Calculation Package
for the
Analysis of Performance of Cells 1-6, with Underdrain, of the Environmental Management Waste Management Facility
Oak Ridge, Tennessee

Date Issued: March 30, 2010

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Revision 0

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Prepared for
the
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Office of Environmental Management

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JACOBS	Calculation No: ENV-002	Page: 1 of 79
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(Ref. FOWI 116 Design Calculations)	Previous Revision Date: NA	Current Revision Date: 3/30/2010
Issuing Department: *Federal Operations Design Engineering*	Supersedes:	
Client: BJC Project Title: Performance Analysis of EMWMF 6 Cell Design Project Number: 35T303X3 BCE12275 System:	Engineering Discipline: ***Environmental/Modeling***	

Calculation Title:

Calculation Package for the Performance Assessment for the Environmental Management Waste Management Facility, Oak Ridge, Tennessee (based on 6-cell design issued 2/10/2010)

Purpose:

This calculation package presents the results of an assessment of the performance of the 6 cell design of the Environmental Management Waste Management Facility (EMWMF). The calculations show that the new cell 6 design at the EMWMF will meet the current WAC requirement. QA/QC steps were taken to verify the input/output data for the risk model and data transfer from modelling output files to tables and calculation.

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Engineering Manager's Approval: Mark Johnson Date: 3/30/2010

Revision History:

Pages Affected By Revision	Revised/Added/Deleted	Description of Revision
All	N.A.	Original Issue

Description of Calculation:

Risk and dose calculation of the Cell 6 design at EMWMF and comparison to the current WAC.

Assumptions:

Assumptions are as stated in the attachment.

Design Inputs:

Design Inputs are as noted in the Attachment.

Software:

Title	Developer	Versions	Revision Level
PATHRAE-RAD and PATHRAE-HAZ	Rogers and Associates Engineering	0	0
MODFLOW	McDonald and Harbaugh	0	0
MODPATH	Pollock	0	0
MT3D	Zheng	0	0

Calculation Section:

See Attachment.

Conclusions/Recommendations:

See Attachment

Reference:

See Attachment

INTRODUCTION

This document presents the results of an assessment of the performance of a build-out of the Environmental Management Waste Management Facility (EMWMF). The EMWMF configuration that was assessed includes the as-constructed Cells 1 through 4, with a groundwater underdrain that was installed beneath Cell 3 during the winter of 2003-2004, and a Cell 5 that is presently under construction, and Cell 6 , whose proposed design is addressed in an *Addendum to Remedial Design Report for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee, DOE/OR/01-1873/V1&D2/A6* (DOE 2010).

The total capacity of the EMWMF with six cells is about 2.2 million cubic yards. This assessment was conducted to determine the conditions under which the approved Waste Acceptance Criteria (WAC) for the EMWMF found in the *Attainment Plan for Risk/Toxicity-Based Waste Acceptance Criteria at the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE 2001a), as revised for constituents added up to October 10, 2008 (Revised Table A.1: Analytic WAC Limits, http://bechteljacobs.org/webindex.html#3), would remain protective of public health and safety for the six-cell disposal facility under consideration. For consistency, the methods of analyses and the exposure scenario used to predict the performance of a six-cell disposal facility were identical to those used in the Remedial Investigation and Feasibility Study (RI/FS) and its Addendum (DOE 1998a, DOE 1998b) to develop the approved WAC. To take advantage of new information and design changes departing from the conceptual design, the modeling domain and model calibration were updated from those used in the RI/FS and its Addendum. It should be noted that this analysis is not intended to justify or propose a change in the approved WAC.

EXPOSURE SCENARIO

The exposure scenario used in the assessment consists of a resident farmer located near the confluence of Bear Creek and Northern Tributary-5 (NT-5). Bear Creek surface water is used for watering livestock and irrigating crops, and drinking water is obtained from a well located near NT-5, between the EMWMF and Bear Creek. This exposure scenario is identical to the exposure scenario used to develop the approved WAC. Figure 1 shows the relative locations of the well, six-cell EMWMF, and Bear Creek and its tributaries used in the RI/FS and Addendum analyses.

REVISION OF THE MODEL DOMAIN

The RI/FS performance modeling domain and the larger modeling domain used in this analysis are also shown in Figure 1. Because the EMWMF is being constructed further to the north and east of the conceptual location of the EMWMF, the modeling domain was revised to include the full extent of the EMWMF in its present location. Detailed descriptions of the groundwater modeling domain and associated specific features are given in Appendix B of the *Engineering Feasibility Plan for Groundwater Suppression at the Environmental Management Waste Management Facility, Oak Ridge, Tennessee* [Bechtel Jacobs Company LLC (BJC) 2003] and

the subsequent report [Jacobs Engineering Group, Inc. (JEG) 2010]. Essential features of the revised modeling domain are:

- The refined model grid is extended north to the top of Pine Ridge (a zero flow groundwater modeling boundary);
- The western groundwater hydraulic head boundary is moved from its previous location in proximity to NT-5 to the west, past NT-6.

Additional changes in the modeling that could influence the projected performance of the EMWMF include:

- A change in the cover design that reduced the rate of infiltration through the waste (DOE 2001b);

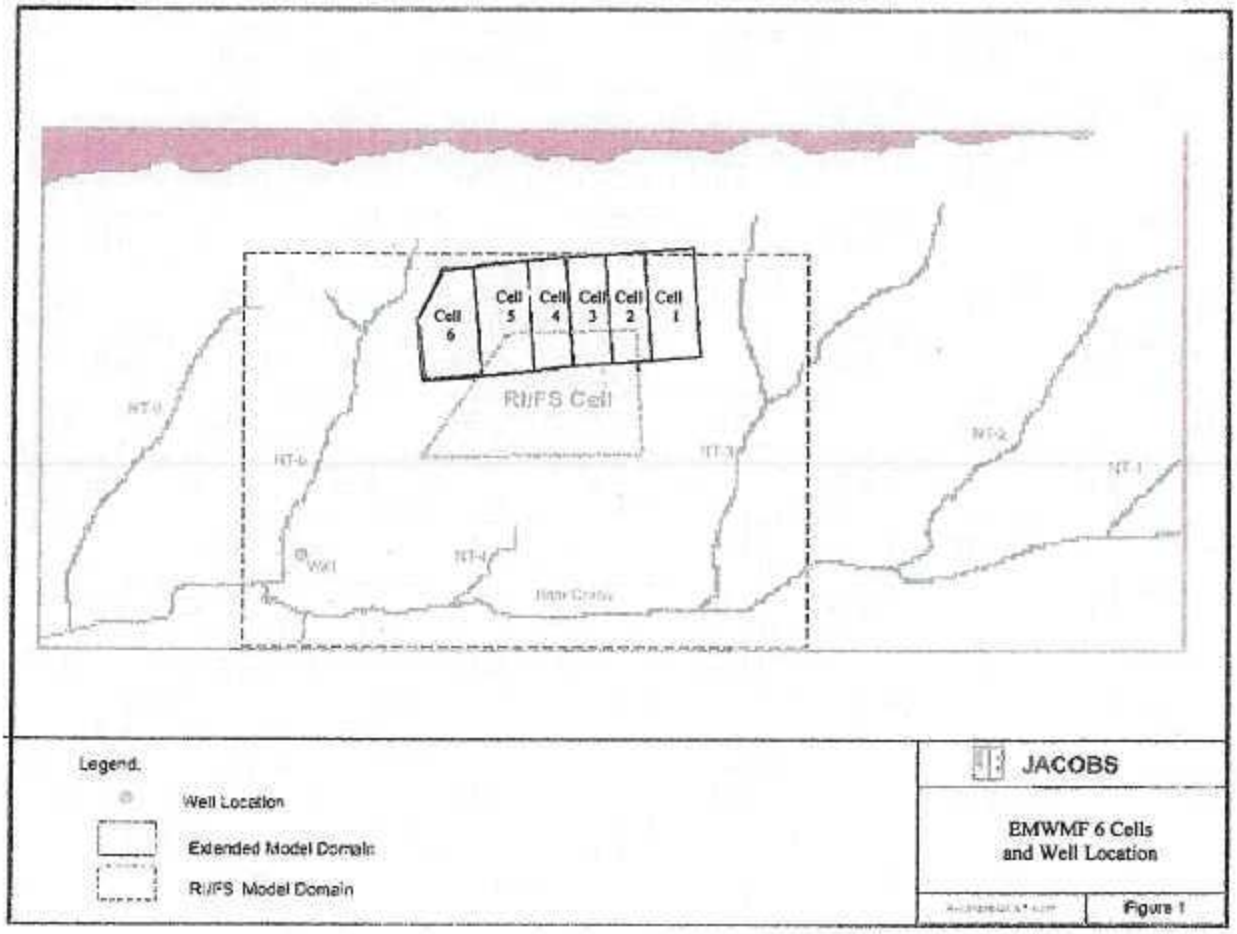

Figure 1. Original modeling domain and the modeling domain used in this analysis, and locations of RI/FS and Addendum disposal facility, EMWMF Cells 1 through 6, and receptor well.

- The addition of an underdrain beneath Cell 3 that was installed in late 2003 and early 2004;

- An increase in the total plan area of the EMWMF;

- All the engineering and design features that are in place and proposed; and

- Calibration of the groundwater model to newly acquired groundwater and geological data up to date.

MODELING CONTAMINANT MIGRATION

The following analyses were performed under the assumption that Cells 1 through 6 have been closed and capped:

- The groundwater flow fields of the revised modeling domain, adjusted for the proposed build-out of the EMWMF to six cells, were assessed using the MODFLOW groundwater model (McDonald and Harbaugh 1988, Jacobs 2010).

- Groundwater flow paths and particle travel times from cells to surface discharge locations were determined using the MODPATH model (Pollock 1989).

- Solute transport calculations were made for movement of contaminants from the disposal facility to the residential well using MT3D (Zheng 1990).

- Dilution factors (DFs) for Bear Creek and the residential well were calculated using the revised modeling domain for the EMWMF. .The DFs are defined as the ratios of the peak steady-state contaminant concentrations in the Bear Creek water or water continuously pumped (250 gallons per day) from the well to unit contaminant concentrations entering the groundwater beneath the disposal facility.

METHOD OF RISK AND DOSE ASSESSMENT

The projected peak risks and doses from radioactive or hazardous constituents in the first 100,000 years after closure were calculated for consumption of drinking water from a well and using Bear Creek surface water for agricultural purposes with a concentration of contaminants in the waste (source term) of 1 Ci/m^3 (curie per cubic meter) for radioactive constituents and 1 kg/m^3 (kilogram per cubic meter) for toxicological constituents, respectively. Those risks and doses were scaled according to the approved WAC concentrations to determine the risks and doses that could occur if each constituent was present alone in the EMWMF at the WAC concentration. Those risks and doses were then compared to the risk and dose criteria upon which the WAC are based.

The calculations were performed in the following steps:

1. PATHRAE [Rogers and Associates Engineering (RAE) 1995a and 1995b] calculations were performed to determine the equivalent annual water consumption per year for Bear Creek [defined as the Equivalent Uptake (EU)]. This equivalent water consumption corresponds to scaling the use of Bear Creek water for drinking and agricultural purposes to an equivalent annual drinking water ingestion that would give the same annual constituent uptake as calculated to come from all pathways. Since drinking water in the resident farmer exposure scenario will be supplied by a well rather than Bear Creek, the annual drinking water volume of 730 l/yr to be supplied by the well is subtracted from the Bear Creek EU to estimate the effective drinking water ingestion that can be associated with agricultural uses for Bear Creek surface water. The PATHRAE calculations also provide peak concentrations of contaminants in Bear Creek water corresponding to a unit source term, the corresponding peak doses or risks associated with those concentrations, and the times of occurrence of the peak concentrations.

2. The calculated DFs for Bear Creek and the residential well were used for scaling the constituent concentrations in Bear Creek to corresponding well concentrations. Using the 6-cell EMWMF configuration and design, the ratio of the constituent concentrations in the well to those in Bear Creek is $DF_{Well}/DF_{Creek} = 0.00060/0.0045 = 0.13$.

3. The peak effective risk or dose was calculated as the risk or dose due to ingestion of 730 l/yr per year of water drawn from the well, plus the consumption of agricultural products and livestock irrigated or watered with Bear Creek surface water. The latter is calculated by subtracting 730 l/yr of water from the EU for Bear Creek water that is calculated by the PATHRAE computer code. Thus:

Peak Effective Risk or Dose = Peak Bear Creek Risk or Dose x

$$[EU-730 + (DF_{Well}/DF_{Creek}) \times 730] / EU$$

where DF_{Well} and DF_{Creek} are the dilution factors calculated for the well and the creek, respectively, and the peak Bear Creek risk or dose correspond to ingestion of Bear Creek water at the annual EU rate.

Radioactive Constituents – Risk

The Peak Bear Creek Risk for radioactive constituents is,

Peak Bear Creek Risk = Peak Bear Creek concentration x EU x

Slope Factor x 30 years exposure duration,

where the peak Bear Creek risk is calculated directly by the PATHRAE-RAD computer code using slope factors [Incremental Lifetime Cancer Risk (ILCR) /pCi] obtained from the EPA's *Health Effects Assessment Summary Tables.*

Hazardous Constituents – Risk and Dose

Peak Bear Creek Risk = Peak Bear Creek Lifetime Intake of Carcinogens x

Slope Factor,

Peak Bear Creek Lifetime Intake for Carcinogens =

Peak Bear Creek Concentration x

EU x 30 years exposure duration /

[70 kg body weight x 365 days per year x 70 year life]

and,

Peak Bear Creek Daily Intake (Dose) for Non-Carcinogens =

Peak Bear Creek Concentration x EU /

[70 kg body weight x 365 days per year],

where the peak Bear Creek daily intake for carcinogens is calculated using PATHRAE-HAZ generated data and the formula immediately above.

The peak risks and doses resulting from constituent concentrations in the waste equal to the WAC concentrations were then calculated as follows:

For radioactive constituents:

Peak Effective Risk for constituents in the waste at the WAC level =

$$\left[\text{Peak Effective Risk from a 1 Ci/m}^3\text{ source x WAC}\right] / 6.25 \times 10^5$$

where the WAC are expressed in picuries per gram (pCi/g) and the factor 6.25×10^5 results from unit conversions.

For hazardous constituents:

Peak Effective Risk or Dose for constituents in the waste at the WAC level =

[Peak Effective Risk or Dose from a 1 kg/m^3 source x WAC] / 625

where the WAC are expressed in milligrams per kilogram (mg/kg) and the factor of 625 comes from unit conversions.

MODELING RESULTS FOR THE EMWMF CELLS 1 THROUGH 6 WITH UNDERDRAIN

Peak risk and dose calculations for the EMWMF Cells 1 through 6 using the PATHRAE-RAD and PATHRAE-HAZ environmental pathway analysis computer codes are based on the following input parameters and data, some of which were generated using MODFLOW and MT3D for the extended modeling domain.

Volume-weighted average waste height 50.6 ft = 15.4 m

Effective Cells 1–6 horizontal dimensions = 2,584 ft x 451 ft = 788 m x 137 m

Waste footprint area = 1,190,401 ft^2 = 110,592 m^2

Waste volume = 5.90 x 10^7 ft^3 = 2.18 x 10^6 cy = 1.67 x 10^6 m^3

Infiltration rate = 0.36 inches/year = 0.91 cm/year

Volume-weighted average distance to Bear Creek or to a drainage feature that gives quick access to Bear Creek = 331 ft = 101 m

Creek dilution factor (DF_{Creek}) = 4.5 x 10^{-3}

Well dilution factor (DF_{Well}) = 6.0 x 10^{-4}

The peak risks and doses calculated using the PATHRAE code for Cells 1 through 6, based on unit source terms, are given in Tables 1 and 2 for the radioactive and hazardous constituents, respectively. The PATHRAE input parameters used in these calculations and summaries of output results are given in Attachment 1. Note that the peak doses in Bear Creek in Table 2, as given by PATHRAE, are always higher than their corresponding peak effective doses because the former are calculated based on the assumption that Beak Creek water is used for all purposes. The constituent concentrations in the well are lower than in Bear Creek and, since most of the effective uptake for most constituents is from drinking water (i.e., water from the well), the effective dose is usually considerably lower.

The projected peak risks and doses from the proposed 6-cell EMWMF, using the approved WAC as the source terms, are given in Tables 3 and 4. Table 3 and 4 also list the time to the projected concentration peak as well as the risk and dose criterion for each contaminant. These are the same criteria as were used to develop the approved WAC.

CONCLUSION

If the approved list of WAC constituents that have finite WAC values (given in Revised Table A.1: Analytic WAC Limits, http://bechteljacobs.org/webindex.html#3) are assumed to be separately in the EMWMF at the maximum allowable concentrations prescribed by their respective WAC, the resultant risks and doses to the receptor are summarized in Tables 3 and 4. It can be seen that those risks and doses will not exceed the current WAC criteria for any of the constituents.

The analyses that led to the development of the projected WAC in Table A.1 showed that, for the original 4-cell configuration of the EMWMF, the concentrations of constituents in the creek water and the well water would be approximately the same. Those analyses also demonstrated that, for the vast majority of the constituents, most of the risks and doses to the receptor comes from drinking well water. Any major reduction in constituent concentrations in the groundwater at the well will greatly reduce projected risks and doses. Groundwater modeling shows that the addition of an underdrain beneath Cell 3 that diverts much of the leachate directly to Bear Creek via the remnant of NT-4, as well as the extension of the EMWMF westward, significantly reduces constituent concentrations in the well water.

The addition of Cells 5 and 6, with the presence of an underdrain under Cell 3, will result in lower risks and doses than were expected when the WAC in Table A.1 were developed. Therefore, the existing WAC are conservatively low for the proposed 6-cell configuration.

Table 1. Peak Effective Risks for the EMWMF for Radioactive Constituents
(risks based on a 1 Ci/m^3 concentration in the waste)

Nuclide	Peak Concentration in Bear Creek (pCi/L)	Ingestion Slope Factor (1/pCi)	Equivalent Uptake (L/yr)	Peak Effective Risk (ILCR)	Time of Projected Peak (yr)
H-3	4.24E-02	7 15E-14	1.17E+03	4.85E-11	330
C-14	2.12E+06	1 03E-12	9 56E+02	2.12E-02	380
Tc-99	1.91E+06	1.40E-12	7.40E+02	8.59E-03	410
I-129	9 84E+05	1.84E-10	8.38E+02	1.11E+00	900
U-233	5.66E+04	4.48E-11	7.38E+02	7 99E-03	45,000
U-234	6 06E+04	4.44E-11	7 38E+02	8.48E-03	45,000
U-235	6.89E+04	4 70E-11	7.38E+02	1.02E-02	53,000
U-236	6.88E+04	4.21E-11	7.38E+02	9.13E-03	46,000
U-238	6.89E+04	6 20E-11	7.38E+02	1.35E-02	53,000
Np-237	4.80E+04	2.95E-10	7 34E+02	4.29E-02	100,000
Pu-239	2 99E+03	3.16E-10	7 33E+02	2 84E-03	95,000
Pu-240	2.19E+00	3.15E-10	7 33E+02	2.07E-06	92,000
Am-241	a	3.28E-10	a	a	a

Note The ratio of the dilution factors DF_{well} to the DF_{creek} is 0 13

a = The PATHRAE code did not indicate a non-zero value for the concentration of Am-241 at any time before 100,000 years. The Am-241 nuclide has the same K_{ds} as the Pu-241 nuclide so it should arrive at key locations at the same time. However, since Am-241 has a half - life of 432 years, less than one tenth of that for Pu-240, much more of it will decay away before about 84,000 years, the time at which Pu-240 begins to show up in a discernable concentration . Therefore it is concluded that the WAC for Am-241 should be set at the specific activity of that nuclide.

