APPENDIX E

ANALYTICAL DATA

1. CAKE DATA

Table E - 1: Inorganics Cake Data (mg/kg)

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
1996	7.70	6.70	1.10	179.10	1191.30	2.04	9.40	40.80	93.50	3.40	769.60
1996	8.70	4.60	0.70	212.00	1155.00	0.10	10.00	48.00	90.00	1.90	790.00
1996	5.30	2.70	0.36	238.60	1260.70	0.70	7.90	42.50	99.30	3.00	828.60
1996	5.60	32.60	0.38	190.80	1042.30	2.10	8.50	34.70	92.70	2.10	788.50
1996	9.50	6.20	0.48	242.90	1042.90	0.02	4.80	38.40	109.50	6.00	852.40
1996	8.40	4.50	0.40	231.20	1016.00	2.00	9.20	36.40	106.40	5.40	808.00
1996	3.70	5.00	0.43	203.50	1104.30	0.10	7.40	44.30	133.50	2.50	1030.40
1996	7.00	6.70	0.59	269.40	1352.90	0.10	17.60	52.90	154.10	5.00	1141.20
1996	7.10	5.50	1.18	242.60	1352.60	0.10	10.00	48.90	138.90	3.60	1215.80
1996	8.30	0.48	0.48	205.20	1133.30	0.60	4.50	32.60	110.50	3.10	976.20
1996	11.10	4.90	0.50	215.00	1090.00	1.80	7.10	41.70	114.00	4.80	950.00
1996	9.20	1.05	0.53	226.80	1252.60	1.40	5.00	36.10	122.10	3.40	1078.90
1996	9.30	8.00	0.50	259.50	1360.00	1.00	4.00	56.00	122.00	5.30	1195.00
1996	8.00	3.20	0.48	226.70	1123.80	1.60	9.50	43.20	99.50	2.80	966.70
1996	6.00	4.90	0.38	209.60	1103.80	1.80	11.90	43.80	83.80	2.40	915.40
1996	6.30	3.90	8.60	269.10	1200.00	0.90	7.00	50.40	110.40	1.60	1039.10
1997	5.40	3.80	0.42	247.50	1108.00	2.00	4.20	46.70	99.20	1.70	962.50
1997	6.00	2.60	9.70	240.90	1187.00	1.60	7.00	45.20	101.30	2.10	987.00
1997	5.50	3.80	0.80	222.50	1116.70	1.70	9.40	40.80	100.00	1.50	950.00
1997	5.00	3.40	2.50	186.00	1156.00	1.60	2.80	42.00	93.60	0.20	972.00
1997	5.90	4.40	6.30	247.50	1220.80	2.00	3.80	45.00	117.10	2.20	1075.00
1997	7.10	2.80	0.43	177.00	921.70	2.20	7.40	29.60	142.60	2.40	747.80
1997	6.70	4.60	0.38	173.10	976.90	1.70	5.40	30.40	126.50	2.20	773.10

Table E-1: Inorganics Cake Data (mg/kg , Continued):

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
1997	8.60	6.70	0.42	212.10	1354.20	1.80	9.60	46.70	129.60	2.10	1012.50
1997	5.70	10.30	1.80	181.50	1130.80	1.90	7.30	42.30	115.40	1.70	976.90
1997	7.70	6.40	3.00	194.30	1100.00	0.10	4.30	44.30	92.20	1.70	865.20
1997	14.70	7.70	3.70	218.70	1380.00	2.90	6.00	66.70	140.00	3.10	1153.30
1997	13.80	5.50	1.90	219.50	1136.80	2.00	16.30	54.20	113.70	1.10	889.50
1997	7.10	5.40	0.53	219.50	1147.40	1.30	15.40	63.20	133.70	2.70	1015.80
1997	10.60	5.10	0.56	183.90	1172.20	2.10	16.70	51.10	119.40	3.40	983.30
1997	7.70	3.90	1.40	166.70	1233.30	2.40	17.50	50.00	116.70	3.00	933.30
1997	9.20	3.60	0.53	145.80	1210.50	0.40	9.20	61.60	106.30	2.90	921.10
1997	8.80	4.40	1.05	150.50	1173.70	1.50	6.50	46.30	108.40	3.00	878.90
1997	6.50	5.70	0.95	182.40	1171.40	0.30	14.30	80.50	155.70	3.30	1000.00
1997	8.50	8.00	0.45	233.60	1104.50	2.20	13.60	63.20	164.50	2.30	940.90
1997	5.20	9.60	0.43	279.10	1104.30	2.80	15.70	60.90	216.50	2.80	1013.00
1997	4.00	12.50	0.48	173.30	1228.60	2.90	12.90	75.70	268.10	2.80	1123.80
1998	9.80	10.00	0.30	256.70	1200.00	2.20	16.70	62.40	210.30	0.60	1048.50
1998	37.20	3.40	0.56	282.80	1472.20	2.20	15.30	72.80	217.80	3.90	1266.70
1998	4.76	5.00	0.70	189.00	1090.50	1.50	14.30	55.70	120.50	2.90	857.10
1998	8.70	2.30	0.43	157.80	1065.20	1.40	8.70	40.90	104.30	2.70	821.70
1998	4.76	1.30	0.48	151.90	1123.80	1.60	12.40	37.60	114.30	2.70	866.70
1998	4.17	4.80	0.42	145.40	1183.30	1.40	7.90	36.50	97.90	2.60	850.00
1998	4.00	2.60	0.40	139.20	1096.00	1.20	6.40	38.60	100.00	3.60	860.00
1998	9.09	2.90	0.45	145.50	1254.50	2.10	12.70	39.50	100.90	3.30	845.50
1998	8.40	4.10	0.40	158.00	1296.00	2.50	11.60	38.40	100.00	2.50	868.00

Table E-1: Inorganics Cake Data (mg/kg, Continued):

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
1998	8.00	3.20	0.48	141.20	1172.00	1.40	16.00	39.60	102.00	2.40	848.00
1998	8.33	1.30	0.42	139.20	1325.00	0.90	6.70	38.80	89.20	2.70	950.00
1998	8.33	4.80	0.42	142.10	1237.50	1.70	13.30	35.00	114.20	4.30	900.00
1998	3.85	3.10	0.38	134.60	1107.70	1.90	8.10	45.80	116.20	2.30	907.70
1998	4.55	4.50	0.45	136.40	1168.20	2.00	12.00	38.90	118.20	2.70	945.50
1998	4.76	2.60	0.48	115.20	1085.70	2.30	11.40	33.30	99.00	2.30	847.60
1998	10.00	1.00	0.50	106.00	1050.00	1.60	13.00	36.00	99.00	2.60	680.00
1998	9.52	0.95	0.48	201.00	1038.00	1.90	13.30	33.80	90.00	0.40	695.20
1998	5.00	4.40	0.50	167.00	1170.00	0.40	11.00	44.50	100.00	0.40	785.00
1998	5.00	4.40	0.50	155.00	1150.00	1.70	15.00	55.00	108.00	1.20	905.00
1998	10.00	3.30	0.50	117.50	1005.00	1.50	9.00	38.00	88.50	3.20	790.00
1998	10.53	2.90	0.53	114.20	947.40	0.80	18.40	63.20	77.90	3.30	689.50
1998	5.26	3.10	0.53	118.40	984.20	0.50	7.70	43.90	58.90	2.50	684.20
1998	4.76	2.70	0.48	152.40	1304.80	0.20	16.20	54.80	82.90	2.60	914.30
1998	11.10	1.11	0.56	175.60	988.90	2.90	6.70	47.80	84.40	3.20	733.30
1999	11.10	3.10	0.56	278.90	1222.20	2.30	55.60	.	75.00	4.20	811.10
1999	10.53	3.20	0.53	146.30	1194.70	0.20	6.30	33.20	105.30	3.70	875.80
1999	11.11	1.11	2.80	166.70	1255.60	1.70	6.70	45.00	111.10	1.30	922.20
1999	9.52	3.00	0.48	123.80	1085.70	1.50	12.40	25.20	53.80	3.20	681.00
1999	10.00	3.90	0.50	123.50	1110.00	2.10	14.00	26.50	40.50	3.00	805.00
1999	10.00	2.00	0.50	100.50	975.00	1.60	11.50	23.30	43.00	4.70	590.00
1999	56.10	1.11	0.56	112.80	1100.00	1.80	15.60	25.60	57.80	4.90	688.90
1999	8.70	4.40	0.43	83.50	708.70	1.40	10.00	18.90	30.40	4.50	639.10

Table E-1: Inorganics Cake Data (mg/kg, Continued):

