E+00	1.57E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.57E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	1.50E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	1.57E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	3.45E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.22E-08
4,4-DDD	0.00E+00	0.00E+00	2.16E-09
4,4-DDE	0.00E+00	0.00E+00	1.69E-09
4,4-DDT	0.00E+00	2.62E-03	6.35E-09
Aroclor-1260	0.00E+00	2.71E-01	5.95E-07
Antimony	0.00E+00	7.21E-02	0.00E+00
Arsenic	0.00E+00	1.65E-02	1.24E-07
Beryllium	0.00E+00	3.61E-04	1.11E-07
Boron	0.00E+00	4.99E-03	0.00E+00
Cadmium	0.00E+00	2.10E-02	0.00E+00
Copper	0.00E+00	7.49E-02	0.00E+00
Manganese	0.00E+00	1.03E-01	0.00E+00
Nickel	0.00E+00	7.42E-03	0.00E+00
Vanadium	0.00E+00	9.45E-03	0.00E+00
Zinc	0.00E+00	1.03E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	5.94E-01	1.09E-06

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	480	IR	0
EF	120	EF	350
FI:	1	FI.	1
ED:	1	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.25E-06	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.22E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	3	1	0.00E+00	6.76E-06	9.66E-08		2.00E-01
Trichloroethene	1.7	1	0.00E+00	3.83E-06	5.47E-08	6.00E-03	1.10E-02
Vinyl chloride	0.12	1	0.00E+00	2.71E-07	3.86E-09		1.90E+00
Bis(2-ethylhexyl)phthalate	1.1	1	0.00E+00	2.48E-06	3.54E-08	2.00E-02	1.40E-02
Benzo(a)anthracene	1	1	0.00E+00	2.25E-06	3.22E-08		7.30E-01
Benzo(b)fluoranthene	1	1	0.00E+00	2.25E-06	3.22E-08		7.30E-01
Benzo(k)fluoranthene	0.96	1	0.00E+00	2.16E-06	3.09E-08		7.30E-02
Benzo(a)pyrene	1	1	0.00E+00	2.25E-06	3.22E-08		7.30E+00
Dibenz(a,h)anthracene	0.22	1	0.00E+00	4.96E-07	7.09E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.78	1	0.00E+00	1.76E-06	2.51E-08		7.30E-01
4,4'-DDD	1.4	0.3	0.00E+00	9.47E-07	1.35E-08		2.40E-01
4,4'-DDE	0.77	0.3	0.00E+00	5.21E-07	7.44E-09		3.40E-01
4,4'-DDT	2.9	0.3	0.00E+00	1.96E-06	2.80E-08	5.00E-04	3.40E-01
Aroclor-1260	12	0.3	0.00E+00	8.12E-06	1.16E-07	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	4.33E-05	6.18E-07	4.00E-04	
Arsenic	3.3	1	0.00E+00	7.44E-06	1.06E-07	3.00E-04	1.75E+00
Beryllium	1.2	1	0.00E+00	2.71E-06	3.86E-08	5.00E-03	4.30E+00
Boron	299	1	0.00E+00	6.74E-04	9.63E-06	9.00E-02	
Cadmium	7	1	0.00E+00	1.58E-05	2.25E-07	5.00E-04	
Copper	1850	1	0.00E+00	4.17E-03	5.96E-05	3.71E-02	
Manganese	342	1	0.00E+00	7.71E-04	1.10E-05	5.00E-03	
Nickel	98.8	1	0.00E+00	2.23E-04	3.18E-06	2.00E-02	
Vanadium	44	1	0.00E+00	9.92E-05	1.42E-06	7.00E-03	
Zinc	2050	1	0.00E+00	4.62E-03	6.60E-05	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION F SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	1.93E-08
Trichloroethene	0.00E+00	6.39E-04	6.02E-10
Vinyl chloride	0.00E+00	0.00E+00	7.34E-09
Bis(2-ethylhexyl)phthalate	0.00E+00	1.24E-04	4.96E-10
Benzo(a)anthracene	0.00E+00	0.00E+00	2.35E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	2.35E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	2.26E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.35E-07
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	5.17E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.83E-08
4,4'-DDD	0.00E+00	0.00E+00	3.25E-09
4,4'-DDE	0.00E+00	0.00E+00	2.53E-09
4,4'-DDT	0.00E+00	3.92E-03	9.53E-09
Aroclor-1260	0.00E+00	4.06E-01	8.93E-07
Antimony	0.00E+00	1.08E-01	0.00E+00
Arsenic	0.00E+00	2.48E-02	1.86E-07
Beryllium	0.00E+00	5.41E-04	1.66E-07
Boron	0.00E+00	7.49E-03	0.00E+00
Cadmium	0.00E+00	3.16E-02	0.00E+00
Copper	0.00E+00	1.12E-01	0.00E+00
Manganese	0.00E+00	1.54E-01	0.00E+00
Nickel	0.00E+00	1.11E-02	0.00E+00
Vanadium	0.00E+00	1.42E-02	0.00E+00
Zinc	0.00E+00	1.54E-02	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	8.90E-01	1.64E-06

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

RELEVANT EQUATION: HEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	50	IR	0
EF	12	EF	350
Fi	1	Fi	1
ED	6	ED	6
BW	70	BW	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	2.35E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	2.01E-09

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION F SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: OCCASIONAL VI ITOR; CTE
CAL CULATE DOSES

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	1	0.00E+00	1.83E-08	1.57E-09		7.30E-01
Benzo(b)fluoranthene	0.71	1	0.00E+00	1.67E-08	1.43E-09		7.30E-01
Benzo(k)fluoranthene	0.87	1	0.00E+00	2.04E-08	1.75E-09		7.30E-02
Benzo(a)pyrene	0.88	1	0.00E+00	2.07E-08	1.77E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.76	1	0.00E+00	1.78E-08	1.53E-09		7.30E-01
Aroclor-1260	11	0.3	0.00E+00	7.75E-08	6.64E-09	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	4.51E-07	3.86E-08	4.00E-04	
Arsenic	2.6	1	0.00E+00	6.11E-08	5.23E-09	3.00E-04	1.75E+00
Beryllium	1.1	1	0.00E+00	2.58E-08	2.21E-09	5.00E-03	4.30E+00
Cadmium	5.9	1	0.00E+00	1.39E-07	1.19E-08	5.00E-04	
Copper	697	1	0.00E+00	1.64E-05	1.40E-06	3.71E-02	
Manganese	268	1	0.00E+00	6.29E-06	5.39E-07	5.00E-03	
Vanadium	48.4	1	0.00E+00	1.14E-06	9.74E-08	7.00E-03	
Zinc	1510	1	0.00E+00	3.55E-05	3.04E-06	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.15E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.04E-09
Benzo(k)fluoranthene	0.00E+00	0.00E+00	1.28E-10
Benzo(a)pyrene	0.00E+00	0.00E+00	1.29E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.12E-09
Aroclor-1260	0.00E+00	3.87E-03	5.11E-08
Antimony	0.00E+00	1.13E-03	0.00E+00
Arsenic	0.00E+00	2.04E-04	9.16E-09
Beryllium	0.00E+00	5.17E-06	9.52E-09
Cadmium	0.00E+00	2.77E-04	0.00E+00
Copper	0.00E+00	4.41E-04	0.00E+00
Manganese	0.00E+00	1.26E-03	0.00E+00
Vanadium	0.00E+00	1.62E-04	0.00E+00
Zinc	0.00E+00	1.18E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
T TAL	0.00E+00	7.47E-03	8.62E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	100	IR	0
EF:	24	EF	350
FI:	1	FI:	1
ED:	25	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:			YOUTH:			ADULT/YOUTH (CANCER RISK):	
CF:	9.39E-08	(AVG ANNUAL DOSE)	CF:	0.00E+00	(AVG ANNUAL DOSE)	CF:	3.35E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	1	0.00E+00	7.33E-08	2.62E-08		7.30E-01
Benzo(b)fluoranthene	0.71	1	0.00E+00	6.67E-08	2.38E-08		7.30E-01
Benzo(k)fluoranthene	0.87	1	0.00E+00	8.17E-08	2.92E-08		7.30E-02
Benzo(a)pyrene	0.88	1	0.00E+00	8.27E-08	2.95E-08		7.30E+00
Indeno(1,2,3-cd)pyrene	0.76	1	0.00E+00	7.14E-08	2.55E-08		7.30E-01
Aroclor-1260	11	0.3	0.00E+00	3.10E-07	1.11E-07	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	1.80E-06	6.44E-07	4.00E-04	
Arsenic	2.6	1	0.00E+00	2.44E-07	8.72E-08	3.00E-04	1.75E+00
Beryllium	1.1	1	0.00E+00	1.03E-07	3.69E-08	5.00E-03	4.30E+00
Cadmium	5.9	1	0.00E+00	5.54E-07	1.98E-07	5.00E-04	
Copper	697	1	0.00E+00	6.55E-05	2.34E-05	3.71E-02	
Manganese	268	1	0.00E+00	2.52E-05	8.99E-06	5.00E-03	
Vanadium	48.4	1	0.00E+00	4.55E-06	1.62E-06	7.00E-03	
Zinc	1510	1	0.00E+00	1.42E-04	5.07E-05	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	1.91E−08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	1.74E−08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	2.13E−09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.16E−07
Indeno(1,2,3−cd)pyrene	0.00E+00	0.00E+00	1.86E−08
Aroclor−1260	0.00E+00	1.55E−02	8.52E−07
Antimony	0.00E+00	4.51E−03	0.00E+00
Arsenic	0.00E+00	8.14E−04	1.53E−07
Beryllium	0.00E+00	2.07E−05	1.59E−07
Cadmium	0.00E+00	1.11E−03	0.00E+00
Copper	0.00E+00	1.76E−03	0.00E+00
Manganese	0.00E+00	5.03E−03	0.00E+00
Vanadium	0.00E+00	6.49E−04	0.00E+00
Zinc	0.00E+00	4.73E−04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**2.99E−02**	**1.44E−06**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE

RELEVANT EQUATION IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	50	IR	0
EF	26	EF	350
FI:	1	FI:	1
ED:	9	ED:	6
BW:	70	BW:	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	3285	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 5.09E-08 (AVG ANNUAL DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

ADULT/YOUTH (CANCER RISK):
CF: 6.54E-09

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	1	0.00E+00	3.97E-08	5.10E-09		7.30E-01
Benzo(b)fluoranthene	0.71	1	0.00E+00	3.61E-08	4.64E-09		7.30E-01
Benzo(k)fluoranthene	0.87	1	0.00E+00	4.43E-08	5.69E-09		7.30E-02
Benzo(a)pyrene	0.88	1	0.00E+00	4.48E-08	5.76E-09		7.30E+00
Indeno(1,2,3-cd)pyrene	0.76	1	0.00E+00	3.87E-08	4.97E-09		7.30E-01
Aroclor-1260	11	0.3	0.00E+00	1.68E-07	2.16E-08	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	9.77E-07	1.26E-07	4.00E-04	
Arsenic	2.6	1	0.00E+00	1.32E-07	1.70E-08	3.00E-04	1.75E+00
Beryllium	1.1	1	0.00E+00	5.60E-08	7.20E-09	5.00E-03	4.30E+00
Cadmium	5.9	1	0.00E+00	3.00E-07	3.86E-08	5.00E-04	
Copper	697	1	0.00E+00	3.55E-05	4.56E-06	3.71E-02	
Manganese	268	1	0.00E+00	1.36E-05	1.75E-06	5.00E-03	
Vanadium	48.4	1	0.00E+00	2.46E-06	3.17E-07	7.00E-03	
Zinc	1510	1	0.00E+00	7.68E-05	9.88E-06	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	3.72E-09
Benzo(b)fluoranthene	0.00E+00	0.00E+00	3.39E-09
Benzo(k)fluoranthene	0.00E+00	0.00E+00	4.15E-10
Benzo(a)pyrene	0.00E+00	0.00E+00	4.20E-08
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	3.63E-09
Aroclor-1260	0.00E+00	8.40E-03	1.66E-07
Antimony	0.00E+00	2.44E-03	0.00E+00
Arsenic	0.00E+00	4.41E-04	2.98E-08
Beryllium	0.00E+00	1.12E-05	3.09E-08
Cadmium	0.00E+00	6.00E-04	0.00E+00
Copper	0.00E+00	9.56E-04	0.00E+00
Manganese	0.00E+00	2.73E-03	0.00E+00
Vanadium	0.00E+00	3.52E-04	0.00E+00
Zinc	0.00E+00	2.56E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.62E-02	2.80E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME

