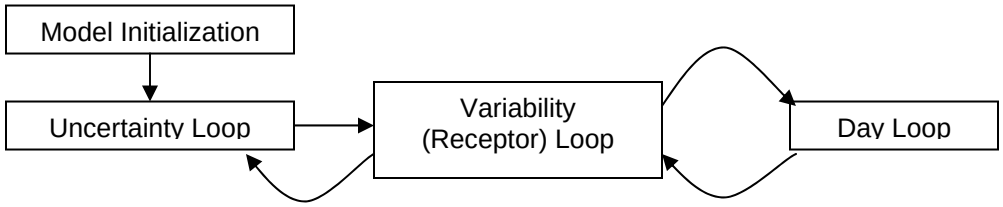
Description of Cabot Carbon/Koppers, Gainesville, Florida On-Site Worker Microexposure Event Model and Example of Model Calculation

The Microexposure Event (MEE) model for On-Site Workers at the Cabot Carbon/Koppers Site in Gainesville, Florida (Site) consists of the following components:

- MEE model as an MS-Excel VBA module with UserForm interface
- An Input Database in MS-Access
- Template output files (by COPC) in MS-Excel
- An optional Output Database in MS-Access

The MEE model is two-dimensional – i.e., it assesses both uncertainty and variability. An overall schematic is shown below:



Each of these components is discussed in detail in the remainder of this document. The example calculations shown demonstrate how the calculations are built for an individual iteration. Attachment 1 provides the supporting average daily dose (ADD), lifetime average daily dose (LADD) and potential risk calculations for the example presented in this document. The values shown are rounded for clarity in this summary. The distributions used in this example are the same as those proposed in the On-Site Human Health Risk Assessment Approach document (AMEC, 2008a)[1]. These can be updated as more relevant and appropriate data become available.

Model Initialization Phase

The Model Initialization Phase consists of the following components:

- *Receptor Type*: The user selects to run a Non-Process Area (NPA) worker or a Process Area (PA) worker. The potential risks to the NPA worker are evaluated based on NPA soil results, while the potential risks to the PA worker are evaluated using the PA soil results. The current model default is to run male workers.

- *Select COPC(s)*: Each of the COPCs can be evaluated individually, or all of the COPCs can be run concurrently.

- *Select Number of Uncertainty and Variability Loops*: The user identifies the number of uncertainty and variability loops to be evaluated in the model run. Each variability loop is analogous to a set of receptors that are evaluated for a given set of uncertainty

[1] AMEC. 2008a. *Proposed Approach to Estimating Potential On-Site Human Health Risks Associated with Soils and Sediments at the Koppers Inc. Wood-Treating Facility in Gainesville, Florida*. Submitted to Beazer East, Inc. June 23, 2008.

assumptions. Thus, if a user selects to run 1,000 Variability Loops and 500 Uncertainty Loops, that is the equivalent of choosing to evaluate 500,000 receptors.

- *Load Input Distribution Data from Input Database*: The appropriate input distributions are uploaded from the Input Database into the model. Proposed distributions for most of the parameters were presented in AMEC (2008a). Proposed distributions describing relative absorption factors (RAFs) are being submitted concurrently with this document (AMEC, 2008b)[2]. Note that the model does not require that a distribution be employed for a parameter. The user can select a single value for the exposure or toxicity assumptions.

The distributions in the Input Database represent cumulative percentile distributions of the input values. The quantiles include 0, 1, 2.5, 5 to 95 (in increments of 5), 97.5, 99 and 100%. Within the model, as a random number is drawn for the particular parameter, the bounding quantiles are identified and the resulting input value is interpolated. For example, if the random number for the body weight of males is 38%, then the bounding values from the input distributions for 35% (71.98 Kg) and 40% (73.62 Kg) are identified from the input distribution, and the appropriate value for body weight calculated using linear interpolation (72.96 Kg, in this case). Table 1 summarizes the quantiles for the distributions from the Input Database that are used in the examples below.