Table 2. Peak Effective Risks and Doses for the EMWMF for Hazardous Constituents (based on a 1 kg/m^3 concentration in the waste)

Constituent	Peak Dose in Bear Creek (mg/kg-day)	Peak Concentration in Bear Creek (mg/L)	Reference Dose (mg/kg-day)	Equivalent Uptake (L/yr)	Slope Factor (1/mg/kg-d)	Peak Effective Risk (ILCR)	Peak Effective Dose (mg/kg-day)
Acenaphthene	*	*	*	*	*	*	*
Acenaphythylene	2.04E-03	7.09E-02	6.00E-02	7.34E+02			2.75E-04
Acetone	3.96E-01	1.38E+01	1.00E-01	7.33E+02			5.92E-02
Aldrin	*	*	*	*	*	*	*
Antimony	4.14E-03	1.44E-01	4.00E-04	7.33E+02			5.53E-04
Aroclor 1221	*	*	*	*	*	*	*
Aroclor 1232	6.10E-04	2.1E-02	*	7.33E+02	4.00E+01	1.38E-05	
Barium	*	*	*	*	*	*	*
Boron	2.03E-02	6.95E-04	2.00E-01	7.48E+02			3.14E+03
Alpha-BHC	1.01E-03	3.52E-02		7.34E+02	6.30E+00	3.86E-04	
Beta-BHC	1.01E-03	3.52E-02		7.33E+02	1.80E+00	1.06E-04	
Delta-BHC	1.01E-03	3.52E-02		7.35E+02	1.80E+00	1.04E-04	
Benzene	4.27E-02	1.49E+00		7.33E+02	2.90E-02	1.85E-01	
Benzoic Acid	4.30E-01	1.50E+01	4.00E+00	7.33E+02			5.65E-02
Benzyl Alcohol	4.23E-01	1.47E+01	3.00E-01	7.33E+02			5.74E-02
Carbazole	2.28E-04	7.93E-03		7.34E+02	2.00E-02	4.04E-02	
Carbon Tetrachloride	3.37E-02	1.17E+00	7.00E-04	7.33E+02	1.30E-01	3.06E-02	3.78E-04
Chlorobenzene	6.29E-02	2.19E+00	2.00E-02	7.33E+02			8.42E-03
Chlordane	*	*	*	*	*	*	*
Chloroform	1.02E-01	3.56E+0	1.00E-02	7.33E+02	6.10E-03	3.06E-2	3.57E-05
Chromium III	8.30E-03	2.72E-01	1.00E+00	7.79E+02			1.53E-03
m-Cresol	3.15E-01	1.10E-01	5.00E-02	7.33E+02			4.21E-02
o-Cresol	2.35E-01	8.18E+00	5.00E-02	7.33E+02			3.14E-02

Table 2. Peak Effective Risks and Doses for the EMWMF for Hazardous Constituents (based on a 1 kg/m^3 concentration in the waste)

Constituent	Peak Dose in Bear Creek (mg/kg-day)	Peak Concentration in Bear Creek (mg/L)	Reference Dose (mg/kg-day)	Equivalent Uptake (L/yr)	Slope Factor (1/mg/kg-d)	Peak Effective Risk (ILCR)	Peak Effective Dose (mg/kg-day)
p-Cresol	3.19E-01	1.11E+01	5.00E-02	7.33E+02			4.26E-02
Cyanide	7.89E-03	2.75E-01	2.00E-02	7.33E+02			1.05E-03
Dibenz[a,h]antracene	*	*	*	*	*	*	*
1-2-Dichlorobenzene	1.01E-02	3.52E-01	9.00E-02	7.33E+02			1.35E-03
1-3-Dichlorobenzene	4.90E-03	1.71E-01	8.90E-02	7.34E+02			6.60E-04
1-4-Dichlorobenzene	1.03E-02	3.58E-01	2.30E-01	7.33E+02	2.40 E-02	1.41E-05	1.38E-03
Diethyphthalate	1.36E-01	4.76E+00	8.00E-01	7.33E+02			1.82E-02
Dimethylphthalate	3.44E-01	1.20E+01	1.00E+01	7.33E-+02			4.59E-02
Di-n-butylphthalate	5.58E-01	1.77E+01	1.00E-01	8.06E+02			2.87E-02
2,4-Dinitrotoluene	3.41E-02	1.19E+00	2.00E-03	7.33E+02	6.8E-04	1.37E-03	4.55E-03
2,6-Dinitrotoluene	4.45E-02	1.55E+00	1.00E-03	7.33E+02	6.80E-01	1.73E-03	5.94E-03
Dieldrin	2.63E-03	8.10E-02	5.00E-05	8.29E+02	1.30E+01		6.15E-04
2,4-D	8.62E-02	3.00E+0	1.00E-02	7.33E+02			1.15E-02
DDD	*	*	*	*	*		
DDE	5.70E-05	1.76E-02		8.27E+02	3.40E-01	1.93E-07	
Endosulfan I	5.69E-05	1.98E-03	6.00E-03	7.34E+02			7.67E-06
Endosulfan II	5.69E-05	1.98E-03	6.00E-03	7.34E+02			7.67E-06
Endrin	3.19E-05	1.10E-03	3.00E-04	7.40E+02			4.52E-06
Endrin Aldehyde	3.19E-03	1.10E-03	3.00E-04	7.40E+02			4.52E-06
Endrin Ketone	3.19E-03	1.10E-03	3.00E-04	7.40E+02			4.52E-06
Hexachlorobenzene	*	*	*	*	*	*	*
Hexachloroethane	6.33E-03	2.20E-01	1.00E-03	7.34E+02	1.40E-02	5.14E-06	8.53E-04
Heptachlor	4.10E-21	1.40E-19	5.00E-04	7.37E+02	4.50E+00	6.16E-06	3.17E-06

Table 2. Peak Effective Risks and Doses for the EMWMF for Hazardous Constituents (based on a 1 kg/m^3 concentration in the waste)

Constituent	Peak Dose in Bear Creek (mg/kg-day)	Peak Concentration in Bear Creek (mg/L)	Reference Dose (mg/kg-day)	Equivalent Uptake (L/yr)	Slope Factor (1/mg/kg-d)	Peak Effective Risk (ILCR)	Peak Effective Dose (mg/kg-day)
Heptachlor Epoxide	2.68E-05	8.81E-04	1.30E-05	7.79E+02	9.10E+00	2.07E-05	4.97E-06
Isophorone	4.27E-02	1.49E+00	2.00E-01	7.33E+02	9.50E-04	2.40E-06	5.88E-03
Lead	*	*	*	*	*	*	*
Lindane	1.00E-03	3.50E-02	3.00E-04	7.35E+02	1.30E+00	7.68E-05	1.7E-04
Manganese	*	*	*	*	*	*	*
Molybdenum	4.03E-03	1.37E-01	5.00E-03	7.50E+02			5.48E-04
Methylene Chloride	6.01E-01	2.10E-01	6.00E-02	7.33E+02	7.50E-03	2.24E-05	8.03E-02
Methylcyclohexane	1.77E-03	6.17E-02	6.00E-02	7.33E+02			2.36E-04
2-Methylnapthalene	3.11E-03	1.08E-01	4.00E-03	7.33E+02			4.19E-04
Nitrobenzene	2.64E-01	9.21E+00	5.00E-04	7.33E+02			3.54E-02
4-Nitrobenzamine	1.35E-09	4.71E-08	3.00E-03	7.33E+02	2.10E-02	1.62E-12	1.80E-10
N-nitroso-di-n-propolyamine	1.74E-01	6.05E+00		7.33E+02	7.00E+00	7.18E-02	
N-Nitrosodiphenylamine	4.42E-03	1.54E-01	2.00E-02	7.33E+02	4.90E-03	1.24E-06	5.90E-04
Napthalene	3.92E-03	1.37E-01	3.60E-02	7.33E+02			5.24E-04
2-Nitrophenol	9.16E-02	3.19E+00	6.20E-02	7.33E+02			3.75E-04
4-Nitrophenol	7.70E-02.	2.68E+00	6.20E-02	7.33E+02			1.03E-02
Phenol	1.82E-01	6.33E+00	6.00E-01	7.33E+02			6.48E-02
Pyridine	4.66E-01	1.63E+01	1.00E-03	7.33E+02			6.22E-02
Selenium	9.16E-03	2.03E-01	5.00E-03	1.31E+03			4.02E-03
Strontium	6.29E-03	1.78E-01	6.00E-01	7.94E+02			1.18E-03
Tin	3.17E-02	2.03E-01	6.00E-01	7.91E+02			5.99E-03
Tetrachloroethene	1.08E-02	1.02E+00	1.00E-02	7.33E+02	5.20E-02	3.31E-05	1.48E-03
2,3,4,6-Tetrachlorophenol	*	*	*	*	*	*	*

Table 2. Peak Effective Risks and Doses for the EMWMF for Hazardous Constituents (based on a 1 kg/m^3 concentration in the waste)

Constituent	Peak Dose in Bear Creek (mg/kg-day)	Peak Concentration in Bear Creek (mg/L)	Reference Dose (mg/kg-day)	Equivalent Uptake (L/yr)	Slope Factor (1/mg/kg-d)	Peak Effective Risk (ILCR)	Peak Effective Dose (mg/kg-day)
1,2,4-Trichlorbenzene	7.21E-03	2.51E-01	5.00E-02	7.35E+02			9.63E-03
Trichloroethene	2.88E-02	1.00E+00		7.33E+02	1.10E-02	1.87E-05	
2,4,6-Trichlorophenol	1.00E-01	3.49E+00	1.00E-02	7.34E+02	1.1E-02	6.37E-05	1.35E-02
Toluene	1.29E-02	4.49E-01	2.00E-01	7.33E+02			3.58E-03
2,4,5-TP(Silvex)	2.53E-02	8.81E-01	8.00E-03	7.34E+02			3.41E-03
U-233[a]	1.47E-03	5.11E-02	3.00E-03	7.37E+02	See Table 3		2.03E-04
U-234[a]	1.63E-03	5.69E-02	3.00E-03	7.37E+02	See Table 3		2.25E-04
U-235[a]	1.99E-03	6.89E-02	3.00E-03	7.37E+02	See Table 3		2.75E-04
U-236[a]	1.98E-03	6.87E-02	3.00E-03	7.37E+02	See Table 3		2.74E-04
U-238[a]	1.99E-03	6.89E-02	3.00E-03	7.37E+02	See Table 3		2.75E-04
Vanadium	*	*	*	*	*	*	*
Vinyl Chloride	1.50E-01	5.24E+00	3.00E-03	7.33E+02	1.40E+00	1.21E-02	2.00E-02
Xylene(mixture)	1.34E-02	4.67E-01	2.00E-01	7.33E+02			1.79E-03
Acetonitrile	6.71E-01	2.34E+01	6.00E-03	7.33E+02			6.95E-02
Acetophenone	4.26E-01	1.49E+01	1.00E-01	7.33E+02			5.69E-02
Acrolein	6.66E-01	2.32E+01	5.00E-04	7.33E+02			6.90E-02
Acrylonitrile	6.59E-01	2.30E+01	1.00E-03	7.33E+02	5.40E-01	2.04E-02	6.83E-02
Butylbenzene	7.75E-03	2.70E-01	3.80E-02	7.33E+02			3.17E-05
Ethylchloride	5.20E-01	1.81E+01	4.00E-01	7.33E+02	2.90E-03	8.62E-05	6.95E-02
1-Hexanol	4.35E-01	1.52E+01	4.00E-02	7.33E+02			5.81E-02
2-Hexanone	4.35E-01	1.52E+01	4.00E-02	7.33E+02			5.81E-02
Trimethylbenzene (mixed isomers)	5.82E-03	2.03E-01	5.00E-02	7.34E+02			1.02E-03
Dibenzofuran	1.70E-01	5.94E+00	4.00E-03	7.33E+02			2.93E-02

Table 2. Peak Effective Risks and Doses for the EMWMF for Hazardous Constituents (based on a 1 kg/m^3 concentration in the waste)

Constituent	Peak Dose in Bear Creek (mg/kg-day)	Peak Concentration in Bear Creek (mg/L)	Reference Dose (mg/kg-day)	Equivalent Uptake (L/yr)	Slope Factor (1/mg/kg-d)	Peak Effective Risk (ILCR)	Peak Effective Dose (mg/kg-day)
2,4-Dimethylphenol	2.96E-02	1.03E+00	2.00E-02	7.33E+02			3.95E-03
Benzidine	1.41E-02	4.19E-01	3.00E-03	7.33E+02	2.30E+02	1.85E-01	1.88E-03
Methanol	6.69E-01	2.33E+01	5.00E-01	7.33E+02			6.94E-02
Methyl Metacrylate	4.50E-01	1.57E+01	1.4E+00	7.33E+02			6.02E-02
Cumene (Isopropylbenzene)	7.71E-03	2.68E-01	1.00E-01	7.33E+02			1.04E-03
(1-Methyl-propyl)benzene	7.71E-03	2.68E-01	3.70E-02	7.33E+02			1.04E-03
1,2-Dimethyl-benzene	2.78E-02	9.69E-01	2.00E+00	7.33E+02			3.74E-04
1-Methyl-4-(1-(methylethyl)benzene	7.71E-03	2.68E-01	3.70E-02	7.33E+02			1.04E-03
Propylbenzene	7.71E-03	2.69E-01	3.70E-02	7.33E+02			1.04E-03
Bromodichloro-methane	5.11E-01	1.78E+01	2.00E-02	7.33E+02	6.20E-02	1.81E-03	5.36E-02
Bromoform	2.59E-01	9.05e+00	2.00E-02	7.33E+02	7.90E-03	1.17E-04	2.69E-02
Bromomethane	5.74E-01	2.00E+01	1.40E-03	7.33E+02			6.82E-02
Carbon Disulfide	1.99E-01	6.94E+00	1.00E-01	7.33E+02			2.66E-02
Chloromethane	5.73E-01	2.00E+01		7.33E+02	1.30E-02	4.27E-04	
o-Chlorotoluene	6.31E-02	2.20E+00	2.00E-02	7.33E+02			2.44E-03
Dibromochloromethane	3.56E-01	1.24E+01	2.00E-02	7.33E+02	8.40E-02	1.33E-03	4.75E-02
Dichlorodifluoromethane	4.72E-02	1.65E+00	2.00E-01	7.33E+02			6.30E-03
1,2,-cis-Dichloroethylene	9.19E-02	3.21E+00	1.00E-02	7.33E+02			1.23E-03
1,2-trans-Dichloroethylene	4.56E-01	1.59E+01	2.00E-02	7.33E+02			6.09E-02
1,2-Dichloropropane	4.23E-01	1.49E+01		7.33E+02	6.80E-02	6.24E-06	

Table 2. Peak Effective Risks and Doses for the EMWMF for Hazardous Constituents (based on a 1 kg/m^3 concentration in the waste)

Constituent	Peak Dose in Bear Creek (mg/kg-day)	Peak Concentration in Bear Creek (mg/L)	Reference Dose (mg/kg-day)	Equivalent Uptake (L/yr)	Slope Factor (1/mg/kg-d)	Peak Effective Risk (ILCR)	Peak Effective Dose (mg/kg-day)
Ethylbenzene	2.85E-02	9.94E-01	1.00E-01	7.33E+02			3.81E-03
N-Hexane	1.61E-03	5.39E+01	6.00E-02	7.34E+02			2.17E-04
Methyl Isobutyl Ketone	6.58E-01	2.29E+01	8.00E-02	7.33E+02			8.79E-02
Propylene Glycol	6.70E-01	2.33E+01	5.00E-01	7.33E+02			8.99E-02
Styrene	5.23E-02	1.82E+00	2.00E-01	7.33E+02			6.99E-03
1,1,1,2-Tetrachloroethane	1.81E-01	6.29E+00	3.00E-02	7.33E+02	2.60E-02	2.76E-04	1.89E-02
1,1,2,2-Tetrachloroethane	1.86E-01	1.18E+01	6.00E-02	7.33E+02	2.00E-01	3.38E-03	3.49E-03
Trichlorofluoromethane	1.86E-01	6.47E+00	3.00E-01	7.33E+02			2.48E-02
1,2,3-Trichloropropane	2.98E-01	1.03E+01	6.00E-03	7.40E+02	7.00E+00	1.27E-01	2.48E-02
1,2,4-Trimethylbenzene	7.21E-03	2.51E-01	5.00E-02	7.33E+02			9.71E-04
1,3,5-Trimethylbenzene	8.14E-03	2.84E-01	5.00E-02	7.33E+02			1.09E-03

Note: The ratio of the well dilution factor to the creek dilution factor is 0.13.

* = Constituent not projected to appear within 100,000 years

ILCR = incremental lifetime cancer risk

^ = The PATHRAE-Haz analysis does not consider biodegradation or radioactive decay and, hence, is conservative.

Table 3. Projected Peak Risks for EMWMF for Radioactive Constituents (risks based on contaminant concentrations in the waste equal to the current WAC)

Nuclide	Projected Peak Risk (ILCR)	Risk Criterion (ILCR)	Time of Projected Peak Risk (yr)
H-3	1.16E-11	1.00E-05	330
C-14	5.59E-06	1.00E-05	380
Tc-99	2.36E-06	1.00E-05	410
I-129	5.17E-06*	1.00E-05	900
U-233	2.17E-05	1.00E-04	45,000
U-234	2.31E-05	1.00E-04	45,000
U-235	2.45E-05	1.00E-04	53,000
U-236	2.49E-05	1.00E-04	46,000
U-238	2.59E-05	1.00E-04	53,000
Np-237	2.19E-05	1.00E-04	100,000
Pu-239	3.27E-06	1.00E-04	95,000
Pu-240	1.92E-08	1.00E-04	92,000
Am-241	a	a	a

* = Based on an I 129 WAC of 2.9 pCi/g

a = The PATHRAE code did not indicate a non-zero value for the concentration of Am-241 at any time before 100,000 years. The Am-241 nuclide has the same K_ds as the Pu-241 nuclide so it should arrive at key locations at the same time. However, since Am-241 has a half - life of 432 years, less than one tenth of that for Pu-240, much more of it will decay away before about 84,000 years, the time at which Pu-240 begins to show up in a discernable concentration . Therefore it is concluded that the WAC for Am-241 should be set at the specific activity of that nuclide.

ILCR = incremental lifetime cancer risk

Table 4. Projected Peak Risks and Doses for EMWMF for Hazardous Constituents (risks and doses based on contaminant concentrations in the waste equal to the corresponding current WAC)

Contaminant	Time of Projected Peak (yr)	Projected Peak Risk (ILCR)	Risk Criterion (ILCR)	Projected Peak Dose (mg/kg-day)	Dose Criterion (mg/kg-day)
Acenaphthene	251,000	*	*	*	*
Acenaphthylene	34,000			1.72E-01	1.8E-01
Acetone	600			2.29E-02	1.0E-01
Aldrin	265,000	*	*	*	*
Antimony	5,200			1.41E-04	1.2E-03
Aroclor 1221	665,000	*	*	*	*
Aroclor 1232	1,000,000	2.21E-06	1.0E-05		
Barium	150,000	*	*	*	*
Boron	10,000			3.69E-01	6.00E-01
Alpha-BHC	12,000	2.29E-05	1.0E-04		
Beta-BHC	14,000	2.38E-05	1.0E-04		
Delta-BHC	14,000	2.33E-05	1.0E-04		
Benzene	4,800	2.37E-05	1.0E-04		
Benzoic Acid	470			9.02E-01	4.0E+00
Benzyl Alcohol	570			1.08E-01	3.0E-01
Carbazole	23,000	4.00E-05	1.0E-04		
Carbon Tetrachloride	6,100	3.39E-05	1.0E-04	4.75E-04	2.1E-03
Chlorobenzene	1,900			4.44E-03	6.0E-02
Chlordane	280,000	*	*	*	*
Chloroform	2,000	2.28E-06	1.0E-04	2.31E-04	3.0E-02
Chromium III	33,000			3.69E-01	3.0E+00
m-Cresol	780			1.14E-02	5.0E-02
o-Cresol	1,100			1.16E-02	5.0E-02
p-Cresol	770			1.16E-02	5.0E-02
Cyanide	33,000			1.13E-02	6.0E-02
Dibenz[a,h]anthracene	>1,000,000	*	*	*	*
1-2-Dichlorobenzene	2,900			2.03E-02	2.7E-01
1-3-Dichlorobenzene	44,000			6.19E-02	2.7E-01
1-4-Dichlorobenzene	4,500	2.26E-06	1.0E-04	6.90E-02	9.0E-01
Diethylphthalate	1,300			1.80E-01	8.0E-01
Dimethylphthalate	710			2.26E-03	1.0E+01
Di-n-butyl-phthalate	470			3.60E-02	1.0E-01

Table 4. Projected Peak Risks and Doses for EMWMF for Hazardous Constituents (risks and doses based on contaminant concentrations in the waste equal to the corresponding current WAC)

Contaminant	Time of Projected Peak (yr)	Projected Peak Risk (ILCR)	Risk Criterion (ILCR)	Projected Peak Dose (mg/kg-day)	Dose Criterion (mg/kg-day)
2,4-Dinitrotoluene	800	2.13E-06	1.0E-05	1.36E-04	6.0E-03
2,6-Dinitrotoluene	741	2.25E-06	1.0E-05	2.29E-04	1.0E-03
Dieldrin	88,000	3.38E-05	1.0E-04	5.92E-05	1.5E-04
2,4-D	660			2.19E-04	1.0E-02
DDD	250,000	*	*	*	*
DDE	6.100	4.01E-05	1.0E-04		
Endosulfan I	14,000			3.67E-03	1.8E-02
Endosulfan II	28,000			3.67E-03	1.8E-02
Endrin	59,000			2.18E-04	9.0E-04
Endrin Aldehyde	140,000			2.20E-04	9.0E-04
Endrin Ketone	140,000			2.20E-04	9.0E-04
Hexachlorobenzene	300,000	*	*	*	*
Hexachloroethane	12,000	2.30E-05	1.0E-04	6.85E+04	3.0E-03
Heptachlor	130,000	2.38E-05	1.0E-04	3.53E-04	1.5E-03
Heptachlor Epoxide	47,000	3.30E-05	1.0E-04	1.22E-05	3.9E-05
Isophorone	4,800	2.28E-05	1.0E-04	1.37E-01	6.0E-01
Lead	540,000	*	*	*	*
Lindane	23,000	2.21E-05	1.0E-04	2.05E-04	9.0E-04
Manganese	>1,000,000	*	*	*	*
Molybdenum	55,000			3.42E-03	1.5E-02
Methylene Chloride	530	2.67E-07	1.0E-05	1.89E-02	6.0E-02
Methylcyclohexane	470			2.94E-03	1.3E-02
2-Methylnapthalene	20,000			2.72E-03	1.2E-02
Nitrobenzene	900			1.12E-04	5.0E-04
4-Nitrobenzamine	1,600	2.26E-06	1.0E-04	3.69E-04	9.0E-03
N-nitroso-di-n-propolyamine	2,300	2.11E-05	1.0E-04		
N-Nitrosodiphenylamine	2,600	2.18E-06	1.0E-04	4.53E-03	6.0E-02
Napthalene	12,000			8.78E-03	1.1E-01
2-Nitrophenol	2,800			4.72E-05	1.2E-01
4-Nitrophenol	3,300			8.78E-03	1.2E-01
Phenol	2,200			1.24E-01	6.0E-01

