

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

PC Code: 079401
DP Barcode: D260506

October 28, 1999

MEMORANDUM

SUBJECT: **Endosulfan:** Refined Drinking Water EECs for Use in the Human Health Risk Assessment.

TO: Phillip Budig, PM Team Reviewer
Robert McNally, Product Manager 60
Registration Division (7505C)

FROM: Dirk F. Young, Ph.D., Environmental Engineer
Environmental Fate and Effects Division (7507C)

Dirk F. Young

THRU: Mah T. Shamim, Ph.D., Chief
ERB IV/EFED (7507C)

M. Shamim 10/28/99

This memo summarizes the Tier II estimated environmental concentrations (EECs) for endosulfan in surface water and groundwater for use in the human health risk assessments. The EECs are summarized in Table 1.

Table 1. Tier II Drinking water EECs for Drinking Water

Isomer	Surface Water Peak EEC	Surface Water Chronic EEC	Ground Water EEC
α -endosulfan	5.2 $\mu\text{g/L}$	0.88 $\mu\text{g/L}$	0.013 $\mu\text{g/L}$
β -endosulfan	2.4 $\mu\text{g/L}$	0.39 $\mu\text{g/L}$	0.006 $\mu\text{g/L}$
Total	7.6 $\mu\text{g/L}$	1.27 $\mu\text{g/L}$	0.019 $\mu\text{g/L}$

In Table 1, the peak surface water EEC represents the upper 1-in-10-year peak event concentration, and the surface water chronic EEC represents the upper 1-in-10-year mean annual concentration. EFED based these surface water EECs on PRZM/EXAMS simulations with the maximum allowable application of endosulfan (1.0 lb a.i. / acre, 3 times per year) to a cotton crop in Mississippi, which likely represents a worst-case scenario. EFED conducted separate simulations for the α - and β -endosulfan isomers, with the application solution comprising 70% α -endosulfan and 30% β -endosulfan. EFED's standard cotton scenario represents a 10-ha cotton field adjacent to a 1-ha pond that is 2 meters deep and has neither hydraulic inlets nor outlets (i.e., pesticide cannot leave by outflow). The simulation was generated with 19 years of

weather data, encompassing the years from 1964 to 1983. Endosulfan enters the pond by both spraydrift and runoff. A summary of the parameters used for the PRZM/EXAMS simulations is given in Table 2. All parameters were taken according to standard EFED practice. The input files for α - and β -endosulfan are located in Attachments 1 and 2, and the output files are located in Attachments 3 and 4, respectively.

The groundwater EECs in Table 1 were generated with SCIGROW. Input parameters and output for the SCIGROW runs can be found in Attachment 5. All parameters used as inputs were chosen according to standard EFED practice. As with the surface water concentrations, the ratio of α -endosulfan to β -endosulfan in the applied solution was 70:30.

Table 2. PRZM/EXAMS environmental fate input parameters		
chemical	α - endosulfan	β - endosulfan
molecular weight	406.9	406.9
Solubility	530 $\mu\text{g/L}$	280 $\mu\text{g/L}$
vapor pressure	3.0×10^{-6} torr	7.2×10^{-7} torr
pH 7 hydrolysis half life	19 days	10.7 days
aqueous photolysis half life (near surface)	stable	stable
soil photolysis half life	stable	stable
aerobic soil metabolism half life	57 days (upper 90% c.i.)	208 days (upper 90% c.i.)
aerobic aquatic metabolism half life	114 days (2 x 57 day soil metabolism PRZM value)	416 days (2 x 125 day soil metabolism PRZM value)
anaerobic aquatic metabolism half life	286 days (2 x upper 90% c.i. of anaerobic soil study)	382 days (2 x upper 90% c.i. of anaerobic soil study)
soil organic carbon partitioning (Koc)	9780 L kg ⁻¹ (mean value)	13582 L kg ⁻¹ (mean value)
crop	cotton	cotton
application rate	70% of 1 lb a.i. acre	30% of 1 lb a.i. acre
number of applications	3	3
application method	aerial	aerial
application dates	1-Jun, 9-Jul, 16-Aug *	1-Jun, 9-Jul, 16-Aug *
spray efficiency	75%	75%
spray drift	5% of mass applied to 1 acre at each application time	5% of mass applied to 1 acre at each application time

* Application dates were taken from the registrant's PRZM simulations, which were included in a July 7, 1999 letter from AgrEvo. Label does not specify intervals.