RELEVANT EQUATION HEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	100	IR	0
EF	26	EF	350
Fi	1	Fi	1
ED	30	ED	6
BW	70	BW	15
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	10950	AT(NON):	2190

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.02E-07 (AVG ANNUAL DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

ADULT/YOUTH (CANCER RISK):
CF: 4.36E-08

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
CALCULATE DOSES:

CHEMICAL	C(MG/KG)	BIOAVAILABILITY	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	1	0.00E+00	7.94E-08	3.40E-08		7.30E-01
Benzo(b)fluoranthene	0.71	1	0.00E+00	7.23E-08	3.10E-08		7.30E-01
Benzo(k)fluoranthene	0.87	1	0.00E+00	8.85E-08	3.79E-08		7.30E-02
Benzo(a)pyrene	0.88	1	0.00E+00	8.95E-08	3.84E-08		7.30E+00
Indeno(1,2,3-cd)pyrene	0.76	1	0.00E+00	7.73E-08	3.31E-08		7.30E-01
Aroclor-1260	11	0.3	0.00E+00	3.36E-07	1.44E-07	2.00E-05	7.70E+00
Antimony	19.2	1	0.00E+00	1.95E-06	8.37E-07	4.00E-04	
Arsenic	2.6	1	0.00E+00	2.65E-07	1.13E-07	3.00E-04	1.75E+00
Beryllium	1.1	1	0.00E+00	1.12E-07	4.80E-08	5.00E-03	4.30E+00
Cadmium	5.9	1	0.00E+00	6.00E-07	2.57E-07	5.00E-04	
Copper	697	1	0.00E+00	7.09E-05	3.04E-05	3.71E-02	
Manganese	268	1	0.00E+00	2.73E-05	1.17E-05	5.00E-03	
Vanadium	48.4	1	0.00E+00	4.93E-06	2.11E-06	7.00E-03	
Zinc	1510	1	0.00E+00	1.54E-04	6.59E-05	3.00E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	2.48E-08
Benzo(b)fluoranthene	0.00E+00	0.00E+00	2.26E-08
Benzo(k)fluoranthene	0.00E+00	0.00E+00	2.77E-09
Benzo(a)pyrene	0.00E+00	0.00E+00	2.80E-07
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	2.42E-08
Aroclor-1260	0.00E+00	1.68E-02	1.11E-06
Antimony	0.00E+00	4.88E-03	0.00E+00
Arsenic	0.00E+00	6.82E-04	1.98E-07
Beryllium	0.00E+00	2.24E-05	2.06E-07
Cadmium	0.00E+00	1.20E-03	0.00E+00
Copper	0.00E+00	1.91E-03	0.00E+00
Manganese	0.00E+00	5.45E-03	0.00E+00
Vanadium	0.00E+00	7.04E-04	0.00E+00
Zinc	0.00E+00	5.12E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.24E-02	1.87E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: UTILITY WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		1
ED1	= YOUTH EXPOSURE DURATION (YEARS):		1
ED2	= ADULT EXPOSURE DURATION (YEARS):		25
BW1	= BODY WEIGHT ADOLESCENT (KG):		1
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.97E-08

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	3	0.5	0.00E+00	4.46E-08	1.59E-08		2.00E-01
Trichloroethene	1.7	0.5	0.00E+00	2.53E-08	9.03E-09	6.00E-03	1.10E-02
Vinyl chloride	0.12	0.5	0.00E+00	1.78E-09	6.37E-10		1.90E+00
Bis(2-ethylhexyl)phthalate	1.1	0.05	0.00E+00	1.64E-09	5.84E-10	1.10E-02	2.50E-02
Benzo(a)anthracene	1	0.05	0.00E+00	1.49E-09	5.31E-10		
Benzo(b)fluoranthene	1	0.05	0.00E+00	1.49E-09	5.31E-10		
Benzo(k)fluoranthene	0.96	0.05	0.00E+00	1.43E-09	5.10E-10		
Benzo(a)pyrene	1	0.05	0.00E+00	1.49E-09	5.31E-10		
Dibenz(a,h)anthracene	0.22	0.05	0.00E+00	3.27E-10	1.17E-10		
Indeno(1,2,3-cd)pyrene	0.78	0.05	0.00E+00	1.16E-09	4.14E-10		
4,4'-DDD	1.4	0.05	0.00E+00	2.08E-09	7.44E-10		3.00E-01
4,4'-DDE	0.77	0.05	0.00E+00	1.15E-09	4.09E-10		4.20E-01
4,4'-DDT	2.9	0.05	0.00E+00	4.31E-09	1.54E-09	4.00E-04	4.20E-01
Aroclor-1260	12	0.05	0.00E+00	1.78E-08	6.37E-09	2.00E-05	7.70E+00
Antimony	19.2	0.01	0.00E+00	5.71E-09	2.04E-09	4.00E-04	
Arsenic	3.3	0.01	0.00E+00	9.82E-10	3.51E-10	2.80E-04	1.80E+00
Beryllium	1.2	0.01	0.00E+00	3.57E-10	1.27E-10	2.50E-04	8.60E+01
Boron	299	0.01	0.00E+00	8.89E-08	3.18E-08	4.50E-03	
Cadmium	7	0.01	0.00E+00	2.08E-09	7.44E-10	1.50E-05	
Copper	1850	0.01	0.00E+00	5.50E-07	1.97E-07	2.20E-02	
Manganese	342	0.01	0.00E+00	1.02E-07	3.63E-08	1.50E-04	
Nickel	98.8	0.01	0.00E+00	2.94E-08	1.05E-08	2.00E-03	
Vanadium	44	0.01	0.00E+00	1.31E-08	4.67E-09	3.50E-04	
Zinc	2060	0.01	0.00E+00	6.10E-07	2.18E-07	1.50E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	3.19E-09
Trichloroethene	0.00E+00	4.21E-06	9.93E-11
Vinyl chloride	0.00E+00	0.00E+00	1.21E-09
Bis(2-ethylhexyl)phthalate	0.00E+00	1.49E-07	1.46E-11
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	2.23E-10
4,4'-DDE	0.00E+00	0.00E+00	1.72E-10
4,4'-DDT	0.00E+00	1.08E-06	6.47E-10
Aroclor-1260	0.00E+00	8.92E-04	4.91E-08
Antimony	0.00E+00	1.43E-06	0.00E+00
Arsenic	0.00E+00	3.91E-06	6.31E-10
Beryllium	0.00E+00	1.43E-06	1.10E-08
Boron	0.00E+00	1.88E-06	0.00E+00
Cadmium	0.00E+00	1.39E-04	0.00E+00
Copper	0.00E+00	2.50E-06	0.00E+00
Manganese	0.00E+00	8.78E-04	0.00E+00
Nickel	0.00E+00	1.47E-06	0.00E+00
Vanadium	0.00E+00	3.74E-06	0.00E+00
Zinc	0.00E+00	4.07E-06	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.84E-03	6.62E-08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: UTILITY WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		1
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR)		1
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		3.5
ED1	= YOUTH EXPOSURE DURATION (YEARS)		1
ED2	= ADULT EXPOSURE DURATION (YEARS)		25
BW1	= BODY WEIGHT ADOLESCENT (KG):		1
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.86E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 5.21E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
1,1,2,2-Tetrachloroethane	3	0.5	0.00E+00	7.81E-07	2.79E-07		2.00E-01
Trichloroethene	1.7	0.5	0.00E+00	4.42E-07	1.58E-07	6.00E-03	1.10E-02
Vinyl chloride	0.12	0.5	0.00E+00	3.12E-08	1.12E-08		1.90E+00
Bis(2-ethylhexyl)phthalate	1.1	0.05	0.00E+00	2.86E-08	1.02E-08	1.10E-02	2.50E-02
Benzo(a)anthracene	1	0.05	0.00E+00	2.60E-08	9.30E-09		
Benzo(b)fluoranthene	1	0.05	0.00E+00	2.60E-08	9.30E-09		
Benzo(k)fluoranthene	0.96	0.05	0.00E+00	2.50E-08	8.92E-09		
Benzo(a)pyrene	1	0.05	0.00E+00	2.60E-08	9.30E-09		
Dibenz(a,h)anthracene	0.22	0.05	0.00E+00	5.73E-09	2.05E-09		
Indeno(1,2,3-cd)pyrene	0.78	0.05	0.00E+00	2.03E-08	7.25E-09		
4,4'-DDD	1.4	0.05	0.00E+00	3.64E-08	1.30E-08		3.00E-01
4,4'-DDE	0.77	0.05	0.00E+00	2.00E-08	7.16E-09		4.20E-01
4,4'-DDT	2.9	0.05	0.00E+00	7.55E-08	2.70E-08	4.00E-04	4.20E-01
Aroclor-1260	12	0.05	0.00E+00	3.12E-07	1.12E-07	2.00E-05	7.70E+00
Antimony	19.2	0.01	0.00E+00	9.99E-08	3.57E-08	4.00E-04	
Arsenic	3.3	0.01	0.00E+00	1.72E-08	6.14E-09	2.80E-04	1.80E+00
Beryllium	1.2	0.01	0.00E+00	6.25E-09	2.23E-09	2.50E-04	8.60E+01
Boron	299	0.01	0.00E+00	1.56E-06	5.56E-07	4.50E-03	
Cadmium	7	0.01	0.00E+00	3.64E-08	1.30E-08	1.50E-05	
Copper	1850	0.01	0.00E+00	9.63E-06	3.44E-06	2.20E-02	
Manganese	342	0.01	0.00E+00	1.78E-06	6.36E-07	1.50E-04	
Nickel	98.8	0.01	0.00E+00	5.14E-07	1.84E-07	2.00E-03	
Vanadium	44	0.01	0.00E+00	2.29E-07	8.18E-08	3.50E-04	
Zinc	2050	0.01	0.00E+00	1.07E-05	3.81E-06	1.50E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	5.58E-08
Trichloroethene	0.00E+00	7.37E-05	1.74E-09
Vinyl chloride	0.00E+00	0.00E+00	2.12E-08
Bis(2-ethylhexyl)phthalate	0.00E+00	2.60E-06	2.56E-10
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	3.90E-09
4,4'-DDE	0.00E+00	0.00E+00	3.01E-09
4,4'-DDT	0.00E+00	1.89E-04	1.13E-08
Aroclor-1260	0.00E+00	1.56E-02	8.59E-07
Antimony	0.00E+00	2.50E-04	0.00E+00
Arsenic	0.00E+00	6.14E-05	1.10E-08
Beryllium	0.00E+00	2.50E-05	1.92E-07
Boron	0.00E+00	3.46E-04	0.00E+00
Cadmium	0.00E+00	2.43E-03	0.00E+00
Copper	0.00E+00	4.38E-04	0.00E+00
Manganese	0.00E+00	1.19E-02	0.00E+00
Nickel	0.00E+00	2.57E-04	0.00E+00
Vanadium	0.00E+00	6.54E-04	0.00E+00
Zinc	0.00E+00	7.11E-05	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.23E-02	1.16E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: FULL–TIME EMPLOYEE; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WAFRF	C = CONCENTRATION IN SOIL (MG/KG)		
	SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
	SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
	AF = ADHERENCE FACTOR (MG/SQ CM)		0.2
	ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS	0.5
		BNAS/PESTICIDES	0.05
		PCBS	0.06
		METALS	0.01
	EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR)		1
	EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR)		150
	ED1 = YOUTH EXPOSURE DURATION (YEARS)		1
	ED2 = ADULT EXPOSURE DURATION (YEARS)		6
	BW1 = BODY WEIGHT ADOLESCENT (KG)		1
	BW2 = BODY WEIGHT ADULT (KG)		70
	AT1 = AVERAGING TIME (DAYS) NONCARCINOGENS (YOUTH):		365
	AT2 = AVERAGING TIME (DAYS) NONCARCINOGENS (ADULT):		2190
	AT3 = AVERAGING TIME (DAYS) CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.82E–07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 4.46E–06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	1.74E-07	1.49E-08		
Benzo(b)fluoranthene	0.71	0.05	0.00E+00	1.58E-07	1.36E-08		
Benzo(k)fluoranthene	0.87	0.05	0.00E+00	1.94E-07	1.66E-08		
Benzo(a)pyrene	0.88	0.05	0.00E+00	1.96E-07	1.68E-08		
Indeno(1,2,3-cd)pyrene	0.76	0.05	0.00E+00	1.70E-07	1.45E-08		
Aroclor-1260	11	0.05	0.00E+00	2.45E-06	2.10E-07	2.00E-05	7.70E+00
Antimony	19.2	0.01	0.00E+00	8.57E-07	7.34E-08	4.00E-04	
Arsenic	2.6	0.01	0.00E+00	1.16E-07	9.94E-09	2.60E-04	1.80E+00
Beryllium	1.1	0.01	0.00E+00	4.91E-08	4.21E-09	2.50E-04	8.60E+01
Cadmium	5.9	0.01	0.00E+00	2.63E-07	2.26E-08	1.50E-05	
Copper	697	0.01	0.00E+00	3.11E-05	2.67E-06	2.20E-02	
Manganese	268	0.01	0.00E+00	1.20E-05	1.02E-06	1.50E-04	
Vanadium	48.4	0.01	0.00E+00	2.16E-06	1.85E-07	3.50E-04	
Zinc	1510	0.01	0.00E+00	6.74E-05	5.77E-06	1.50E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	1.23E-01	1.62E-06
Antimony	0.00E+00	2.14E-03	0.00E+00
Arsenic	0.00E+00	4.14E-04	1.79E-08
Beryllium	0.00E+00	1.96E-04	3.62E-07
Cadmium	0.00E+00	1.75E-02	0.00E+00
Copper	0.00E+00	1.41E-03	0.00E+00
Manganese	0.00E+00	7.97E-02	0.00E+00
Vanadium	0.00E+00	6.17E-03	0.00E+00
Zinc	0.00E+00	4.49E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.31E-01	2.00E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM)		1
ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		250
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		25
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.33E-05
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.72E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	1.45E-06	5.18E-07		
Benzo(b)fluoranthene	0.71	0.05	0.00E+00	1.32E-06	4.71E-07		
Benzo(k)fluoranthene	0.87	0.05	0.00E+00	1.62E-06	5.78E-07		
Benzo(a)pyrene	0.88	0.05	0.00E+00	1.64E-06	5.84E-07		
Indeno(1,2,3-cd)pyrene	0.76	0.05	0.00E+00	1.41E-06	5.05E-07		
Aroclor-1260	11	0.05	0.00E+00	2.05E-05	7.30E-06	2.00E-05	7.70E+00
Antimony	19.2	0.01	0.00E+00	7.14E-06	2.55E-06	4.00E-04	
Arsenic	2.6	0.01	0.00E+00	9.67E-07	3.45E-07	2.80E-04	1.80E+00
Beryllium	1.1	0.01	0.00E+00	4.09E-07	1.46E-07	2.50E-04	8.60E+01
Cadmium	5.9	0.01	0.00E+00	2.19E-06	7.83E-07	1.50E-05	
Copper	697	0.01	0.00E+00	2.59E-04	9.26E-05	2.20E-02	
Manganese	268	0.01	0.00E+00	9.96E-05	3.56E-05	1.50E-04	
Vanadium	48.4	0.01	0.00E+00	1.80E-05	6.43E-06	3.50E-04	
Zinc	1510	0.01	0.00E+00	5.61E-04	2.01E-04	1.50E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	1.02E+00	5.62E-05
Antimony	0.00E+00	1.78E-02	0.00E+00
Arsenic	0.00E+00	3.45E-03	6.21E-07
Beryllium	0.00E+00	1.64E-03	1.26E-06
Cadmium	0.00E+00	1.44E-01	0.00E+00
Copper	0.00E+00	1.19E-02	0.00E+00
Manganese	0.00E+00	6.04E-01	0.00E+00
Vanadium	0.00E+00	5.14E-02	0.00E+00
Zinc	0.00E+00	3.74E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.92E+00	6.94E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE	C = CONCENTRATION IN SOIL (MG/KG)		
	SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
	SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
	AF = ADHERENCE FACTOR (MG/SQ CM)		0.2
	ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
	EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR)		1
	EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR)		80
	ED1 = YOUTH EXPOSURE DURATION (YEARS)		1
	ED2 = ADULT EXPOSURE DURATION (YEARS)		1
	BW1 = BODY WEIGHT ADOLESCENT (KG)		1
	BW2 = BODY WEIGHT ADULT (KG)		70
	AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
	AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
	AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS)	CF1 =	0.00E+00	CANCER RISK = (CF3)*(C)*(ABS)	CF3 =	3.40E-08
DOSEadult = (CF2)*(C)*(ABS)	CF2 =	2.38E-06			