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
1999	18.30	5.10	3.33	110.00	922.20	1.80	17.20	21.10	28.30	0.40	600.00
1999	27.60	7.10	2.86	132.40	976.20	1.50	11.90	24.80	36.70	3.60	676.20
1999	10.00	9.50	1.00	150.00	1125.00	1.60	11.50	30.00	100.00	1.40	913.50
1999	7.70	6.60	0.91	151.40	1140.90	1.20	20.90	30.00	97.70	1.00	850.00
1999	7.40	5.50	0.87	118.70	1026.10	2.00	16.10	24.60	81.70	0.09	939.10
1999	9.80	3.60	4.20	123.70	1173.70	2.50	7.70	25.00	90.50	3.80	984.20
1999	10.90	2.30	4.10	121.60	1073.70	2.70	10.60	26.60	77.40	3.70	884.20
1999	7.90	4.60	0.17	75.00	1111.10	2.20	11.70	15.60	81.10	3.70	977.80
1999	7.50	4.20	1.05	110.00	926.30	1.10	18.40	27.10	91.10	3.20	802.60
1999	5.60	2.50	1.18	155.30	1229.40	0.90	20.90	35.30	140.60	1.10	958.80
1999	14.70	6.10	3.50	180.00	1428.60	2.40	25.60	43.60	115.70	3.00	1078.60
1999	8.30	2.90	0.95	123.80	981.00	2.00	15.20	29.00	83.30	2.20	795.20
1999	5.10	2.90	7.60	126.20	1019.00	1.50	14.50	17.40	73.80	2.30	842.90
1999	5.10	2.20	1.11	127.20	1005.60	1.40	15.00	28.60	65.00	2.10	827.80
1999	6.20	5.00	10.30	155.90	1194.10	1.50	18.80	39.40	70.60	2.10	958.80
1999	6.25	2.60	1.25	346.30	1306.30	1.80	11.90	54.40	54.40	2.40	1112.50
2000	7.70	1.18	1.18	245.90	1147.10	1.50	14.10	38.50	54.10	2.00	947.10
2000	8.20	1.43	1.43	214.30	1464.30	1.90	15.00	37.10	89.30	2.60	1185.70
2000	5.90	1.00	1.00	175.00	1170.00	1.30	13.50	28.30	55.00	2.30	1050.00
2000	.	0.91	0.91	156.80	1181.80	2.00	14.50	25.00	65.90	1.90	1045.50
2000	7.90	3.20	0.91	167.30	1040.90	1.80	11.40	32.60	63.60	2.10	900.00
2000	7.90	2.70	1.40	159.10	1159.10	4.40	9.10	31.60	187.30	2.00	1059.10
2000	7.20	4.00	0.95	126.20	1114.30	2.50	12.40	38.60	76.20	5.50	1057.10

Table E-1: Inorganics Cake Data (mg/kg, Continued):

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
2000	6.50	2.90	0.83	116.70	1129.20	2.10	13.80	35.80	87.50	1.60	1000.00
2000	8.20	2.40	1.05	107.90	1084.20	2.40	8.90	31.30	86.80	3.50	1057.90
2000	8.80	0.91	0.91	110.90	927.30	1.90	3.60	31.80	80.90	3.30	913.60
2000	9.50	1.00	1.00	106.00	1040.00	1.90	3.80	34.50	92.00	2.70	1025.00
2000	8.71	0.95	0.95	120.00	1228.57	2.22	9.52	37.62	90.00	1.90	928.57
2000	10.11	1.05	1.05	130.53	1242.11	2.10	12.63	42.63	77.89	2.37	994.74
2000	8.81	9.52	4.76	160.00	1076.19	2.11	16.67	44.10	85.71	2.19	942.86
2000	7.81	7.69	3.85	125.00	1003.85	1.57	13.85	31.15	80.77	2.23	865.38
2000	7.90	10.00	5.00	143.00	995.00	2.01	8.50	35.40	94.50	5.90	970.00
2000	8.00	11.11	5.56	135.56	1027.78	1.81	2.22	31.11	93.89	2.39	961.11
2000	7.16	10.53	5.26	141.05	1073.68	nv	8.42	31.58	85.79	5.37	866.32
2000	13.50	12.50	6.25	166.88	1337.50	nv	10.00	35.63	77.50	7.06	931.25
2000	5.24	11.76	5.88	152.35	1094.12	nv	8.24	31.76	78.24	3.94	935.29
2000	5.59	11.76	5.88	140.59	1176.47	nv	8.82	32.94	43.53	4.12	994.12
2000	8.17	11.11	5.56	121.11	1111.11	nv	11.11	30.56	70.56	3.39	966.67
2000	5.15	10.00	5.00	117.50	1045.00	nv	11.00	27.00	61.00	3.25	860.00
2001	6.60	10.53	5.26	252.10	1094.70	2.10	5.30	38.90	63.20	2.60	731.60
2001	4.70	11.11	5.56	173.30	1127.80	2.70	11.10	32.80	75.00	1.60	744.40
2001	4.30	9.09	4.55	133.60	1100.00	1.80	0.60	28.60	66.80	3.10	863.60
2001	7.40	9.09	4.55	147.30	1086.40	1.70	8.60	26.40	74.50	2.60	822.70
2001	5.80	9.52	4.76	156.20	1047.60	2.10	10.00	26.70	61.40	2.10	819.00
2001	6.50	9.09	4.55	117.30	1077.30	1.50	10.50	25.50	60.00	1.20	868.20
2001	6.00	9.09	4.55	150.90	995.50	2.20	6.40	29.50	71.40	2.70	763.60

Table E-1: Inorganics Cake Data (mg/kg, Continued):

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
2001	5.70	9.52	4.76	137.10	1052.40	1.60	5.20	31.90	74.80	2.30	819.00
2001	6.10	8.00	4.00	103.20	1028.00	1.40	10.80	22.80	48.80	2.30	692.00
2001	8.80	10.00	5.00	133.00	1285.00	2.50	9.50	27.00	82.50	2.30	910.00
2001	6.10	4.00	4.00	102.40	1016.00	1.90	14.80	22.80	70.00	4.80	764.00
2001	5.90	5.26	5.26	168.90	1042.10	2.10	14.70	31.10	68.90	4.50	852.60
2001	5.10	4.76	4.76	143.30	852.40	2.20	11.90	29.00	73.80	0.60	971.40
2001	5.30	5.00	5.00	120.50	870.00	2.20	12.00	24.50	71.50	0.60	970.00
2001	5.70	5.88	5.88	159.40	1511.80	2.10	20.60	32.40	91.80	5.50	1235.30
2001	3.60	4.76	4.76	91.40	1066.70	5.00	14.80	26.70	75.70	5.00	804.80
2001	3.50	7.14	7.14	95.00	1150.00	3.90	11.40	111.40	48.60	3.50	878.60
2001	3.60	5.56	5.56	98.90	1183.30	2.10	18.90	71.10	78.30	4.10	894.40
2001	2.20	4.76	4.76	111.90	1081.00	1.40	10.50	49.50	73.30	2.00	883.30
2001	4.90	5.26	5.26	112.60	1142.10	5.10	11.10	41.60	83.20	3.40	884.20
2001	3.20	5.00	5.00	107.00	1060.00	1.50	11.00	76.50	71.50	3.90	850.00
2001	3.00	4.55	4.55	133.20	1050.00	1.60	12.30	45.50	70.90	3.90	822.70
2001	3.90	2.80	3.80	102.90	1076.50	2.00	12.40	29.40	67.60	3.50	882.40
2001	3.80	2.30	3.40	168.40	994.70	2.00	12.10	26.80	57.40	3.80	810.50
2002	3.30	2.20	4.40	209.40	1276.50	0.70	18.80	30.60	61.20	3.10	958.80
2002	2.90	2.60	4.10	146.20	1304.80	0.80	19.00	27.60	63.30	3.00	990.50
2002	2.80	2.30	6.10	100.00	1155.60	1.30	18.30	48.30	55.00	3.20	944.40
2002	3.30	2.00	6.10	110.60	1044.40	1.80	15.00	43.90	53.30	3.00	833.30
2002	3.90	3.10	5.70	96.00	1250.00	1.00	15.40	32.90	66.00	1.80	730.00
2002	3.40	3.10	5.60	92.10	1273.70	1.90	15.40	28.20	61.60	2.50	700.00

Table E-1: Inorganics Cake Data (mg/kg, Continued):

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
2002	26.70	2.60	5.70	82.50	1070.80	0.70	12.10	21.60	56.30	2.00	608.30
2002	3.60	2.80	5.60	95.00	1168.20	0.90	13.50	23.30	63.60	3.40	704.50
2002	3.40	2.80	5.30	151.70	1120.80	1.30	12.90	26.00	67.50	5.30	716.70
2002	4.00	2.80	5.40	133.90	1200.00	1.00	13.10	25.00	68.70	4.70	747.80
2002	2.20	1.70	3.90	98.30	845.80	1.10	14.00	16.60	54.20	3.00	533.30
2002	3.10	2.80	5.00	145.20	1282.60	1.40	18.50	25.50	84.30	3.80	769.60
2002	6.50	2.10	5.00	118.00	1080.00	0.50	13.00	21.60	72.00	4.40	665.00
2002	6.10	2.70	5.50	105.70	1247.60	0.40	15.00	22.00	83.30	4.50	790.50
2002	3.70	3.40	4.70	87.80	1250.00	0.80	18.20	22.70	73.30	3.70	822.20
2002	3.70	2.70	4.20	108.90	1126.30	1.00	17.10	25.40	70.50	3.90	736.80
2002	4.20	3.20	4.20	107.60	1235.30	1.30	18.20	27.20	82.40	3.90	829.40
2002	4.20	3.10	4.00	101.20	1247.10	1.30	19.90	27.40	75.90	3.60	829.40
2002	4.10	3.10	6.90	99.30	1333.30	1.10	21.20	29.00	77.30	5.10	933.30
2002	4.30	2.60	7.00	117.30	1200.00	1.20	18.00	29.70	73.30	4.50	873.30
2002	3.60	2.90	5.70	120.00	1205.60	1.00	14.00	27.90	61.70	5.30	816.70
2002	3.10	2.50	5.60	117.90	1163.20	0.90	13.30	25.40	54.70	5.10	805.30
2003	3.70	2.80	6.80	111.20	1241.20	1.20	12.90	27.50	64.10	5.20	905.90
2003	3.80	2.40	5.90	98.80	1262.50	1.00	13.60	28.40	56.50	5.10	931.30
2003	3.90	2.80	5.10	99.50	1257.90	1.40	12.50	25.80	60.50	1.90	894.70
2003	3.90	2.80	4.90	106.90	1250.00	1.10	11.60	27.60	65.00	2.90	868.80
2003	2.90	3.00	4.40	139.40	1194.10	0.70	10.80	24.80	60.60	1.60	811.80
2003	3.70	3.10	5.10	150.60	1233.30	0.60	10.70	26.40	71.10	1.70	872.20
2003	27.50	2.70	4.40	117.50	1180.00	0.60	9.70	24.00	61.50	1.80	840.00