Table 4. Projected Peak Risks and Doses for EMWMF for Hazardous Constituents (risks and doses based on contaminant concentrations in the waste equal to the corresponding current WAC)

Contaminant	Time of Projected Peak (yr)	Projected Peak Risk (ILCR)	Risk Criterion (ILCR)	Projected Peak Dose (mg/kg-day)	Dose Criterion (mg/kg-day)
Pyridine	510			2.2E-04	1.0E-03
Selenium	81,000			1.21E-02	1.5E-02
Strontium	37,000			6.19E-01	1.8E+00
Tin	14,000			6.69E-03	1.8E+00
Tetrachloroethene	19,000	2.27E-05	1.0E-04	2.20E-02	3.0E-02
2,3,4,6-Tetrachlorophenol	680,000	*	*	*	*
1,2,4-Trichlorbenzene	5,200			1.57E-03	3.0E-02
Trichloroethene	7,100	2.30E-05	1.0E-04		
2,4,6-Trichlorophenol	2,500	2.25E-06	1.0E-04	a	3.0E-04
Toluene	16,000			1.35E-01	6.0E-01
2,4,5-TP (Silvex)	990			1.80E-03	8.0E-03
U-233[b]	66,000		See Table 2	5.14E-04	3.0E-03
U-234[b]	67,000		See Table 2	5.43E-04	3.0E-03
U-235[b]	86,000		See Table 2	6.53E-04	3.0E-03
U-236[b]	77,000		See Table 2	6.46E-04	3.0E-03
U-238[b]	86,000		See Table 2	6.63E-04	3.0E-03
Vanadium	540,000	*	*		*
Vinyl Chloride	1,700	5.61E-06	1.0E-04	8.30E-05	3.0E-03
Xylene (mixture)	3,400			4.29E-02	6.0E-01
Chloromethane	560	2.99E-06	1.0E-05		
Acetonitrile	470			1.65E-04	6.0E-03
Acetophenone	770			3.00E-02	1.0E-01
Acrolein	470			7.38E-04	5.0E-04
Acrylonitrile	480	3.04E-06	1.0E-05	2.96E-04	1.0E-03
Butylbenzene	5,800			7.38E-04	
Ethylchloride	620	3.03E-06	1.0E-05	1.20E-01	4.0E-01
1-Hexanol	550			9.02E-03	4.0E-02
2-Hexanone	550			9.02E-03	4.0E-02
Trimethylbenzene (mixed isomers)	5,200			4.56E-02	1.5E-01
Dibenzofuran	620,000	*	*	*	*
2,4-Dimethylphenol	8,700			1.36E-02	6.0E-02

Table 4. Projected Peak Risks and Doses for EMWMF for Hazardous Constituents (risks and doses based on contaminant concentrations in the waste equal to the corresponding current WAC)

Contaminant	Time of Projected Peak (yr)	Projected Peak Risk (ILCR)	Risk Criterion (ILCR)	Projected Peak Dose (mg/kg-day)	Dose Criterion (mg/kg-day)
Benzidine	18,000	3.79E-05	1.0E-04	1.91E-05	6.0E-02
Methanol	410			1.22E-01	5.0E-01
Methyl Metacrylate	530			3.19E-01	1.4E+00
Cumene (Isopropyl-benzene)	5,900			6.76E-02	3.00E-1
(1-Methyl-propyl)-benzene	5,900			2.48E-03	1.1E-02
1,2-Dimethyl-benzene	2,000			4.54E-02	6.0E-02
1-Methyl-4-(1- methylethyl)-benzene	5,900			2.48E-02	1.1E-01
Propylbenzene	5,900			2.48E-02	1.1E-01
Bromodichloro-methane	502	2.91E-06	1.0E-05	6.04E-03	2.0E-02
Bromoform	1,300	3.01E-07	1.0E-05	2.64E-03	2.0E-02
Bromomethane	560			4.30E-04	1.4E-03
Carbon Disulfide	800			3.02E-02	1.0E-01
Chloromethane	560	2.99E-06	1.0E-05		
o-Chlorotoluene	3,300			1.20E-03	2.0E-02
Dibromochloro-methane	930	7.80E-07	1.0E-05	5.58E-03	2.0E-02
Dichlorodifluoro-methane	510			6.26E-02	2.0E-01
1,2,-cis-Dichloroethylene	3,700			9.80E-03	1.0E-01
1,2-trans-Dichloroetylene	720			6.05E-03	2.0E-02
1,2-Dichloropropane	770	1.10E-08	1.0E-05		
Ethylbenzene	1,800			3.00E-02	3.0E-01
N-Hexane	1,400			6.13E-04	6.0E-03
Methyl Isobutyl Ketone	480			2.39E-01	8.0E-01
Propylene Glycol	470			1.58E-01	1.25E+01
Styrene	6,400			1.79E-01	6.0E-01

Table 4. Projected Peak Risks and Doses for EMWMF for Hazardous Constituents (risks and doses based on contaminant concentrations in the waste equal to the corresponding current WAC)

Contaminant	Time of Projected Peak (yr)	Projected Peak Risk (ILCR)	Risk Criterion (ILCR)	Projected Peak Dose (mg/kg-day)	Dose Criterion (mg/kg-day)
1,1,1,2-Tetrachloroethane	1,500	3.10E-07	1.0E-05	8.89E-03	3.0E-02
1,1,2,2-Tetrachloroethane	980	2.64E-06	1.0E-05	1.80E-03	6.0E-03
Trichlorofluoro-methane	1,300			9.12E-02	9.0E-01
1,2,3-Trichloropropane	990	3.27E-06	1.0E-05	1.89E-03	6.0E-03
1,2,4-Trimethylbenzene	5,200			3.39E-02	1.5E-01
1,3,5-Trimethylbenzene	11,000			4.52E-02	1.5E-01

ILCR = incremental lifetime cancer risk

* = Constituent not projected to appear within 100,000 years.

a = Both a slope factor and a reference dose exist for this constituent but there is no dose-based WAC for it given in Revised Table A.1: Analytic WAC Limits. http://bechteljacobs.org/webindex.html#3.

[b] = The PATHRAE-Haz code does not consider biodegradation or radioactive decay and, hence, projected risk and dose estimates are conservative.

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RAE 1995b. *The PATHRAE-HAZ Performance Assessment Code for the Land Disposal of Hazardous Chemical Wastes*, Rogers and Associates Engineering Corporation, RAE-9500/2-2, Salt Lake City, UT.

Zheng, C. 1990. *A Modular Three-Dimensional Transport Model for Simulation of Advection, Dispersion and Chemical Reactions of Contaminants in Groundwater Systems*, S.S. Papadopulos & Associates, Inc.

ATTACHMENT 1

PATHRAE ENVIRONMENTAL TRANSPORT ANALYSIS

INPUT AND OUTPUT FOR THE EMWMF

CELLS 1-6

```
PATHRAE-RAD(PC)  Version 2.2d  February 1995
   Date:  2-1-2010
   Time: 13:29:52

 W. A. C. - February 2010  New Proposed Cell 1-6 EMWMF

 *****  Mirror Image of Input Files  *****

 -- Input File:  ABCDEF.DAT
 W. A. C. - February, 2010  New Proposed Cell 1-6 EMWMF
 2,1000.,100000.
 35,0,5
 1,2
 0.,137.,788.,2.23E+5,1.,101.,0.
 1800.,6.,0.,0.,0.,0.,.315,0.
 20,2,0,1,1
 4.0,15.4,1.67E+06.,-1.,0.,1600.,.40,.705,0.90,1.
 1.0E-7,8000.,.705,0.,1.0E+0, 0.01,0E+0
 240.,5.56E-4,.22,.02,3.0E-4,20.,.01
 4,6.3,.23,0.,1.1E-06,.01,0.,0.,0.,0.,0.
 0,0,0,0,0,0,0
 1,0,0,1
 0.0091,4.24,0.04,7.17,.025,10.,0.00001,1.,0.,.25

 -- Input File:  BRCDCF.DAT
 101,H-3      6.4E-08,  6.4E-08,  0.00E+00,
 102,C-14     2.1E-06,  2.1E-06,  1.88E-09,
 103,K-40     1.9E-05,  1.2E-05,  1.4E-05,
 104,Co-57    1.2E-06,  9.1E-06,  1.34E-05,
 105,Co-60    2.7E-05,  2.2E-04,  2.74E-04,
 106,Sr-90    1.4E-04,  1.3E-03,  3.32E-08,
 107,Nb-95    2.6E-06,  4.5E-06,  7.8E-05,
 108,Tc-99    1.5E-06,  7.5E-06,  6.3E-11,
 109,Cs-134   7.3E-05,  4.6E-05,  1.78E-04,
 110,Cs-137   5.0E-05,  3.2E-05,  6.85E-05,
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111,Ba-133    3.4E-06,  6.9E-06,  4.2E-05,
112,Eu-152    6.5E-06,  2.2E-04,  1.28E-04,
113,Eu-154    9.5E-06,  2.9E-04,  1.39E-04,
114,Eu-155    1.5E-06,  4.1E-05,  6.89E-06,
055,Ra-226    8.6E-03,  7.9E-03,  7.6E-07,
116,Th-228    3.8E-04,  3.1E-01,  2.8E-07,
051,Th-229    4.0E-03,  2.0E+00,  1.0E-05,
036,Th-230    5.5E-04,  3.2E-01,  9.1E-08,
037,Th-232    5.0E-03,  1.6E+00,  6.44E-08,
053,Pa-231    2.5E-02,  1.3E+00,  3.6E-06,
121,U-232     1.31E-03, 1.4E-01,  8.36E-08,
054,U-233     2.89E-04, 1.4E-01,  8.36E-08,
038,U-234     2.83E-04, 1.3E-01,  8.74E-08,
039,U-235     2.67E-04, 1.2E-01,  1.73E-05,
040,U-236     2.69E-04, 1.3E-01,  7.59E-08,
041,U-238     2.7E-04,  1.2E-01,  2.82E-06,
042,Np-237    4.4E-03,  4.9E-01,  3.2E-06,
043,Pu-238    3.2E-03,  3.9E-01,  9.79E-08,
044,Pu-239    3.5E-03,  4.3E-01,  4.29E-08,
045,Pu-240    3.5E-03,  5.1E-01,  8.2E-08,
048,Am-241    3.6E-03,  4.4E-01,  3.21E-06,
132,Cm-243    2.5E-03,  3.1E-01,  1.46E-05,
050,Cm-244    2.0E-03,  2.5E-01,  1.03E-07,
020,I-129     2.8E-04,  1.8E-04,  2.2E-06,
025,Be-10     4.2E-06,  3.5E-04,  0.0E-00

-- Input File:  INVNTRY.DAT
101, 1.23E+01, 1.67E+06,    .0,  .000,      0., 0.,   1.,  H-3
102, 5.73E+03, 1.67E+06,    .0,  .000,      0., 0.,   1.,  C-14
103, 1.28E+09, 1.67E+06,  10.3,  .986,      0., 0.,   1.,  K-40
104, 7.42E-01, 1.67E+06,  24.7,  .125,      0., 0.,   1.,  Co-57
105, 5.27E+00, 1.67E+06,   9.2, 1.253,      0., 0.,   1.,  Co-60
106, 2.86E+01, 1.67E+06,    .0,  .000,      0., 0.,   1.,  Sr-90
107, 9.60E-02, 1.67E+06,  11.6,  .765,      0., 0.,   1.,  Nb-95
108, 2.13E+05, 1.67E+06,  29.2,  .089,      0., 0.,   1.,  Tc-99
109, 2.06E+00, 1.67E+06,  12.1,  .700,      0., 0.,   1.,  Cs-134
110, 3.02E+01, 1.67E+06,  12.8,  .615,      0., 0.,   1.,  Cs-137
111, 1.07E+01, 1.67E+06,  22.2,  .154,      0., 0.,   1.,  Ba-133
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112, 1.36E+01, 1.67E+06,  14.0,  .497,       0., 0.,   1.,  Eu-152
113, 8.80E+00, 1.67E+06,  12.5,  .657,       0., 0.,   1.,  Eu-154
114, 4.96E+00, 1.67E+06,  32.1,  .078,       0., 0.,   1.,  Eu-155
055, 1.60E+03, 1.67E+06,  21.5,  .170,       0., 0.,   1.,  Ra-226
116, 1.91E+00, 1.67E+06,  25.9,  .112,       0., 0.,   1.,  Th-228
051, 7.34E+03, 1.67E+06,  28.8,  .091,       0., 0.,   1.,  Th-229
036, 7.70E+04, 1.67E+06,  30.3,  .084,       0., 0.,   1.,  Th-230
037, 1.40E+10, 1.67E+06,  35.5,  .070,       0., 0.,   1.,  Th-232
053, 3.28E+04, 1.67E+06,  22.8,  .146,       0., 0.,   1.,  Pa-231
121, 7.20E+01, 1.67E+06,  25.7,  .000,       0., 0.,   1.,  U-232
054, 1.59E+05, 1.67E+06,  25.7,  .115,       0., 0.,   1.,  U-233
038, 2.44E+05, 1.67E+06,  35.5,  .070,       0., 0.,   1.,  U-234
039, 7.04E+08, 1.67E+06,  21.6,  .169,       0., 0.,   1.,  U-235
040, 2.34E+07, 1.67E+06,  36.6,  .068,       0., 0.,   1.,  U-236
041, 4.47E+09, 1.67E+06,  12.0,  .718,       0., 0.,   1.,  U-238
042, 2.14E+06, 1.67E+06,  34.9,  .072,       0., 0.,   1.,  Np-237
043, 8.78E+01, 1.67E+06,  45.3,  .055,       0., 0.,   1.,  Pu-238
044, 2.41E+04, 1.67E+06,  25.8,  .113,       0., 0.,   1.,  Pu-239
045, 6.54E+03, 1.67E+06,  46.3,  .054,       0., 0.,   1.,  Pu-240
048, 4.32E+02, 1.67E+06,  43.5,  .057,       0., 0.,   1.,  Am-241
132, 2.85E+01, 1.67E+06,  22.0,  .159,       0., 0.,   1.,  Cm-243
050, 1.81E+01, 1.67E+06,  43.5,  .057,       0., 0.,   1.,  Cm-244
020, 1.60E+07, 1.67E+06,  62.0,  .040, 1.0e-02, 0.,   1.,  I-129
025, 1.60E+07, 1.67E+06,    .0,  .000,       0., 0.,   1.,  Be-10

-- Input File:  RQSITE.DAT
101,-1.99e-1, 0.00E+0, 0.00E+0,  H-3
102,-1.09e+0, 0.00E+0, 0.00E+0,  C-14
103,-3.98e+0, 3.00E+0, 3.00E+1,  K-40
104,-3.97e+6, 8.00E+1, 8.00E+2,  Co-57
105,-3.97e+6, 8.00E+1, 8.00E+2,  Co-60
106,-8.74e+0, 3.00E+0, 3.00E+1,  Sr-90
107,-2.38e+1, 3.79E+1, 3.79E+2,  Nb-95
108,-1.29e+0, 0.00E+0, 0.00E+0,  Tc-99
109,-1.99e+1, 9.69E+1, 9.69E+2,  Cs-134
110,-1.99e+1, 3.00E+2, 3.00E+3,  Cs-137
111,    -55., 5.50E+0, 5.50E+1,  Ba-133
112,-3.78e+0, 4.00E+0, 4.00E+1,  Eu-152
```

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113,-3.78e+0, 4.00E+0, 4.00E+1,  Eu-154
114,-3.78e+0, 4.00E+0, 4.00E+1,  Eu-155
055,-1.99e+1, 3.00E+2, 3.00E+3,  Ra-226
116,-5.36e+1, 3.00E+2, 3.00E+3,  Th-228
051,-5.36e+1, 3.00E+2, 3.00E+3,  Th-229
036,-5.36e+1, 3.00E+2, 3.00E+3,  Th-230
037,-5.36e+1, 3.00E+2, 3.00E+3,  Th-232
053,-5.47e+1, 4.00E+1, 4.00E+2,  Pa-231
121,-4.00e+1, 7.00E-1, 2.00E+1,  U-232
054,-4.00e+1, 7.00E-1, 2.00E+1,  U-233
038,-4.00e+1, 7.00E-1, 2.00E+1,  U-234
039,-4.00e+1, 7.00E-1, 2.00E+1,  U-235
040,-4.00e+1, 7.00E-1, 2.00E+1,  U-236
041,-4.00e+1, 7.00E-1, 2.00E+1,  U-238
042,-5.56e+1, 4.00E+0, 4.00E+1,  Np-237
043,-5.76e+1, 4.00E+0, 4.00E+1,  Pu-238
044,-5.76e+1, 4.00E+0, 4.00E+1,  Pu-239
045,-5.76e+1, 4.00E+0, 4.00E+1,  Pu-240
048,-5.76e+1, 4.00E+0, 4.00E+1,  Am-241
132,-5.76e+1, 4.00E+0, 4.00E+1,  Cm-243
050,-5.76e+1, 4.00E+0, 4.00E+1,  Cm-244
020,-1.99E-1, 0.00E+0, 1.99E-1,  I-129
025,-8.00E+2, 8.00E+1, 8.00E+2,  Be-10

-- Input File:  UPTAKE.DAT
0.5,    0.2,     1.89
0.67,   0.65,    2.1E-3,    438.,    438.
0.0,    2160.,   24.,      1440.,      1.,   0.83
50.,    6.,      48.,       480.,     48.
.05,   0.0008,   60.,         8.,     50.
14.,     176.,  110.,         0.,     95.,    730., 6.9
H-3                .25, 4.8E+0, 4.8E-1, 1.0E-2,    0., 1.2E-2, 9.0E-1
C-14               .25, 5.5E+0, 5.5E-1, 1.2E-2,    0., 3.1E-2, 4.6E+3
K-40               .25, 3.7E-1, 3.7E-2, 1.0E-2,    0., 1.2E-2, 1.0E+3
Co-57              .25, 9.4E-3, 9.4E-4, 1.0E-3,    0., 1.3E-2, 5.0E+1
Co-60              .25, 9.4E-3, 9.4E-4, 1.0E-3,    0., 1.3E-2, 5.0E+1
Sr-90              .25, 1.7E-2, 1.7E-3, 8.0E-4,    0., 6.0E-4, 3.0E+1
Nb-95              .25, 9.4E-3, 9.4E-4, 2.5E-3,    0., 2.8E-1, 3.0E+4
```

```
Tc-99           .25, 2.5E-1, 2.5E-2, 1.0E-3,   0., 1.0E-4, 1.5E+1
Cs-134          .25, 1.0E-2, 1.0E-3, 1.2E-2,   0., 4.0E-3, 2.0E+3
Cs-137          .25, 1.0E-2, 1.0E-3, 1.2E-2,   0., 4.0E-3, 2.0E+3
Ba-133          .25, 5.0E-3, 5.0E-4, 4.0E-4,   0., 3.2E-3, 4.0E+0
Eu-152          .25, 2.5E-3, 2.5E-4, 5.0E-6,   0., 4.8E-3, 2.5E+1
Eu-154          .25, 2.5E-3, 2.5E-4, 5.0E-6,   0., 4.8E-3, 2.5E+1
Eu-155          .25, 2.5E-3, 2.5E-4, 5.0E-6,   0., 4.8E-3, 2.5E+1
Ra-226          .25, 3.1E-4, 3.1E-5, 8.0E-3,   0., 3.4E-2, 5.0E+1
Th-228          .25, 4.2E-3, 4.2E-4, 5.0E-6,   0., 2.0E-4, 3.0E+1
Th-229          .25, 4.2E-3, 4.2E-4, 5.0E-6,   0., 2.0E-4, 3.0E+1
Th-230          .25, 4.2E-3, 4.2E-4, 5.0E-6,   0., 2.0E-4, 3.0E+1
Th-232          .25, 4.2E-3, 4.2E-4, 5.0E-6,   0., 2.0E-4, 3.0E+1
Pa-231          .25, 2.5E-3, 2.5E-4, 5.0E-6,   0., 8.0E+2, 1.1E+1
U-232           .25, 2.5E-3, 2.5E-4, 5.0E-4,   0., 3.4E-4, 2.0E+0
U-233           .25, 2.5E-3, 2.5E-4, 5.0E-4,   0., 3.4E-4, 2.0E+0
U-234           .25, 2.5E-3, 2.5E-4, 5.0E-4,   0., 3.4E-4, 2.0E+0
U-235           .25, 2.5E-3, 2.5E-4, 5.0E-4,   0., 3.4E-4, 2.0E+0
U-236           .25, 2.5E-3, 2.5E-4, 5.0E-4,   0., 3.4E-4, 2.0E+0
U-238           .25, 2.5E-3, 2.5E-4, 5.0E-4,   0., 3.4E-4, 2.0E+0
Np-237          .25, 2.5E-3, 2.5E-4, 5.0E-6,   0., 2.0E-4, 1.0E+1
Pu-238          .25, 2.5E-4, 2.5E-5, 2.0E-6,   0., 1.4E-5, 3.5E+0
Pu-239          .25, 2.5E-4, 2.5E-5, 2.0E-6,   0., 1.4E-5, 3.5E+0
Pu-240          .25, 2.5E-4, 2.5E-5, 2.0E-6,   0., 1.4E-5, 3.5E+0
Am-241          .25, 2.5E-4, 2.5E-5, 5.0E-6,   0., 2.0E-4, 2.5E+1
Cm-243          .25, 2.5E-3, 2.5E-4, 5.0E-6,   0., 2.0E-4, 2.5E+1
Cm-244          .25, 2.5E-3, 2.5E-4, 5.0E-6,   0., 2.0E-4, 2.5E+1
I-129           .25, 2.0E-2, 2.0E-3, 7.0E-3,   0., 1.0E-2, 4.0E+1
Be-10           .25, 1.0E-2, 2.5E-3, 9.0E-7,   0., 1.0E-2, 1.0E+2
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TOTAL EQUIVALENT UPTAKE FACTORS FOR PATHRAE