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
1,1,2,2-Tetrachloroethane	3	0.5	0.00E+00	3.57E-06	5.10E-08		2.00E-01
Trichloroethene	1.7	0.5	0.00E+00	2.02E-06	2.89E-08	6.00E-03	1.10E-02
Vinyl chloride	0.12	0.5	0.00E+00	1.43E-07	2.04E-09		1.90E+00
Bis(2-ethylhexyl)phthalate	1.1	0.05	0.00E+00	1.31E-07	1.87E-09	1.10E-02	2.50E-02
Benzo(a)anthracene	1	0.05	0.00E+00	1.19E-07	1.70E-09		
Benzo(b)fluoranthene	1	0.05	0.00E+00	1.19E-07	1.70E-09		
Benzo(k)fluoranthene	0.96	0.05	0.00E+00	1.14E-07	1.63E-09		
Benzo(a)pyrene	1	0.05	0.00E+00	1.19E-07	1.70E-09		
Dibenz(a,h)anthracene	0.22	0.05	0.00E+00	2.62E-08	3.74E-10		
Indeno(1,2,3-cd)pyrene	0.78	0.05	0.00E+00	9.28E-08	1.33E-09		
4,4'-DDD	1.4	0.05	0.00E+00	1.67E-07	2.38E-09		3.00E-01
4,4'-DDE	0.77	0.05	0.00E+00	9.16E-08	1.31E-09		4.20E-01
4,4'-DDT	2.9	0.05	0.00E+00	3.45E-07	4.93E-09	4.00E-04	4.20E-01
Aroclor-1260	12	0.05	0.00E+00	1.43E-06	2.04E-08	2.00E-05	7.70E+00
Antimony	19.2	0.01	0.00E+00	4.57E-07	6.53E-09	4.00E-04	
Arsenic	3.3	0.01	0.00E+00	7.85E-08	1.12E-09	2.80E-04	1.80E+00
Beryllium	1.2	0.01	0.00E+00	2.86E-08	4.08E-10	2.50E-04	8.60E+01
Boron	299	0.01	0.00E+00	7.12E-06	1.02E-07	4.50E-03	
Cadmium	7	0.01	0.00E+00	1.67E-07	2.38E-09	1.50E-05	
Copper	1850	0.01	0.00E+00	4.40E-05	6.29E-07	2.20E-02	
Manganese	342	0.01	0.00E+00	8.14E-06	1.16E-07	1.50E-04	
Nickel	98.8	0.01	0.00E+00	2.35E-06	3.36E-08	2.00E-03	
Vanadium	44	0.01	0.00E+00	1.05E-06	1.50E-08	3.50E-04	
Zinc	2050	0.01	0.00E+00	4.88E-05	6.97E-07	1.50E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	1.02E-08
Trichloroethene	0.00E+00	3.37E-04	3.18E-10
Vinyl chloride	0.00E+00	0.00E+00	3.88E-09
Bis(2-ethylhexyl)phthalate	0.00E+00	1.19E-05	4.67E-11
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	7.14E-10
4,4'-DDE	0.00E+00	0.00E+00	5.50E-10
4,4'-DDT	0.00E+00	8.63E-04	2.07E-09
Aroclor-1260	0.00E+00	7.14E-02	1.57E-07
Antimony	0.00E+00	1.14E-03	0.00E+00
Arsenic	0.00E+00	2.80E-04	2.02E-09
Beryllium	0.00E+00	1.14E-04	3.51E-08
Boron	0.00E+00	1.58E-03	0.00E+00
Cadmium	0.00E+00	1.11E-02	0.00E+00
Copper	0.00E+00	2.00E-03	0.00E+00
Manganese	0.00E+00	5.43E-02	0.00E+00
Nickel	0.00E+00	1.18E-03	0.00E+00
Vanadium	0.00E+00	2.99E-03	0.00E+00
Zinc	0.00E+00	3.25E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.48E-01	2.12E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE	C = CONCENTRATION IN SOIL (MG/KG)		
	SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
	SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY)		3600
	AF = ADHERENCE FACTOR (MG/SQ CM)		1
	ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS	0.5
		BNAS/PESTICIDES	0.05
		PCBS	0.06
		METALS	0.01
	EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR)		1
	EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR)		120
	ED1 = YOUTH EXPOSURE DURATION (YEARS)		1
	ED2 = ADULT EXPOSURE DURATION (YEARS)		1
	BW1 = BODY WEIGHT ADOLESCENT (KG)		1
	BW2 = BODY WEIGHT ADULT (KG)		70
	AT1 = AVERAGING TIME (DAYS) NONCARCINOGENS (YOUTH):		365
	AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		365
	AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 2.55E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.78E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
1,1,2,2-Tetrachloroethane	3	0.5	0.00E+00	2.68E-05	3.82E-07		2.00E-01
Trichloroethene	1 7	0.5	0.00E+00	1.52E-05	2.17E-07	6.00E-03	1.10E-02
Vinyl chloride	0.12	0.5	0.00E+00	1.07E-06	1.53E-08		1.90E+00
Bis(2-ethylhexyl)phthalate	1 1	0.05	0.00E+00	9.82E-07	1.40E-08	1.10E-02	2.50E-02
Benzo(a)anthracene	1	0.05	0.00E+00	8.92E-07	1.27E-08		
Benzo(b)fluoranthene	1	0.05	0.00E+00	8.92E-07	1.27E-08		
Benzo(k)fluoranthene	0.96	0.05	0.00E+00	8.57E-07	1.22E-08		
Benzo(a)pyrene	1	0.05	0.00E+00	8.92E-07	1.27E-08		
Dibenz(a,h)anthracene	0 22	0.05	0.00E+00	1.96E-07	2.80E-09		
Indeno(1,2,3-cd)pyrene	0 78	0.05	0.00E+00	6.96E-07	9.94E-09		
4,4'-DDD	1 4	0 05	0.00E+00	1.25E-06	1.78E-08		3.00E-01
4,4'-DDE	0 77	0 05	0.00E+00	6.87E-07	9.82E-09		4.20E-01
4,4'-DDT	2 9	0.05	0.00E+00	2.59E-06	3.70E-08	4.00E-04	4.20E-01
Aroclor-1260	12	0.05	0.00E+00	1.07E-05	1.53E-07	2.00E-05	7.70E+00
Antimony	19 2	0.01	0.00E+00	3.43E-06	4.90E-08	4.00E-04	
Arsenic	3 3	0 01	0.00E+00	5.89E-07	8.41E-09	2.80E-04	1.80E+00
Beryllium	1 2	0 01	0.00E+00	2.14E-07	3.06E-09	2.50E-04	8.60E+01
Boron	299	0 01	0.00E+00	5.34E-05	7.62E-07	4.50E-03	
Cadmium	7	0 01	0.00E+00	1.25E-06	1.78E-08	1.50E-05	
Copper	1850	0.01	0.00E+00	3.30E-04	4.72E-06	2.20E-02	
Manganese	342	0.01	0.00E+00	6.10E-05	8.72E-07	1.50E-04	
Nickel	98 8	0 01	0.00E+00	1.76E-05	2.52E-07	2.00E-03	
Vanadium	44	0.01	0.00E+00	7.85E-06	1.12E-07	3.50E-04	
Zinc	2050	0.01	0.00E+00	3.66E-04	5.23E-06	1.50E-01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	7.65E-08
Trichloroethene	0.00E+00	2.53E-03	2.38E-09
Vinyl chloride	0.00E+00	0.00E+00	2.91E-08
Bis(2-ethylhexyl)phthalate	0.00E+00	8.92E-05	3.51E-10
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	5.35E-09
4,4'-DDE	0.00E+00	0.00E+00	4.12E-09
4,4'-DDT	0.00E+00	6.47E-03	1.55E-08
Aroclor-1260	0.00E+00	5.35E-01	1.18E-06
Antimony	0.00E+00	8.57E-03	0.00E+00
Arsenic	0.00E+00	2.10E-03	1.51E-08
Beryllium	0.00E+00	8.57E-04	2.63E-07
Boron	0.00E+00	1.19E-02	0.00E+00
Cadmium	0.00E+00	8.33E-02	0.00E+00
Copper	0.00E+00	1.50E-02	0.00E+00
Manganese	0.00E+00	4.07E-01	0.00E+00
Nickel	0.00E+00	8.82E-03	0.00E+00
Vanadium	0.00E+00	2.24E-02	0.00E+00
Zinc	0.00E+00	2.44E-03	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.11E+00	1.59E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: OCCASIONAL VISTOR; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS:	0.05
		METALS:	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		12
ED1	= YOUTH EXPOSURE DURATION (YEARS):		1
ED2	= ADULT EXPOSURE DURATION (YEARS):		6
BW1	= BODY WEIGHT ADOLESCENT (KG):		1
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		2190
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.06E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISTOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	1.39E–08	1.19E–09		
Benzo(b)fluoranthene	0.71	0.05	0.00E+00	1.27E–08	1.09E–09		
Benzo(k)fluoranthene	0.87	0.05	0.00E+00	1.55E–08	1.33E–09		
Benzo(a)pyrene	0.88	0.05	0.00E+00	1.57E–08	1.35E–09		
Indeno(1,2,3–cd)pyrene	0.76	0.05	0.00E+00	1.36E–08	1.16E–09		
Aroclor–1260	11	0.05	0.00E+00	1.96E–07	1.68E–08	2.00E–05	7.70E+00
Antimony	19.2	0.01	0.00E+00	6.85E–08	5.87E–09	4.00E–04	
Arsenic	2.6	0.01	0.00E+00	9.28E–09	7.95E–10	2.80E–04	1.80E+00
Beryllium	1.1	0.01	0.00E+00	3.93E–09	3.37E–10	2.50E–04	8.60E+01
Cadmium	5.9	0.01	0.00E+00	2.11E–08	1.81E–09	1.50E–05	
Copper	697	0.01	0.00E+00	2.49E–06	2.13E–07	2.20E–02	
Manganese	268	0.01	0.00E+00	9.57E–07	8.20E–08	1.50E–04	
Vanadium	48.4	0.01	0.00E+00	1.73E–07	1.48E–08	3.50E–04	
Zinc	1510	0.01	0.00E+00	5.39E–06	4.62E–07	1.50E–01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISTOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	9.82E-03	1.30E-07
Antimony	0.00E+00	1.71E-04	0.00E+00
Arsenic	0.00E+00	3.31E-06	1.43E-09
Beryllium	0.00E+00	1.67E-06	2.89E-08
Cadmium	0.00E+00	1.40E-03	0.00E+00
Copper	0.00E+00	1.13E-04	0.00E+00
Manganese	0.00E+00	[illegible].38E-03	0.00E+00
Vanadium	0.00E+00	4.94E-04	0.00E+00
Zinc	0.00E+00	3.50E-06	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.85E-02**	**1.60E-07**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: OCCASIONAL VISTOR; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		1
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR)		1
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR)		24
ED1	= YOUTH EXPOSURE DURATION (YEARS)		1
ED2	= ADULT EXPOSURE DURATION (YEARS)		25
BW1	= BODY WEIGHT ADOLESCENT (KG)		1
BW2	= BODY WEIGHT ADULT (KG)		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.27E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.57E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISTOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	1.39E–07	4.97E–08		
Benzo(b)fluoranthene	0.71	0.05	0.00E+00	1.27E–07	4.53E–08		
Benzo(k)fluoranthene	0.87	0.05	0.00E+00	1.55E–07	5.55E–08		
Benzo(a)pyrene	0.88	0.05	0.00E+00	1.57E–07	5.61E–08		
Indeno(1,2,3–cd)pyrene	0.76	0.05	0.00E+00	1.36E–07	4.84E–08		
Aroclor–1260	11	0.05	0.00E+00	1.96E–06	7.01E–07	2.00E–05	7.70E+00
Antimony	19.2	0.01	0.00E+00	6.85E–07	2.45E–07	4.00E–04	
Arsenic	2.6	0.01	0.00E+00	9.28E–08	3.31E–08	2.80E–04	1.80E+00
Beryllium	1.1	0.01	0.00E+00	3.93E–08	1.40E–08	2.50E–04	8.60E+01
Cadmium	5.9	0.01	0.00E+00	2.11E–07	7.52E–08	1.50E–05	
Copper	697	0.01	0.00E+00	2.49E–05	8.89E–06	2.20E–02	
Manganese	268	0.01	0.00E+00	9.57E–06	3.42E–06	1.50E–04	
Vanadium	48.4	0.01	0.00E+00	1.73E–06	6.17E–07	3.50E–04	
Zinc	1510	0.01	0.00E+00	5.39E–05	1.92E–05	1.50E–01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISTOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	9.82E-02	5.40E-06
Antimony	0.00E+00	1.71E-03	0.00E+00
Arsenic	0.00E+00	3.31E-04	5.97E-08
Beryllium	0.00E+00	1.57E-04	1.21E-06
Cadmium	0.00E+00	1.40E-02	0.00E+00
Copper	0.00E+00	1.13E-03	0.00E+00
Manganese	0.00E+00	6.38E-02	0.00E+00
Vanadium	0.00E+00	4.94E-03	0.00E+00
Zinc	0.00E+00	3.59E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.85E-01	6.66E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