Table E-1: Inorganics Cake Data (mg/kg, Continued):

Year	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
2003	2.70	3.00	4.70	109.50	1185.70	0.80	10.00	22.90	61.90	3.10	852.40
2003	3.00	3.20	4.70	115.40	1216.70	1.00	9.40	22.60	65.00	3.00	783.30
2003	2.80	2.70	4.50	110.00	1108.00	1.10	8.80	20.50	72.40	2.80	748.00
2003	4.20	2.50	4.70	94.50	1095.50	1.40	2.90	21.90	66.80	1.30	772.70
2003	4.30	2.70	4.90	93.30	1158.30	1.20	4.80	22.90	67.10	2.00	762.50
2003	3.60	2.40	5.60	111.70	1183.30	1.10	10.20	29.40	69.30	3.20	801.70
2003	3.40	2.50	4.90	103.50	1160.00	1.50	11.10	25.90	66.50	2.20	705.00
2003	2.10	2.10	4.90	98.80	1193.80	2.00	13.30	25.40	69.40	2.40	793.80
2003	2.30	2.20	4.60	121.10	1122.20	1.30	12.70	29.80	77.80	2.20	772.20
2003	3.00	2.60	4.00	151.90	1181.30	1.20	8.40	24.30	61.20	2.20	737.50
2003	2.30	2.30	3.40	99.20	1019.20	1.70	8.00	22.70	79.20	1.60	588.50
2003	2.10	2.40	4.50	113.50	1121.70	1.00	10.30	25.30	59.10	2.50	682.60
2003	5.50	2.30	4.50	90.00	1064.30	1.00	8.30	22.90	57.30	3.10	597.10

Table E - 2: Organics Cake Data (ng/kg)

Date	PCDD/F TEQ	Total PCB
28-Jul-99	14.9	
28-Oct-99	9.3	
4-Oct-00	11.3	165.45
20-Jun-01	15	
2002	5.11	

2. PELLET DATA

Table E - 3: Inorganics Pellet Data

	As	Cd	Co	Cr	Cu	Hg	Mo	Ni	Pb	Se	Zn
14-Jun-01	4.60	<1.05	<3.2	111.00	1077.00	0.66	7.90	25.30	69.00	1.35	865.00
19-Jun-01	5.10	<1.04	12.00	145.00	1175.00	0.70	7.30	25.70	74.80	0.53	910.00
30-May-02	4.8	<0.86	<4.3	172	1060	1.2	12.7	50.1	77.7	1.3	872
14-Jun-02	4.6	<1.05	<3.2	111	1077	0.66	7.9	25.3	69	1.35	865
19-Jun-02	5.1	<1.04	12	145	1175	0.7	7.3	25.7	74.8	0.53	910
15-Sep-02	2.52	2.95	3.6	85.1	1288	1.2	16.8	22.5	67.7	<0.15	1020
30-Sep-02	2.74	3.1	3.7	115	1241	1.17	17.4	26.4	76.8	<0.31	702
15-Oct-02	0.72	3.87	<5.4	119.4	1399	1.22	18.9	31.1	92	0.08	871
30-Oct-02	0.92	3.46	<5.7	109	1417	0.14	20.8	27.8	80.5	0.01	884
15-Nov-02	1.31	2.9	5.7	97.7	1346	1.33	18.9	27.3	76.2	<.3	894
30-Nov-02	1.02	3.1	5.9	119.9	1293	1.01	16.3	28.1	74.1	<0.29	840
15-Dec-02	1.12	2.9	6	131.8	1336	0.79	14.3	27.1	60.7	<0.28	873
31-Dec-02	0.99	3	4.9	117.1	1264	2.63	15	26	61.3	<0.28	782
15-Jan-03	1.80	2.90	6.70	120.90	1400.50	0.90	14.80	26.80	63.30	0.29	947.20
3-Feb-03	1.20	2.80	4.80	92.00	1308.00	1.20	14.60	23.10	57.80	0.27	935.00
21-Feb-03	2.40	3.20	4.20	114.10	1399.70	0.80	13.00	26.00	62.10	0.26	876.20

3. CALCULATIONS

Landfill Top Dressing Calculation

It was assumed that a mixture of pellets, straw, and sand would be applied to the top of landfill soil.

Equation 1

$$r_{bulk} = \frac{m_{total}}{\left[\left(\frac{m_{straw}}{r_{straw}}\right)+\left(\frac{m_{pellets}}{r_{pellets}}\right)+\left(\frac{m_{sand}}{r_{sand}}\right)\right]}$$

Where:

ρ_{bulk}	=	Bulk density of mixture (kg/m^3)
m_{total}	=	Total mass of straw/pellets/sand in mixture (kg)
m_{straw}	=	Straw mass in mixture (kg)
$m_{pellets}$	=	Pellet mass in mixture (kg)
m_{sand}	=	Sand mass in mixture (kg)
ρ_{straw}	=	Straw density (kg/m^3)
$\rho_{pellets}$	=	Pellet density (kg/m^3)
ρ_{sand}	=	Sand density (kg/m^3)

Equation 2

$$Loading_m = r_{bulk} \times AR$$

Where:

$Loading_m$	=	Loading of mixture per hectare (kg/ha)
ρ_{bulk}	=	Bulk density of mixture (kg/m^3)
AR	=	Application Rate of mixture (m^3/ha) = 1500 m^3/ha

Equation 3

$$D_{pellets} = \frac{m_{pellets}}{V_{total}}$$

Where:

$D_{pellets}$	=	Pellet mass in 1 m^3 of mixture (kg/m^3), i.e. “density” of pellets in mixture
$m_{pellets}$	=	Pellet mass in mixture (kg)
V_{total}	=	Volume of straw/pellets/sand in mixture (m^3)

Equation 4

$$PAR = D_{pellets} \times AR$$

Where:

PAR	=	Pellet Application Rate (kg/ha)
$D_{pellets}$	=	Pellet mass in 1 m^3 of mixture (kg/m^3), i.e. "density" of pellets in mixture
AR	=	Application Rate of mixture (m^3/ha) = 1500 m^3/ha

Equation 5

$$DPAR = 0.9 \times PAR$$

Where:

DPAR	=	Dry Pellet Application Rate (kg/ha)
0.9	=	Fraction of dry material in pellet (unitless)
PAR	=	Pellet Application Rate (kg/ha)

Equation 6

$$Loading_i = C_i \times DPAR$$

Where:

$Loading_i$	=	Loading of i^{th} CoC per hectare (mg/ha)
C_i	=	Concentration of i^{th} CoC in each pellet (mg/kg)
DPAR	=	Dry Pellet Application Rate (kg/ha)

Equation 7

$$TDSC_i = \frac{Loading_i}{Loading_m}$$

Where:

$TDSC_i$	=	Top Dressing Soil Concentration of i^{th} CoC (mg/kg)
$Loading_i$	=	Loading of i^{th} CoC per hectare (mg/ha)
$Loading_m$	=	Loading of mixture per hectare (kg/ha)

Sample Calculation: Molybdenum

The following makeup of the straw/pellets/sand mixture was assumed:

Material	Density (kg/m^3)	Mass (kg)	Volume (m^3)
Straw	100	200	2.00
Pellets	630	100	0.16
Sand	1500	2000	1.33
Total		2300	3.49

From this information and Equation 1, the bulk density may be calculated as follows:

$$r_{bulk} = \frac{2300\,kg}{\left[\left(\frac{200\,kg}{100\,kg/m^3}\right)+\left(\frac{100\,kg}{630\,kg/m^3}\right)+\left(\frac{2000\,kg}{1500\,kg/m^3}\right)\right]} = 659\,kg/m^3$$

From Equation 2, the loading of total mixture per hectare can be calculated, assuming an application rate of 1500 m3/ha:

$$Loading_m = 659\,kg/m^3 \times 1500\,m^3/ha = 987955\,kg/ha$$

From Equation 3, the mass of pellets per m3 of mixture can be calculated:

$$D_{pellets} = \frac{100\,kg}{3.49\,m^3} = 29\,kg/m^3$$

This quantity may be used in Equation 4 to calculate the pellet application rate:

$$PAR = 29\,kg/m^3 \times 1500\,m^3/ha = 42955\,kg/ha$$

The dry pellet application rate may then be calculated using Equation 5:

$$DPAR = 0.9 \times 42955\, kg/ha = 38659\, kg/ha$$

Using this result, the 95% UCLM pellet concentration of molybdenum, 12.68 mg/kg, and Equation 6, the loading of molybdenum may then be calculated:

$$Loading_{Mo} = 12.68\, mg/kg \times 38659\, kg/ha = 490304\, mg/ha$$

Finally, the top dressing soil concentration of molybdenum may be calculated Equation 7 and the results of Equation 2 and Equation 6:

$$TDSC_{Mo} = \frac{490304\, mg/ha}{987955\, kg/ha} = 0.50\, mg/kg$$

Amended Soil Concentration

Equation 8

$$Loading_i = C_i^p \times AR$$

Where:

$Loading_i$	=	Loading of i^{th} CoC per hectare (mg/ha)
C_i^p	=	Concentration of i^{th} CoC in pellets (mg/kg)
AR	=	Application Rate (kg/ha) = 5400 kg/ha

Equation 9

$$C_i^1 = \left[\frac{Loading_i}{V_{soil} \times r_{bulk}}\right] + OTR_i$$

Where:

C_i^1	=	Concentration of ith CoC in soil after 1 year (mg/kg)
$Loading_i$	=	Loading of ith CoC per hectare (mg/ha)
V_{soil}	=	Volume of affected soil (m^3/ha) = 500 m^3/ha
ρ_{bulk}	=	Bulk density of soil (kg/m^3) = 1330 kg/m^3
OTR_i		Ontario Typical Range concentration of ith CoC in soil (mg/kg)