NUCLIDE	UT(J,1) RIVER L/YR	UT(J,2) WELL L/YR	UT(J,3) EROSION L/YR	UT(J,4) BATHTUB L/YR	UT(J,5) SPILLAGE L/YR	UT(J,6) FOOD KG/YR
H-3	1.166E+03	1.166E+03	1.172E+03	1.172E+03	1.172E+03	0.000E+00
C-14	9.564E+02	9.564E+02	3.270E+04	3.270E+04	3.270E+04	0.000E+00
K-40	8.639E+02	8.639E+02	7.764E+03	7.765E+03	7.765E+03	1.308E+01
Co-57	8.023E+02	8.023E+02	1.146E+03	1.146E+03	1.146E+03	1.933E-01
Co-60	8.055E+02	8.055E+02	1.150E+03	1.150E+03	1.150E+03	2.120E-01
Sr-90	7.414E+02	7.414E+02	9.484E+02	9.484E+02	9.484E+02	1.056E-01
Nb-95	1.699E+03	1.699E+03	2.007E+05	2.007E+05	2.007E+05	1.850E+00
Tc-99	7.403E+02	7.403E+02	8.438E+02	8.438E+02	8.438E+02	1.469E+00
Cs-134	8.365E+02	8.365E+02	1.461E+04	1.461E+04	1.461E+04	2.702E-01
Cs-137	8.371E+02	8.371E+02	1.464E+04	1.464E+04	1.464E+04	2.778E-01
Ba-133	7.518E+02	7.518E+02	7.794E+02	7.794E+02	7.794E+02	4.490E-02
Eu-152	7.572E+02	7.572E+02	9.296E+02	9.296E+02	9.296E+02	2.623E-02
Eu-154	7.571E+02	7.571E+02	9.296E+02	9.296E+02	9.296E+02	2.614E-02
Eu-155	7.570E+02	7.570E+02	9.294E+02	9.294E+02	9.294E+02	2.595E-02
Th-228	7.337E+02	7.337E+02	9.403E+02	9.403E+02	9.403E+02	1.799E-02
U-232	7.380E+02	7.380E+02	7.518E+02	7.518E+02	7.518E+02	1.356E-02
Cm-243	7.338E+02	7.338E+02	9.063E+02	9.063E+02	9.063E+02	1.118E-02
I-129	8.327E+02	8.327E+02	1.109E+03	1.109E+03	1.109E+03	5.624E-01
Be-10	7.837E+02	7.837E+02	1.474E+03	1.474E+03	1.474E+03	2.267E-01
Th-230	7.338E+02	7.338E+02	9.408E+02	9.410E+02	9.409E+02	1.884E-02
Th-232	7.338E+02	7.338E+02	9.408E+02	9.410E+02	9.409E+02	1.885E-02
U-234	7.380E+02	7.380E+02	7.518E+02	7.518E+02	7.518E+02	1.357E-02
U-235	7.380E+02	7.380E+02	7.518E+02	7.518E+02	7.518E+02	1.357E-02
U-236	7.380E+02	7.380E+02	7.518E+02	7.518E+02	7.518E+02	1.357E-02
U-238	7.380E+02	7.380E+02	7.518E+02	7.518E+02	7.518E+02	1.357E-02
Np-237	7.338E+02	7.338E+02	8.028E+02	8.028E+02	8.028E+02	1.122E-02
Pu-238	7.329E+02	7.329E+02	7.570E+02	7.570E+02	7.570E+02	1.058E-03
Pu-239	7.329E+02	7.329E+02	7.570E+02	7.570E+02	7.570E+02	1.059E-03
Pu-240	7.329E+02	7.329E+02	7.570E+02	7.570E+02	7.570E+02	1.059E-03
Am-241	7.338E+02	7.338E+02	9.063E+02	9.063E+02	9.063E+02	1.121E-03
Cm-244	7.338E+02	7.338E+02	9.063E+02	9.063E+02	9.063E+02	1.116E-02
Th-229	7.338E+02	7.338E+02	9.408E+02	9.408E+02	9.409E+02	1.884E-02

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   Pa-231       4.076E+06 4.076E+06 4.076E+06 4.077E+06 4.079E+06 2.641E+03
   U-233        7.380E+02 7.380E+02 7.518E+02 7.518E+02 7.518E+02 1.357E-02
   Ra-226       9.620E+02 9.620E+02 1.307E+03 1.307E+03 1.307E+03 1.901E-02


**********  PATHRAE INPUT SUMMARY  **********

 THERE ARE 80 ISOTOPES IN THE DOSE FACTOR LIBRARY
 NUMBER OF TIMES FOR CALCULATION IS  2
 YEARS TO BE CALCULATED ARE ...

   1000.00100000.00

 THERE ARE  35 ISOTOPES IN THE INVENTORY FILE
 THE VALUE OF IFLAG IS 0
 NUMBER OF PATHWAYS IS  5

             PATHWAY            TYPE OF USAGE
                               FOR UPTAKE FACTORS
    1  GROUNDWATER TO RIVER          2
    0  3X,I2,2X,A22,6X,I2))          0
    0  3X,I2,2X,A22,6X,I2))          0
    0  3X,I2,2X,A22,6X,I2))          0
    0  3X,I2,2X,A22,6X,I2))          0

 TIME OF OPERATION OF WASTE FACILITY IN YEARS                    0.
 LENGTH OF REPOSITORY (M)                                      137.
 WIDTH OF REPOSITORY (M)                                       788.
 RIVER FLOW RATE (M**3/YR)                                       2.23E+05
 STREAM FLOW RATE (M**3/YR)                                      1.00E+00
 DISTANCE TO RIVER (M)                                         101.

 OPERATIONAL SPILLAGE FRACTION                                   0.00E+00
 DENSITY OF AQUIFER (KG/M**3)                                 1800.
 LONGITUDINAL DISPERSIVITY (M)                                   6.00E+00
 LATERAL DISPERSION COEFFICIENT -- Y AXIS (M**2/YR)              0.00E+00
 NUMBER OF MESH POINTS FOR DISPERSION CALCULATION               20
 FLAG FOR GAMMA PATHWAY OPTIONS                                  2
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FLAG FOR GAMMA BUILDUP CALCULATION	0
FLAG FOR ATMOSPHERIC PATHWAY	0
COVER THICKNESS OVER WASTE (M)	4.00
THICKNESS OF WASTE IN PITS (M)	15.40
TOTAL WASTE VOLUME (M**3)	1.670E+06
DISTANCE TO WELL -- X COORDINATE (M)	-1.
DISTANCE TO WELL -- Y COORDINATE (M)	0.
DENSITY OF WASTE (KG/M**3)	1600.
FRACTION OF FOOD CONSUMED THAT IS GROWN ON SITE	.400
FRACTION OF YEAR SPENT IN DIRECT RADIATION FIELD	.705
DEPTH OF PLANT ROOT ZONE (M)	.900
AREAL DENSITY OF PLANTS (KG/M**2)	1.000
AVERAGE DUST LOADING IN AIR (KG/M**3)	1.00E-07
ANNUAL ADULT BREATHING RATE (M**3/YR)	8000.
FRACTION OF YEAR EXPOSED TO DUST	.705
CANISTER LIFETIME (YEARS)	0.
INVENTORY SCALING FACTOR	1.00E+00
HEIGHT OF ROOMS IN RECLAIMER HOUSE (CM)	240.
AIR CHANGE RATE IN RECLAIMER HOUSE (CHANGES/SEC)	5.56E-04
RADON EMANATING POWER OF THE WASTE	2.20E-01
DIFFUSION COEFF. OF RADON IN WASTE (CM**2/SEC)	2.00E-02
DIFFUSION COEFF. OF RN IN CONCRETE (CM**2/SEC)	3.00E-04
THICKNESS OF CONCRETE SLAB FLOOR (CM)	20.0
DIFFUSION COEFF. OF RADON IN COVER (CM**2/SEC)	1.00E-02
ATMOSPHERIC STABILITY CLASS	4
AVERAGE WIND SPEED (M/S)	6.30
FRACTION OF TIME WIND BLOWS TOWARD RECEPTOR	.2300
RECEPTOR DISTANCE FOR ATMOSPHERIC PATHWAY (M)	.0
DUST RESUSPENSION RATE FOR OFFSITE TRANSPORT (M**3/S)	1.10E-06
DEPOSITION VELOCITY (M/S)	.0100
STACK HEIGHT (M)	.0
STACK INSIDE DIAMETER (M)	.00

STACK GAS VELOCITY (M/S)	.0
HEAT EMISSION RATE FROM BURNING (CAL/S)	0.00E+00
DECAY CHAIN FLAGS 0 0 0 0 0 0	0
FLAG FOR INPUT SUMMARY PRINTOUT	1
FLAG FOR DIRECTION OF TRENCH FILLING	0
FLAG FOR GROUNDWATER PATHWAY OPTIONS	0
AMOUNT OF WATER PERCOLATING THROUGH WASTE ANNUALLY (M)	9.10E-03
DEGREE OF SOIL SATURATION	1.000
RESIDUAL SOIL SATURATION	.000
PERMEABILITY OF VERTICAL ZONE (M/YR)	.32
SOIL NUMBER	.000
POROSITY OF AQUIFER	.04
POROSITY OF UNSATURATED ZONE	.25
DISTANCE FROM AQUIFER TO WASTE (M)	7.2
AVERAGE VERTICAL GROUNDWATER VELOCITY (M/YR)	2.50E-02
HORIZONTAL VELOCITY OF AQUIFER (M/YR)	4.2
LENGTH OF PERFORATED WELL CASING (M)	10.000
SURFACE EROSION RATE (M/YR)	1.000E-05
LEACH RATE SCALING FACTOR	1.000E+00
ANNUAL RUNOFF OF PRECIPITATION (M)	0.00E+00

***** PEAK CONCENTRATIONS AND TIMES FOR PATHWAY 1 *****
***** RIVER AT 101.0 M *****

NUCLIDE	PEAK CONCENTRATION (CI/M**3)	PEAK TIME (YR)	AVERAGE DOSE AT PEAK TIME (MREM/YR)	AVERAGE RISK AT PEAK TIME (HE/YR)
H-3	4.24E-11	325.0	3.16E-06	8.85E-13
C-14	2.12E-03	382.0	4.25E+03	1.19E-03
K-40	6.67E-04	74754.8	1.10E+04	3.07E-03
Co-57		> 1000000.0		
Co-60		> 1000000.0		
Tc-99	1.91E-03	408.7	2.12E+03	5.94E-04

Cs-134		> 1000000.0		
Cs-137		> 1000000.0		
Th-228		> 1000000.0		
I-129	9.84E-04	902.9	2.31E+05	6.47E-02
Be-10		> 1000000.0		
Th-230		> 1000000.0		
Th-232		> 1000000.0		
U-234	6.06E-05	44787.2	1.27E+04	3.54E-03
U-235	6.89E-05	52983.0	1.36E+04	3.80E-03
U-236	6.88E-05	46360.2	1.37E+04	3.82E-03
U-238	6.89E-05	52983.0	1.37E+04	3.84E-03
Np-237	4.80E-05	101331.5	1.55E+05	4.34E-02
Pu-239	2.99E-06	94921.3	7.66E+03	2.14E-03
Pu-240	2.19E-09	92477.9	5.61E+00	1.57E-06
Th-229		> 1000000.0		
Pa-231	1.58E-13	905476.8	1.61E+01	4.52E-06
U-233	5.66E-05	44704.4	1.21E+04	3.38E-03
Ra-226		> 1000000.0		

PATHWAY 1
GROUNDWATER TO RIVER

********* NUCLIDE DOSES (mrem/yr) ********

NUCLIDE/TIME	1000.	100000.
H-3	0.0E+00	0.0E+00
C-14	3.9E+03	0.0E+00
K-40	0.0E+00	8.4E-07
Co-57	0.0E+00	0.0E+00
Co-60	0.0E+00	0.0E+00
Sr-90	0.0E+00	0.0E+00
Nb-95	0.0E+00	0.0E+00
Tc-99	2.1E+03	0.0E+00
Cs-134	0.0E+00	0.0E+00

Cs-137	0.0E+00	0.0E+00
Ba-133	0.0E+00	0.0E+00
Eu-152	0.0E+00	0.0E+00
Eu-154	0.0E+00	0.0E+00
Eu-155	0.0E+00	0.0E+00
Th-228	0.0E+00	0.0E+00
U-232	0.0E+00	0.0E+00
Cm-243	0.0E+00	0.0E+00
I-129	2.3E+05	0.0E+00
Be-10	0.0E+00	0.0E+00
Th-230	0.0E+00	0.0E+00
Th-232	0.0E+00	0.0E+00
U-234	0.0E+00	1.1E+04
U-235	0.0E+00	1.4E+04
U-236	0.0E+00	1.4E+04
U-238	0.0E+00	1.4E+04
Np-237	0.0E+00	1.5E+05
Pu-238	0.0E+00	0.0E+00
Pu-239	0.0E+00	6.9E+03
Pu-240	0.0E+00	3.1E+00
Am-241	0.0E+00	0.0E+00
Cm-244	0.0E+00	0.0E+00
Th-229	0.0E+00	0.0E+00
Pa-231	0.0E+00	0.0E+00
U-233	0.0E+00	9.5E+03
Ra-226	0.0E+00	0.0E+00

NUCLIDE CONCENTRATIONS IN RIVER (Ci/m**3)

NUCLIDE/TIME	1000.	100000.
H-3	0.0E+00	0.0E+00
C-14	2.0E-03	0.0E+00
K-40	0.0E+00	5.1E-14
Co-57	0.0E+00	0.0E+00
Co-60	0.0E+00	0.0E+00
Sr-90	0.0E+00	0.0E+00
Nb-95	0.0E+00	0.0E+00

Tc-99	1.9E-03	0.0E+00
Cs-134	0.0E+00	0.0E+00
Cs-137	0.0E+00	0.0E+00
Ba-133	0.0E+00	0.0E+00
Eu-152	0.0E+00	0.0E+00
Eu-154	0.0E+00	0.0E+00
Eu-155	0.0E+00	0.0E+00
Th-228	0.0E+00	0.0E+00
U-232	0.0E+00	0.0E+00
Cm-243	0.0E+00	0.0E+00
I-129	9.8E-04	0.0E+00
Be-10	0.0E+00	0.0E+00
Th-230	0.0E+00	0.0E+00
Th-232	0.0E+00	0.0E+00
U-234	0.0E+00	5.2E-05
U-235	0.0E+00	6.9E-05
U-236	0.0E+00	6.9E-05
U-238	0.0E+00	6.9E-05
Np-237	0.0E+00	4.8E-05
Pu-238	0.0E+00	0.0E+00
Pu-239	0.0E+00	2.7E-06
Pu-240	0.0E+00	1.2E-09
Am-241	0.0E+00	0.0E+00
Cm-244	0.0E+00	0.0E+00
Th-229	0.0E+00	0.0E+00
Pa-231	0.0E+00	0.0E+00
U-233	0.0E+00	4.5E-05
Ra-226	0.0E+00	0.0E+00

PATHRAE-HAZ(PC) Version 2.2d February 1995
Date: 2-1-2010
Time: 10:36:31

W. A. C. - February, 2010 New Proposed Cell 1-6 EMWMF

TOTAL EQUIVALENT UPTAKE FACTORS FOR PATHRAE

CONTAMINANT	UT(J,1) RIVER L/YR	UT(J,2) WELL L/YR	UT(J,3) EROSION L/YR	UT(J,4) BATHTUB L/YR	UT(J,5) SPILLAGE L/YR	UT(J,6) FOOD KG/YR
Acenaphthene	7.365E+02	7.365E+02	8.326E+03	8.327E+03	8.327E+03	6.144E-01
Acetone	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	5.480E+01
Antimony	7.332E+02	7.332E+02	1.423E+03	1.423E+03	1.423E+03	2.153E-01
Barium	7.372E+02	7.372E+02	7.648E+02	7.649E+02	7.649E+02	5.213E-01
Boron	7.474E+02	7.474E+02	7.474E+02	7.477E+02	7.477E+02	3.026E+01
Alpha-BHC	7.342E+02	7.342E+02	7.342E+02	7.343E+02	7.343E+02	9.609E-01
Beta-BHC	7.346E+02	7.346E+02	7.346E+02	7.346E+02	7.346E+02	8.399E-01
Delta-BHC	7.329E+02	7.329E+02	7.329E+02	7.330E+02	7.330E+02	3.820E+00
Carbazole	7.340E+02	7.340E+02	3.839E+03	3.839E+03	3.839E+03	1.081E+00
Carbontetchl	7.329E+02	7.329E+02	7.329E+02	7.329E+02	7.329E+02	1.231E+00
Chloroform	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	2.955E+00
Chromium III	7.787E+02	7.787E+02	2.159E+03	2.159E+03	2.159E+03	6.445E-01
Dieldrin	8.286E+02	8.286E+02	8.284E+02	8.287E+02	8.287E+02	2.459E+00
Dinbutylphthalat	8.061E+02	8.061E+02	8.061E+02	8.061E+02	8.061E+02	1.249E-01
Isophorone	7.329E+02	7.329E+02	7.328E+02	7.329E+02	7.329E+02	2.030E+00
Lead	7.369E+02	7.369E+02	2.807E+03	2.807E+03	2.807E+03	4.682E-01
Manganese	7.355E+02	7.355E+02	3.496E+03	3.498E+03	3.498E+03	3.346E+00
Methchloride	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	0.000E+00
Naphthalene	7.332E+02	7.332E+02	2.044E+03	2.044E+03	2.044E+03	1.981E+00
NnitroNpropyl	7.328E+02	7.328E+02	7.797E+02	7.797E+02	7.797E+02	2.488E+01
Phenol	7.328E+02	7.328E+02	7.887E+02	7.887E+02	7.887E+02	2.150E+01
Selenium	1.312E+03	1.312E+03	1.312E+03	1.316E+03	1.316E+03	7.577E+01
Strontium	7.941E+02	7.941E+02	7.931E+02	7.941E+02	7.941E+02	2.096E+01
Tetrachloroethen	7.329E+02	7.329E+02	7.329E+02	7.329E+02	7.329E+02	1.273E+00
Tin	7.907E+02	7.907E+02	2.149E+04	2.149E+04	2.149E+04	1.895E+01