Example – The text boxes in this document present example calculations of the sequence of the first two iterations of the day-loop iterations of the MEE model for a hypothetical on-Site worker.

- PA Worker assessed in Process Area
- User selects COPC: Arsenic
- User selects (as an example) 500 uncertainty loops and 1000 receptor loops. Therefore, for each uncertainty loop, the receptor loop will iterate 1000 times.

Uncertainty Loop

The Uncertainty Loop contains those input parameters that are assumed to represent uncertainty about the exact value of the parameter, rather than variability between people. For some parameters professional judgment may be exercised to determine whether they should be evaluated as uncertainty or variability. For example, there are no studies available that have directly quantified the dermal adherence of sandy soils on workers at wood treatment facilities. Therefore, there is some uncertainty in using surrogate studies, such as those that examined the dermal adherence of construction workers, to assess potential dermal adherence for the On-Site workers at this facility. Consequently, it is more appropriate to assess dermal adherence as uncertainty rather than receptor variability.

The current version of the model includes up to three parameters in the uncertainty loop:

- *Dermal Adherence Factors (DAFs)*: DAFs are related to exposed skin surface type. Because the NPA and PA workers have different exposed skin surfaces (the PA workers

[2] AMEC. 2008b. *Relative Absorption Factors (RAFs) for Oral and Dermal Absorption of Compounds in Soil Cabot Carbon/Koppers Site, Gainesville, Florida*. Submitted to Beazer East, Inc. July 23, 2008.

wear more personal protective equipment) the DAF distributions vary between these two receptors. The derivation of the DAFs was presented in the AMEC (2008a).

- *Relative Bioavailability Factors (RAFs)*: RAFs are COPC- specific and pathway-specific. Distributions are available for many of the COPCs and pathways. RAFs are scaled from 0 to 1 (the latter is equivalent to 100% bioavailability). The derivation of the RAF distributions is presented in AMEC (2008b).

- *Toxicity Values*: These can be fixed default EPA values or can be distributions of toxicity values, which can include the default EPA values as part of the distribution. The user can select to run these as part of the Uncertainty Loop (if distributions are used) or the Variability (Receptor) Loop (when fixed values are used). In this example, toxicity is run in the Variability Loop since the arsenic toxicity values are the fixed defaults recommended by EPA. The Approach Document (AMEC, 2008a) showed toxicity values in the Uncertainty Loop because it presumed distributions might be used for the toxicity values.

The random numbers are drawn independently for the DAF and RAF terms using Excel's built-in random number generator (RNG). This is repeated for each uncertainty loop, but the values from a given uncertainty loop are not changed for the variability loops that run under the uncertainty loop. Therefore, if the user selects to run 500 uncertainty loops, there will be 500 different combinations of DAFs and RAFs that are evaluated in the model.

Example – continued

- Uncertainty Loop #1
- PA Worker assessed in Process Area, Arsenic
- RNG draws value of 48% for DAF. By interpolation for the PA worker, the DAF for this uncertainty loop is 0.039 mg/cm^2.
- RNG draws value of 56% for Dermal-RAF for arsenic. By interpolation, the Dermal-RAF for this uncertainty loop is 0.00915.
- RNG draws value of 96% for Oral-RAF for arsenic. By interpolation, the Oral-RAF for this uncertainty loop is 0.278.
- A distribution for the Inhalation-RAF was not available so it is was conservatively assumed to be 1.

Once the user-specified runs of the variability loop are completed, these values are cleared and new values are re-selected for the next iteration of the uncertainty loop. The clearing and re-selection process is continued until the user-specified iterations of the variability are complete.

Variability (Receptor) Loop

The Variability Loop contains those input parameters that represent the potential variability between the receptors. In an MEE framework, the Variability Loop parameters are split between those that define a receptor's exposure profile (i.e., parameters that define for how long and for how many days a year they are exposed and how much a receptor weighs over the course of the expsoure period) and those that can vary on a daily basis (examples of 'Day Loop' parameters are soil ingestion rate and exposure time). The exposure parameters that define the receptor's exposure profile include the following:

- *Exposure Duration (ED)*: Selected from distributions derived from job tenure information reported in Burmaster (2000)[3]. This is based on census data for the 'Lumber and Wood Products Industrial Category'. Actual data job tenure data from the facility can also be used, if available.