Equation 10

$$C_i^{10} = 10 \times \left[\frac{Loading_i}{V_{soil} \times r_{bulk}} \right] + OTR_i$$

Where:

C_i^{10}	=	Concentration of ith CoC in soil after 10 years (mg/kg)
$Loading_i$	=	Loading of ith CoC per hectare (mg/ha)
V_{soil}	=	Volume of affected soil (m^3/ha) = 500 m^3/ha
ρ_{bulk}	=	Bulk density of soil (kg/m^3) = 1330 kg/m^3
OTR_i		Ontario Typical Range concentration of ith CoC in soil (mg/kg)

Equation 11

$$C_i^{25} = 25 \times \left[\frac{Loading_i}{V_{soil} \times r_{bulk}} \right] + OTR_i$$

Where:

Ci25	=	Concentration of ith CoC in soil after 25 years (mg/kg)
$Loading_i$	=	Loading of ith CoC per hectare (mg/ha)
Vsoil	=	Volume of affected soil (m3/ha) = 500 m^3/ha
?$_{bulk}$	=	Bulk density of soil (kg/m3) = 1330 kg/m^3
OTR_i		Ontario Typical Range concentration of ith CoC in soil (mg/kg)

Sample Calculation: Lead

The lead loading may be calculated using its 95% UCLM pellet concentration, 92.93 mg/kg, the application rate of the pellets, which is assumed to be 5400 kg/ha, and Equation 8:

$$Loading_i = 92.93\,mg/kg \times 5400\,kg/ha = 501805\,mg/ha$$

After 1 year of application, the lead concentration in soil may be calculated using

Equation 9. The volume of affected soil was assumed to be 500 m3, the soil bulk density was assumed to be 1330 kg/m3, and the Ontario Typical Range concentration of lead in soil is 35 mg/kg.

$$C_i^1 = \left[\frac{501805\,mg/ha}{500\,m^3/ha \times 1330\,kg/m^3}\right] + 35\,mg/kg = 35.75\,mg/kg$$

Similarly, Equation 10 may be used to calculate the lead concentration in soil after 10 years of pellet application:

$$C_i^{10} = 10 \times \left[\frac{501805\,mg/ha}{500\,m^3/ha \times 1330\,kg/m^3}\right] + 35\,mg/kg = 42.55\,mg/kg$$

Finally, and in the same way, Equation 11 may be used to calculate the lead concentration in soil after 25 years of pellet application:

$$C_i^{25} = 25 \times \left[\frac{501805\,mg/ha}{500\,m^3/ha \times 1330\,kg/m^3}\right] + 35\,mg/kg = 53.86\,mg/kg$$

Table E - 4: Soil Vapour Calculation (Dioxins/Furans)

Csa	Concentration in soil-air	g/m^3	8.5E-17	$C_{sa}=C_w$ (H/RT)
H	Henry's Law Constant	$Pa.m^3/mol$	1.00E+04	H=Vp/S
R	universal gas constant	$m^3Pa/mol.K$	8.314	constant
T	soil temperature	K	280	US EPA (2003): User's Guide for Evaluating Subsurface Vapor Intrusion Into Buildings.
Cw	aqueous concentration in soil layer	g/m^3	1.97E-17	Cw=Cs/Kd
Vp	vapour pressure	Pa	8.72E-06	only need if no H value
S	water solubility	mol/m^3	8.68E-10	
	water solubility	mg/L	4.00E-07	only need if no H value
MW	molecular weight	g/mol	4.61E+02	only need if no H value
Cs	Concentration in soil	g/g	4.73E-12	
Kd	sorption partition coefficient	m^3/g	2.40E+05	Kd=Koc.foc
Koc	organic carbon partition coefficient	m^3/g	2.40E+07	(not a log)
foc	fraction of organic carbon in soil	g/g	0.01	default (AERIS, CCME 1990)
Ca	concentration in air at breathing zone	g/m^3	4.25E-18	Ca=Csa.dm/hb
dm	depth of soil mixing zone	m	0.05	assumed
hb	height of breathing zone	m	1	assumed

Based on OCDD

Table E - 5: Soil Vapour Calculation (PCBs)

Csa	Concentration in soil-air	g/m^3	1.3E-12	Csa=Cw (H/RT)
H	Henry's Law Constant	$Pa.m^3/mol$	55.588	H=Vp/S
R	universal gas constant	$m^3Pa/mol.K$	8.314	constant
T	soil temperature	K	280	US EPA (2003): User's Guide for Evaluating Subsurface Vapor Intrusion Into Buildings.
Cw	aqueous concentration in soil layer	g/m^3	5.40E-11	Cw=Cs/Kd
Vp	vapour pressure	Pa	1.20	only need if no H value
S	water solubility	mol/m^3	2.16E-02	
	water solubility	mg/L	4.08	only need if no H value
MW	molecular weight	g/mol	1.89E+02	only need if no H value
Cs	Concentration in soil	g/g	1.05E-08	
Kd	sorption partition coefficient	m^3/g	1.95E+02	Kd=Koc.foc
Koc	organic carbon partition coefficient	m^3/g	1.95E+04	(not a log)
foc	fraction of organic carbon in soil	g/g	0.01	default (AERIS, CCME 1990)
Ca	concentration in air at breathing zone	g/m^3	6.45E-14	Ca=Csa.dm/hb
dm	depth of soil mixing zone	m	0.05	assumed
hb	height of breathing zone	m	1	assumed

Based on 1-Cl isomers

4. EXPOSURE ASSESSMENT AND RISK EVALUATION CALCULATIONS

Non-Carcinogenic Worksheet: Arsenic

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Arsenic
Soil Concentration (5cm depth) (mg/kg)	4.1E+00
Pellet Concentration (mg/kg)	8.1E+00
Landfill Application soil Concentration (mg/kg)	3.2E-01
AF.s Dermal Soil absorption factor (unitless)	0.03
Bioavailability In Soil (unitless)	0.24
Bioavailability In Food (unitless)	0.7
Bioavailability In Water (unitless)	1
Oral T.R.V (mg/kg-d)	3.00E-04
Soil Concentration (15 cm depth) (mg/kg)	3.0E+00
Plant Bioconcentration Factor (fruit)	0.006
Plant Bioconcentration Factor (rootveg)	0.006
Plant Bioconcentration Factor (veg)	0.059
Fruit Concentration (mg/kg)	3.4E-03
Root Vegetable Concentration (mg/kg)	3.4E-03
Other Vegetable Concentration (mg/kg)	3.3E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential

Non Carcinogenic Dose (mg/kg-d)

	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	4.0E-06	4.6E-08	NA	NA	4.3E-06	1.1E-06	9.5E-06	3E-02	No
Adult	1.4E-07	4.7E-08	NA	NA	2.0E-06	2.5E-07	2.5E-06	8E-03	No

Recreational

Non Carcinogenic Dose (mg/kg-d)

	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	8.3E-06	4.5E-08	NA	NA	NA	NA	8.4E-06	3E-02	No
Adult Golfer	1.6E-07	8.2E-08	NA	NA	NA	NA	2.4E-07	8E-04	No

City Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	1.4E-06	6.1E-08	NA	NA	NA	NA	1.4E-06	5E-03	No

Landfill Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	5.3E-08	4.8E-09	NA	NA	NA	NA	5.8E-08	2E-04	No

Cancer Worksheet Target Risk 10^{-5}: Arsenic

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Arsenic
Soil Concentration (5cm depth) (mg/kg)	4.1E+00
Pellet Concentration (mg/kg)	8.1E+00
Landfill Application soil Concentration (mg/kg)	3.2E-01
AF.s Dermal Soil absorption factor (unitless)	0.03
Oral Slope Factor (mg/kg-d)-1	1.50E+00
Bioavailability In Soil (unitless)	0.24
Bioavailability In Food (unitless)	0.7
Bioavailability In Water (unitless)	1
Soil Concentration (15 cm depth) (mg/kg)	3.0E+00
Plant Bioconcentration Factor (fruit)	0.006
Plant Bioconcentration Factor (rootveg)	0.006
Plant Bioconcentration Factor (veg)	0.059
Fruit Concentration (mg/kg)	3.4E-03
Root Vegetable Concentration (mg/kg)	3.4E-03
Other Vegetable Concentration (mg/kg)	3.3E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	
Exposure Limit (mg/kg-day)	6.67E-06

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Residential	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Composite Adult	4.1E-07	4.4E-08	NA	NA	2.4E-06	3.4E-07	3.1E-06	5E-01	No

Parkland	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Composite Adult	4.2E-07	3.3E-08	NA	NA	NA	NA	4.5E-07	7E-02	No
Adult Golfer	1.1E-07	6.0E-08	NA	NA	NA	NA	1.8E-07	3E-02	No

City Worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	5.5E-07	2.5E-08	NA	NA	NA	NA	5.7E-07	9E-02	No

Landfill worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	2.1E-08	1.9E-09	NA	NA	NA	NA	2.3E-08	3E-03	No

Cancer Worksheet Target Risk 10^{-6}: Arsenic

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Arsenic
Soil Concentration (5cm depth) (mg/kg)	4.1E+00
Pellet Concentration (mg/kg)	8.1E+00
Landfill Application soil Concentration (mg/kg)	3.2E-01
AF.s Dermal Soil absorption factor (unitless)	0.03
Oral Slope Factor (mg/kg-d)-1	1.50E+00
Bioavailability In Soil (unitless)	0.24
Bioavailability In Food (unitless)	0.7
Bioavailability In Water (unitless)	1
Soil Concentration (15 cm depth) (mg/kg)	3.0E+00
Plant Bioconcentration Factor (fruit)	0.006
Plant Bioconcentration Factor (rootveg)	0.006
Plant Bioconcentration Factor (veg)	0.059
Fruit Concentration (mg/kg)	3.4E-03
Root Vegetable Concentration (mg/kg)	3.4E-03
Other Vegetable Concentration (mg/kg)	3.3E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	
Exposure Limit (mg/kg-day)	6.67E-07