C = CONCENTRATION IN SOIL (MG/KG)		
SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY):		0
SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY):		3800
AF = ADHERENCE FACTOR (MG/SQ CM)		0.2
ABS = ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
	BNAS/PESTICIDES:	0.05
	PCBS:	0.05
	METALS:	0.01
EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		26
ED1 = YOUTH EXPOSURE DURATION (YEARS):		1
ED2 = ADULT EXPOSURE DURATION (YEARS):		9
BW1 = BODY WEIGHT ADOLESCENT (KG):		1
BW2 = BODY WEIGHT ADULT (KG):		70
AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		3285
AT3 = AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 9.94E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 7.73E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	3.02E–08	3.88E–09		
Benzo(b)fluoranthene	0.71	0.05	0.00E+00	2.75E–08	3.53E–09		
Benzo(k)fluoranthene	0.87	0.05	0.00E+00	3.36E–08	4.33E–09		
Benzo(a)pyrene	0.88	0.05	0.00E+00	3.40E–08	4.38E–09		
Indeno(1,2,3–cd)pyrene	0.76	0.05	0.00E+00	2.94E–08	3.78E–09		
Aroclor–1260	11	0.05	0.00E+00	4.25E–07	5.47E–08	2.00E–05	7.70E+00
Antimony	19.2	0.01	0.00E+00	1.48E–07	1.91E–08	4.00E–04	
Arsenic	2.6	0.01	0.00E+00	2.01E–08	2.59E–09	2.80E–04	1.80E+00
Beryllium	1.1	0.01	0.00E+00	8.51E–09	1.09E–09	2.50E–04	8.60E+01
Cadmium	5.9	0.01	0.00E+00	4.56E–08	5.87E–09	1.50E–05	
Copper	697	0.01	0.00E+00	5.39E–06	6.93E–07	2.20E–02	
Manganese	268	0.01	0.00E+00	2.07E–06	2.66E–07	1.50E–04	
Vanadium	48.4	0.01	0.00E+00	3.74E–07	4.81E–08	3.50E–04	
Zinc	1510	0.01	0.00E+00	1.17E–05	1.50E–06	1.50E–01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	2.13E-02	4.21E-07
Antimony	0.00E+00	3.71E-04	0.00E+00
Arsenic	0.00E+00	7.18E-05	4.65E-09
Beryllium	0.00E+00	3.40E-06	9.41E-08
Cadmium	0.00E+00	3.04E-03	0.00E+00
Chromium	0.00E+00	2.46E-04	0.00E+00
Manganese	0.00E+00	1.38E-02	0.00E+00
Vanadium	0.00E+00	1.07E-03	0.00E+00
Zinc	0.00E+00	7.79E-06	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	4.00E-02	5.20E-07