- *Exposure Frequency (EF)*: Selected from the proposed input distribution presented in AMEC (2008a). The product of ED and EF is the total number of days exposed for each receptor. The total number of days defines the number of times the Day Loop is iterated for a particular receptor.

- *Body Weight (BW)*: Selected from the proposed male BW input distributions presented in AMEC 2008a.

- *Skin Surface Area (SSA)*: Calculated from BW using the equation from FDEP (2005) and defined by receptor type because the NPA and PA workers have different skin surface areas exposed.

Values for the parameters that define a receptors' exposure profile are selected once at the beginning of the variability loop and remain the same for all of the days a particular receptor is exposed to on-Site soils. As described above for the uncertainty loop, for those parameters defined by a distribution, the value for each parameter is selected at random from the user-defined distribution using Excel's RNG.

The Day Loop portion of the Variability Loop includes the following parameters:

- *Soil Ingestion Rates*: Selected from the proposed input distribution presented in AMEC, 2008a.

- *COPC concentration in soil*: The distribution is derived from measured concentrations of COPCs in on-Site soils and is COPC-specific and area-specific.

- *Inhalation Rates (InR)*: Selected from the proposed input distribution presented in AMEC, 2008a.

- *Exposure Time (ET)*: Selected from the proposed input distribution presented in AMEC, 2008a. This parameter is used to estimate the number of hours a worker is on-Site and exposed to dust in air.

- *Respirable Particulate Matter (RPM)*: The RPM values represent the PM_{10} values from an air monitoring station located near Gainesville, as discussed in AMEC, 2008a. This distribution can be updated pending review of new or alternate datasets.

- *COPC concentration in air (as dust)*: This is calculated as the product of RPM and COPC concentration in soil, adjusting to concentration units of mg/m^3. These are COPC-specific and specific to the area of the Site a receptor is assumed to be exposed.

[3] Burmaster, D.E. 2000. Distributions of total job tenure for mean and women in selected industries and occupations in the United States, February 1996. *Risk Analysis*. 20(2): 205-224.

Unique values for the parameters that define a receptors' daily exposure are selected for every day the receptor is exposed (i.e., at the beginning of every Day Loop). For those parameters defined by a distribution, the values are selected at random using Excel's RNG from the user-defined distributions.

The LADD (or ADD, depending upon the type of toxicity value) is calculated at the end of each Day Loop. Once all of the days for a given Variability (Receptor) Loop are completed (the number of days being defined by the product of EF and ED), the LADDs (or ADDs) and associated estimates of potential risk from each Day Loop are summed to derive the total LADD (or ADD) and potential risk for that given receptor. The potential risks are then estimated by applying the appropriate toxicity benchmark for the evaluated COPC and exposure pathway. Therefore, at the end of all of the Day Loops for a given receptor there is one set of potential risk estimates for each evaluated COPC and exposure pathway. These results are stored by the model.

The model then proceeds to the next Variability (Receptor) Loop, creates a new receptor profile, calculates the number of days exposed, and starts the Day Loops again for that new receptor. A new set of potential risk estimates for each evaluated COPC and exposure pathway is then calculated. These results are stored by the model.

After completion of all the variability loops, the model then calculates pre-defined percentiles of potential risks by COPC and pathway and saves these percentiles by exposure pathway and COPC in an Excel table[4]. This results in percentile risks across all of the variability (receptor) loops. As an example, if the user selected to run 50 variability loops (i.e., 50 receptors), the model summarizes the percentiles of the risks across all 50 variability loops and stores the percentile results. This represents the variability among receptors for a fixed combination of uncertainty parameters and is an interim output of the model.

The model then returns to the uncertainty loop, re-selects the uncertainty parameters, and restarts the variability loop with a new set of receptors and input parameters. The process is continued until all of the user-defined uncertainty loops have been completed.