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Residential	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Composite Adult	4.1E-07	4.4E-08	NA	NA	2.4E-06	3.4E-07	3.1E-06	5E+00	Yes

Parkland	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Composite Adult	4.2E-07	3.3E-08	NA	NA	NA	NA	4.5E-07	7E-01	No
Adult Golfer	1.1E-07	6.0E-08	NA	NA	NA	NA	1.8E-07	3E-01	No

City Worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	5.5E-07	2.5E-08	NA	NA	NA	NA	5.7E-07	9E-01	No

Landfill worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	2.1E-08	1.9E-09	NA	NA	NA	NA	2.3E-08	3E-02	No

Inhalation Cancer Worksheet Target Risk 10^{-5}: Arsenic

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Arsenic
Soil Concentration (5cm depth) (mg/kg)	4.1E+00
Soil Concentration (15cm depth) (mg/kg)	3.0E+00
Pellet concentration (mg/kg)	8.1E+00
Landfill soil concentration (mg/kg)	3.2E-01
Estimated Vapour Concentration (mg/m3)	
Inhalation Unit Risk (mg/m3)-1	4.30E+00
Inhalation Exposure Limit (mg/m3)	2.33E-06
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	2.7E-08	1E-02	NA	NA	1E-02	No

Parkland Non Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	1.9E-08	8E-03	NA	NA	8E-03	No
Adult Golfer	5.1E-08	2E-02	NA	NA	2E-02	No

City Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	1.0E-07	4E-02	NA	NA	4E-02	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	8.1E-09	3E-03	NA	NA	3E-03	No

Inhalation Cancer Worksheet Target Risk 10^{-6} : Arsenic

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Arsenic
Soil Concentration (5cm depth) (mg/kg)	4.1E+00
Soil Concentration (15cm depth) (mg/kg)	3.0E+00
Pellet concentration (mg/kg)	8.1E+00
Landfill soil concentration (mg/kg)	3.2E-01
Estimated Vapour Concentration (mg/m3)	
Inhalation Unit Risk (mg/m3)-1	4.30E+00
Inhalation Exposure Limit (mg/m3)	2.33E-07
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	2.7E-08	1E-01	NA	NA	1E-01	No

Parkland Non Carcinogenic	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	1.9E-08	8E-02	NA	NA	8E-02	No
Adult Golfer	5.1E-08	2E-01	NA	NA	2E-01	No

City Worker Non Carcinogenic Dose (mg/kg-d)	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	1.0E-07	4E-01	NA	NA	4E-01	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	8.1E-09	3E-02	NA	NA	3E-02	No

Non-Carcinogenic Worksheet: Cadmium

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Cadmium
Soil Concentration (5cm depth) (mg/kg)	1.3E+00
Pellet Concentration (mg/kg)	5.1E+00
Landfill Application soil Concentration (mg/kg)	2.0E-01
AF.s Dermal Soil absorption factor (unitless)	0.14
Oral T.R.V (mg/kg-d)	5.00E-04
Soil Concentration (15 cm depth) (mg/kg)	6.5E-01
Plant Bioconcentration Factor (fruit)	0.15
Plant Bioconcentration Factor (rootveg)	0.15
Plant Bioconcentration Factor (veg)	0.75
Fruit Concentration (mg/kg)	1.8E-02
Root Vegetable Concentration (mg/kg)	1.8E-02
Other Vegetable Concentration (mg/kg)	9.2E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	7.2E-06	7.0E-08	NA	NA	2.0E-05	8.4E-06	3.5E-05	7E-02	No
Adult	1.7E-07	6.5E-08	NA	NA	9.1E-06	1.9E-06	1.1E-05	2E-02	No

Recreational

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	7.2E-06	7.0E-08	NA	NA	NA	NA	7.3E-06	1E-02	No
Adult Golfer	2.2E-07	1.3E-07	NA	NA	NA	NA	3.4E-07	7E-04	No

City Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	3.6E-06	1.8E-07	NA	NA	NA	NA	3.7E-06	7E-03	No

Landfill Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	1.4E-07	1.4E-08	NA	NA	NA	NA	1.5E-07	3E-04	No

Inhalation Cancer Target Risk 10^{-5}: Cadmium

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Cadmium
Soil Concentration (5cm depth) (mg/kg)	1.3E+00
Soil Concentration (15cm depth) (mg/kg)	6.5E-01
Pellet concentration (mg/kg)	5.1E+00
Landfill soil concentration (mg/kg)	2.0E-01
Estimated Vapour Concentration (mg/m3)	
Inhalation Unit Risk (mg/m3)-1	9.80E+00
Inhalation Exposure Limit (mg/m3)	1.02E-06
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	8.3E-09	8E-03	NA	NA	8E-03	No

Parkland Non Carcinogenic	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	6.6E-09	6E-03	NA	NA	6E-03	No
Adult Golfer	1.7E-08	2E-02	NA	NA	2E-02	No

City Worker Non Carcinogenic Dose (mg/kg-d)	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	6.5E-08	6E-02	NA	NA	6E-02	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	5.1E-09	5E-03	NA	NA	5E-03	No

Inhalation Cancer Target Risk 10^{-6}: Cadmium

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Cadmium
Soil Concentration (5cm depth) (mg/kg)	1.3E+00
Soil Concentration (15cm depth) (mg/kg)	6.5E-01
Pellet concentration (mg/kg)	5.1E+00
Landfill soil concentration (mg/kg)	2.0E-01
Estimated Vapour Concentration (mg/m3)	
Inhalation Unit Risk (mg/m3)-1	9.80E+00
Inhalation Exposure Limit (mg/m3)	1.02E-07
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	8.3E-09	8E-02	NA	NA	8E-02	No

Parkland Non Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	6.6E-09	6E-02	NA	NA	6E-02	No
Adult Golfer	1.7E-08	2E-01	NA	NA	2E-01	No

City Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	6.5E-08	6E-01	NA	NA	6E-01	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	5.1E-09	5E-02	NA	NA	5E-02	No

Non-Carcinogenic Worksheet: Cobalt

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Cobalt
Soil Concentration (5cm depth) (mg/kg)	8.4E+00
Pellet Concentration (mg/kg)	3.3E+00
Landfill Application soil Concentration (mg/kg)	1.3E-01
AF.s Dermal Soil absorption factor (unitless)	0.1
Oral T.R.V (mg/kg-d)	2.00E-02
Bioavailability in Soil (unitless)	3.00E-03
Soil Concentration (15 cm depth) (mg/kg)	7.9E+00
Plant Bioconcentration Factor (fruit)	0.007
Plant Bioconcentration Factor (rootveg)	0.007
Plant Bioconcentration Factor (veg)	0.02
Fruit Concentration (mg/kg)	1.1E-02
Root Vegetable Concentration (mg/kg)	1.1E-02
Other Vegetable Concentration (mg/kg)	3.0E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential
Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	7.6E-08	3.1E-07	NA	NA	7.6E-06	4.8E-06	1.3E-05	6E-04	No
Adult	3.9E-09	3.5E-07	NA	NA	3.4E-06	1.1E-06	4.9E-06	2E-04	No

Recreational
Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	7.6E-08	3.1E-07	NA	NA	NA	NA	3.9E-07	2E-05	No
Adult Golfer	4.0E-09	5.7E-07	NA	NA	NA	NA	5.7E-07	3E-05	No

City Worker
Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	6.9E-09	8.3E-08	NA	NA	NA	NA	9.0E-08	4E-06	No

Landfill Worker
Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	2.7E-10	6.5E-09	NA	NA	NA	NA	6.7E-09	3E-07	No

Land Use	
Receptors	Resident, Park User, City Worker
Contaminant of Concern	Cobalt
Soil Concentration (5cm depth) (mg/kg)	8.4E+00
Soil Concentration (15cm depth) (mg/kg)	7.9E+00
Pellet concentration (mg/kg)	3.3E+00
Landfill soil concentration (mg/kg)	1.3E-01
Estimated Vapour Concentration (mg/m3)	
InhalationT.R.V (mg/m3)	2.18E-05
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

Residential Non Carcinogenic	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Toddler	4.0E-08	2E-03	NA	NA	2E-03	No
Adult	6.5E-08	3E-03	NA	NA	3E-03	No

Parkland Non Carcinogenic	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inahlation HQ	Exceeds Tolerable Benchmark
Toddler	4.0E-08	2E-03	NA	NA	2E-03	No
Adult Golfer	1.1E-07	5E-03	NA	NA	5E-03	No

City Worker Non Carcinogenic Dose (mg/kg-d)	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	4.2E-08	2E-03	NA	NA	2E-03	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	3.3E-09	1E-04	NA	NA	1E-04	No

Non-Carcinogenic Worksheet: Chromium III

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Chromium
Soil Concentration (5cm depth) (mg/kg)	5.8E+01
Pellet Concentration (mg/kg)	1.6E+02
Landfill Application soil Concentration (mg/kg)	6.2E+00
AF.s Dermal Soil absorption factor (unitless)	0.04
Oral T.R.V (mg/kg-d)	1.50E+00
Soil Concentration (15 cm depth) (mg/kg)	3.7E+01
Plant Bioconcentration Factor (fruit)	0.0045
Plant Bioconcentration Factor (rootveg)	0.0045
Plant Bioconcentration Factor (veg)	0.0075
Fruit Concentration (mg/kg)	3.1E-02
Root Vegetable Concentration (mg/kg)	3.1E-02
Other Vegetable Concentration (mg/kg)	5.2E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	2.7E-04	8.7E-07	2.3E-07	NA	1.6E-05	1.4E-05	3.0E-04	2E-04	No
Adult	8.1E-06	8.6E-07	7.8E-08	NA	7.4E-06	3.3E-06	2.0E-05	1E-05	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	2.7E-04	8.7E-07	2.3E-07	NA	NA	NA	2.7E-04	2E-04	No
Adult Golfer	9.4E-06	1.6E-06	1.4E-07	NA	NA	NA	1.1E-05	7E-06	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	1.1E-04	1.6E-06	3.7E-07	NA	NA	NA	1.1E-04	8E-05	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	4.4E-06	1.3E-07	2.9E-08	NA	NA	NA	4.5E-06	3E-06	No