Toluene	7.330E+02	7.330E+02	7.329E+02	7.330E+02	7.330E+02	1.106E+00
Trichloroethene	7.329E+02	7.329E+02	7.329E+02	7.329E+02	7.329E+02	1.735E+00
U-233	7.371E+02	7.371E+02	8.061E+02	8.061E+02	8.061E+02	1.201E-01
U-234	7.371E+02	7.371E+02	8.061E+02	8.061E+02	8.061E+02	1.201E-01
U-235	7.371E+02	7.371E+02	8.061E+02	8.061E+02	8.061E+02	1.201E-01
U-236	7.371E+02	7.371E+02	8.061E+02	8.061E+02	8.061E+02	1.201E-01
U-238	7.371E+02	7.371E+02	8.061E+02	8.061E+02	8.061E+02	1.201E-01
Vanadium	7.457E+02	7.457E+02	8.147E+02	8.147E+02	8.147E+02	4.151E-02
124Trichlorb	7.339E+02	7.339E+02	7.339E+02	7.343E+02	7.343E+02	8.070E+01
Molybdenum	7.498E+02	7.498E+02	7.498E+02	7.498E+02	7.498E+02	3.254E+00
benzidine	7.328E+02	7.328E+02	7.328E+02	7.333E+02	7.333E+02	2.825E+01
Chlordane	7.905E+02	7.905E+02	7.905E+02	7.908E+02	7.908E+02	4.617E-01
MethylPropylB	7.334E+02	7.334E+02	7.334E+02	7.334E+02	7.334E+02	1.525E+00
124TriMethylB	7.333E+02	7.333E+02	7.333E+02	7.333E+02	7.333E+02	1.777E+00
MethylEthylB	7.334E+02	7.334E+02	7.334E+02	7.334E+02	7.334E+02	1.525E+00
12DiMethylB	7.330E+02	7.330E+02	7.330E+02	7.330E+02	7.330E+02	2.566E+00
PropylB	7.334E+02	7.334E+02	7.334E+02	7.334E+02	7.334E+02	1.525E+00
Aldrin	7.330E+02	7.330E+02	7.330E+02	7.340E+02	7.340E+02	2.940E+00
Aroclor1221	7.351E+02	7.351E+02	7.351E+02	7.354E+02	7.354E+02	7.641E-01
Aroclor1232	7.331E+02	7.331E+02	7.331E+02	7.332E+02	7.332E+02	2.273E+00
DDD	8.493E+02	8.493E+02	8.493E+02	8.494E+02	8.494E+02	5.277E-01
DDE	8.270E+02	8.270E+02	8.270E+02	8.270E+02	8.270E+02	5.224E-01
Acenaphthylene	7.337E+02	7.337E+02	7.337E+02	7.338E+02	7.338E+02	1.201E+00
Benzoic Acid	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.266E+01
Dibenzofuran	7.352E+02	7.352E+02	7.352E+02	7.357E+02	7.357E+02	7.206E-01
Diethylphth	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	5.498E+00
24-Dimethylphe	7.328E+02	7.328E+02	7.328E+02	7.329E+02	7.329E+02	7.604E+00
Dimethylphth	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.898E+01
2Methylnaptha	7.342E+02	7.342E+02	7.342E+02	7.343E+02	7.343E+02	9.609E-01
2346Tetrachlor	7.351E+02	7.351E+02	7.351E+02	7.357E+02	7.357E+02	7.641E-01
Benzyl Alcohol	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	3.668E+01
Acentonitrile	7.329E+02	7.329E+02	7.329E+02	7.329E+02	7.329E+02	2.529E+02
Acrolien	7.329E+02	7.329E+02	7.328E+02	7.329E+02	7.329E+02	1.813E+02
Acylonitrle	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.138E+02
Bromodichloro	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	9.708E+00
Bromoform	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	6.340E+00
Bromometh	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	3.246E+01
CarbonDiS	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	8.445E+00

Chlorometh	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	4.637E+01
0-ChloroTu	7.332E+02	7.333E+02	7.332E+02	7.333E+02	7.333E+02	1.775E+00
Cumene	7.334E+02	7.334E+02	7.334E+02	7.335E+02	7.335E+02	1.525E+00
Dibromochloro	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	8.445E+00
Dichlorodiflo	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	8.445E+00
12cisDichloro	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.266E+01
12transDichl	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	8.431E+01
12Dichlprop	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.097E+01
Ethylbenz	7.330E+02	7.330E+02	7.330E+02	7.330E+02	7.330E+02	2.605E+00
Nhexane	7.342E+02	7.342E+02	7.342E+02	7.342E+02	7.342E+02	9.609E-01
MethylIso	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	3.246E+01
PropGlycol	7.334E+02	7.334E+02	7.332E+02	7.334E+02	7.334E+02	1.560E+03
Styrene	7.329E+02	7.329E+02	7.329E+02	7.330E+02	7.330E+02	3.358E+00
1112Tetra	7.330E+02	7.330E+02	7.330E+02	7.330E+02	7.330E+02	2.940E+00
1122Tetra	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	6.340E+00
TriChloFlo	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	5.498E+00
123TriChlopr	7.400E+02	7.400E+02	7.400E+02	7.400E+02	7.400E+02	4.928E-01
Trimethbenz	7.339E+02	7.339E+02	7.339E+02	7.339E+02	7.339E+02	1.077E+00
135Trimeth	7.333E+02	7.333E+02	7.333E+02	7.333E+02	7.333E+02	1.690E+00
acetophenone	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.645E+01
Ethylchlorid	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	2.488E+01
Methonal	7.330E+02	7.330E+02	7.329E+02	7.330E+02	7.330E+02	4.637E+02
MMetacrylate	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	2.825E+01
Cyanide	7.328E+02	7.328E+02	7.570E+02	7.582E+02	7.582E+02	3.668E+01
Dibenz[a,h]	1.898E+03	1.898E+03	1.941E+03	1.955E+03	1.949E+03	1.255E+00
24Dinitrotoluene	7.328E+02	7.328E+02	7.770E+02	7.770E+02	7.770E+02	1.097E+01
26Dinitrotoluene	7.328E+02	7.328E+02	7.756E+02	7.756E+02	7.756E+02	1.645E+01
Endosulfan	7.334E+02	7.334E+02	3.661E+04	3.661E+04	3.661E+04	1.444E+00
4Nitrobenzenamin	7.328E+02	7.328E+02	7.357E+03	7.357E+03	7.357E+03	2.867E+01
4Nitrophenol	7.328E+02	7.328E+02	2.872E+03	2.872E+03	2.872E+03	1.266E+01
NNitrosodiphen	7.330E+02	7.330E+02	7.696E+02	7.696E+02	7.696E+02	2.605E+00
Xylene	7.332E+02	7.332E+02	1.113E+03	1.113E+03	1.113E+03	1.981E+00
12Dichloro	7.332E+02	7.333E+02	1.334E+03	1.334E+03	1.334E+03	1.775E+00
13Dichloro	7.335E+02	7.335E+02	1.424E+03	1.424E+03	1.424E+03	1.362E+00
14Dichloro	7.332E+02	7.332E+02	1.347E+03	1.347E+03	1.347E+03	1.775E+00
Methylcyclo	7.329E+02	7.329E+02	1.561E+03	1.561E+03	1.561E+03	3.526E+00
2Nitrophenol	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.519E+01
EndosulfanII	7.334E+02	7.334E+02	7.334E+02	7.334E+02	7.334E+02	1.444E+00

Aldehyde	7.400E+02	7.400E+02	7.400E+02	7.401E+02	7.401E+02	4.928E-01
Ketone	7.400E+02	7.400E+02	7.400E+02	7.401E+02	7.401E+02	4.928E-01
Chlorobenzene	7.329E+02	7.329E+02	7.329E+02	7.329E+02	7.329E+02	3.820E+00
Vinyl Chloride	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	2.488E+01
o-cresol	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.266E+01
m-cresol	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.097E+01
p-cresol	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.266E+01
14Dichlorobenzen	7.332E+02	7.332E+02	7.332E+02	7.333E+02	7.333E+02	1.775E+00
Hexachlorobenzen	7.695E+02	7.695E+02	7.695E+02	7.696E+02	7.696E+02	4.244E-01
Hexachloroethane	7.342E+02	7.342E+02	7.342E+02	7.343E+02	7.343E+02	9.609E-01
Nitrobenzene	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	1.434E+01
246-Trichlorphnl	7.337E+02	7.337E+02	7.337E+02	7.337E+02	7.337E+02	1.201E+00
Pyridine	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	2.825E+01
24-D	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	5.498E+00
245-TP (Silvex)	7.342E+02	7.342E+02	7.342E+02	7.342E+02	7.342E+02	9.609E-01
Endrin	7.400E+02	7.400E+02	7.400E+02	7.401E+02	7.401E+02	4.928E-01
Heptachlor	7.365E+02	7.365E+02	7.365E+02	7.366E+02	7.366E+02	6.144E-01
Heptachlor epoxd	7.789E+02	7.789E+02	7.789E+02	7.789E+02	7.789E+02	4.365E-01
Lindane	7.337E+02	7.337E+02	7.337E+02	7.338E+02	7.338E+02	1.201E+00
124trimethylb	7.339E+02	7.339E+02	7.339E+02	7.339E+02	7.339E+02	1.077E+00
1hexanol	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	2.488E+01
2hexanone	7.328E+02	7.328E+02	7.328E+02	7.328E+02	7.328E+02	2.488E+01
butylbenzene	7.334E+02	7.334E+02	7.334E+02	7.334E+02	7.334E+02	1.525E+00

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**********  Image of Input Files  **********

 -- Input File:  ABCDEF.DAT
 W. A. C. - February, 2010   New Proposed Cell 1-6 EMWMF
 202,0,5
 1,2
 0.,137.,788.,2.23E+5,1.,101.,0.
 1800.,6.,0.,0.,0.,0.,.315,0.
 20,2,0,1,1
 4.0,15.4,1.67E=06.,-1.,0.,1600.,.40,.705,0.90,1.
 1.0E-7,8000.,.705,0.,1.0E+0, 0.01,0E+0
 240.,5.56E-4,.22,.02,3.0E-4,20.,.01
 4,6.3,.23,0.,1.1E-06,.01,0.,0.,0.,0.,0.
 0,0,0,0,0,0,0
 1,0,0,1
 0.0091,4.24,0.04,7.17,.025,10.,0.00001,1.,0.,.25

 -- Input File:  BRCDCF.DAT
 501,Acenaphthene          0., 6.0E-01,      0.,      0.
 502,Acetone               0., 1.0E-01,      0.,      0.
 505,Antimony              0., 4.0E-04,      0.,      0.
 511,Barium                0., 7.0E-02,      0.,      0.
 512,Benzene          2.9e-02,      0.,      0.,      0.
 513,Boron                 0., 2.0E-01,      0.,      0.
 519,Carbazole        2.0E-02,      0.,      0.,      0.
 520,Carbontetchl     1.3E-01, 7.0e-04,      0.,      0.
 521,Chloroform       6.1E-03, 1.0e-02,      0.,      0.
 522,Chromium III          0., 1.0e+00,      0.,      0.
 532,Dieldrin         1.3E+01, 5.0e-05,      0.,      0.
 533,Dinbutylphthalat      0., 1.0e-01,      0.,      0.
 541,Isophorone       9.5E-04, 2.0e-01,      0.,      0.
 542,Lead                  0., 1.4E-03,      0.,      0.
 545,Manganese             0., 4.7E-02,      0.,      0.
 547,Methchloride     7.5E-03, 6.0e-02,      0.,      0.
 549,Naphthalene           0., 3.6E-02,      0.,      0.
 551,NnitroNpropyl    7.0E+00,      0.,      0.,      0.
 554,Phenol                0., 6.0E-01,      0.,      0.
 557,Selenium              0., 5.0E-03,      0.,      0.
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560,Strontium              0., 6.0e-01,      0.,      0.
561,Tetrachloroethen  5.2E-02, 1.0e-02,      0.,      0.
563,Tin                    0., 6.0E-01,      0.,      0.
564,Toluene                0., 2.0e-01,      0.,      0.
565,Trichloroethene   1.1E-02,      0.,      0.,      0.
567,U-233                  0., 3.0E-03,      0.,      0.
568,U-234                  0., 3.0E-03,      0.,      0.
569,U-235                  0., 3.0E-03,      0.,      0.
570,U-236                  0., 3.0E-03,      0.,      0.
571,U-238                  0., 3.0E-03,      0.,      0.
572,Vanadium               0., 7.0E-03,      0.,      0.
592,124Trichlorb      0.00e+00,5.0e-02,      0.,      0.
593,Molybdenum        0.00e+0, 5.0E-03,      0.,      0.
596,benzidine         2.3E+02, 3.0e-03,      0.,      0.
597,Chlordane         3.5E-01, 5.0E-04,      0.,      0.
619,MethylPropylB     0., 3.7e-02,      0.,      0.
620,124TriMethylB     0., 5.0e-02,      0.,      0.
622,MethylEthylB      0., 3.7e-02,      0.,      0.
624,12DiMethylB       0., 2.0e+00,      0.,      0.
625,PropylB           0., 3.7e-02,      0.,      0.
626,Aldrin             1.7E+01, 3.0e-05,      0.,      0.
628,Aroclor1221       4.0E-01,      0.,      0.,      0.
629,Aroclor1232       4.0E-01,      0.,      0.,      0.
630,DDD               2.4E-01,      0.,      0.,      0.
631,DDE               3.4E-01,      0.,      0.,      0.
633,Alpha-BHC         6.3E+00,      0.,      0.,      0.
634,Beta-BHC          1.8E+00,      0.,      0.,      0.
635,Delta-BHC         1.8E+00,      0.,      0.,      0.
636,Acenaphthylene          0., 6.0e-02,      0.,      0.
637,Benzoic Acid           0., 4.0e+00,      0.,      0.
638,Dibenzofuran           0., 4.0e-03,      0.,      0.
639,Diethylphth            0., 8.0e-01,      0.,      0.
640,24-Dimethylphe         0., 2.0e-02,      0.,      0.
641,Dimethylphth           0., 1.0E+01,      0.,      0.
642,2Methylnaptha          0., 4.0e-03,      0.,      0.
643,2346Tetrachlor         0., 3.0e-02,      0.,      0.
644,Benzyl Alcohol         0., 3.0e-01,      0.,      0.
645,Acentonitrile           0., 6.0e-03      0.,      0.
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646,Acrolien              0., 5.0e-04       0.,       0.
647,Acylonitrle       5.4E-01, 1.0E-03,      0.,       0.
648,Bromodichloro     6.2E-02, 2.0E-02,      0.,       0.
649,Bromoform         7.9E-03, 2.0E-02,      0.,       0.
650,Bromometh             0., 1.4E-03,       0.,       0.
651,CarbonDiS            0., 1.0E-01,      0.,       0.
652,Chlorometh       1.3E-02,       0.,      0.,       0.
653,0-ChloroTu           0., 2.0E-02,      0.,       0.
654,Cumene               0., 1.0E-01,      0.,       0.
655,Dibromochloro    8.4E-02, 2.0E-02,      0.,       0.
656,Dichlorodiflo        0., 2.0e-01,      0.,       0.
657,12cisDichloro        0., 1.0e-02,      0.,       0.
658,12transDichl         0., 2.0E-02,      0.,       0.
659,12Dichlprop      6.8E-02,       0.,      0.,       0.
660,Ethylbenz            0., 1.0E-01,      0.,       0.
661,Nhexane              0., 6.0e-02,      0.,       0.
662,MethylIso            0., 8.0e-02,      0.,       0.
664,PropGlycol           0., 5.0e-01,      0.,       0.
665,Styrene              0., 2.0e-01,      0.,       0.
666,1112Tetra        2.6E-02, 3.0e-02,      0.,       0.
667,1122Tetra        2.0E-01, 6.0e-02,      0.,       0.
668,TriChloFlo           0., 3.0E-01,      0.,       0.
669,123TriChlopr     7.0E+00, 6.0e-03,      0.,       0.
670,Trimethbenz          0., 5.0e-02,      0.,       0.
671,135Trimeth           0., 5.0e-02,      0.,       0.
673,acetophenone         0., 1.0e-01,      0.,       0.
674,Ethylchlorid     2.9E-03, 4.0E-01,      0.,       0.
676,Methonal             0., 5.0e-01,      0.,       0.
677,MMetacrylate        0., 1.40e+00,      0.,       0.
679,Cyanide              0., 2.0e-02,      0.,       0.
680,Dibenz[a,h]      7.3e+00,       0.,      0.,       0.
681,24Dinitrotoluene    6.8e-01, 2.0e-03,      0.,       0.
682,26Dinitrotoluene 6.8e-01, 1.0e-03,      0.,       0.
684,Endosulfan           0., 6.0e-03,      0.,       0.
685,4Nitrobenzenamin 2.1E-02, 3.0e-03,      0.,       0.
686,4Nitrophenol         0., 6.2e-02,      0.,       0.
687,NNitrosodiphen   4.9e-03, 2.0e-02,      0.,       0.
688,Xylene               0., 2.0e-01,      0.,       0.
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689,12Dichloro            0., 9.0e-02,      0.,      0.
690,13Dichloro            0., 8.9e-02,      0.,      0.
691,14Dichloro        2.4e-02, 2.3e-01,      0.,      0.
692,Methylcyclo           0., 6.0e-02,      0.,      0.
696,2Nitrophenol          0., 6.20E-02,     0.,      0.
698,EndosulfanII          0., 6.0e-03,      0.,      0.
699,Aldehyde              0., 3.0E-04,      0.,      0.
700,Ketone                0., 3.0e-04,      0.,      0.
701,Chlorobenzene         0., 2.0e-02,      0.,      0.
702,Vinyl Chloride    1.4e+00, 3.0e-03,     0.,      0.
703,o-cresol              0., 5.0e-02,      0.,      0.
704,m-cresol              0., 5.0e-02,      0.,      0.
705,p-cresol              0., 5.0e-03,      0.,      0.
706,14Dichlorobenzen  2.4e-02, 2.3E-01,     0.,      0.
707,Hexachlorobenzen  1.6e+00, 8.0e-04,     0.,      0.
709,Hexachloroethane  1.4e-02, 1.0e-03,     0.,      0.
710,Nitrobenzene          0., 5.0e-04,      0.,      0.
711,246-Trichlorphnl  1.1e-02,      0.,     0.,      0.
712,Pyridine              0., 1.0e-03,      0.,      0.
713,24-D                  0., 1.0e-02,      0.,      0.
714,245-TP (Silvex)       0., 8.0e-03,      0.,      0.
716,Endrin                0., 3.0e-04,      0.,      0.
717,Heptachlor         4.5e+0, 5.0e-04,     0.,      0.
718,Heptachlor epoxd   9.1e+0, 1.3e-05,     0.,      0.
719,Lindane            1.3e+0, 3.0e-04,     0.,      0.
723,124trimethylb         0., 5.0e-02,      0.,      0.
724,1hexanol              0., 4.0E-02,      0.,      0.
725,2hexanone             0., 4.0E-02,      0.,      0.
726,butylbenzene          0., 3.8E-02,      0.,      0.