Following completion of all of the uncertainty loops, an additional summarization is performed by calculating pre-defined percentiles of potential risks by COPC and pathway across each of the interim output risk results, as shown in the schematic below.

[4] There is also an option to send the individual receptor loop risk risks to an Output database. The latter allows the retention of the individual risk results by uncertainty and variability, as opposed to the pre-defined percentile values that are exported to Excel by the model.

Interim Output

	VARIABILITY LOOP RISKS			
UncertLoop ↓	**0%RISK**	**1%RISK**	**2.5%RISK …**	**100%RISK**
1				
2				
3 …				

[At end of all uncertainty loops]

	VARIABILITY LOOP RISKS			
UncertRisks ↓	**0%RISK**	**1%RISK**	**2.5%RISK …**	**100%RISK**
0%RISK				
1%RISK				
2.5%RISK …				
100%RISK				

The lower table in the schematic above is the principal output of the MEE model. These tables are prepared for each COPC, exposure pathway, across the pathways for a given COPC, and across all COPCs. Graphs can be generated from this table showing the bounding uncertainty estimates across the risk variability range.

Example – continued

Uncertainty Loop #1 (as described in the prior text box)

- PA Worker assessed in Process Area, Arsenic
- Uncertainty Parameters: DAF = 0.039 mg/cm^2, Dermal-RAF = 0.00915, Oral-RAF = 0.278, Inhalation-RAF = 1

Variability Loop #1

- RNG draws value of 81% for ED. By interpolation, the ED for this receptor is 12.34 years
- RNG draws value of 26% for EF. By interpolation, the EF for this receptor is 231.24 days/year.
- The model then multiplies EF times ED to establish the total number of days this particular receptor will be exposed to on-Site soils. For the receptor in this example the product of ED and EF is 2,853 days, so the Day Loop will be iterated 2,853 times.
- RNG draws value of 28% for BW. By interpolation, the BW for this receptor is 69.7 Kg.
- SSA is calculated from the BW using FDEP (2005) equation and also presented in the AMEC (2008a). In this case, the surface area exposed is 437.3 cm^2 given the bodyweight selected for this receptor.
- The toxicity values are the oral, dermal and inhalation slope factors for Arsenic from EPA.

Day Loop #1 in Variability Loop #1

- RNG draws a value of 83% for the soil ingestion rates. By interpolation, the soil ingestion rate is 31.7 mg/day for the first day
- RNG draws value of 52% for Arsenic in the process area (PA). By interpolation of the site-specific distribution in the PA, the spatially-weighted mean arsenic concentration the receptor is exposed to during the first day is 106.95 mg/Kg.
- RNG draws value of 81% for inhalation rates. By interpolation, the air inhalation rate is 1.6 m^3/h for the first day.
- RNG draws value of 16% for exposure time (ET). By interpolation, the ET for this receptor is 7.1 hours for the first day.
- RNG draws value of 91% for respirable particulate matter (RPM). By interpolation, the RPM is for this receptor is 0.014 mg/m^3 for the first day.
- COPC in dust calculated as product of soil EPC and RPM; the value is 1.5E-6 mg/m^3 for the first day.

At the end of Day Loop #1, the model estimates Day Loop LADDs (in mg/kg-day) for arsenic of 5.3E-10, 9.4E-12, and 9.0E-14 for the cancer ingestion, dermal, and inhalation exposures (respectively), using the standard exposure equations presented in AMEC (2008a). These Day Loop LADDs are associated with Day Loop potential cancer risks of 7.9E-10, 1.4E-11, and 1.4E-12, respectively, or a total risk of 8.1E-10 (not shown in Attachment 1). These results are saved; the model then clears the values for each of the exposure parameters in the Day Loop and starts the second iteration (out of 2,853, in this example) by using Excel's RNG to select exposure parameters for the second iteration of the Day Loop.