Non-Carcinogenic Worksheet: Copper

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Copper
Soil Concentration (5cm depth) (mg/kg)	2.6E+02
Pellet Concentration (mg/kg)	1.2E+03
Landfill Application soil Concentration (mg/kg)	4.5E+01
AF.s Dermal Soil absorption factor (unitless)	0.1
Adult Oral T.R.V (mg/kg-d)	3.00E-02
Toddler Oral T.R.V (mg/kg-d)	1.00E-01
Soil Concentration (15 cm depth) (mg/kg)	1.1E+02
Plant Bioconcentration Factor (fruit)	0.25
Plant Bioconcentration Factor (rootveg)	0.25
Plant Bioconcentration Factor (veg)	0.11
Fruit Concentration (mg/kg)	5.1
Root Vegetable Concentration (mg/kg)	5.1
Other Vegetable Concentration (mg/kg)	2.3
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.5E-03	9.9E-06	1.0E-06	NA	1.7E-03	2.4E-03	5.6E-03	6E-02	No
Adult	3.3E-05	8.9E-06	3.2E-07	NA	7.2E-04	5.4E-04	1.3E-03	4E-02	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.5E-03	9.9E-06	1.0E-06	NA	NA	NA	1.5E-03	2E-02	No
Adult Golfer	4.3E-05	1.8E-05	6.5E-07	NA	NA	NA	6.1E-05	2E-03	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	8.1E-04	2.9E-05	2.7E-06	NA	NA	NA	8.4E-04	3E-02	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	3.2E-05	2.3E-06	2.1E-07	NA	NA	NA	3.4E-05	1E-03	No

Non-Carcinogen Worksheet: Mercury

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Mercury
Soil Concentration (5cm depth) (mg/kg)	1.15
Pellet Concentration (mg/kg)	1.72
Landfill Application soil Concentration (mg/kg)	6.7E-02
AF.s Dermal Soil absorption factor (unitless)	0.05
Oral T.R.V (mg/kg-d)	3.00E-04
Soil Concentration (15 cm depth) (mg/kg)	0.92
Plant Bioconcentration Factor (fruit)	0.2
Plant Bioconcentration Factor (rootveg)	0.2
Plant Bioconcentration Factor (veg)	0.38
Fruit Concentration (mg/kg)	3.5E-02
Root Vegetable Concentration (mg/kg)	3.5E-02
Other Vegetable Concentration (mg/kg)	6.6E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	4.4E-06	2.1E-08	NA	NA	2.0E-05	1.6E-05	4.0E-05	1E-01	No
Adult	1.7E-07	2.3E-08	NA	NA	8.8E-06	3.7E-06	1.3E-05	4E-02	No

Recreational

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	4.4E-06	2.1E-08	NA	NA	NA	NA	4.4E-06	1E-02	No
Adult Golfer	1.9E-07	3.9E-08	NA	NA	NA	NA	2.2E-07	7E-04	No

City Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	1.2E-06	2.2E-08	NA	NA	NA	NA	1.2E-06	4E-03	No

Landfill Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	4.7E-08	1.7E-09	NA	NA	NA	NA	4.9E-08	2E-04	No

Non-Carcinogenic Inhalation Worksheet: Mercury

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Mercury
Soil Concentration (5cm depth) (mg/kg)	1.1E+00
Soil Concentration (15cm depth) (mg/kg)	9.2E-01
Pellet concentration (mg/kg)	1.7E+00
Landfill soil concentration (mg/kg)	6.7E-02
Estimated Vapour Concentration (mg/m3)	
InhalationT.R.V (mg/m3)	3.00E-04
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

Residential Non Carcinogenic	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Toddler	5.5E-09	2E-05	NA	NA	2E-05	No
Adult	8.5E-09	3E-05	NA	NA	3E-05	No

Parkland Non Carcinogenic	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inahlation HQ	Exceeds Tolerable Benchmark
Toddler	5.5E-09	2E-05	NA	NA	2E-05	No
Adult Golfer	1.5E-08	5E-05	NA	NA	5E-05	No

City Worker Non Carcinogenic Dose (mg/kg-d)	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	2.2E-08	7E-05	NA	NA	7E-05	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)	Inhalation contaminated soil particles Dose (mg/m3)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m3)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	1.7E-09	6E-06	NA	NA	6E-06	No

Non-Carcinogen Worksheet: Molybdenum

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Molybdenum
Soil Concentration (5cm depth) (mg/kg)	2.8E+00
Pellet Concentration (mg/kg)	1.3E+01
Landfill Application soil Concentration (mg/kg)	5.0E-01
AF.s Dermal Soil absorption factor (unitless)	0.1
Oral T.R.V (mg/kg-d)	5.00E-03
Soil Concentration (15 cm depth) (mg/kg)	1.1E+00
Plant Bioconcentration Factor (fruit)	0.06
Plant Bioconcentration Factor (rootveg)	0.06
Plant Bioconcentration Factor (veg)	0.25
Fruit Concentration (mg/kg)	1.3E-02
Root Vegetable Concentration (mg/kg)	1.3E-02
Other Vegetable Concentration (mg/kg)	5.3E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.7E-05	1.1E-07	1.1E-08	NA	1.2E-05	5.8E-06	3.4E-05	7E-03	No
Adult	3.5E-07	9.5E-08	3.4E-09	NA	5.4E-06	1.3E-06	7.2E-06	1E-03	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.7E-05	1.1E-07	1.1E-08	NA	NA	NA	1.7E-05	3E-03	No
Adult Golfer	4.6E-07	1.9E-07	6.9E-09	NA	NA	NA	6.5E-07	1E-04	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	8.8E-06	3.2E-07	3.0E-08	NA	NA	NA	9.2E-06	2E-03	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	3.5E-07	2.5E-08	2.3E-09	NA	NA	NA	3.7E-07	7E-05	No

Non-Carcinogen Worksheet: Nickel

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Nickel
Soil Concentration (5cm depth) (mg/kg)	2.3E+01
Pellet Concentration (mg/kg)	3.9E+01
Landfill Application soil Concentration (mg/kg)	1.5E+00
AF.s Dermal Soil absorption factor (unitless)	0.35
Oral T.R.V (mg/kg-d)	2.00E-02
Soil Concentration (15 cm depth) (mg/kg)	17.61
Plant Bioconcentration Factor (fruit)	0.06
Plant Bioconcentration Factor (rootveg)	0.06
Plant Bioconcentration Factor (veg)	0.053
Fruit Concentration (mg/kg)	2.0E-01
Root Vegetable Concentration (mg/kg)	2.0E-01
Other Vegetable Concentration (mg/kg)	1.8E-01
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	9.0E-05	3.0E-06	NA	NA	8.0E-05	9.2E-05	2.6E-04	1E-02	No
Adult	3.4E-06	3.1E-06	NA	NA	3.5E-05	2.1E-05	6.3E-05	3E-03	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	9.0E-05	3.0E-06	NA	NA	NA	NA	9.3E-05	5E-03	No
Adult Golfer	3.7E-06	5.4E-06	NA	NA	NA	NA	9.1E-06	5E-04	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	2.7E-05	3.4E-06	NA	NA	NA	NA	3.0E-05	2E-03	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	1.1E-06	2.6E-07	NA	NA	NA	NA	1.3E-06	7E-05	No

Inhalation Cancer Target Risk 10^{-5} Worksheet: Nickel

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Nickel
Soil Concentration (5cm depth) (mg/kg)	2.3E+01
Soil Concentration (15cm depth) (mg/kg)	1.8E+01
Pellet concentration (mg/kg)	3.9E+01
Landfill soil concentration (mg/kg)	1.5E+00
Estimated Vapour Concentration (mg/m3)	
Inhalation Unit Risk (mg/m3)-1	2.40E-01
Inhalation Exposure Limit (mg/m3)	4.17E-05
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	1.5E-07	4E-03	NA	NA	4E-03	No

Parkland Non Carcinogenic	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	1.1E-07	3E-03	NA	NA	3E-03	No
Adult Golfer	2.9E-07	7E-03	NA	NA	7E-03	No

City Worker Non Carcinogenic Dose (mg/kg-d)	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	4.9E-07	1E-02	NA	NA	1E-02	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)	Concentration of particulates	Exposure Ratio	Concentration of	Exposure	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	3.8E-08	9E-04	NA	NA	9E-04	No

Inhalation Cancer Target Risk 10^{-6} Worksheet: Nickel

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Nickel
Soil Concentration (5cm depth) (mg/kg)	2.3E+01
Soil Concentration (15cm depth) (mg/kg)	1.8E+01
Pellet concentration (mg/kg)	3.9E+01
Landfill soil concentration (mg/kg)	1.5E+00
Estimated Vapour Concentration (mg/m3)	
Inhalation Unit Risk (mg/m3)-1	2.40E-01
Inhalation Exposure Limit (mg/m3)	4.17E-06
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0

Residential Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	1.5E-07	4E-02	NA	NA	4E-02	No

Parkland Non Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	1.1E-07	3E-02	NA	NA	3E-02	No
Adult Golfer	2.9E-07	7E-02	NA	NA	7E-02	No

City Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	4.9E-07	1E-01	NA	NA	1E-01	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of	Exposure Ratio	Concentration of	Exposure Ratio		
Worker	3.8E-08	9E-03	NA	NA	9E-03	No

Non-Carcinogenic Worksheet: Lead

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Lead
Soil Concentration (5cm depth) (mg/kg)	5.4E+01
Pellet Concentration (mg/kg)	9.3E+01
Landfill Application soil Concentration (mg/kg)	3.6E+00
AF.s Dermal Soil absorption factor (unitless)	0.006
Oral T.R.V (mg/kg-d)	3.60E-03
Bioavailability in Soil (unitless)	5.70E-01
Soil Concentration (15 cm depth) (mg/kg)	4.1E+01
Plant Bioconcentration Factor (fruit)	0.009
Plant Bioconcentration Factor (rootveg)	0.009
Plant Bioconcentration Factor (veg)	0.051
Fruit Concentration (mg/kg)	7.1E-02
Root Vegetable Concentration (mg/kg)	7.1E-02
Other Vegetable Concentration (mg/kg)	4.0E-01
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential	Non Carcinogenic Dose (mg/kg-d)							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.2E-04	1.2E-07	2.1E-07	NA	8.3E-05	3.2E-05	2.4E-04	7E-02	No
Adult	4.5E-06	1.3E-07	7.6E-08	NA	3.8E-05	7.4E-06	5.1E-05	1E-02	No

Recreational	Non Carcinogenic Dose (mg/kg-d)							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.2E-04	1.2E-07	2.1E-07	NA	NA	NA	1.2E-04	3E-02	No
Adult Golfer	4.9E-06	2.2E-07	1.3E-07	NA	NA	NA	5.3E-06	1E-03	No

City Worker	Non Carcinogenic Dose (mg/kg-d)							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	3.7E-05	1.4E-07	2.2E-07	NA	NA	NA	3.7E-05	1E-02	No

Landfill Worker	Non Carcinogenic Dose (mg/kg-d)							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	1.4E-06	1.1E-08	1.7E-08	NA	NA	NA	1.5E-06	4E-04	No

Non-Carcinogen Worksheet: Selenium

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Selenium
Soil Concentration (5cm depth) (mg/kg)	1.1E+00
Pellet Concentration (mg/kg)	3.1E+00
Landfill Application soil Concentration (mg/kg)	1.2E-01
AF.s Dermal Soil absorption factor (unitless)	0.002
Oral T.R.V (mg/kg-d)	5.00E-03
Soil Concentration (15 cm depth) (mg/kg)	6.9E-01
Plant Bioconcentration Factor (fruit)	0.025
Plant Bioconcentration Factor (rootveg)	0.025
Plant Bioconcentration Factor (veg)	0.49
Fruit Concentration (mg/kg)	3.3E-03
Root Vegetable Concentration (mg/kg)	3.3E-03
Other Vegetable Concentration (mg/kg)	6.4E-02
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	5.2E-06	8.3E-10	4.4E-09	NA	1.1E-05	1.5E-06	1.8E-05	4E-03	No
Adult	1.5E-07	8.2E-10	1.5E-09	NA	5.3E-06	3.4E-07	5.8E-06	1E-03	No

Recreational

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	5.2E-06	8.3E-10	4.4E-09	NA	NA	NA	5.2E-06	1E-03	No
Adult Golfer	1.8E-07	1.5E-09	2.7E-09	NA	NA	NA	1.8E-07	4E-05	No

City Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	2.2E-06	1.6E-09	7.3E-09	NA	NA	NA	2.2E-06	4E-04	No

Landfill Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	8.5E-08	1.2E-10	5.7E-10	NA	NA	NA	8.6E-08	2E-05	No

Non-Carcinogen Worksheet : Zinc

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Zinc
Soil Concentration (5cm depth) (mg/kg)	2.6E+02
Pellet Concentration (mg/kg)	9.0E+02
Landfill Application soil Concentration (mg/kg)	3.5E+01
AF.s Dermal Soil absorption factor (unitless)	0.02
Oral T.R.V (mg/kg-d)	3.00E-01
Soil Concentration (15 cm depth) (mg/kg)	1.4E+02
Plant Bioconcentration Factor (fruit)	0.9
Plant Bioconcentration Factor (rootveg)	0.9
Plant Bioconcentration Factor (veg)	0.56
Fruit Concentration (mg/kg)	2.3E+01
Root Vegetable Concentration (mg/kg)	2.3E+01
Other Vegetable Concentration (mg/kg)	1.4E+01
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	1.3E-03	1.9E-06	1.0E-06	NA	8.2E-03	1.1E-02	2.0E-02	7E-02	No
Adult	3.4E-05	1.8E-06	3.3E-07	NA	3.6E-03	2.4E-03	6.0E-03	2E-02	No

Recreational

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	1.3E-03	1.9E-06	1.0E-06	NA	NA	NA	1.3E-03	4E-03	No
Adult Golfer	4.1E-05	3.5E-06	6.3E-07	NA	NA	NA	4.5E-05	2E-04	No

City Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	6.2E-04	4.5E-06	2.1E-06	NA	NA	NA	6.3E-04	2E-03	No

Landfill Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	2.4E-05	3.5E-07	1.6E-07	NA	NA	NA	2.5E-05	8E-05	No

Non-Carcinogen Worksheet: PCB

Receptors	Resident, Park User, City Worker
Contaminant of Concern	PCBs
Soil Concentration (5cm depth) (mg/kg)	1.1E-02
Pellet Concentration (mg/kg)	1.7E-04
Landfill Application soil Concentration (mg/kg)	6.5E-06
AF.s Dermal Soil absorption factor (unitless)	0.067
Oral T.R.V (mg/kg-d)	2.00E-05
Soil Concentration (15 cm depth) (mg/kg)	1.1E-02
Plant Bioconcentration Factor (fruit)	0.01
Plant Bioconcentration Factor (rootveg)	0.01
Plant Bioconcentration Factor (veg)	0.01
Fruit Concentration (mg/kg)	2.0E-05
Root Vegetable Concentration (mg/kg)	2.0E-05
Other Vegetable Concentration (mg/kg)	2.0E-05
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	2.9E-08	2.6E-10	NA	NA	8.3E-09	9.1E-09	4.7E-08	2E-03	No
Adult	1.7E-09	3.0E-10	NA	NA	3.7E-09	2.1E-09	7.7E-09	4E-04	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	2.9E-08	2.6E-10	NA	NA	NA	NA	2.9E-08	1E-03	No
Adult Golfer	1.7E-09	4.8E-10	NA	NA	NA	NA	2.2E-09	1E-04	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	1.2E-10	2.8E-12	NA	NA	NA	NA	1.2E-10	6E-06	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)								Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	4.5E-12	2.2E-13	NA	NA	NA	NA	4.7E-12	2E-07	No

Carcinogen Worksheet Target Risk 10^{-5}: PCB

Receptors	Resident, Park User, City Worker
Contaminant of Concern	PCBs
Soil Concentration (5cm depth) (mg/kg)	1.1E-02
Pellet Concentration (mg/kg)	1.7E-04
Landfill Application soil Concentration (mg/kg)	6.5E-06
AF.s Dermal Soil absorption factor (unitless)	0.067
Oral Slope Factor (mg/kg-d)-1	2.00E+00
Soil Concentration (15 cm depth) (mg/kg)	1.1E-02
Plant Bioconcentration Factor (fruit)	0.01
Plant Bioconcentration Factor (rootveg)	0.01
Plant Bioconcentration Factor (veg)	0.01
Fruit Concentration (mg/kg)	2.0E-05
Root Vegetable Concentration (mg/kg)	2.0E-05
Other Vegetable Concentration (mg/kg)	2.0E-05
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	
Exposure Limit (mg/kg-day)	5.00E-06

Residential									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Composite Adult	3.6E-09	2.8E-10	NA	NA	4.4E-09	2.8E-09	1.1E-08	2E-03	No

Parkland									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Composite Adult	3.6E-09	1.9E-10	NA	NA	NA	NA	3.8E-09	8E-04	No
Adult Golfer	1.2E-09	3.5E-10	NA	NA			1.6E-09	3E-04	No

City Worker									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	4.6E-11	1.1E-12	NA	NA	NA	NA	4.7E-11	9E-06	No

Landfill worker									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	1.8E-12	8.7E-14	NA	NA	NA	NA	1.9E-12	4E-07	No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no
en Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Carcinogen Worksheet Target Risk 10^{-6}: PCB

Receptors	Resident, Park User, City Worker
Contaminant of Concern	PCBs
Soil Concentration (5cm depth) (mg/kg)	1.1E-02
Pellet Concentration (mg/kg)	1.7E-04
Landfill Application soil Concentration (mg/kg)	6.5E-06
AF.s Dermal Soil absorption factor (unitless)	0.067
Oral Slope Factor (mg/kg-d)-1	2.00E+00
Soil Concentration (15 cm depth) (mg/kg)	1.1E-02
Plant Bioconcentration Factor (fruit)	0.01
Plant Bioconcentration Factor (rootveg)	0.01
Plant Bioconcentration Factor (veg)	0.01
Fruit Concentration (mg/kg)	2.0E-05
Root Vegetable Concentration (mg/kg)	2.0E-05
Other Vegetable Concentration (mg/kg)	2.0E-05
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	
Exposure Limit (mg/kg-day)	5.00E-07

Residential									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Composite Adult	3.6E-09	2.8E-10	NA	NA	4.4E-09	2.8E-09	1.1E-08	2E-02	No

Parkland									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Composite Adult	3.6E-09	1.9E-10	NA	NA	NA	NA	3.8E-09	8E-03	No
Adult Golfer	1.2E-09	3.5E-10	NA	NA	NA	NA	1.6E-09	3E-03	No

City Worker									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	4.6E-11	1.1E-12	NA	NA	NA	NA	4.7E-11	9E-05	No