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE

C	= CONCENTRATION IN SOIL (MG/KG)		
SA1	= YOUTH SKIN SURFACE AREA (SQ CM/DAY)		0
SA2	= ADULT SKIN SURFACE AREA (SQ CM/DAY)		3800
AF	= ADHERENCE FACTOR (MG/SQ CM)		1
ABS	= ABSORPTION FRACTION (DECIMAL FRACTION)	VOCS:	0.5
		BNAS/PESTICIDES:	0.05
		PCBS	0.05
		METALS	0.01
EF1	= YOUTH EXPOSURE FREQUENCY (DAYS/YEAR):		1
EF2	= ADULT EXPOSURE FREQUENCY (DAYS/YEAR):		26
ED1	= YOUTH EXPOSURE DURATION (YEARS):		1
ED2	= ADULT EXPOSURE DURATION (YEARS):		25
BW1	= BODY WEIGHT ADOLESCENT (KG):		1
BW2	= BODY WEIGHT ADULT (KG):		70
AT1	= AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH):		365
AT2	= AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT):		9125
AT3	= AVERAGING TIME (DAYS), CARCINOGENS:		25550

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.38E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 3.87E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
CALCULATE DOSES

CHEMICAL	C (MG/KG)	ABSORPTION FRACTION	ANNUAL YOUTH DOSE (MG/KG/DAY)	ANNUAL ADULT DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	0.78	0.05	0.00E+00	1.51E–07	5.39E–08		
Benzo(b)fluoranthene	0.71	0.05	0.00E+00	1.37E–07	4.90E–08		
Benzo(k)fluoranthene	0.87	0.05	0.00E+00	1.68E–07	6.01E–08		
Benzo(a)pyrene	0.88	0.05	0.00E+00	1.70E–07	6.08E–08		
Indeno(1,2,3–cd)pyrene	0.76	0.05	0.00E+00	1.47E–07	5.25E–08		
Aroclor–1260	11	0.05	0.00E+00	2.13E–06	7.60E–07	2.00E–05	7.70E+00
Antimony	19.2	0.01	0.00E+00	7.42E–07	2.65E–07	4.00E–04	
Arsenic	2.6	0.01	0.00E+00	1.01E–07	3.59E–08	2.80E–04	1.80E+00
Beryllium	1.1	0.01	0.00E+00	4.25E–08	1.52E–08	2.50E–04	8.60E+01
Cadmium	5.9	0.01	0.00E+00	2.28E–07	8.15E–08	1.50E–05	
Copper	697	0.01	0.00E+00	2.70E–05	9.63E–06	2.20E–02	
Manganese	268	0.01	0.00E+00	1.04E–05	3.70E–06	1.50E–04	
Vanadium	48.4	0.01	0.00E+00	1.87E–06	6.68E–07	3.50E–04	
Zinc	1510	0.01	0.00E+00	5.84E–05	2.09E–05	1.50E–01	
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		
			0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK:

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	1.06E-01	5.85E-06
Antimony	0.00E+00	1.86E-03	0.00E+00
Arsenic	0.00E+00	3.59E-04	6.46E-08
Beryllium	0.00E+00	1.70E-04	1.31E-06
Cadmium	0.00E+00	1.52E-02	0.00E+00
Copper	0.00E+00	1.23E-03	0.00E+00
Manganese	0.00E+00	6.91E-02	0.00E+00
Vanadium	0.00E+00	5.35E-03	0.00E+00
Zinc	0.00E+00	3.89E-04	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.00E-01	7.22E-06

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION $DI = (C \times IR \times ET \times EF \times ED) / (BW \times AT)$

WHERE
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	30	IR	0
EF	1	EF	1
ET:	8	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.22E-03 (AVG ANNUAL DOSE)
CF: 4.36E-04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	2.7E-07	0.00E+00	3.30E-10	1.18E-10		2.03E-01
Trichloroethene	1.5E-07	0.00E+00	1.87E-10	6.67E-11		6.00E-03
Vinyl chloride	1.1E-08	0.00E+00	1.32E-11	4.71E-12		3.00E-01
Bis(2-ethylhexyl)phthalate	9.9E-08	0.00E+00	1.21E-10	4.32E-11		
Benzo(a)anthracene	9.0E-08	0.00E+00	1.10E-10	3.93E-11		
Benzo(b)fluoranthene	9.0E-08	0.00E+00	1.10E-10	3.93E-11		
Benzo(k)fluoranthene	8.6E-08	0.00E+00	1.06E-10	3.77E-11		
Benzo(a)pyrene	9.0E-08	0.00E+00	1.10E-10	3.93E-11		
Dibenz(a,h)anthracene	2.0E-08	0.00E+00	2.42E-11	8.64E-12		
Indeno(1,2,3-cd)pyrene	7.0E-08	0.00E+00	8.57E-11	3.06E-11		
4,4'-DDD	1.3E-07	0.00E+00	1.54E-10	5.50E-11		
4,4'-DDE	6.9E-08	0.00E+00	8.46E-11	3.02E-11		
4,4'-DDT	2.6E-07	0.00E+00	3.19E-10	1.14E-10		3.40E-01
Aroclor-1260	1.1E-06	0.00E+00	1.32E-09	4.71E-10		
Antimony	1.7E-06	0.00E+00	2.11E-09	7.54E-10		
Arsenic	3.0E-07	0.00E+00	3.63E-10	1.30E-10		1.51E+01
Beryllium	1.1E-07	0.00E+00	1.32E-10	4.71E-11		
Boron	2.7E-06	0.00E+00	3.29E-08	1.17E-08	5.71E-03	
Cadmium	6.3E-07	0.00E+00	7.69E-10	2.75E-10		6.30E+00
Copper	1.7E-04	0.00E+00	2.03E-07	7.26E-08		
Manganese	3.1E-05	0.00E+00	3.76E-08	1.34E-08	1.43E-05	
Nickel	8.9E-06	0.00E+00	1.09E-08	3.88E-09		
Vanadium	4.0E-06	0.00E+00	4.84E-09	1.73E-09		
Zinc	1.8E-04	0.00E+00	2.25E-07	8.05E-08		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	2.39E-11
Trichloroethene	0.00E+00	0.00E+00	4.00E-13
Vinyl chloride	0.00E+00	0.00E+00	1.41E-12
Bis(2-ethylhexyl)phthalate	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	0.00E+00
4,4'-DDE	0.00E+00	0.00E+00	0.00E+00
4,4'-DDT	0.00E+00	0.00E+00	3.87E-11
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	1.96E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	5.75E-06	0.00E+00
Cadmium	0.00E+00	0.00E+00	1.73E-09
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	2.63E-03	0.00E+00
Nickel	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.63E-03	3.75E-09

RISK ASSESSMENT SPREADSHEET - INHALATION

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT:		YOUTH:	
IR:	3.9	IR:	0
EF:	3.5	EF:	1
ET:	8	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 4.27E-03 (AVG-ANNUAL DOSE)
CF: 1.53E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
1,1,2,2-Tetrachloroethane	2.7E-07	0.00E+00	1.15E-09	4.12E-10		2.03E-01
Trichloroethene	1.5E-07	0.00E+00	6.54E-10	2.34E-10		6.00E-03
Vinyl chloride	1.1E-08	0.00E+00	4.62E-11	1.65E-11		3.00E-01
Bis(2-ethylhexyl)phthalate	9.9E-08	0.00E+00	4.23E-10	1.51E-10		
Benzo(a)anthracene	9.0E-08	0.00E+00	3.85E-10	1.37E-10		
Benzo(b)fluoranthene	9.0E-08	0.00E+00	3.85E-10	1.37E-10		
Benzo(k)fluoranthene	8.6E-08	0.00E+00	3.69E-10	1.32E-10		
Benzo(a)pyrene	9.0E-08	0.00E+00	3.85E-10	1.37E-10		
Dibenz(a,h)anthracene	2.0E-08	0.00E+00	8.46E-11	3.02E-11		
Indeno(1,2,3-cd)pyrene	7.0E-08	0.00E+00	3.00E-10	1.07E-10		
4,4'-DDD	1.3E-07	0.00E+00	5.39E-10	1.92E-10		
4,4'-DDE	6.9E-08	0.00E+00	2.96E-10	1.06E-10		
4,4'-DDT	2.6E-07	0.00E+00	1.12E-09	3.98E-10		3.40E-01
Aroclor-1260	1.1E-06	0.00E+00	4.62E-09	1.65E-09		
Antimony	1.7E-06	0.00E+00	7.39E-09	2.64E-09		
Arsenic	3.0E-07	0.00E+00	1.27E-09	4.53E-10		1.51E+01
Beryllium	1.1E-07	0.00E+00	4.62E-10	1.65E-10		
Boron	2.7E-05	0.00E+00	1.15E-07	4.11E-08	5.71E-03	
Cadmium	6.3E-07	0.00E+00	2.69E-09	9.62E-10		6.30E+00
Copper	1.7E-04	0.00E+00	7.12E-07	2.54E-07		
Manganese	3.1E-05	0.00E+00	1.32E-07	4.70E-08	1.43E-05	
Nickel	8.9E-06	0.00E+00	3.80E-08	1.36E-08		
Vanadium	4.0E-06	0.00E+00	1.69E-08	6.04E-09		
Zinc	1.8E-04	0.00E+00	7.89E-07	2.82E-07		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARI : UTILITY WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	8.37E-11
Trichloroethene	0.00E+00	0.00E+00	1.40E-12
Vinyl chloride	0.00E+00	0.00E+00	4.95E-12
Bis(2-ethylhexyl)phthalate	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4-DDD	0.00E+00	0.00E+00	0.00E+00
4,4-DDE	0.00E+00	0.00E+00	0.00E+00
4,4-DDT	0.00E+00	0.00E+00	1.35E-10
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	6.85E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	2.01E-05	0.00E+00
Cadmium	0.00E+00	0.00E+00	6.06E-09
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	9.20E-03	0.00E+00
Nickel	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**9.22E-03**	**1.31E-08**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION $IEX = (C \times IR \times ET \times EF \times ED)/(BW \times AT)$

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH:	
IR:	2.5	IR:	0
EF:	150	EF:	1
ET:	8	ET:	1
ED:	6	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.17E-01 (AVG ANNUAL DOSE)
CF: 1.01E-02 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.4E-08	0.00E+00	1.65E-09	1.41E-10		
Benzo(b)fluoranthene	1.3E-08	0.00E+00	1.50E-09	1.29E-10		
Benzo(k)fluoranthene	1.6E-08	0.00E+00	1.84E-09	1.58E-10		
Benzo(a)pyrene	1.6E-08	0.00E+00	1.86E-09	1.59E-10		
Indeno(1,2,3-cd)pyrene	1.4E-08	0.00E+00	1.61E-09	1.38E-10		
Aroclor-1260	2.0E-07	0.00E+00	2.32E-08	1.99E-09		
Antimony	3.5E-07	0.00E+00	4.06E-08	3.48E-09		
Arsenic	4.7E-08	0.00E+00	5.50E-09	4.71E-10		1.51E+01
Beryllium	2.0E-08	0.00E+00	2.32E-09	1.99E-10		
Cadmium	1.1E-07	0.00E+00	1.25E-08	1.07E-09		6.30E+00
Copper	1.3E-05	0.00E+00	1.47E-06	1.26E-07		
Manganese	4.8E-06	0.00E+00	5.66E-07	4.86E-08	1.43E-05	
Vanadium	8.7E-07	0.00E+00	1.02E-07	8.77E-09		
Zinc	2.7E-05	0.00E+00	3.19E-06	2.74E-07		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 6 – DRM
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	7.11E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	6.73E-09
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	3.96E-02	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.96E-02	1.38E-08

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB–NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: FULL–TIME EMPLOYEE; RME

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION [illegible]