Day Loop #2 in Variability Loop #1

- RNG draws values of 55% for soil ingestion rates, 85% for arsenic in PA area, 38% for inhalation rates, 32% for ET, and 83% for RPM, By interpolation, the values for each of the parameters for the second day are: soil ingestion (20.1 mg/day), Arsenic in soil (133.6 mg/Kg), inhalation rate (1.34 m^3/h), ET (7.6 h/day), RPM (0.012 mg/m^3), and Arsenic in dust (1.6E-6 mg/m^3).
- The resulting Day Loop LADDs (in mg/kg-day) for soil ingestion, soil dermal contact and soil inhalation are: 6.6E-10, 1.2E-11 and 8.6E-14, respectively. These correspond to Day Loop excess lifetime cancer risks of 9.9E-10, 1.8E-11, and 1.3E-12, respectively, and a total risk of 1.0E-9.

The draws are then repeated for each additional day until the total number of days (2,853 for receptor in this example) is reached. The risks are summed by pathway to yield the receptor's total risk.

Attachment 1 shows the ADD, LADD and risk calculations for arsenic using a PA worker (both genders) though two Day Loops. This demonstrates how the Variability Loop and Day Loop parameters change as the model iterates.

Table 1. Beazer-Gainesville On-Site Worker Microexposure Event Model
Quantiles for Input Parameter Distributions Used for the MEE Example

Percentile	Soil Conc Process Area Arsenic (mg/Kg)	Dermal Adherence Factor (DAF) (mg/cm^2)	Dermal RAF Arsenic	Oral RAF Arsenic	Inhal RAF Arsenic	Exp Duration (ED) (years)	Exp Freq (EF) (days/yr)	Body Weight (BW) (Kg)	Skin Surface Area (SSA) (cm^2)	Soil Ingestion Rates (mg/day)	Inhalation Rates (m3/h)	Exposure Time (ET) (h/day)	Respirable Particulate Matter (RPM) (mg/m^3)	Arsenic Dust Conc (mg/m^3)
0	22.0	0.001	0.0051	0.0006	1	0.25	225.2	44.0	319.8	0.697	1.05	6.0	0.0036	7.9E-08
0.01	48.0	0.003	0.0067	0.023	1	0.25	226.2	46.9	333.8	2.67	1.05	6.3	0.0041	1.9E-07
0.025	53.7	0.006	0.0070	0.042	1	0.25	226.9	51.3	354.7	3.92	1.07	6.4	0.0041	2.2E-07
0.05	63.3	0.009	0.0074	0.059	1	0.25	227.7	58.6	388.5	5.34	1.12	6.6	0.0045	2.8E-07
0.1	72.3	0.014	0.0077	0.082	1	0.25	228.9	62.3	405.1	7.35	1.17	6.9	0.0050	3.6E-07
0.15	78.2	0.018	0.0080	0.097	1	0.25	229.7	64.9	416.6	8.90	1.21	7.1	0.0056	4.4E-07
0.2	83.6	0.021	0.0082	0.109	1	0.38	230.5	66.8	424.9	10.2	1.24	7.3	0.0059	5.0E-07
0.25	87.7	0.024	0.0083	0.120	1	0.51	231.1	68.7	433.1	11.5	1.27	7.4	0.0065	5.7E-07
0.3	91.6	0.027	0.0085	0.130	1	0.92	231.7	70.3	440.1	12.8	1.3	7.5	0.0069	6.3E-07
0.35	95.2	0.031	0.0086	0.139	1	1.35	232.2	72.0	447.1	14.1	1.32	7.7	0.0072	6.9E-07
0.4	98.7	0.034	0.0087	0.147	1	1.72	232.7	73.6	454.0	15.5	1.35	7.8	0.0076	7.5E-07
0.45	102.2	0.037	0.0089	0.155	1	2.09	233.2	75.3	460.9	17.0	1.38	7.9	0.0080	8.2E-07
0.5	105.6	0.04	0.0090	0.163	1	2.45	233.7	76.9	467.8	18.5	1.4	8.0	0.0085	9.0E-07
0.55	109.0	0.044	0.0091	0.172	1	3.49	234.1	78.6	474.9	20.1	1.43	8.1	0.0089	9.7E-07
0.6	112.5	0.047	0.0093	0.180	1	4.23	234.5	80.4	482.1	21.9	1.47	8.2	0.0093	1.0E-06
0.65	116.0	0.051	0.0094	0.188	1	6.21	234.9	82.1	489.2	23.7	1.5	8.3	0.0097	1.1E-06
0.7	120.0	0.055	0.0095	0.197	1	8.23	235.3	83.9	496.2	25.6	1.54	8.5	0.0104	1.2E-06
0.75	123.9	0.059	0.0097	0.207	1	10.3	235.7	85.6	503.2	27.7	1.58	8.6	0.0111	1.4E-06
0.8	128.2	0.064	0.0098	0.218	1	12.4	236.1	88.4	514.6	30.1	1.62	8.7	0.0118	1.5E-06
0.85	133.6	0.071	0.0100	0.231	1	15.1	236.6	91.3	525.9	32.8	1.67	8.9	0.0126	1.7E-06
0.9	140.4	0.079	0.0103	0.246	1	18.0	237.3	95.7	543.0	35.9	1.72	9.1	0.0138	1.9E-06
0.95	150.2	0.092	0.0106	0.270	1	21.9	238.1	102.7	569.8	40.0	1.81	9.4	0.0170	2.6E-06
0.975	161.6	0.105	0.0110	0.290	1	23.4	238.6	104.8	577.9	42.9	1.85	9.6	0.0212	3.4E-06
0.99	168.5	0.119	0.0113	0.314	1	24.3	239.1	106.1	582.7	45.5	1.9	9.7	0.0231	3.9E-06
1	199.7	0.187	0.0126	0.400	1	25.0	240.0	107.0	586.0	49.7	1.95	10.0	0.0284	5.7E-06