Landfill worker									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	1.8E-12	8.7E-14	NA	NA	NA	NA	1.9E-12	4E-06	No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no
en Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Inhalation Cancer Target Risk 10^{-5}: PCB

Receptors	Resident, Park User, City Worker
Contaminant of Concern	PCBs
Soil Concentration (5cm depth) (mg/kg)	1.1E-02
Soil Concentration (15cm depth) (mg/kg)	1.1E-02
Pellet concentration (mg/kg)	1.7E-04
Landfill soil concentration (mg/kg)	6.5E-06
Estimated Vapour Concentration (mg/m3)	1.3E-09
Inhalation Unit Risk (mg/m3)-1	1.00E-01
Inhalation Exposure Limit (mg/m3)	1.00E-04
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	1

Residential Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	7.4E-11	7E-07	1.3E-09	1E-05	1E-05	No

Parkland Non Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	4.9E-11	5E-07	1.3E-09	1E-05	1E-05	No
Adult Golfer	1.3E-10	1E-06	1.3E-09	1E-05	1E-05	No

City Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	2.1E-12	2E-08	1.3E-09	1E-05	1E-05	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	1.6E-13	2E-09	1.3E-09	1E-05	1E-05	No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Inhalation Cancer Target Risk 10^{-6}: PCB

Receptors	Resident, Park User, City Worker
Contaminant of Concern	PCBs
Soil Concentration (5cm depth) (mg/kg)	1.1E-02
Soil Concentration (15cm depth) (mg/kg)	1.1E-02
Pellet concentration (mg/kg)	1.7E-04
Landfill soil concentration (mg/kg)	6.5E-06
Estimated Vapour Concentration (mg/m3)	1.3E-09
Inhalation Unit Risk (mg/m3)-1	1.00E-01
Inhalation Exposure Limit (mg/m3)	1.00E-05
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	1

Residential Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	7.4E-11	7E-06	1.3E-09	1E-04	1E-04	No

Parkland Non Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	4.9E-11	5E-06	1.3E-09	1E-04	1E-04	No
Adult Golfer	1.3E-10	1E-05	1.3E-09	1E-04	1E-04	No

City Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	2.1E-12	2E-07	1.3E-09	1E-04	1E-04	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	1.6E-13	2E-08	1.3E-09	1E-04	1E-04	No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Non-Carcinogen Worksheet: Dioxins/Furans

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Dioxins/Furans
Soil Concentration (5cm depth) (mg/kg)	4.7E-06
Pellet Concentration (mg/kg)	1.5E-05
Landfill Application soil Concentration (mg/kg)	5.8E-07
AF.s Dermal Soil absorption factor (unitless)	0.06
Oral T.R.V (mg/kg-d)	2.00E-09
Soil Concentration (15 cm depth) (mg/kg)	2.7E-06
Plant Bioconcentration Factor (fruit)	0.0056
Plant Bioconcentration Factor (rootveg)	0.0056
Plant Bioconcentration Factor (veg)	0.0056
Fruit Concentration (mg/kg)	2.9E-09
Root Vegetable Concentration (mg/kg)	2.9E-09
Other Vegetable Concentration (mg/kg)	2.9E-09
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRVexists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	2.3E-11	1.1E-13	NA	NA	1.2E-12	1.3E-12	2.6E-11	1E-02	No
Adult	6.4E-13	1.0E-13	NA	NA	5.3E-13	3.0E-13	1.6E-12	8E-04	No

Recreational

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	2.3E-11	1.1E-13	NA	NA	NA	NA	2.3E-11	1E-02	No
Adult Golfer	7.6E-13	1.9E-13	NA	NA	NA	NA	9.5E-13	5E-04	No

City Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	1.0E-11	2.2E-13	NA	NA	NA	NA	1.1E-11	5E-03	No

Landfill Worker

Non Carcinogenic Dose (mg/kg-d)

	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	4.0E-13	1.7E-14	NA	NA	NA	NA	4.2E-13	2E-04	No

Carcinogen Worksheet Target Risk 10^{-5}: Dioxins/Furans

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Dioxins/Furans
Soil Concentration (5cm depth) (mg/kg)	4.7E-06
Pellet Concentration (mg/kg)	1.5E-05
Landfill Application soil Concentration (mg/kg)	5.8E-07
AF.s Dermal Soil absorption factor (unitless)	0.06
Oral Slope Factor (mg/kg-d)-1	1.50E+05
Soil Concentration (15 cm depth) (mg/kg)	2.7E-06
Plant Bioconcentration Factor (fruit)	0.0056
Plant Bioconcentration Factor (rootveg)	0.0056
Plant Bioconcentration Factor (veg)	0.0056
Fruit Concentration (mg/kg)	2.90E-09
Root Vegetable Concentration (mg/kg)	2.90E-09
Other Vegetable Concentration (mg/kg)	2.90E-09
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Exposure Limit (mg/kg-day)	6.67E-11

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Residential	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Composite	2.2E-12	9.9E-14	NA	NA	6.3E-13	4.1E-13	3.3E-12	5E-02	No

Parkland	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Composite Adult	2.2E-12	7.6E-14	NA	NA	NA	NA	2.3E-12	3E-02	No
Adult Golfer	5.6E-13	1.4E-13	NA	NA	NA	NA	7.0E-13	1E-02	No

City Worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Worker	4.1E-12	8.9E-14	NA	NA	NA	NA	4.2E-12	6E-02	No

Landfill worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Worker	1.6E-13	7.0E-15	NA	NA	NA	NA	1.7E-13	3E-03	No

Carcinogen Worksheet Target Risk 10^{-6}: Dioxins/Furans

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Dioxins/Furans
Soil Concentration (5cm depth) (mg/kg)	4.7E-06
Pellet Concentration (mg/kg)	1.5E-05
Landfill Application soil Concentration (mg/kg)	5.8E-07
AF.s Dermal Soil absorption factor (unitless)	0.06
Oral Slope Factor (mg/kg-d)-1	1.50E+05
Soil Concentration (15 cm depth) (mg/kg)	2.7E-06
Plant Bioconcentration Factor (fruit)	0.0056
Plant Bioconcentration Factor (rootveg)	0.0056
Plant Bioconcentration Factor (veg)	0.0056
Fruit Concentration (mg/kg)	2.90E-09
Root Vegetable Concentration (mg/kg)	2.90E-09
Other Vegetable Concentration (mg/kg)	2.90E-09
Inhalation Contaminanted Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Exposure Limit (mg/kg-day)	6.67E-12

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Residential	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Composite Adult	2.2E-12	9.9E-14	NA	NA	6.3E-13	4.1E-13	3.3E-12	5E-01	No

Parkland	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Composite Adult	2.2E-12	7.6E-14	NA	NA	NA	NA	2.3E-12	3E-01	No
Adult Golfer	5.6E-13	1.4E-13	NA	NA	NA	NA	7.0E-13	1E-01	No

City Worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Worker	4.1E-12	8.9E-14	NA	NA	NA	NA	4.2E-12	6E-01	No

Landfill worker	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Worker	1.6E-13	7.0E-15	NA	NA	NA	NA	1.7E-13	3E-02	No

Inhalation Cancer Target Risk 10^{-5}: Dioxin/Furans

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Dioxins/Furans
Soil Concentration (5cm depth) (mg/kg)	4.7E-06
Soil Concentration (15cm depth) (mg/kg)	2.7E-06
Pellet concentration (mg/kg)	1.5E-05
Landfill soil concentration (mg/kg)	5.8E-07
Estimated Vapour Concentration (mg/m3)	8.5E-14
Inhalation Unit Risk (mg/m3)-1	3.44E+04
Inhalation Exposure Limit (mg/m3)	2.91E-10
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	1

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic							
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark	Total Concnetratior
Composite	3.0E-14	1E-04	8.5E-14	3E-04	4E-04	No	1.2E-13

Parkland Non Carcinogenic							
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark	
Composite	2.3E-14	8E-05	8.5E-14	3E-04	4E-04	No	1.1E-13
Adult Golfer	6.0E-14	2E-04	8.5E-14	3E-04	5E-04	No	1.4E-13

City Worker Non Carcinogenic Dose (mg/kg-d)							
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark	
Worker	1.9E-13	6E-04	8.5E-14	3E-04	9E-04	No	2.7E-13

Landfill Worker Non Carcinogenic Dose (mg/kg-d)							
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark	
Worker	1.5E-14	5E-05	8.5E-14	3E-04	3E-04	No	1.0E-13

Inhalation Cancer Target Risk 10^{-6}: Dioxin/Furans

Receptors	Resident, Park User, City Worker
Contaminant of Concern	Dioxins/Furans
Soil Concentration (5cm depth) (mg/kg)	4.7E-06
Soil Concentration (15cm depth) (mg/kg)	2.7E-06
Pellet concentration (mg/kg)	1.5E-05
Landfill soil concentration (mg/kg)	5.8E-07
Estimated Vapour Concentration (mg/m3)	8.50E-14
Inhalation Unit Risk $(mg/m3)^{-1}$	3.44E+04
Inhalation Exposure Limit (mg/m3)	2.91E-11
Inhalation Contaminanted Soil Particles (y=1/n=0)	1
Inhalation of Contaminated Vapours (y=1/n=0)	1

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	3.0E-14	1E-03	8.5E-14	3E-03	4E-03	No

Parkland Non Carcinogenic					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Composite	2.3E-14	8E-04	8.5E-14	3E-03	4E-03	No
Adult Golfer	6.0E-14	2E-03	8.5E-14	3E-03	5E-03	No

City Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	1.9E-13	6E-03	8.5E-14	3E-03	9E-03	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)					Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m^3)	Exposure Ratio	Concentration of Vapours (mg/m^3)	Exposure Ratio		
Worker	1.5E-14	5E-04	8.5E-14	3E-03	3E-03	No