WHERE C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	20	IR	0
EF	250	EF	1
ET:	8	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.96E–01 (AVG ANNUAL DOSE)
CF: 6.99E–02 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.4E-08	0.00E+00	2.75E-09	9.81E-10		
Benzo(b)fluoranthene	1.3E-08	0.00E+00	2.50E-09	8.93E-10		
Benzo(k)fluoranthene	1.6E-08	0.00E+00	3.06E-09	1.09E-09		
Benzo(a)pyrene	1.6E-08	0.00E+00	3.10E-09	1.11E-09		
Indeno(1,2,3-cd)pyrene	1.4E-08	0.00E+00	2.68E-09	9.56E-10		
Aroclor-1260	2.0E-07	0.00E+00	3.87E-08	1.38E-08		
Antimony	3.5E-07	0.00E+00	6.76E-08	2.42E-08		
Arsenic	4.7E-08	0.00E+00	9.16E-09	3.27E-09		1.51E+01
Beryllium	2.0E-08	0.00E+00	3.87E-09	1.38E-09		
Cadmium	1.1E-07	0.00E+00	2.08E-08	7.42E-09		6.30E+00
Copper	1.3E-05	0.00E+00	2.46E-06	8.77E-07		
Manganese	4.8E-06	0.00E+00	9.44E-07	3.37E-07	1.43E-05	
Vanadium	8.7E-07	0.00E+00	1.70E-07	6.09E-08		
Zinc	2.7E-05	0.00E+00	5.32E-06	1.90E-06		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: FULL-TIME EMPLOYEE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	4.94E-08
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	4.68E-08
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	6.60E-02	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**6.60E-02**	**9.62E-08**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT:		YOUTH:	
IR:	3.9	IR:	0
EF:	80	EF:	1
ET:	8	ET:	1
ED:	1	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 9.77E-02 (AVG ANNUAL DOSE)
CF: 1.40E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	2.7E-07	0.00E+00	2.64E-08	3.77E-10		2.03E-01
Trichloroethene	1.5E-07	0.00E+00	1.49E-08	2.14E-10		6.00E-03
Vinyl chloride	1.1E-08	0.00E+00	1.06E-09	1.51E-11		3.00E-01
Bis(2-ethylhexyl)phthalate	9.9E-08	0.00E+00	9.67E-09	1.38E-10		
Benzo(a)anthracene	9.0E-08	0.00E+00	8.79E-09	1.26E-10		
Benzo(b)fluoranthene	9.0E-08	0.00E+00	8.79E-09	1.26E-10		
Benzo(k)fluoranthene	8.6E-08	0.00E+00	8.44E-09	1.21E-10		
Benzo(a)pyrene	9.0E-08	0.00E+00	8.79E-09	1.26E-10		
Dibenz(a,h)anthracene	2.0E-08	0.00E+00	1.93E-09	2.76E-11		
Indeno(1,2,3-cd)pyrene	7.0E-08	0.00E+00	6.86E-09	9.80E-11		
4,4'-DDD	1.3E-07	0.00E+00	1.23E-08	1.76E-10		
4,4'-DDE	6.9E-08	0.00E+00	6.77E-09	9.67E-11		
4,4'-DDT	2.6E-07	0.00E+00	2.55E-08	3.64E-10		3.40E-01
Aroclor-1260	1.1E-06	0.00E+00	1.06E-07	1.51E-09		
Antimony	1.7E-06	0.00E+00	1.69E-07	2.41E-09		
Arsenic	3.0E-07	0.00E+00	2.90E-08	4.14E-10		1.51E+01
Beryllium	1.1E-07	0.00E+00	1.06E-08	1.51E-10		
Boron	2.7E-05	0.00E+00	2.63E-06	3.76E-08	5.71E-03	
Cadmium	6.3E-07	0.00E+00	6.15E-08	8.79E-10		6.30E+00
Copper	1.7E-04	0.00E+00	1.63E-05	2.32E-07		
Manganese	3.1E-05	0.00E+00	3.01E-06	4.30E-08	1.43E-05	
Nickel	8.9E-06	0.00E+00	8.69E-07	1.24E-08		
Vanadium	4.0E-06	0.00E+00	3.87E-07	5.53E-09		
Zinc	1.8E-04	0.00E+00	1.80E-05	2.57E-07		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	7.65E-11
Trichloroethene	0.00E+00	0.00E+00	1.28E-12
Vinyl chloride	0.00E+00	0.00E+00	4.52E-12
Bis(2-ethylhexyl)phthalate	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4-DDD	0.00E+00	0.00E+00	0.00E+00
4,4-DDE	0.00E+00	0.00E+00	0.00E+00
4,4-DDT	0.00E+00	0.00E+00	1.24E-10
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	6.26E-09
Barium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	4.00E-04	0.00E+00
Cadmium	0.00E+00	0.00E+00	5.54E-09
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	2.10E-01	0.00E+00
Nickel	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	2.11E-01	1.20E-08

RISK ASSESSMENT SPREADSHEET - INHALATION

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR:	3.9	IR:	0
EF:	120	EF:	1
ET:	8	ET:	1
ED:	1	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	365	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.47E-01 (AVG ANNUAL DOSE)
CF: 2.09E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TW)
SITE 6 - DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
1,1,2,2-Tetrachloroethane	2.7E-07	0.00E+00	3.96E-08	5.65E-10		2.03E-01
Trichloroethene	1.5E-07	0.00E+00	2.24E-08	3.20E-10		6.00E-03
Vinyl chloride	1.1E-08	0.00E+00	1.58E-09	2.26E-11		3.00E-01
Bis(2-ethylhexyl)phthalate	9.9E-08	0.00E+00	1.45E-08	2.07E-10		
Benzo(a)anthracene	9.0E-08	0.00E+00	1.32E-08	1.88E-10		
Benzo(b)fluoranthene	9.0E-08	0.00E+00	1.32E-08	1.88E-10		
Benzo(k)fluoranthene	8.6E-08	0.00E+00	1.27E-08	1.81E-10		
Benzo(a)pyrene	9.0E-08	0.00E+00	1.32E-08	1.88E-10		
Dibenz(a,h)anthracene	2.0E-08	0.00E+00	2.90E-09	4.14E-11		
Indeno(1,2,3-cd)pyrene	7.0E-08	0.00E+00	1.03E-08	1.47E-10		
4,4'-DDD	1.3E-07	0.00E+00	1.85E-08	2.64E-10		
4,4'-DDE	6.9E-08	0.00E+00	1.02E-08	1.45E-10		
4,4'-DDT	2.6E-07	0.00E+00	3.82E-08	5.46E-10		3.40E-01
Aroclor-1260	1.1E-06	0.00E+00	1.58E-07	2.26E-09		
Antimony	1.7E-06	0.00E+00	2.53E-07	3.62E-09		
Arsenic	3.0E-07	0.00E+00	4.35E-08	6.22E-10		1.51E+01
Beryllium	1.1E-07	0.00E+00	1.58E-08	2.26E-10		
Boron	2.7E-05	0.00E+00	3.94E-06	5.63E-08	5.71E-03	
Cadmium	6.3E-07	0.00E+00	9.23E-08	1.32E-09		6.30E+00
Copper	1.7E-04	0.00E+00	2.44E-05	3.49E-07		
Manganese	3.1E-05	0.00E+00	4.51E-06	6.44E-08	1.43E-05	
Nickel	8.9E-06	0.00E+00	1.30E-06	1.86E-08		
Vanadium	4.0E-06	0.00E+00	5.80E-07	8.29E-09		
Zinc	1.8E-04	0.00E+00	2.70E-05	3.86E-07		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
1,1,2,2-Tetrachloroethane	0.00E+00	0.00E+00	1.15E-10
Trichloroethene	0.00E+00	0.00E+00	1.92E-12
Vinyl chloride	0.00E+00	0.00E+00	6.78E-12
Bis(2-ethylhexyl)phthalate	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
4,4'-DDD	0.00E+00	0.00E+00	0.00E+00
4,4'-DDE	0.00E+00	0.00E+00	0.00E+00
4,4'-DDT	0.00E+00	0.00E+00	1.86E-10
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	9.39E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Boron	0.00E+00	6.91E-04	0.00E+00
Cadmium	0.00E+00	0.00E+00	8.31E-09
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	3.15E-01	0.00E+00
Nickel	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	3.16E-01	1.80E-08

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION $ID = (C \cdot IR \cdot ET \cdot EF \cdot ED) / (BW \cdot AT)$

WHERE C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	0.8	IR	0
EF	12	EF	1
ET:	8	ET:	1
ED:	6	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	2190	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 3.01E-03 (AVG ANNUAL DOSE)
CF: 2.58E-04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.4E-08	0.00E+00	4.22E-11	3.62E-12		
Benzo(b)fluoranthene	1.3E-08	0.00E+00	3.84E-11	3.29E-12		
Benzo(k)fluoranthene	1.6E-08	0.00E+00	4.71E-11	4.03E-12		
Benzo(a)pyrene	1.6E-08	0.00E+00	4.76E-11	4.08E-12		
Indeno(1,2,3-cd)pyrene	1.4E-08	0.00E+00	4.11E-11	3.52E-12		
Aroclor-1260	2.0E-07	0.00E+00	5.95E-10	5.10E-11		
Antimony	3.5E-07	0.00E+00	1.04E-09	8.90E-11		
Arsenic	4.7E-08	0.00E+00	1.41E-10	1.21E-11		1.51E+01
Beryllium	2.0E-08	0.00E+00	5.95E-11	5.10E-12		
Cadmium	1.1E-07	0.00E+00	3.19E-10	2.74E-11		6.30E+00
Copper	1.3E-05	0.00E+00	3.77E-08	3.23E-09		
Manganese	4.9E-08	0.00E+00	1.45E-08	1.24E-09	1.43E-05	
Vanadium	8.7E-07	0.00E+00	2.62E-09	2.24E-10		
Zinc	2.7E-06	0.00E+00	8.17E-08	7.00E-09		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: OCCASIONAL VISITOR; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	1.82E-10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	1.72E-10
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	1.01E-03	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.01E-03	3.54E-10

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS:

ADULT		YOUTH	
IR:	0.8	IR:	0
EF:	24	EF:	1
ET:	8	ET:	1
ED:	25	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	9125	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 6.01E-03 (AVG ANNUAL DOSE)
CF: 2.15E-03 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.4E-08	0.00E+00	8.44E-11	3.01E-11		
Benzo(b)fluoranthene	1.3E-08	0.00E+00	7.68E-11	2.74E-11		
Benzo(k)fluoranthene	1.6E-08	0.00E+00	9.41E-11	3.36E-11		
Benzo(a)pyrene	1.6E-08	0.00E+00	9.52E-11	3.40E-11		
Indeno(1,2,3-cd)pyrene	1.4E-08	0.00E+00	8.22E-11	2.94E-11		
Aroclor-1260	2.0E-07	0.00E+00	1.19E-09	4.25E-10		
Antimony	3.5E-07	0.00E+00	2.08E-09	7.42E-10		
Arsenic	4.7E-08	0.00E+00	2.81E-10	1.00E-10		1.51E+01
Beryllium	2.0E-08	0.00E+00	1.19E-10	4.25E-11		
Cadmium	1.1E-07	0.00E+00	6.38E-10	2.28E-10		6.30E+00
Copper	1.3E-05	0.00E+00	7.54E-08	2.69E-08		
Manganese	4.8E-06	0.00E+00	2.90E-08	1.04E-08	1.43E-05	
Vanadium	8.7E-07	0.00E+00	5.24E-09	1.87E-09		
Zinc	2.7E-05	0.00E+00	1.63E-07	5.84E-08		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: OCCASIONAL VISITOR; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	1.52E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	1.44E-09
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	2.03E-03	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**2.03E-03**	**2.95E-09**