Notes:
These are the distribution of values used in the MEE example and were discussed in AMEC (2008a).
The values shown for the arsenic Process Area soil concentrations are the spatial bootstrap mean values.

Attachment 1
Example Calculations Based On MEE Model Iterations - Arsenic in PA Workers

Risk Calculation

Scenario:	Current
Receptor:	KI Site Process Worker
Medium:	Shallow Soil (0-1')

Hazard Quotient (HQ) = ADD (mg/kg-day) / RfD (mg/kg-d)
Cancer Risk (ELCR) = LADD (mg/kg-day) * CSF [1/(mg/kg-day)]

Parameter (units)	Var Loop 1, Day Loop 1	Var Loop 1, Day Loop 2	
Uncertainty Parameters			
DAF: Dermal Adherence Factor (mg/cm2)	0.039	0.039	
Oral-RAF: Absorption Adjustment Factor (Oral-Soil) (unitless)	0.278	0.278	
Dermal-RAF: Absorption Adjustment Factor (Dermal-Soil) (unitless)	0.00915	0.00915	
Inhalation-RAF: Absorption Adjustment Factor (Inhal-Soil) (unitless)	1	1	
Variability Parameters - Receptor Loops			
ED: Exposure Duration (years)	12.34	12.34	
EF: Exposure Frequency (days/year)	231.24	231.24	
BW: Body Weight (kg)	69.7	69.7	
SSA: Skin Surface Area (cm2/event)	437.3	437.3	Calc from BW
FI: Fraction Ingested from Site (unitless)	1	1	
FA: Fraction Absorbed from Site (unitless)	1	1	
RfDo: Oral Reference Dose (mg/kg-day)	0.0003	0.0003	Toxicity values run in variability loop since are fixed values
RfDd: Dermal Reference Dose (mg/kg-day)	0.0003	0.0003	Toxicity values run in variability loop since are fixed values
RfDi: Dermal Reference Dose (mg/kg-day)	No value	No value	No value reported in IRIS for As non-cancer inhalation pathway
CSFo: Oral Cancer Slope Factor [1/(mg/kg-day)]	1.5	1.5	Toxicity values run in variability loop since are fixed values
CSFd: Dermal Cancer Slope Factor [1/(mg/kg-day)]	1.5	1.5	Toxicity values run in variability loop since are fixed values
CSFo: Inhal Cancer Slope Factor [1/(mg/kg-day)]	15.1	15.1	Toxicity values run in variability loop since are fixed values
Variability Parameters - Day Loops			
ET: Exposure Time (h/day)	7.1	7.6	
RPM: Respirable Particulate Matter (mg/m3)	0.014	0.012	
CS: Constituent Concentration in Soil (mg/kg)	106.95	133.6	
Cd: Constituent Concentration in Air as Dust (mg/m3)	1.5E-06	1.6E-06	
IR: Ingestion Rate (mg/day)	31.7	20.1	
InhR: Inhalation Rates (m3/h)	1.6	1.34	
ATnc: Averaging Time (days) (ED x 365 days/yr, noncancer)	4504.1	4504.1	
ATc: Averaging Time (days) (70 yr. x 365 days/yr, cancer)	25550	25550	
CF: Conversion factor (kg/mg)	1.00E-06	1.00E-06	