-- Input File:  INVNTRY.DAT
501, 1.00e+10,1.67E+06,    0.,    0., 3.42e0 , 0.,  Acenaphthene
502, 1.00e+10,1.67E+06,    0.,    0.,      0., 0.,  Acetone
505, 1.00e+10,1.67E+06,    0.,    0.,      0., 0.,  Antimony
511, 1.00E+10,1.67E+06,    0.,    0.,      0., 0.,  Barium
512, 1.00e+10,1.67E+06,    0.,    0.,      0., 0.,  Benzene
513, 1.00E+10,1.67E+06,    0.,    0.,      0., 0.,  Boron
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519, 1.00e+10,1.67E+06,    0.,    0., 1.8E+00, 0.,  Carbazole
520, 1.00e+10,1.67E+06,    0.,    0.,      0., 0.,  Carbontetchl
521, 1.00e+10,1.67E+06,    0.,    0.,      0., 0.,  Chloroform
522, 1.00E+10,1.67E+06,    0.,    0.,      0., 0.,  Chromium III
532, 1.00e+10,1.67E+06,    0.,    0.,      0., 0.,  Dieldrin
533, 1.00e+10,1.67E+06,    0.,    0.,      0., 0.,  Dinbutylphthalat
541, 1.00e+10,1.67E+06,     0.,    0.,      0., 0.,  Isophorone
542, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  Lead
545, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  Manganese
547, 1.00e+10,1.67E+06,     0.,    0., 1.30E+04, 0.,  Methchloride
549, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  Naphthalene
551, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  NnitroNpropyl
554, 1.00E+10,1.67E+06,     0.,    0., 9.3e+04, 0.,  Phenol
557, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  Selenium
560, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  Strontium
561, 1.00e+10,1.67E+06,     0.,    0.,      0., 0.,  Tetrachloroethen
563, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  Tin
564, 1.00e+10,1.67E+06,     0.,    0.,      0., 0.,  Toluene
565, 1.00e+10,1.67E+06,     0.,    0.,      0., 0.,  Trichloroethene
567, 1.59E+05,1.67E+06,     0.,    0.,      0., 0.,  U-233
568, 2.44E+05,1.67E+06,     0.,    0.,      0., 0.,  U-234
569, 7.04E+08,1.67E+06,     0.,    0.,      0., 0.,  U-235
570, 2.34E+07,1.67E+06,     0.,    0.,      0., 0.,  U-236
571, 4.47E+09,1.67E+06,     0.,    0.,      0., 0.,  U-238
572, 1.00E+10,1.67E+06,     0.,    0.,      0., 0.,  Vanadium
592, 1.00E+10,1.67E+06,    0.,    0., 5.7e+01, 0.,  124Trichlorb
593, 1.00E+10,1.67E+06,    0.,    0.,7.66E+04, 0.,  Molybdenum
592, 1.00E+10,1.67E+06,    0.,    0., 3.22E+02, 0.,  benzidine
598, 1.00E+10,1.67E+06,    0.,    0.,    0.056, 0.,  Chlordane
619, 1.00E+10,1.67E+06,    0.,    0., 6.10e+01, 0.,  MethylPropylB
620, 1.00E+10,1.67E+06,    0.,    0., 5.70e+01, 0.,  124TriMethylB
622, 1.00E+10,1.67E+06,    0.,    0., 6.10e+01, 0.,  MethylEthylB
624, 1.00E+10,1.67E+06,    0.,    0., 2.20e+02, 0.,  12DiMethylB
625, 1.00E+10,1.67E+06,    0.,    0., 6.10e+01, 0.,  PropylB
626, 1.00E+10,1.67E+06,    0.,    0.,     0.017, 0.,  Aldrin
628, 1.00E+10,1.67E+06,    0.,    0.,      4.83, 0.,  Aroclor1221
629, 1.00E+10,1.67E+06,    0.,    0.,      4.83, 0.,  Aroclor1232
630, 1.00E+10,1.67E+06     0.,    0.,      0.09, 0.,  DDD
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631, 1.00E+10,1.67E+06,    0.,    0.,      0.04, 0.,  DDE
633, 1.00E+10,1.67E+06,    0.,    0.,        8., 0.,  Alpha-BHC
634, 1.00E+10,1.67E+06,    0.,    0.,        8., 0.,  Beta-BHC
635, 1.00E+10,1.67E+06,    0.,    0.,        8., 0.,  Delta-BHC
636, 1.00E+10,1.67E+06,    0.,    0., 1.61e+01, 0.,  Acenaphthylene
637, 1.00E+10,1.67E+06,    0.,    0., 3.40e+03, 0.,  Benzolic Acid
638, 1.00E+10,1.67E+06,    0.,    0.,  3.1e+00, 0.,  Dibenzofuran
639, 1.00E+10,1.67E+06,    0.,    0., 1.08e+03, 0.,  Diethylphth
640, 1.00E+10,1.67E+06,    0.,    0., 7.87e+03, 0.,  24-Dimethylphe
641, 1.00E+10,1.67E+06,    0.,    0.,  4.0e+03, 0.,  Dimethylphth
642, 1.00E+10,1.67E+06,    0.,    0., 2.46e+01, 0.,  2Methylnaptha
643, 1.00E+10,1.67E+06,    0.,    0.,  2.3e+01, 0.,  2346Tetrachlor
644, 1.00E+10,1.67E+06,    0.,    0., 4.29e+04, 0.,  Benzyl Alcohol
645, 1.00E+10,1.67E+06,    0.,    0., 1.00E+06, 0.,  Acentonitrile
646, 1.00E+10,1.67E+06,    0.,    0., .12E+05,  0.,  Acrolien
647, 1.00E+10,1.67E+06,    0.,    0., 7.45E+04,  0., Acylonitrle
648, 1.00E+10,1.67E+06,    0.,    0., 3.03E+03,  0., Bromodichloro
649, 1.00E+10,1.67E+06,    0.,    0.,  .10E+03,  0.,  Bromoform
650, 1.00E+10,1.67E+06,    0.,    0.,  .52E+04,  0.,  Bromometh
651, 1.00E+10,1.67E+06,    0.,    0., 1.18E+03,  0.,  CarbonDiS
652, 1.00E+10,1.67E+06,    0.,    0., 5.32E+03,  0.,  Chlorometh
653, 1.00E+10,1.67E+06,    0.,    0., 3.74E+02,  0.,  0-ChloroTu
654, 1.00E+10,1.67E+06,    0.,    0., 6.13E+01,  0.,  Cumene
655, 1.00E+10,1.67E+06,    0.,    0., 2.70E+03,  0.,  Dibromochloro
656, 1.00E+10,1.67E+06,    0.,    0., 2.80E+02,  0.,  Dichlorodiflo
657, 1.00E+10,1.67E+06,    0.,    0., 3.50E+03,  0.,  12cisDichloro
658, 1.00E+10,1.67E+06,    0.,    0., 3.50E+03,  0.,  12transDichl
659, 1.00E+10,1.67E+06,    0.,    0., 2.80E+03,  0.,  12Dichlprop
660, 1.00E+10,1.67E+06,    0.,    0., 1.69E+02,  0.,  Ethylbenz
661, 1.00E+10,1.67E+06,    0.,    0., 9.50E+00,  0.,  Nhexane
662, 1.00E+10,1.67E+06,    0.,    0., 1.90E+04,  0.,  MethylIso
664, 1.00E+10,1.67E+06,    0.,    0., 1.00E+06,  0.,  PropGlycol
665, 1.00E+10,1.67E+06,    0.,    0., 3.10E+02,  0.,  Styrene
666, 1.00E+10,1.67E+06,    0.,    0., 1.07E+03,  0.,  1112Tetra
667, 1.00E+10,1.67E+06,    0.,    0., 2.87E+03,  0.,  1122Tetra
668, 1.00E+10,1.67E+06,    0.,    0., 1.10E+03,  0.,  TriChloFlo
669, 1.00E+10,1.67E+06,    0.,    0., 1.75E+03,  0.,  123TriChlopr
670, 1.00E+10,1.67E+06,    0.,    0., 5.70E+01,  0.,  Trimethbenz
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671, 1.00E+10,1.67E+06,    0.,    0., 4.82E+01,  0., 135Trimeth
673, 1.00E+10,1.67E+06,    0.,    0., 6.13E+03,  0., acetophenone
674, 1.00E+10,1.67E+06,    0.,    0., 6.70E+03,  0., Ethylchlorid
676, 1.00E+10,1.67E+06,    0.,    0., 1.00E+06,  0., Methonal
677, 1.00E+10,1.67E+06,    0.,    0., 1.50e+04, 0.,  MMetacrylate
679, 1.00E+10,1.67E+06,    0.,    0., 1.00e+06, 0.,  Cyanide
680, 1.00E+10,1.67E+06,    0.,    0., 1.03e-03, 0.,  Dibenz[a,h]
681, 1.00E+10,1.67E+06,    0.,    0., 2.70e+02, 0.,  24Dinitrotoluene
682, 1.00E+10,1.67E+06,    0.,    0., 3.52e+02, 0.,  26Dinitrotoluene
684, 1.00E+10,1.67E+06,    0.,    0., 4.50e-01, 0.,  Endosulfan
685, 1.00E+10,1.67E+06,    0.,    0., 1.07e-05, 0.,  4Nitrobenzenamin
686, 1.00E+10,1.67E+06,    0.,    0., 1.16e+04, 0.,  4Nitrophenol
687, 1.00E+10,1.67E+06,    0.,    0., 3.50e+01, 0.,  NNitrosodiphen
688, 1.00E+10,1.67E+06,    0.,    0., 1.06E+02, 0.,  Xylene
689, 1.00E+10,1.67E+06,    0.,    0., 8.00E+01, 0.,  12Dichloro
690, 1.00E+10,1.67E+06,    0.,    0., 1.25E+02, 0.,  13Dichloro
691, 1.00E+10,1.67E+06,    0.,    0., 8.13E+01, 0.,  14Dichloro
692, 1.00E+10,1.67E+06,    0.,    0., 1.40E+01, 0.,  Methylcyclo
696, 1.00E+10,1.67E+06,    0.,    0.,  2.5E+03, 0.,  2Nitrophenol
697, 1.00E+10,1.67E+06,    0.,    0.,     0.45, 0.,  EndosufanII
699, 1.00E+10,1.67E+06,    0.,    0.,     0.25, 0.,  Aldehyde
700, 1.00E+10,1.67E+06,    0.,    0.,     0.25, 0.,  Ketone
701, 1.00E+10,1.67E+06,    0.,    0., 4.98e+02, 0.,  Chlorobenzene
702, 1.00E+10,1.67E+06,    0.,    0.,  8.8e+03, 0.,  Vinyl Chloride
703, 1.00E+10,1.67E+06,    0.,    0., 2.59e+04, 0.,  o-cresol
704, 1.00E+10,1.67E+06,    0.,    0., 2.27e+04, 0.,  m-cresol
705, 1.00E+10,1.67E+06,    0.,    0., 2.15e+04, 0.,  p-cresol
706, 1.00E+10,1.67E+06,    0.,    0., 8.13e+01, 0.,  14Dichlorobenzen
707, 1.00E+10,1.67E+06,    0.,    0.,  6.2e-03, 0.,  Hexachlorobenzen
709, 1.00E+10,1.67E+06,    0.,    0.,  5.0e+01, 0.,  Hexachloroethane
710, 1.00E+10,1.67E+06,    0.,    0., 2.09e+03, 0.,  Nitrobenzene
711, 1.00E+10,1.67E+06,    0.,    0.,  8.0e+02, 0.,  246-Trichlorophnl
712, 1.00E+10,1.67E+06,    0.,    0.,  1.0e+06, 0.,  Pyridine
713, 1.00E+10,1.67E+06,    0.,    0., 6.82e+02, 0.,  24-D
714, 1.00E+10,1.67E+06,    0.,    0.,  2.0e+02, 0.,  245-TP (Silvex)
716, 1.00E+10,1.67E+06,    0.,    0.,  2.5e-01, 0.,  Endrin
717, 1.00E+10,1.67E+06,    0.,    0.,  1.8e-01, 0.,  Heptachlor
718, 1.00E+10,1.67E+06,    0.,    0.,  2.0e-01, 0.,  Heptachlor epoxd
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719, 1.00E+10,1.67E+06,     0.,     0.,  8.0e+00, 0.,  Lindane
723, 1.00E+10,1.67E+06,     0.,     0., 5.70e+01, 0.,  124trimethylb
724, 1.00E+10,1.67E+06,     0.,     0., 5.90e+03, 0.,  1hexanol
725, 1.00E+10,1.67E+06,     0.,     0., 5.90e+03, 0.,  2hexanone
726, 1.00E+10,1.67E+06,     0.,     0., 6.13E+01, 0.,  butylbenzene


-- Input File:  RQSITE.DAT
501,    -92.,    9.2,    92.,  Acenaphthene
502, -0.044,     0., 0.044,  Acetone
505,    -19.,    1.9,    19.,  Antimony
511,    -55.,    5.5,    55.,  Barium
512,    -1.7,     0.,    1.7,  Benzene
513,    -3.000, 0.30, 3.000,    Boron
519, -6.78.,   .678, 6.78.,  Carbazole
520,    -2.2,     0.,    2.2,  Carbontetchl
521,   -0.62,     0.,   0.62,  Chloroform
522,    -10.,    1.0,    10.,  Chromium III
532,    -34.,     0.,    34.,  Dieldrin
533, -1.E-6,     0., 1.E-6,  Dinbutylphthalat
541,    -1.7,     0.,    1.7,  Isophorone
542,   -100.,   10.,   100.,  Lead
545,   -200.,   20.,   200.,  Manganese
547, -2010.,     0., 2010.,  Methchloride
549,    -19.,    1.9,    19.,  Naphthalene
551,    -0.3,   0.03,    0.3,  NnitroNpropyl
554,   -0.28,  0.028,   0.28,  Phenol
557,    -15.,    1.5,    15.,  Selenium
560,   -13.5,     0.,   13.5,  Strontium
561,    -7.2,     0.,    7.2,  Tetrachloroethen
 563,    -2.5,   .25,    2.5,  Tin
564,     -6.,     0.,     6.,  Toluene
565,    -2.6,     0.,    2.6,  Trichloroethene
567,   -40.0,    0.7,   20.0,  U-233
568,   -40.0,    0.7,   20.0,  U-234
569,   -40.0,    0.7,   20.0,  U-235
570,   -40.0,    0.7,   20.0,  U-236
571,   -40.0,    0.7,   20.0,  U-238
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572,  -100.,   10.,   100.,  Vanadium
592,   -1.44, 0.144, 1.44,   124Trichlorb
593,    -20.0,   2.0, 20.0,   Molybdenum
596,   -5.48, 0.548, 5.48,   benzidine
597, -173.,   17.3, 173.,    Chlordane
619, -1.65,  0.165,   1.65, MethylPropylB
620, -1.40,  0.140,   1.40, 124TriMethylB
622, -1.65,  0.165,   1.65, MethylEthylB
624, -0.48,  0.048,   0.48, 12DiMethylB
625, -1.65,  0.165,   1.65, PropylB
626  -97.4,  9.74,  97.4,   Aldrin
628, -120.,  120., 120.,    Aroclor1221
629, -15.0,  15.0, 15.0,    Aroclor1232
630, -91.6,  9.16,  91.6,   DDD
631,  -1.73,  .173, 1.73,   DDE
633,  -3.52, .352,  3.52,   Alpha-BHC
634,  -4.28, .428,  4.28,   Beta-BHC
635,  -4.28, .428,  4.28,   Delta-BHC
636   -12.2,  1.22, 12.2,   Acenaphthylene
637,  -.0012, .00012,.0012, Benzoic Acid
638,  -226.,  22.6, 226.,   Dibenzofuran
639,  -.252, .0252, .252,   Diethylphth
640,  -2.52, .252,  2.52,   24-Dimethlphe
641, -.0742, .00742, .0742, Dimethylphth
642,  -5.94,  .594,  5.94,  2Methylnaptha
643,  -249.,  24.9, 249.,   2346Tetrachlor
644,  -.0313,.00313, .0313, Benzyl Alcohol
645, -0.00154,.000154,.00154,  Acentonitrile
646, -0.00278, .000278, .00278,  Acrolien
647, -0.00444,0.000444,0.00444,  Acylonitrle
648, -0.0108,   0.00108, 0.0108, Bromodichloro
649, -0.252,    0.0252,   0.252, Bromoform
650, -0.0283,  0.00283,  0.0283, Bromometh
651, -0.10300, 0.01030, 0.1030,  CarbonDiS
652, -0.0286,  0.00286,  0.0286, Chlorometh
653, -0.886,    0.0886,   0.886, 0-ChloroTu
654, -1.65,      0.165,   1.65, Cumene
655,  -0.1410,  0.01410,  0.1410, Dibromochloro
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656,   -0.01370, 0.00137,  0.0137, Dichlorodiflo
657,   -0.9960,  0.09960,  0.9960, 12cisDichloro
658,   -0.0760,  0.00760,  0.0760, 12transDichl
659,   -0.0940,  0.00940,  0.0940, 12Dichlprop
660,   -0.4080,  0.04080,  0.4080, Ethylbenz
661,   -0.298,    0.0298,   0.298, Nhexane
662,   -0.0047,  0.00047,  0.0047, MethylIso
663,   -0.020,   0.0020,   0.020,  MMetacrylate
664,   -0.002,    0.0002,   0.002, PropGlycol
665,   -1.82,      0.182,    1.82, Styrene
666,   -0.318,    0.0318,   0.318, 1112Tetra
667,   -0.158,    0.0156,   0.156, 1122Tetra
668,   -0.268,    0.0268,   0.268, TriChloFlo
669,   -0.161,    0.0161,   0.161, 123TriChlopr
670,   -1.44,      0.144,    1.44, Trimethbenz
671,   -3.34,      0.334,    3.34, 135Trimeth
673,   -.0924,     .00924,   .0924, acetophenone
674,   -0.0475,  0.00475,  0.0475, Ethylchlorid
676,   -0.002,    0.0002,   0.002, Methonal
677,    -0.020,   0.0020,  0.020,  MMetacrylate
679,   -9.9,        0.99,    9.9,  Cyanide
680,   -3580.0,    358.0, 3580.0,  Dibenz[a,h]
681,   -0.1020,    .0102,  0.102,  24Dinitrotoluene
682,   -0.0839,  0.00839, 0.0839,  26Dinitrotoluene
684,   -4.08,      0.408,   4.08,  Endosulfan
685,   -0.344,   0.0344,   0.344,  4Nitrobenzenamin
686,   -0.874,   0.0874,   0.874,  4Nitrophenol
687,   -0.654,   0.0654,   0.654,  NNitrosodiphen
688,   -.886,    0.0886,    .886,  Xylene
689,   -0.758,   0.0758,   0.758,  12Dichloro
690,   -16.06,    1.606,   16.06,  13Dichloro
691,   -1.232,   0.1232,   1.232,  14DiChloro
692,   -.199,        0.,      0.,  Methylcyclo
696,  -7.1e-1,   7.1e-2,   7.1e-1, 2Nitrophenol
698,-4.08E+00, 4.08E+00, 4.08E-01, EndosulfanII
699,-2.16E+01, 2.16E+01, 2.16E+00, Aldehyde
700,-2.16E+01, 2.16E+01, 2.16E+00, Ketone
701,    -.438,    .0438,    .438,   Chlorobenzene
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702,    -.372,    .0372,      .372,    Vinyl Chloride
703,   -.182,     .0182,      .182,    o-cresol
704,   -.0956,     .00956,  .0956,     m-cresol
705,   -.0922,      .00922,  .0922,    p-cresol
706,   -1.232,    .1232,    1.232,    14Dichlorobenzen
707,   -110.,      11.,      110.,     Hexachlorobenzen
709,   -3.56,      .356,     3.56,     Hexachloroethane
710,   -.129,     .0129,     .129,     Nitrobenzene
711,   -.636,     .0636,     .636,     246-Trichlorophnl
712,   -.0138,   .00138,    .0138,     Pyridine
713,   -.0588,    .00588,   .0588,     24-D
714,   -.1608,   .01608,    .1608,     245-TP (Silvex)
716,   -21.6,      2.16,     21.6,     Endrin
717,   -48.0,     4.8,       48.0,     Heptachlor
718,   -17.3,     1.73,      17.3,     Heptachlor epoxd
719,   -6.76,      0.676,    6.76,     Lindane
723,    -1.440,    0.1440,   1.440,    124trimethylb
724,    -0.026,    0.0026,   0.026,    1hexanol
725,    -0.026,    0.0026,   0.026,    2hexanone
726,    -1.630,    0.1630,   1.630,    butylbenzene