RISK ASSESSMENT SPREADSHEET - INHALATION

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	26	EF:	1
ET:	2.5	ET:	1
ED:	9	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	3285	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 2.04E-03 (AVG ANNUAL DOSE)
CF: 2.62E-04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	1.4E-08	0.00E+00	2.86E-11	3.67E-12		
Benzo(b)fluoranthene	1.3E-08	0.00E+00	2.60E-11	3.34E-12		
Benzo(k)fluoranthene	1.6E-08	0.00E+00	3.19E-11	4.10E-12		
Benzo(a)pyrene	1.6E-08	0.00E+00	3.22E-11	4.14E-12		
Indeno(1,2,3-cd)pyrene	1.4E-08	0.00E+00	2.78E-11	3.58E-12		
Aroclor-1260	2.0E-07	0.00E+00	4.03E-10	5.18E-11		
Antimony	3.5E-07	0.00E+00	7.03E-10	9.04E-11		
Arsenic	4.7E-08	0.00E+00	9.52E-11	1.22E-11		1.51E+01
Beryllium	2.0E-08	0.00E+00	4.03E-11	5.18E-12		
Cadmium	1.1E-07	0.00E+00	2.16E-10	2.78E-11		6.30E+00
Copper	1.3E-05	0.00E+00	2.55E-08	3.28E-09		
Manganese	4.8E-06	0.00E+00	9.82E-09	1.26E-09	1.43E-05	
Vanadium	8.7E-07	0.00E+00	1.77E-09	2.28E-10		
Zinc	2.7E-05	0.00E+00	5.53E-08	7.11E-09		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	1.85E-10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	1.75E-10
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	6.87E-04	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	6.87E-04	3.60E-10

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/13/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION $[illegible] = (C \times IR \times ET \times EF \times ED) / (BW \times AT)$

WHERE
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR	0.8	IR	0
EF	26	EF	1
ET:	2.5	ET:	1
ED:	30	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	10950	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 2.04E-03 (AVG ANNUAL DOSE)
CF: 8.72E-04 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE TW)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG–DAY/MG)
Benzo(a)anthracene	1.4E-08	0.00E+00	2.86E-11	1.22E-11		
Benzo(b)fluoranthene	1.3E-08	0.00E+00	2.60E-11	1.11E-11		
Benzo(k)fluoranthene	1.6E-08	0.00E+00	3.19E-11	1.37E-11		
Benzo(a)pyrene	1.6E-08	0.00E+00	3.22E-11	1.38E-11		
Indeno(1,2,3-cd)pyrene	1.4E-08	0.00E+00	2.78E-11	1.19E-11		
Aroclor-1260	2.0E-07	0.00E+00	4.03E-10	1.73E-10		
Antimony	3.5E-07	0.00E+00	7.03E-10	3.01E-10		
Arsenic	4.7E-08	0.00E+00	9.52E-11	4.08E-11		1.51E+01
Beryllium	2.0E-08	0.00E+00	4.03E-11	1.73E-11		
Cadmium	1.1E-07	0.00E+00	2.16E-10	9.26E-11		6.30E+00
Copper	1.3E-05	0.00E+00	2.55E-08	1.09E-08		
Manganese	4.8E-08	0.00E+00	9.82E-09	4.21E-09	1.43E-05	
Vanadium	8.7E-07	0.00E+00	1.77E-09	7.60E-10		
Zinc	2.7E-05	0.00E+00	5.53E-08	2.37E-08		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT ONSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	6.16E-10
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	5.84E-10
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	6.87E-04	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**6.87E-04**	**1.20E-09**

RISK ASSESSMENT SPREADSHEET – INHALATION

SITE NAME: SITE 6 – DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/20/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; CTE

REFERENCE: EPA, DECEMBER 1989

RELEVANT EQUATION: IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE:
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT:		YOUTH:	
IR:	0.8	IR:	0
EF:	234	EF:	1
ET:	24	ET:	1
ED:	9	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	3285	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 1.76E-01 (AVG ANNUAL DOSE)
CF: 2.26E-02 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; CTE
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	3.1E-09	0.00E+00	5.49E-10	7.05E-11		
Benzo(b)fluoranthene	2.8E-09	0.00E+00	4.99E-10	6.42E-11		
Benzo(k)fluoranthene	3.5E-09	0.00E+00	6.12E-10	7.87E-11		
Benzo(a)pyrene	3.5E-09	0.00E+00	6.19E-10	7.96E-11		
Indeno(1,2,3-cd)pyrene	3.0E-09	0.00E+00	5.35E-10	6.87E-11		
Aroclor-1260	4.4E-08	0.00E+00	7.74E-09	9.95E-10		
Antimony	7.7E-08	0.00E+00	1.35E-08	1.74E-09		
Arsenic	1.0E-08	0.00E+00	1.83E-09	2.35E-10		1.51E+01
Beryllium	4.4E-09	0.00E+00	7.74E-10	9.95E-11		
Cadmium	2.4E-08	0.00E+00	4.15E-09	5.34E-10		6.30E+00
Copper	2.8E-08	0.00E+00	4.90E-07	6.30E-08		
Manganese	1.1E-08	0.00E+00	1.89E-07	2.42E-08	1.43E-05	
Vanadium	1.9E-07	0.00E+00	3.40E-08	4.38E-09		
Zinc	6.0E-08	0.00E+00	1.06E-06	1.37E-07		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET – INHALATION (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; CTE
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	3.55E-09
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	3.36E-09
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	1.32E-02	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	**0.00E+00**	**1.32E-02**	**6.91E-09**

RISK ASSESSMENT SPREADSHEET - INHALATION

SITE NAME: SITE 6 - DRMO
LOCATION: NSB-NLON, GROTON, CONNECTICUT
DATE: 01/20/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INHALATION OF AMBIENT AIR ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; RME

REFERENCE EPA, DECEMBER 1989

RELEVANT EQUATION IEX = (C x IR x ET x EF x ED)/(BW x AT)

WHERE
C = MEAN CONCENTRATION IN AIR (MG/M3)
IR = INHALATION RATE (M3/HOUR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

ENTER INPUT PARAMETERS

ADULT		YOUTH	
IR:	0.8	IR:	0
EF:	350	EF:	1
ET:	24	ET:	1
ED:	30	ED:	1
BW:	70	BW:	1
AT(CAR):	25550	AT(CAR):	25550
AT(NON):	10950	AT(NON):	365

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 2.63E-01 (AVG ANNUAL DOSE)
CF: 1.13E-01 (LIFETIME DOSE)

YOUTH:
CF: 0.00E+00 (AVG ANNUAL DOSE)

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; RME
CALCULATE DOSES:

CHEMICAL	C (MG/M3)	YOUTH ANNUAL DOSE (MG/KG/DAY)	ADULT ANNUAL DOSE (MG/KG/DAY)	LIFETIME AVERAGE DOSE (MG/KG/DAY)	RFD (MG/KG/DAY)	CSF (KG-DAY/MG)
Benzo(a)anthracene	3.1E-09	0.00E+00	8.21E-10	3.52E-10		
Benzo(b)fluoranthene	2.8E-09	0.00E+00	7.47E-10	3.20E-10		
Benzo(k)fluoranthene	3.5E-09	0.00E+00	9.15E-10	3.92E-10		
Benzo(a)pyrene	3.5E-09	0.00E+00	9.26E-10	3.97E-10		
Indeno(1,2,3-cd)pyrene	3.0E-09	0.00E+00	8.00E-10	3.43E-10		
Aroclor-1260	4.4E-08	0.00E+00	1.16E-08	4.96E-09		
Antimony	7.7E-08	0.00E+00	2.02E-08	8.66E-09		
Arsenic	1.0E-08	0.00E+00	2.74E-09	1.17E-09		1.51E+01
Beryllium	4.4E-09	0.00E+00	1.16E-09	4.96E-10		
Cadmium	2.4E-08	0.00E+00	6.21E-09	2.66E-09		6.30E+00
Copper	2.8E-06	0.00E+00	7.33E-07	3.14E-07		
Manganese	1.1E-06	0.00E+00	2.82E-07	1.21E-07	1.43E-05	
Vanadium	1.9E-07	0.00E+00	5.09E-08	2.18E-08		
Zinc	6.0E-06	0.00E+00	1.59E-06	6.81E-07		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		
		0.00E+00	0.00E+00	0.00E+00		

RISK ASSESSMENT SPREADSHEET - INHALATION (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: ADULT RESIDENT OFFSITE; RME
DETERMINE HAZARD INDICES AND CANCER RISK

CHEMICAL	HAZARD INDEX YOUTH	HAZARD INDEX ADULT	INCREMENTAL CANCER RISK
Benzo(a)anthracene	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00
Aroclor-1260	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.00E+00	0.00E+00	1.77E-08
Beryllium	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	1.68E-08
Copper	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	1.97E-02	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
0	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	1.97E-02	3.45E-08

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 6 – DRMO
LOCATION: SNB-NLON, GROTON, CONNECTICUT
DATE: 01/12/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT DER = (C * SA * PC * ET * EF * ED) / (BW * AT * CF)

WHERE C = SURFACE WATER CONCENTRATION (UG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS

SA	2700	AVERAGE ANNUAL DOSE
ET	8	CONVERSION FACTOR 6.89E-04
EF:	1	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 2.46E-04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Trichloroethene	0.002	1.60E-02	2.20E-08	6.00E-03	3.67E-06
Arsenic	0.0043	1.00E-03	2.96E-09	2.80E-04	1.06E-05
Boron	1.58	1.00E-03	1.09E-06	4.50E-03	2.42E-04
Cadmium	0.0026	1.00E-03	1.79E-09	1.50E-05	1.19E-04
Manganese	0.602	1.00E-03	4.15E-07	1.50E-04	2.76E-03
Vanadium	0.0424	1.00E-03	2.92E-08	3.50E-04	8.34E-05
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					3.22E-03

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: UTILITY WORKER; CTE
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF - DERMAL (KG-DAY/MG)	INCREMENTAL CANCER RISK
Trichloroethene	0.002	7.87E-09	1.10E-02	8.66E-11
Arsenic	0.0043	1.06E-09	1.80E+00	1.90E-09
Boron	1.58	3.89E-07		0.00E+00
Cadmium	0.0026	6.40E-10		0.00E+00
Manganese	0.602	1.48E-07		0.00E+00
Vanadium	0.0424	1.04E-08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				1.99E-09

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 6 - DRMO
LOCATION: SNB-NLON, GROTON, CONNECTICUT
DATE: 01/12/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: UTILITY WORKER; RME

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x CF)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 2.41E-03
EF:	3.5	
ED:	25	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 8.61E-04
AT(NONCAR):	9125	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GR UNDWATER (PAGE TWO)
SITE 6 - DRMO
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Trichloroethene	0.002	1.60E-02	7.72E-08	6.00E-03	1.29E-05
Arsenic	0.0043	1.00E-03	1.04E-08	2.80E-04	3.70E-05
Boron	1.58	1.00E-03	3.81E-06	4.50E-03	8.47E-04
Cadmium	0.0026	1.00E-03	6.27E-09	1.50E-05	4.18E-04
Manganese	0.602	1.00E-03	1.45E-06	1.50E-04	9.68E-03
Vanadium	0.0424	1.00E-03	1.02E-07	3.50E-04	2.92E-04
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					1.13E-02