INGESTION PATHWAY

		Noncancer Hazard Quotient				Excess Lifetime Cancer Risk			
Constituent	Soil Concentration (mg/kg)	Oral-Soil RAF (noncancer) Chronic	Oral Day Loop ADD (mg/kg-day)	Chronic RfD (mg/kg-day)	Day Loop Oral Soil HQo	Oral-Soil AAF (cancer)	Oral Day Loop LADD (mg/kg-day)	CSF [1/(mg/kg-day)]	Day Loop Oral Soil Risk
ARSENIC									
Var Loop 1, Day Loop 1	106.95	0.278	3.00E-09	3.00E-04	1.00E-05	0.278	5.29E-10	1.50E+00	7.94E-10
Var Loop 1, Day Loop 2	133.60	0.278	3.75E-09	3.00E-04	1.25E-05	0.278	6.61E-10	1.50E+00	9.92E-10
Continues until reaches max exposed days (2853 for this example)									

DERMAL PATHWAY

		Noncancer Hazard Quotient				Excess Lifetime Cancer Risk			
Constituent	Soil Concentration (mg/kg)	Dermal-Soil RAF (noncancer) Chronic	Dermal Day Loop ADD (mg/kg-day)	Chronic RfD (mg/kg-day)	Soil HQd	Dermal-Soil AAF (cancer)	Dermal Day Loop LADD (mg/kg-day)	CSF [1/(mg/kg-day)]	Day Loop Dermal Soil Risk
ARSENIC									
Var Loop 1, Day Loop 1	106.95	0.00915	5.32E-11	3.00E-04	1.77E-07	0.00915	9.37E-12	1.50E+00	1.41E-11
Var Loop 1, Day Loop 2	133.60	0.00915	6.64E-11	3.00E-04	2.21E-07	0.00915	1.17E-11	1.50E+00	1.76E-11
Continues until reaches max exposed days (2853 for this example)									

INHALATION PATHWAY

			Noncancer Hazard Quotient	Excess Lifetime Cancer Risk			
Constituent	Soil Concentration (mg/kg)	Dust Concentration (mg/m3)	Inhalation HQ	Inhal-Soil RAF (cancer)	Inhal Day Loop LADD (mg/kg-day)	CSF [1/(mg/kg-day)]	Inhal Soil Risk
ARSENIC			Noncancer inhalation risks				
Var Loop 1, Day Loop 1	106.95	1.54E-06	are not evaluated - no	1	9.01E-14	1.51E+01	1.36E-12
Var Loop 1, Day Loop 2	133.60	1.64E-06	inhalation RfD available	1	8.58E-14	1.51E+01	1.30E-12
Continues until reaches max exposed days (2853 for this example)							

Note:
Cancer and Non-Cancer Risks are summed across all of the exposed days to represent the receptor's total potential risk(s)
FI and FA can also be input in the model but for the KI worker are assumed to be 1.0.