-- Input File:  UPTAKE.DAT
0.5,    0.2,     1.89
0.67,   0.65,    2.1E-3,    438.,    438.
0.0,    2160.,   24.,      1440.,      1.,   0.83
50.,    6.,      48.,       480.,     48.
.05,   0.0008,   60.,         8.,     50.
14.,     176.,  110.,         0.,     95.,    730., 6.9
Acenaphthene      .25, 1.2e-1, 1.2e-2, 1.6e-4,    0., 5.0e-4, 1.1e+3
Acetone           .25, 1.3e+1, 1.3e+0, 1.5E-8,    0., 1.5E-8, 1.5E-8
Antimony          .25, 5.0e-2, 5.0e-3, 2.5e-5,    0., 4.0e-5, 1.0e+2
Barium            .25, 1.0e-1, 1.0E-2, 4.8E-4,    0., 2.0e-4, 4.0e+0
Benzene           .25, 5.8E-1, 5.8E-2, 3.3E-6,    0., 3.3E-6, 3.3E-6
Boron             .25, 4.0e+0, 4.0e-1, 1.5e-3,    0., 8.0e-4, 0.0e+0
Carbazole         .25, 2.4e-1, 2.4e-2, 5.0e-5,    0., 1.6e-4, 4.5e+2
Carbontetchl      .25, 2.9e-1, 2.9e-2, 1.1e-5,    0., 1.1e-5, 1.1e-5
Chloroform        .25, 7.0e-1, 7.0e-2, 2.3e-6,    0., 2.3e-6, 2.3e-6
Chromium III      .25, 4.0e-2, 4.0E-3, 1.0e-5,    0., 9.0e-3, 2.0e+2
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Dieldrin          .25, 9.2e-2, 9.2e-3, 7.9e-3,   0., 7.9e-3, 7.9e-3
Isophorone        .25, 4.8E-1, 4.8E-2, 4.6e-6,   0., 4.6e-6, 4.6e-6
Lead              .25, 9.0e-2, 9.0e-3, 3.0e-4,   0., 4.0e-4, 3.0e+2
Manganese         .25, 6.8e-1, 6.8E-2, 3.0e-5,   0., 5.0e-4, 4.0e+2
MethChoride       .25, 6.7e+0, 6.7e-1,  1.6e-7,   0., 5.0e-7, 0.0e+0
Naphthalene       .25, 4.6e-1, 4.6E-2, 1.6e-5,   0., 5.0e-5, 1.9e+2
NnitroNpropyl     .25, 5.9e+0, 5.9e-1, 2.0e-7,   0., 6.3e-7, 6.8e+0
Phenol            .25, 5.1E+0, 5.1E-1, 2.5e-7,   0., 7.9e-7, 8.1e+0
Selenium          .25, 5.0e-1, 5.0e-2, 1.0e-2,   0., 1.0e-1, 0.0e+0
Strontium         .25, 1.1E+0, 1.1E-1, 2.8E-3,   0., 8.0e-3, 0.0E+0
Tetrachloroethen  .25, 3.0e-1, 3.0e-2, 1.0e-5,   0., 1.0e-5, 1.0e-5
Thallium          .25,     0.,     0.,     0.,   0.,     0.,     0.
Tin               .25, 1.0e+0, 1.0E-1, 1.0e-3,   0., 1.0e-2, 3.0e+3
Toluene           .25, 2.6e-1, 2.6e-2, 1.3e-5,   0., 1.3e-5, 1.3e-5
Trichloroethene   .25, 4.1e-1, 4.1e-2, 6.0e-6,   0., 6.0e-6, 6.0e-6
U-233             .25, 2.3e-2, 2.3E-3, 4.0e-4,   0., 3.0e-4, 1.0e+1
U-234             .25, 2.3e-2, 2.3E-3, 4.0e-4,   0., 3.0e-4, 1.0e+1
U-235             .25, 2.3e-2, 2.3E-3, 4.0e-4,   0., 3.0e-4, 1.0e+1
U-236             .25, 2.3e-2, 2.3E-3, 4.0e-4,   0., 3.0e-4, 1.0e+1
U-238             .25, 2.3e-2, 2.3E-3, 4.0e-4,   0., 3.0e-4, 1.0e+1
Vanadium          .25, 5.5e-3, 5.5E-4, 2.0e-5,   0., 2.5e-3, 1.0e+1
124Trichlorb      .25, 2.44e-1,2.44e+0,4.8e-5,   0., 1.5e-04,0.0e+0
Molybdenum        .25, 4.0e-1, 4.0e-2, 1.7e-3,   0., 1.0e-03,0.0e+0
benzidine         .25, 6.7e+0, 6.7e-1, 1.6e-7,   0., 5.0e-7, 0.0e+0
Chlordane         .25, 2.5E-2, 2.5E-3, 2.5E-3,   0., 7.9E-3, 0.0e+0
MethylPropylB     .25, 3.5e-1, 3.5e-2, 2.5e-5,   0., 7.9e-5, 0.0e+0
124TriMethylB     .25, 4.1e-1, 4.1e-2, 2.1e-5,   0., 6.6e-5, 0.0e+0
MethylEthylB      .25, 3.5e-1, 3.5e-2, 2.5e-5,   0., 7.9e-5, 0.0e+0
12DiMethylB       .25, 6.0e-1, 6.0e-2, 1.1e-5,   0., 3.4e-5, 0.0e+0
PropylB           .25, 3.5e-1, 3.5e-2, 2.5e-5,   0., 7.9e-5, 0.0e+0
Aldrin            .25, 6.9e-1, 6.9e-2, 7.9e-6,   0., 2.5e-5, 0.0e+0
Aroclor1221       .25, 1.6e-1, 1.6e-2, 9.9e-5,   0., 3.1e-4, 0.0e+0
Aroclor1232       .25, 5.3e-1, 5.3e-2, 1.3e-5,   0., 4.0e-5, 0.0e+0
DDD               .25, 1.6e-2, 1.6e-3, 5.0e-3,   0., 1.6e-2, 0.0e+0
DDE               .25, 1.9e-2, 1.9e-3, 4.0e-3,   0., 1.3e-2, 0.0e+0
Alpha-BHC         .25, 2.1e-1, 2.1e-2, 6.3e-5,   0., 2.0e-4, 0.0e+0
Beta-BHC          .25, 1.8e-1, 1.8e-2, 7.9e-5,   0., 2.5e-4, 0.0e+0
Delta-BHC         .25, 9.0e-1, 9.0e-2, 5.0e-6,   0., 1.6e-5, 0.0e+0
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Acenaphthylene	.25,	2.7e-1,	2.7e-2,	4.0e-5,	0.,	1.3e-4, 0.0e+0
Benzoic Acid	.25,	3.0e+0,	3.0e-1,	6.3e-7,	0.,	2.0e-6, 0.0e+0
Dibenzofuran	.25,	1.5e-1,	1.5e-2,	1.0e-4,	0.,	3.3e-4, 0.0e+0
Diethylphth	.25,	1.3e+0,	1.3e-1,	2.5e-6,	0.,	7.9e-6, 0.0e+0
24-Dimethylphe	.25,	1.8e+0,	1.8e-1,	1.6e-6,	0.,	5.0e-6, 0.0e+0
Dimethylphth	.25,	4.5e+0,	4.5e-1,	3.1e-7,	0.,	1.0e-6, 0.0e+0
2Methylnaptha	.25,	2.1e-1,	2.1e-2,	6.3e-5,	0.,	2.0e-4, 0.0e+0
2346Tetrachlor	.25,	1.6e-1,	1.6e-2,	9.9e-5,	0.,	3.1e-4, 0.0e+0
Benzyl Alcohol	.25,	8.7e+0,	8.7e-1,	9.9e-8,	0.,	3.1e-7, 0.0e+0
Acentonitrile	.25,	6.0e+1,	6.0e+0,	3.6e-9,	0.,	1.1e-8, 0.0e+0
Acrolien	.25,	4.3e+1,	4.3e+0,	6.3e-9,	0.,	2.0e-8, 0.0e+0
Acylonitrle	.25,	2.7e+1,	2.7e+0,	1.4e-8,	0.,	4.4e-8, 0.0e+0
Bromodichloro	.25,	2.3e+0,	2.3e-1,	9.9e-7,	0.,	3.1e-6, 0.0e+0
Bromoform	.25,	1.5E+0,	1.5e-1,	2.0e-6,	0.,	6.3e-6, 0.0e+0
Bromometh	.25,	7.7E+0,	7.7e-1,	1.3e-7,	0.,	4.0e-7, 0.0e+0
CarbonDiS	.25,	2.0e+0,	2.0e-1,	1.3e-6,	0.,	4.0e-6, 0.0e+0
Chlorometh	.25,	1.1e+1,	1.1e+0,	6.4e-8,	0.,	2.0e-7, 0.0e+0
0-ChloroTu	.25,	4.1E-1,	4.1e-2,	2.0e-5,	0.,	6.3e-5, 0.0e+0
Cumene	.25,	3.5E-1,	3.5e-2,	2.5e-5,	0.,	7.9e-5, 0.0e+0
Dibromochloro	.25,	2.0E+0,	2.0e-1,	1.3e-6,	0.,	4.0e-6, 0.0e+0
Dichlorodiflo	.25,	2.0E+0,	2.0e-1,	1.3e-6,	0.,	4.0e-6, 0.0e+0
12cisDichloro	.25,	3.0e+0,	3.0e-1,	6.3e-7,	0.,	2.0e-6, 0.0e+0
12transDichl	.25,	2.0e+1,	2.0e+0,	2.4e-8,	0.,	7.5e-8, 0.0e+0
12Dichlprop	.25,	2.6e+0,	2.6e-1,	7.9e-7,	0.,	2.5e-6, 0.0e+0
Ethylbenz	.25,	6.1e-1,	6.1e-2,	9.9e-6,	0.,	3.1e-5, 0.0e+0
Nhexane	.25,	2.1e-1,	2.1e-2,	6.3e-5,	0.,	2.0e-4, 0.0e+0
MethylIso	.25,	7.7e+0,	7.7e-1,	1.3e-7,	0.,	4.0e-7, 0.0e+0
MethChoride	.25,	6.7e+0,	6.7e-1,	1.6e-7,	0.,	5.0e-7, 0.0e+0
PropGlycol	.25,	3.7e+2,	3.7e+1,	1.6e-10,	0.,	5.0e-10, 0.0e+0
Styrene	.25,	7.9e-1,	7.9e-2,	6.3e-6,	0.,	2.0e-5, 0.0e+0
1112Tetra	.25,	6.9e-1,	6.9e-2,	7.9e-6,	0.,	2.5e-5, 0.0e+0
1122Tetra	.25,	1.5e+0,	1.5e-1,	2.0e-6,	0.,	6.3e-6, 0.0e+0
TriChloFlo	.25,	1.3e+0,	1.3e-1,	2.5e-6,	0.,	7.9e-6, 0.0e+0
123TriChlopr	.25,	8.2e-2,	8.2e-3,	3.1e-4,	0.,	1.0e-3, 0.0e+0
Trimethbenz	.25,	2.4e-1,	2.4e-2,	4.8e-5,	0.,	1.5e-4, 0.0e+0
135Trimeth	.25,	3.9e-1,	3.9e-2,	2.1e-5,	0.,	6.6e-5, 0.0e+0
acetophenone	.25,	3.9e+0,	3.9e-1,	4.0e-7,	0.,	1.3e-6, 0.0e+0
Ethylchlorid	.25,	5.9e+0,	5.9e-1,	2.0e-7,	0.,	6.3e-7, 0.0e+0

Methonal	.25,	1.1E+2,	1.1e+1,	1.3E-9,	0.,	4.2E-9, 0.0e+0
MMetacrylate	.25,	6.7e+0,	6.7e-1,	1.6e-7,	0.,	5.0e-7, 0.0e+0
Cyanide	.25,	8.7e+0,	8.7e-1,	9.9e-8,	0.,	3.1e-7, 3.5e+0
Dibenz[a,h]	.25,	4.3e-3,	4.3e-4,	5.0e-2,	0.,	1.6e-1, 6.3e+0
24Dinitrotoluene	.25,	2.6e+0,	2.6e-1,	7.9e-7,	0.,	2.5e-6, 6.4e+0
26Dinitrotoluene	.25,	3.9e+0,	3.9e-1,	4.0e-7,	0.,	1.3e-6, 6.2e+0
Endosulfan	.25,	3.3e-1,	3.3e-2,	2.8e-5,	0.,	8.9e-5, 5.2e+3
4Nitrobenzenamin	.25,	6.8e+0,	6.8e-1,	2.0e-7,	0.,	6.2e-7, 9.6e+2
4Nitrophenol	.25,	3.0e-0,	3.0e-1,	6.3e-7,	0.,	2.0e-6, 3.1e+2
NNitrosodiphen	.25,	6.1e-1,	6.1e-2,	9.9e-6,	0.,	3.0e-5, 5.3e+0
Xylene	.25,	4.6e-1,	4.6e-2,	1.6e-5,	0.,	5.0e-5, 5.5e+1
12Dichloro	.25,	4.1e-1,	4.1e-2,	2.0e-5,	0.,	6.3e-5, 8.7e+1
13Dichloro	.25,	3.1e-1,	3.1e-2,	3.1e-5,	0.,	1.0e-4, 1.0e+2
14Dichloro	.25,	4.1e-1,	4.1e-2,	2.0e-5,	0.,	6.3e-5, 8.9e+1
Methylcyclo	.25,	8.3e-1,	8.3e-2,	5.7e-6,	0.,	1.8e-5, 1.2e+2
2Nitrophenol	.25,	3.6e+0,	3.6e-1,	4.9e-7,	0.,	1.6e-6, 0.
EndosulfanII	.25,	3.3e-1,	3.3e-2,	2.8e-5,	0.,	8.9e-5, 0.0e+0
Aldehyde	.25,	8.2e-2,	8.2e-3,	3.1e-4,	0.,	1.0e-3, 0.0e+0
Ketone	.25,	8.2e-2,	8.2e-3,	3.1e-4,	0.,	1.0e-3, 0.0e+0
Chlorobenzene	.25,	9.0e-1,	9.0e-2,	5.0e-6,	0.,	1.6e-5, 0.0e+0
Vinyl Chloride	.25,	5.9e+0,	5.9e-1,	2.0e-7,	0.,	6.3e-7, 0.0e+0
o-cresol	.25,	3.0e+0,	3.0e-1,	6.3e-7,	0.,	2.0e-6, 0.0e+0
m-cresol	.25,	2.6e+0,	2.6e-1,	7.9e-7,	0.,	2.5e-6, 0.0e+0
p-cresol	.25,	3.0e+0,	3.0e-1,	6.3e-7,	0.,	2.0e-6, 0.0e+0
Hexachlorobenzen	.25,	3.2e-2,	3.2e-3,	1.6e-3,	0.,	5.0e-3, 0.0e+0
Hexachloroethane	.25,	2.1e-1,	2.1e-2,	6.3e-5,	0.,	2.0e-4, 0.0e+0
Nitrobenzene	.25,	3.4e+0,	3.4e-1,	5.0e-7,	0.,	1.6e-6, 0.0e+0
246-Trichlorphnl	.25,	2.7e-1,	2.7e-2,	4.0e-5,	0.,	1.3e-4, 0.0e+0
Pyridine	.25,	6.7e+0,	6.7e-1,	1.6e-7,	0.,	5.0e-7, 0.0e+0
24-D	.25,	1.3e+0,	1.3e-1,	2.5e-6,	0.,	7.9e-6, 0.0e+0
245-TP (Silvex)	.25,	2.1e-1,	2.1e-2,	6.3e-5,	0.,	2.0e-4, 0.0e+0
Endrin	.25,	8.2e-2,	8.2e-3,	3.1e-4,	0.,	1.0e-3, 0.0e+0
Heptachlor	.25,	1.2e-1,	1.2e-2,	1.6e-4,	0.,	5.0e-4, 0.0e+0
Heptachlor epoxd	.25,	2.8e-2,	2.8e-3,	2.0e-3,	0.,	6.3e-3, 0.0e+0
Lindane	.25,	2.7e-1,	2.7e-2,	4.0e-5,	0.,	1.3e-4, 0.0e+0
124trimethylb	.25,	2.4e-1,	2.4e-2,	4.8e-5,	0.,	1.5e-4, 0.0e+0
1hexanol	.25,	5.9e+0,	5.9e-1,	2.0e-7,	0.,	6.3e-7, 0.0e+0
2hexanone	.25,	5.9e+0,	5.9e-1,	2.0e-7,	0.,	6.3e-7, 0.0e+0

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 butylbenzene      .25, 3.5e-1, 3.5e-2, 2.5e-5,    0., 7.9e-5, 0.0e+0



THERE ARE 202 CONTAMINANTS IN THE RISK FACTOR LIBRARY
THE VALUE OF IFLAG IS 0
 NUMBER OF PATHWAYS IS  5

             PATHWAY              TYPE OF USAGE
                                FOR UPTAKE FACTORS
    1  GROUNDWATER TO RIVER          2
    0  3X,I2,2X,A22,6X,I2))          0
    0  3X,I2,2X,A22,6X,I2))          0
    0  3X,I2,2X,A22,6X,I2))          0
    0  3X,I2,2X,A22,6X,I2))          0

 TIME OF OPERATION OF WASTE FACILITY IN YEARS                    0.
 LENGTH OF REPOSITORY (M)                                      137.
 WIDTH OF REPOSITORY (M)                                       788.
 RIVER FLOW RATE (M**3/YR)                                      2.23E+05
 STREAM FLOW RATE (M**3/YR)                                     1.00E+00
 DISTANCE TO RIVER (M)                                         101.

 OPERATIONAL SPILLAGE FRACTION                                  0.00E+00
 DENSITY OF AQUIFER (KG/M**3)                                  1800.
 LONGITUDINAL DISPERSIVITY (M)                                  6.00E+00
 LATERAL DISPERSION COEFFICIENT -- Y AXIS (M**2/YR)             0.00E+00
 NUMBER OF MESH POINTS FOR DISPERSION CALCULATION              20
 FLAG FOR ATMOSPHERIC PATHWAY                                   0

 COVER THICKNESS OVER WASTE (M)                                 4.00
 THICKNESS OF WASTE IN PITS (M)                                15.40
 TOTAL WASTE VOLUME (M**3)                                      1.670E+06
 DISTANCE TO WELL -- X COORDINATE (M)                          -1.
 DISTANCE TO WELL -- Y COORDINATE (M)                           0.
 DENSITY OF WASTE (KG/M**3)                                    1600.
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FRACTION OF FOOD CONSUMED THAT IS GROWN ON SITE	.400
FRACTION OF YEAR CONTAMINANTS CONTACT SKIN	.705
AREA OF SKIN IN CONTACT WITH CONTAMINANTS (M**2)	.0100
DEPTH OF PLANT ROOT ZONE (M)	.900
AREAL DENSITY OF PLANTS (KG/M**2)	1.000
AVERAGE DUST LOADING IN AIR (KG/M**3)	1.00E-07
ANNUAL ADULT BREATHING RATE (M**3/YR)	8000.
FRACTION OF YEAR EXPOSED TO DUST	.705
CANISTER LIFETIME (YEARS)	0.
INVENTORY SCALING FACTOR	1.00E+00
HEIGHT OF ROOMS IN RECLAIMER HOUSE (CM)	240.
AIR CHANGE RATE IN RECLAIMER HOUSE (CHANGES/SEC)	5.56E-04
ATMOSPHERIC STABILITY CLASS	4
AVERAGE WIND SPEED (M/S)	6.30
FRACTION OF TIME WIND BLOWS TOWARD RECEPTOR	.2300
RECEPTOR DISTANCE FOR ATMOSPHERIC PATHWAY (M)	.0
DUST RESUSPENSION RATE FOR OFFSITE TRANSPORT (M**3/S)	1.10E-06
DEPOSITION VELOCITY (M/S)	.0100
STACK HEIGHT (M)	.0
STACK INSIDE DIAMETER (M)	.00
STACK GAS VELOCITY (M/S)	.0
HEAT EMISSION RATE FROM BURNING (CAL/S)	0.00E+00
FLAGS FOR DEGRADATION SERIES	0 0 0 0 0 0 0
FLAG FOR INPUT SUMMARY PRINTOUT	1
FLAG FOR DIRECTION OF TRENCH FILLING	0
FLAG FOR GROUNDWATER PATHWAY OPTIONS	1
AMOUNT OF WATER PERCOLATING THROUGH WASTE ANNUALLY (M)	9.10E-03
DEGREE OF SOIL SATURATION	1.000
RESIDUAL SOIL SATURATION	.000
PERMEABILITY OF VERTICAL ZONE (M/YR)	.32
SOIL NUMBER	.000
POROSITY OF AQUIFER	.04
POROSITY OF UNSATURATED ZONE	.25

DISTANCE FROM AQUIFER TO WASTE (M)	7.2
AVERAGE VERTICAL GROUNDWATER VELOCITY (M/YR)	2.50E-02
HORIZONTAL VELOCITY OF AQUIFER (M/YR)	4.24E+00
LENGTH OF PERFORATED WELL CASING (M)	10.000
SURFACE EROSION RATE (M/YR)	1.000E-05
LEACH RATE SCALING FACTOR	1.000E+00
ANNUAL RUNOFF OF PRECIPITATION (M)	0.00E+00

***** PEAK CONCENTRATIONS AND TIMES FOR PATHWAY 1 *****
***** RIVER AT 101.0 M *****

CONTAMINANT	PEAK CONCENTRATION (MG/L)	PEAK TIME (YR)	AVERAGE DOSE AT PEAK TIME (MG/KG-DAY)	AVERAGE RISK AT PEAK TIME (HE/LIFE)	FRACTION OF ADI
Acenaphthene	1.51E-02	250605.0	4.34E-04	0.00E+00	7.24E-04
Acetone	1.38E+01	603.4	3.96E-01	0.00E+00	3.96E+00
Antimony	1.44E-01	52064.3	4.14E-03	0.00E+00	1.04E+01
Barium	5.01E-02	149974.7	1.45E-03	0.00E+00	2.07E-02
Benzene	1.49E+00	4777.3	4.27E-02	1.24E-03	0.00E+00
Boron	6.95E-01	10258.2	2.03E-02	0.00E+00	1.02E-01
Carbazole	7.93E-03	22594.9	2.28E-04	4.56E-06	0.00E+00
Carbontetchl	1.17E+00	6067.9	3.37E-02	4.38E-03	4.81E+01
Chloroform	3.56E+00	1989.6	1.02E-01	6.23E-04	1.02E+01
Chromium III	2.72E-01	33104.0	8.30E-03	0.00E+00	8.30E-03
Dieldrin	8.10E-02	88150.1	2.63E-03	3.41E-02	5.25E+01
Isophorone	1.49E+00	4777.3	4.27E-02	4.06E-05	2.14E-01
Lead	2.70E-02	536630.9	7.78E-04	0.00E+00	5.56E-01
Manganese	1.35E-02	1072735.7	3.88E-04	0.00E+00	8.27E-03
Naphthalene	1.41E-01	102504.4	4.05E-03	0.00E+00	1.13E-01
NnitroNpropyl	6.05E+00	2270.2	1.74E-01	1.22E+00	0.00E+00

Phenol	6.33E+00	2165.5	1.82E-01	0.00E+00	3.03E-01
Selenium	1.78E-01	81129.0	9.16E-03	0.00E+00	1.83E+00
Strontium	2.03E-01	35235.5	6.29E-03	0.00E+00	1.05E-02
Tetrachloroethen	3.76E-01	18973.9	1.08E-02	5.61E-04	1.08E+00
Tin	1.02E+00	14041.5	3.17E-02	0.00E+00	5.28E-02
Toluene	4.49E-01	15876.5	1.29E-02	0.00E+00	6.44E-02
Trichloroethene	1.00E+00	7100.4	2.88E-02	3.17E-04	0.00E+00
U-233	5.11E-02	66339.1	1.47E-03	0.00E+00	4.91E-01
U-234	5.65E-02	67303.3	1.63E-03	0.00E+00	5.43E-01
U-235	6.89E-02	86395.1	1.99E-03	0.00E+00	6.62E-01
U-236	6.87E-02	77138.5	1.98E-03	0.00E+00	6.61E-01
U-238	6.89E-02	86395.1	1.99E-03	0.00E+00	6.62E-01
Vanadium	2.70E-02	536630.9	7.87E-04	0.00E+00	1.12E-01
124Trichlorb	2.51E-01	5166.8	7.21E-03	0.00E+00	1.44E-01
Molybdenum	1.37E-01	54784.0	4.03E-03	0.00E+00	8.05E-01
Benzidine	4.91E-01	18352.1	1.41E-02	3.24E+00	4.69E+00
Chlordane	2.47E-04	279434.2	7.63E-06	2.67E-06	1.53E-02
MethylPropylB	2.69E-01	5852.2	7.71E-03	0.00E+00	2.08E-01
MethylEthylB	2.69E-01	5852.2	7.71E-03	0.00E+00	2.08E-01
12DiMethylB	9.69E-01	2033.7	2.78E-02	0.00E+00	1.39E-02
PropylB	2.69E-01	5852.2	7.71E-03	0.00E+00	2.08E-01
Aldrin	7.49E-05	265291.5	2.15E-06	3.65E-05	7.16E-02
Aroclor1221	2.10E-02	665437.6	6.04E-04	2.41E-04	0.00E+00
Aroclor1232	2.13E-02	131752.8	6.11E-04	2.44E-04	0.00E+00
DDD	3.96E-04	249517.1	1.32E-05	3.16E-06	0.00E+00
DDE	1.76E-04	6113.3	5.70E-06	1.94E-06	0.00E+00
Alpha-BHC	3.52E-02	11955.3	1.01E-03	6.38E-03	0.00E+00
Beta-BHC	3.52E-02	14435.7	1.01E-03	1.82E-03	0.00E+00
Delta-BHC	3.52E-02	14435.7	1.01E-03	1.82E-03	0.00E+00
Acenaphthylene	7.09E-02	33570.1	2.04E-03	0.00E+00	3.39E-02
Benzoic Acid	1.50E+01	471.1	4.30E-01	0.00E+00	1.07E-01
Dibenzofuran	1.22E-02	198073.6	3.52E-04	0.00E+00	8.80E-02
Diethylphth	4.76E+00	1289.6	1.36E-01	0.00E+00	1.71E-01
24-Dimethylphe	1.03E+00	8691.6	2.96E-02	0.00E+00	1.48E+00
Dimethylphth	1.20E+01	709.3	3.44E-01	0.00E+00	3.44E-02
Dinbutylphthalat	1.77E+01	467.1	5.58E-01	0.00E+00	5.58E+00
2Methylnaptha	1.08E-01	19853.4	3.11E-03	0.00E+00	7.79E-01
2346Tetrachlor	1.11E-02	677603.5	3.19E-04	0.00E+00	1.06E-02