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 6 – DRMO
EXPOSURE SCENARIO: UTILITY WORKER; RME
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF – DERMAL (KG–DAY/MG)	INCREMENTAL CANCER RISK
Trichloroethene	0.002	2.76E–08	1.10E–02	3.03E–10
Arsenic	0.0043	3.70E–09	1.80E+00	6.66E–09
Boron	1.58	1.36E–06		0.00E+00
Cadmium	0.0026	2.24E–09		0.00E+00
Manganese	0.602	5.18E–07		0.00E+00
Vanadium	0.0424	3.65E–08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				6.97E–09

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 6 – DRMO
LOCATION: SNB-NLON, GROTON, CONNECTICUT
DATE: 01/12/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE

REFERENCE: EPA, DECEMBER 1989

DERMAL CONTACT DEX = (C x SA x PC x ET x EF x ED)/(BW x AT x CF)

WHERE
C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS

SA:	2200	AVERAGE ANNUAL DOSE
ET:	8	CONVERSION FACTOR 5.51E-02
EF:	80	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 7.87E-04
AT(NONCAR):	365	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE HAZARD INDICES

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Trichloroethene	0.002	1.60E-02	1.76E-06	6.00E-03	2.94E-04
Arsenic	0.0043	1.00E-03	2.37E-07	2.80E-04	8.46E-04
Boron	1.58	1.00E-03	8.71E-05	4.50E-03	1.93E-02
Cadmium	0.0026	1.00E-03	1.43E-07	1.50E-05	9.55E-03
Manganese	0.602	1.00E-03	3.32E-05	1.50E-04	2.21E-01
Vanadium	0.0424	1.00E-03	2.34E-06	3.50E-04	6.68E-03
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					2.58E-01

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; CTE
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF - DERMAL (KG-DAY/MG)	INCREMENTAL CANCER RISK
Trichloroethene	0.002	2.52E-08	1.10E-02	2.77E-10
Arsenic	0.0043	3.39E-09	1.80E+00	6.09E-09
Boron	1.58	1.24E-06		0.00E+00
Cadmium	0.0026	2.05E-09		0.00E+00
Manganese	0.602	4.74E-07		0.00E+00
Vanadium	0.0424	3.34E-08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				6.37E-09

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: SITE 6 – DRMO
LOCATION: SNB-NLON, GROTON, CONNECTICUT
DATE: 01/12/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
ONE EXPOSURE SCENARIO IS CONSIDERED: DERMAL CONTACT WITH GROUNWATER
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME

REFERENCE EPA, DECEMBER 1989

DERMAL CONTACT DRW = [illegible]

WHERE C = SURFACE WATER CONCENTRATION (MG/L)
SA = SURFACE AREA AVAILABLE FOR CONTACT (SQ CM)
PC = DERMAL PERMEABILITY CONSTANT (CM/HR)
ET = EXPOSURE TIME (HOURS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1000 CUBIC CM/L)

INPUT PARAMETERS

SA	2700	AVERAGE ANNUAL DOSE
ET	8	CONVERSION FACTOR 8.27E-02
EF:	120	
ED:	1	LIFETIME ANNUAL DOSE
BW:	70	CONVERSION FACTOR 1.18E-03
AT(NONCAR):	365	
AT(CAR):	25550	

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
SITE 6 – DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE HAZARD INDICES:

CHEMICAL	CONCENTRATION (MG/L)	DERMAL PERMEABILITY CONSTANT	AVERAGE ANNUAL DOSE (MG/KG/DAY)	DERMAL REFERENCE DOSE (MG/KG/DAY)	HAZARD INDEX
Trichloroethene	0.002	1.60E-02	2.65E-06	6.00E-03	4.41E-04
Arsenic	0.0043	1.00E-03	3.55E-07	2.80E-04	1.27E-03
Boron	1.58	1.00E-03	1.31E-04	4.50E-03	2.90E-02
Cadmium	0.0026	1.00E-03	2.15E-07	1.50E-05	1.43E-02
Manganese	0.602	1.00E-03	4.98E-05	1.50E-04	3.32E-01
Vanadium	0.0424	1.00E-03	3.50E-06	3.50E-04	1.00E-02
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
			0.00E+00		0.00E+00
TOTAL HAZARD INDEX					3.87E-01

RISK ASSESSMENT SPREADSHEET - DERMAL CONTACT WITH GROUNDWATER (PAGE THREE)
SITE 6 - DRMO
EXPOSURE SCENARIO: CONSTRUCTION WORKER; RME
CALCULATE INCREMENTAL CANCER RISKS:

CHEMICAL	CONCENTRATION (MG/L)	LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY)	CSF - DERMAL (KG-DAY/MG)	INCREMENTAL CANCER RISK
Trichloroethene	0.002	3.78E-08	1.10E-02	4.16E-10
Arsenic	0.0043	5.08E-09	1.80E+00	9.14E-09
Boron	1.58	1.87E-06		0.00E+00
Cadmium	0.0026	3.07E-09		0.00E+00
Manganese	0.602	7.11E-07		0.00E+00
Vanadium	0.0424	5.01E-08		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
0	0	0.00E+00		0.00E+00
TOTAL RISK				9.56E-09

RESULTS OF THE USEPA BIOKINETIC UPTAKE MODEL FOR EXPOSURE TO LEAD
SITE 6 - DRMO; SURFACE SOIL
NSB-NLON, GROTON, CONNECTICUT

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	754.0	200.0
1-2	754.0	200.0
2-3	754.0	200.0
3-4	754.0	200.0
4-5	754.0	200.0
5-6	754.0	200.0
6-7	754.0	200.0

Additional Dust Sources: None DEFAULT

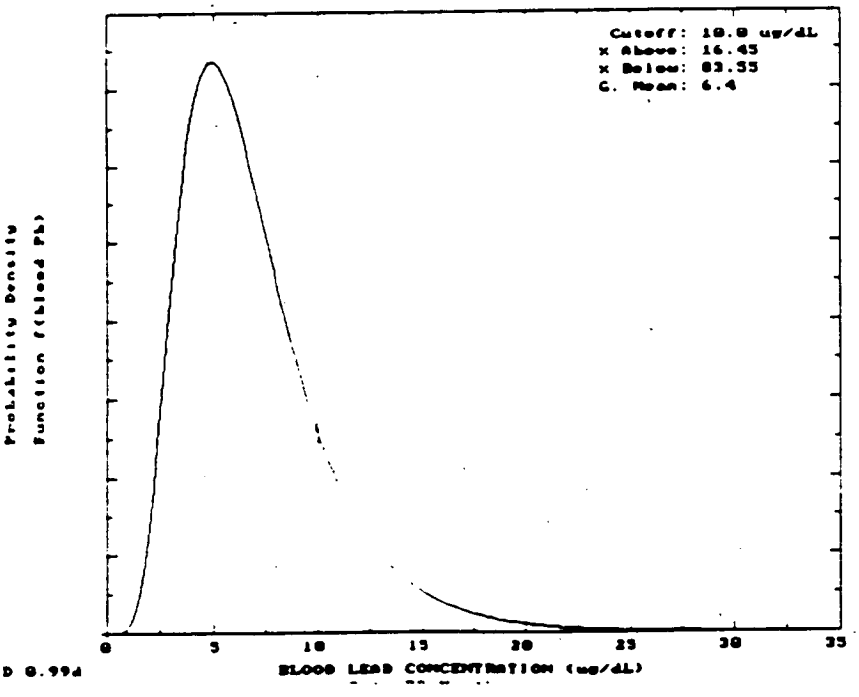
PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	6.8	12.65	9.90
1-2:	7.7	18.72	15.40
2-3:	7.2	19.47	15.71
3-4:	6.9	19.77	16.02
4-5:	5.7	16.15	12.33
5-6:	4.9	15.37	11.26
6-7:	4.4	15.18	10.71

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.39	0.35	0.00	0.02
1-2:	2.45	0.85	0.00	0.03
2-3:	2.80	0.90	0.00	0.06
3-4:	2.75	0.93	0.00	0.07
4-5:	2.75	1.01	0.00	0.07
5-6:	2.94	1.08	0.00	0.09
6-7:	3.27	1.10	0.00	0.09



LEAD 0.99d

RESULTS OF THE USEPA BIOKINETIC UPTAKE MODEL FOR EXPOSURE TO LEAD
SITE 6 - DRMO; ALL SOIL
NSB-NLON, GROTON, CONNECTICUT

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

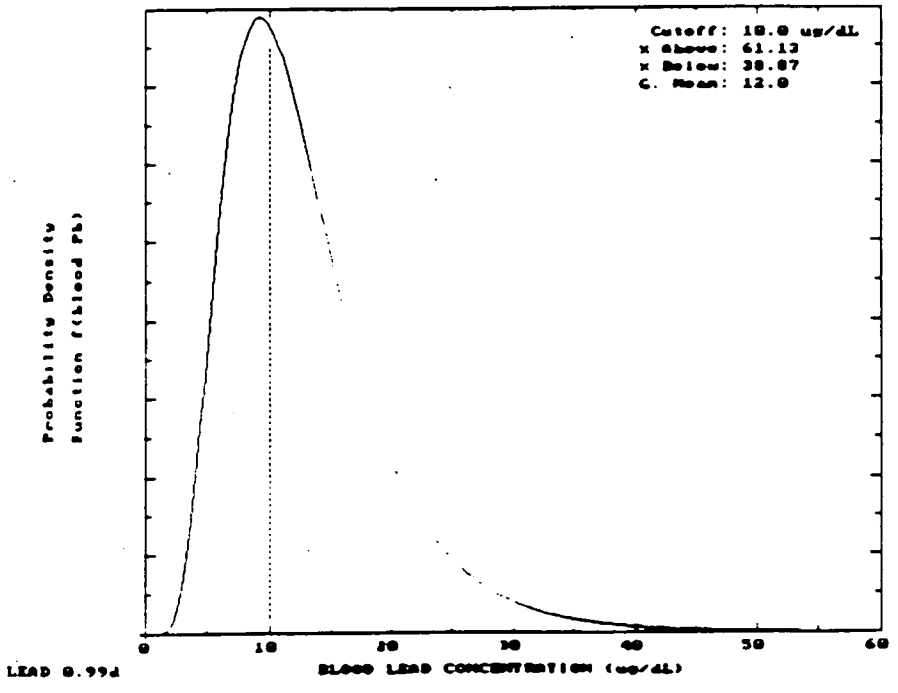
Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	2220.0	200.0
1-2	2220.0	200.0
2-3	2220.0	200.0
3-4	2220.0	200.0
4-5	2220.0	200.0
5-6	2220.0	200.0
6-7	2220.0	200.0

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	12.4	23.78	21.37
1-2:	14.3	35.38	32.52
2-3:	13.5	37.02	33.74
3-4:	13.0	38.25	34.93
4-5:	11.0	31.40	27.90
5-6:	9.3	29.68	25.85
6-7:	8.3	29.00	24.80

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.09	0.30	0.00	0.02
1-2:	2.09	0.72	0.00	0.03
2-3:	2.44	0.78	0.00	0.06
3-4:	2.43	0.82	0.00	0.07
4-5:	2.52	0.92	0.00	0.07
5-6:	2.74	1.00	0.00	0.09
6-7:	3.07	1.03	0.00	0.09