Benzyl Alcohol	1.47E+01	569.3	4.23E-01	0.00E+00	1.41E+00
Acentonitrile	2.34E+01	472.2	6.71E-01	0.00E+00	1.12E+02
Acrolien	2.32E+01	476.2	6.66E-01	0.00E+00	1.33E+03
Acylonitrle	2.30E+01	481.6	6.59E-01	3.56E-01	6.59E+02
Bromodichloro	1.78E+01	502.4	5.11E-01	3.17E-02	2.56E+01
Bromoform	9.05E+00	1289.6	2.59E-01	2.05E-03	1.30E+01
Bromometh	2.00E+01	559.5	5.74E-01	0.00E+00	4.10E+02
CarbonDiS	6.94E+00	803.3	1.99E-01	0.00E+00	1.99E+00
Chlorometh	2.00E+01	560.5	5.73E-01	7.45E-03	0.00E+00
0-ChloroTu	2.20E+00	3358.8	6.31E-02	0.00E+00	3.16E+00
Cumene	1.97E-01	50976.4	5.65E-03	0.00E+00	5.65E-02
Dibromochloro	1.24E+01	927.3	3.56E-01	2.99E-02	1.78E+01
Dichlorodiflo	1.65E+00	511.9	4.72E-02	0.00E+00	2.36E-01
12cisDichloro	3.21E+00	3717.8	9.19E-02	0.00E+00	9.19E+00
12transDichl	1.59E+01	715.2	4.56E-01	0.00E+00	2.28E+01
12Dichlprop	1.48E+01	773.9	4.23E-01	2.88E-02	0.00E+00
Ethylbenz	9.94E-01	1798.7	2.85E-02	0.00E+00	2.85E-01
Nhexane	5.59E-02	1439.7	1.61E-03	0.00E+00	2.68E-02
MethylIso	2.29E+01	482.5	6.58E-01	0.00E+00	8.23E+00
MethChoride	2.10E+01	532.4	6.01E-01	4.51E-03	1.00E+01
PropGlycol	2.33E+01	473.7	6.70E-01	0.00E+00	1.34E+00
Styrene	1.82E+00	6407.0	5.23E-02	0.00E+00	2.62E-01
1112Tetra	6.29E+00	1505.0	1.81E-01	4.69E-03	6.02E+00
1122Tetra	1.18E+01	976.3	3.37E-01	6.74E-02	5.62E+00
TriChloFlo	6.47E+00	1341.8	1.86E-01	0.00E+00	6.19E-01
123TriChlopr	1.03E+01	992.6	2.98E-01	2.09E+00	4.97E+01
Trimethbenz	3.35E-01	5166.8	9.63E-03	0.00E+00	1.93E-01
135Trimeth	2.84E-01	11367.8	8.14E-03	0.00E+00	1.63E-01
acetophenone	1.49E+01	768.7	4.26E-01	0.00E+00	4.26E+00
Ethylchlorid	1.81E+01	622.2	5.20E-01	1.51E-03	1.30E+00
Methonal	2.33E+01	473.7	6.69E-01	0.00E+00	1.34E+00
MMetacrylate	1.57E+01	532.4	4.50E-01	0.00E+00	3.21E-01
Cyanide	2.75E-01	32777.6	7.89E-03	0.00E+00	3.94E-01
Dibenz[a,h]		> 1000000.0			
24Dinitrotoluene	1.19E+00	800.0	3.41E-02	2.32E-02	1.71E+01
26Dinitrotoluene	1.55E+00	741.0	4.45E-02	3.02E-02	4.45E+01
Endosulfan	1.98E-03	13783.0	5.69E-05	0.00E+00	9.48E-03
4Nitrobenzenamin	4.71E-08	1589.8	1.35E-09	2.84E-11	4.51E-07

4Nitrophenol	2.68E+00	3319.6	7.70E-02	0.00E+00	1.24E+00
NNitrosodiphen	1.54E-01	2601.6	4.42E-03	2.17E-05	2.21E-01
Xylene	4.67E-01	3358.8	1.34E-02	0.00E+00	6.70E-02
12Dichloro	3.52E-01	2941.0	1.01E-02	0.00E+00	1.12E-01
13Dichloro	1.71E-01	44068.2	4.90E-03	0.00E+00	5.50E-02
14Dichloro	3.58E-01	4488.0	1.03E-02	2.47E-04	4.47E-02
Methylcyclo	6.17E-02	467.1	1.77E-03	0.00E+00	2.95E-02
2Nitrophenol	3.19E+00	2784.4	9.16E-02	0.00E+00	1.48E+00
EndosulfanII	1.98E-03	28378.7	5.69E-05	0.00E+00	9.48E-03
Aldehyde	1.10E-03	143553.4	3.19E-05	0.00E+00	1.06E-01
Ketone	1.10E-03	143553.4	3.19E-05	0.00E+00	1.06E-01
Chlorobenzene	2.19E+00	1896.6	6.29E-02	0.00E+00	3.15E+00
Vinyl Chloride	5.24E+00	1681.2	1.50E-01	2.10E-01	5.01E+01
o-cresol	8.18E+00	1061.1	2.35E-01	0.00E+00	4.69E+00
m-cresol	1.10E+01	779.2	3.15E-01	0.00E+00	6.30E+00
p-cresol	1.11E+01	768.1	3.19E-01	0.00E+00	6.39E+01
Hexachlorobenzen	2.73E-05	299560.2	8.23E-07	1.32E-06	1.03E-03
Hexachloroethane	2.20E-01	12085.9	6.33E-03	8.86E-05	6.33E+00
Nitrobenzene	9.21E+00	888.2	2.64E-01	0.00E+00	5.28E+02
246-Trichlorphnl	3.49E+00	2542.8	1.00E-01	1.10E-03	0.00E+00
Pyridine	1.63E+01	512.2	4.66E-01	0.00E+00	4.66E+02
24-D	3.00E+00	659.0	8.62E-02	0.00E+00	8.62E+00
245-TP (Silvex)	8.81E-01	991.9	2.53E-02	0.00E+00	3.16E+00
Endrin	1.10E-03	59135.6	3.19E-05	0.00E+00	1.06E-01
Heptachlor	7.93E-04	130936.6	2.29E-05	1.03E-04	4.57E-02
Heptachlor epoxd	8.81E-04	47440.7	2.69E-05	2.44E-04	2.07E+00
Lindane	3.52E-02	22529.6	1.01E-03	1.32E-03	3.37E+00
124trimethylb	2.51E-01	5166.8	7.21E-03	0.00E+00	1.44E-01
1hexanol	1.52E+01	552.0	4.35E-01	0.00E+00	1.09E+01
2hexanone	1.52E+01	552.0	4.35E-01	0.00E+00	1.09E+01
butylbenzene	2.70E-01	5786.9	7.75E-03	0.00E+00	2.04E-01

PATHWAY 1

********* CONTAMINANT DOSES (mg/kg-day) ********

TIMES	1000.	100000.
Acenaphthene	0.0E+00	0.0E+00
Acetone	3.2E-03	0.0E+00
Antimony	0.0E+00	2.1E-06
Barium	0.0E+00	0.0E+00
Benzene	0.0E+00	0.0E+00
Boron	0.0E+00	0.0E+00
Carbazole	0.0E+00	2.3E-04
Carbontetchl	0.0E+00	0.0E+00
Chloroform	0.0E+00	0.0E+00
Chromium III	0.0E+00	0.0E+00
Dieldrin	0.0E+00	2.6E-03
Isophorone	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00
Manganese	0.0E+00	0.0E+00
Naphthalene	0.0E+00	4.0E-03
NnitroNpropyl	1.8E-07	0.0E+00
Phenol	5.8E-05	0.0E+00
Selenium	0.0E+00	4.1E-03
Strontium	0.0E+00	0.0E+00
Tetrachloroethen	0.0E+00	0.0E+00
Tin	0.0E+00	0.0E+00
Toluene	0.0E+00	0.0E+00
Trichloroethene	0.0E+00	0.0E+00
U-233	0.0E+00	1.3E-03
U-234	0.0E+00	1.5E-03
U-235	0.0E+00	2.0E-03
U-236	0.0E+00	2.0E-03
U-238	0.0E+00	2.0E-03
Vanadium	0.0E+00	0.0E+00
124Trichlorb	0.0E+00	0.0E+00
Molybdenum	0.0E+00	1.6E-03
benzidine	0.0E+00	0.0E+00
Chlordane	0.0E+00	0.0E+00

MethylPropylB	0.0E+00	0.0E+00
MethylEthylB	0.0E+00	0.0E+00
12DiMethylB	0.0E+00	0.0E+00
PropylB	0.0E+00	0.0E+00
Aldrin	0.0E+00	0.0E+00
Aroclor1221	0.0E+00	0.0E+00
Aroclor1232	0.0E+00	6.1E-04
DDD	0.0E+00	0.0E+00
DDE	0.0E+00	5.7E-06
Alpha-BHC	0.0E+00	1.0E-03
Beta-BHC	0.0E+00	1.0E-03
Delta-BHC	0.0E+00	1.0E-03
Acenaphthylene	0.0E+00	2.0E-03
Benzoic Acid	2.8E-12	0.0E+00
Dibenzofuran	0.0E+00	0.0E+00
Diethylphth	1.4E-01	0.0E+00
24-Dimethylphe	0.0E+00	0.0E+00
Dimethylphth	3.4E-01	0.0E+00
2Methylnaptha	0.0E+00	0.0E+00
2346Tetrachlor	0.0E+00	0.0E+00
Benzyl Alcohol	5.5E-06	0.0E+00
Acentonitrile	1.7E-17	0.0E+00
Acrolien	6.3E-17	0.0E+00
Acylonitrle	3.5E-16	0.0E+00
Bromodichloro	6.1E-06	0.0E+00
Bromoform	2.6E-01	0.0E+00
Bromometh	7.5E-07	0.0E+00
CarbonDiS	2.0E-01	0.0E+00
Chlorometh	9.5E-07	0.0E+00
O-ChloroTu	0.0E+00	0.0E+00
Cumene	0.0E+00	6.4E-08
Dibromochloro	3.6E-01	0.0E+00
Dichlorodiflo	4.7E-02	0.0E+00
Dinbutylphthalat	2.8E-18	0.0E+00
12cisDichloro	0.0E+00	0.0E+00
12transDichl	4.6E-01	0.0E+00
12Dichlprop	4.2E-01	0.0E+00
Ethylbenz	0.0E+00	0.0E+00

Nhexane	9.4E-04	1.6E-03
MethylIso	4.5E-16	0.0E+00
MethChoride	8.1E-10	0.0E+00
PropGlycol	2.8E-17	0.0E+00
Styrene	0.0E+00	0.0E+00
1112Tetra	2.0E-02	0.0E+00
1122Tetra	3.4E-01	0.0E+00
TriChloPlo	1.8E-01	0.0E+00
123TriChlopr	3.0E-01	0.0E+00
Trimethbenz	0.0E+00	0.0E+00
135Trimeth	0.0E+00	0.0E+00
acetophenone	4.3E-01	0.0E+00
Ethylchlorid	9.8E-02	0.0E+00
2Hexanone	1.2E-07	0.0E+00
MMetacrylate	6.1E-10	0.0E+00
Methonal	2.8E-17	0.0E+00
Cyanide	0.0E+00	0.0E+00
Dibenz(a,h)	0.0E+00	0.0E+00
24Dinitrotoluene	3.4E-02	0.0E+00
26Dinitrotoluene	4.4E-02	0.0E+00
Endosulfan	0.0E+00	5.7E-05
4Nitrobenzenamin	0.0E+00	1.4E-09
4Nitrophenol	0.0E+00	0.0E+00
NNitrosodiphen	0.0E+00	0.0E+00
Xylene	0.0E+00	0.0E+00
12Dichloro	0.0E+00	0.0E+00
13Dichloro	0.0E+00	8.9E-22
14Dichloro	0.0E+00	0.0E+00
Methylcyclo	1.8E-03	1.8E-0
2Nitrophenol	0.0E+00	0.0E+00
EndosulfanII	0.0E+00	5.7E-05
Aldehyde	0.0E+00	3.2E-05
Ketone	0.0E+00	3.2E-05
Chlorobenzene	0.0E+00	0.0E+00
Vinyl Chloride	0.0E+00	0.0E+00
o-cresol	2.3E-01	0.0E+00
m-cresol	3.1E-01	0.0E+00
p-cresol	3.2E-01	0.0E+00

Hexachlorobenzen	0.0E+00	0.0E+00
Hexachloroethane	0.0E+00	0.0E+00
Nitrobenzene	2.6E-01	0.0E+00
246-Trichlorphnl	0.0E+00	0.0E+00
Pyridine	2.3E-12	0.0E+00
24-D	8.6E-02	0.0E+00
245-TP (Silvex)	2.5E-02	0.0E+00
Endrin	0.0E+00	3.2E-05
Heptachlor	0.0E+00	4.1E-21
Heptachlor epoxd	0.0E+00	2.7E-05
Lindane	0.0E+00	1.0E-03
124trimethylb	0.0E+00	0.0E+00
1hexanol	9.1E-08	0.0E+00
2-Hexanone	1.7E-01	0.0E+00
butylbenzene	0.0E+00	0.0E+00

CONTAMINANT CONCENTRATIONS IN RIVER (mg/l)

TIMES	1000.	100000.
Acenaphthene	0.0E+00	0.0E+00
Acetone	1.1E-01	0.0E+00
Antimony	0.0E+00	7.4E-05
Barium	0.0E+00	0.0E+00
Benzene	0.0E+00	0.0E+00
Boron	0.0E+00	0.0E+00
Carbazole	0.0E+00	7.9E-03
Carbontetchl	0.0E+00	0.0E+00
Chloroform	0.0E+00	0.0E+00
Chromium III	0.0E+00	0.0E+00
Dieldrin	0.0E+00	8.1E-02
Isophorone	0.0E+00	0.0E+00
Lead	0.0E+00	0.0E+00
Manganese	0.0E+00	0.0E+00
Naphthalene	0.0E+00	1.4E-01
NnitroNpropyl	6.3E-06	0.0E+00
Phenol	2.0E-03	0.0E+00
Selenium	0.0E+00	7.9E-02

Strontium	0.0E+00	0.0E+00
Tetrachloroethen	0.0E+00	0.0E+00
Tin	0.0E+00	0.0E+00
Toluene	0.0E+00	0.0E+00
Trichloroethene	0.0E+00	0.0E+00
U-233	0.0E+00	4.5E-02
U-234	0.0E+00	5.2E-02
U-235	0.0E+00	6.9E-02
U-236	0.0E+00	6.9E-02
U-238	0.0E+00	6.9E-02
Vanadium	0.0E+00	0.0E+00
124Trichlorb	0.0E+00	0.0E+00
Molybdenum	0.0E+00	5.5E-02
benzidine	0.0E+00	0.0E+00
Chlordane	0.0E+00	0.0E+00
MethylPropylB	0.0E+00	0.0E+00
MethylEthylB	0.0E+00	0.0E+00
12DiMethylB	0.0E+00	0.0E+00
PropylB	0.0E+00	0.0E+00
Aldrin	0.0E+00	0.0E+00
Aroclor1221	0.0E+00	0.0E+00
Aroclor1232	0.0E+00	2.1E-02
DDD	0.0E+00	0.0E+00
DDE	0.0E+00	1.8E-04
Alpha-BHC	0.0E+00	3.5E-02
Beta-BHC	0.0E+00	3.5E-02
Delta-BHC	0.0E+00	3.5E-02
Acenaphthylene	0.0E+00	7.1E-02
Benzoic Acid	9.8E-11	0.0E+00
Dibenzofuran	0.0E+00	0.0E+00
Diethylphth	4.7E+00	0.0E+00
24-Dimethylphe	0.0E+00	0.0E+00
Dimethylphth	1.2E+01	0.0E+00
2Methylnaptha	0.0E+00	0.0E+00
2346Tetrachlor	0.0E+00	0.0E+00
Benzyl Alcohol	1.9E-04	0.0E+00
Acentonitrile	6.1E-16	0.0E+00
Acrolien	2.2E-15	0.0E+00

Acylonitrle	1.2E-14	0.0E+00
Bromodichloro	2.1E-04	0.0E+00
Bromoform	9.0E+00	0.0E+00
Bromometh	2.6E-05	0.0E+00
CarbonDiS	6.9E+00	0.0E+00
Chlorometh	3.3E-05	0.0E+00
0-ChloroTu	0.0E+00	0.0E+00
Cumene	0.0E+00	2.2E-06
Dibromochloro	1.2E+01	0.0E+00
Dichlorodiflo	1.6E+00	0.0E+00
Dinbutylphthalat	8.9E-17	0.0E+00
12cisDichloro	0.0E+00	0.0E+00
12transDichl	1.6E+01	0.0E+00
12Dichlprop	1.5E+01	0.0E+00
Ethylbenz	0.0E+00	0.0E+00
Nhexane	3.3E-02	5.6E-02
MethylIso	1.6E-14	0.0E+00
MethChoride	2.8E-08	0.0E+00
PropGlycol	9.8E-16	0.0E+00
Styrene	0.0E+00	0.0E+00
1112Tetra	6.9E-01	0.0E+00
1122Tetra	1.2E+01	0.0E+00
TriChloFlo	6.3E+00	0.0E+00
123TriChlopr	1.0E+01	0.0E+00
Trimethbenz	0.0E+00	0.0E+00
135Trimeth	0.0E+00	0.0E+00
acetophenone	1.5E+01	0.0E+00
Ethylchlorid	3.4E+00	0.0E+00
2Hexanone	4.2E-06	0.0E+00
MMetacrylate	2.1E-08	0.0E+00
Methonal	9.8E-16	0.0E+00
Cyanide	0.0E+00	0.0E+00
Dibenz[a,h]	0.0E+00	0.0E+00
24Dinitrotoluene	1.2E+00	0.0E+00
26Dinitrotoluene	1.6E+00	0.0E+00
Endosulfan	0.0E+00	2.0E-03
4Nitrobenzenamin	0.0E+00	4.7E-08
4Nitrophenol	0.0E+00	0.0E+00

NNitrosodiphen	0.0E+00	0.0E+00
Xylene	0.0E+00	0.0E+00
12Dichloro	0.0E+00	0.0E+00
13Dichloro	0.0E+00	3.1E-20
14Dichloro	0.0E+00	0.0E+00
Methylcyclo	6.2E-02	6.2E-02
2Nitrophenol	0.0E+00	0.0E+00
EndosulfanII	0.0E+00	2.0E-03
Aldehyde	0.0E+00	1.1E-03
Ketone	0.0E+00	1.1E-03
Chlorobenzene	0.0E+00	0.0E+00
Vinyl Chloride	0.0E+00	0.0E+00
o-cresol	8.2E+00	0.0E+00
m-cresol	1.1E+01	0.0E+00
p-cresol	1.1E+01	0.0E+00
14Dichlorobenzen	0.0E+00	0.0E+00
Hexachlorobenzen	0.0E+00	0.0E+00
Hexachloroethane	0.0E+00	0.0E+00
Nitrobenzene	9.2E+00	0.0E+00
246-Trichlorphnl	0.0E+00	0.0E+00
Pyridine	8.2E-11	0.0E+00
24-D	3.0E+00	0.0E+00
245-TP (Silvex)	8.8E-01	0.0E+00
Endrin	0.0E+00	1.1E-03
Heptachlor	0.0E+00	1.4E-19
Heptachlor epoxd	0.0E+00	8.8E-04
Lindane	0.0E+00	3.5E-02
124trimethylb	0.0E+00	0.0E+00
1hexanol	3.2E-06	0.0E+00
2hexanone	3.2E-06	0.0E+00
butylbenzene	0.0E+00	0.0E+00