ATTACHMENT 1: α -endosulfan PRZM Input File

*** PRZM 3.1;File modified 10/25/99 from mscotttn1.inp ***
*** Location: Yazoo County, Mississippi; MLRA: O-134 ***
*** Weather: MET131.MET Jackson, MS ***
*** Manning's N: Assume fallow surface with residues not more than 1 ton/acre
*** See MSCOTTN1.wpd for scenario description and metadata ***

Chemical: endosulfan (alpha)

Location: Mississippi; Crop: cotton; MLRA: O-134

*** record 3

0.76 0.15 0 17.00 1 1

***record 6

4

***record 7

0.49 0.40 0.75 10.00 5.80 4 6.00 354.0

***record 8

3

***record 9

1	0.20	125.00	98.00	3	99	93	92	0.00
120.00								
2	0.20	125.00	98.00	3	94	84	83	0.00
120.00								
3	0.20	125.00	98.00	3	99	83	83	0.00
120.00								

1 3

0101 2109 2209

0.63 0.16 0.18

0.02 0.02 0.02

2 3

0105 0709 2209

0.16 0.13 0.13

0.02 0.02 0.02

3 3

0105 0709 2209

0.16 0.13 0.09

0.02 0.02 0.02

***record 10

20

***record 11

01 564	07 964	220964	1
01 565	07 965	220965	2
01 566	07 966	220966	3
01 567	07 967	220967	1
01 568	07 968	220968	2
01 569	07 969	220969	3
01 570	07 970	220970	1
01 571	07 971	220971	2
01 572	07 972	220972	3
01 573	07 973	220973	1
01 574	07 974	220974	2
01 575	07 975	220975	3

01 576	07 976	220976	1
01 577	07 977	220977	2
01 578	07 978	220978	3
01 579	07 979	220979	1
01 580	07 980	220980	2
01 581	07 981	220981	3
01 582	07 982	220982	1
01 583	07 983	220983	2

Application schedule: XX (appl. method) apps @ XX.XXkg/ha @ XX% eff w/ X% drift

60 1 0 0
 Chemical: Koc=9780 (alpha) ; AESM t1/2 = XX days

010664	0 2 0.00	1.12 0.75 0.05
090764	0 2 0.00	1.12 0.75 0.05
160864	0 2 0.00	1.12 0.75 0.05
010665	0 2 0.00	1.12 0.75 0.05
090765	0 2 0.00	1.12 0.75 0.05
160865	0 2 0.00	1.12 0.75 0.05
010666	0 2 0.00	1.12 0.75 0.05
090766	0 2 0.00	1.12 0.75 0.05
160866	0 2 0.00	1.12 0.75 0.05
010667	0 2 0.00	1.12 0.75 0.05
090767	0 2 0.00	1.12 0.75 0.05
160867	0 2 0.00	1.12 0.75 0.05
010668	0 2 0.00	1.12 0.75 0.05
090768	0 2 0.00	1.12 0.75 0.05
160868	0 2 0.00	1.12 0.75 0.05
010669	0 2 0.00	1.12 0.75 0.05
090769	0 2 0.00	1.12 0.75 0.05
160869	0 2 0.00	1.12 0.75 0.05
010670	0 2 0.00	1.12 0.75 0.05
090770	0 2 0.00	1.12 0.75 0.05
160870	0 2 0.00	1.12 0.75 0.05
010671	0 2 0.00	1.12 0.75 0.05
090771	0 2 0.00	1.12 0.75 0.05
160871	0 2 0.00	1.12 0.75 0.05
010672	0 2 0.00	1.12 0.75 0.05
090772	0 2 0.00	1.12 0.75 0.05
160872	0 2 0.00	1.12 0.75 0.05
010673	0 2 0.00	1.12 0.75 0.05
090773	0 2 0.00	1.12 0.75 0.05
160873	0 2 0.00	1.12 0.75 0.05
010674	0 2 0.00	1.12 0.75 0.05
090774	0 2 0.00	1.12 0.75 0.05
160874	0 2 0.00	1.12 0.75 0.05
010675	0 2 0.00	1.12 0.75 0.05
090775	0 2 0.00	1.12 0.75 0.05
160875	0 2 0.00	1.12 0.75 0.05
010676	0 2 0.00	1.12 0.75 0.05
090776	0 2 0.00	1.12 0.75 0.05
160876	0 2 0.00	1.12 0.75 0.05

4

010677	0	2	0.00	1.12	0.75	0.05						
090777	0	2	0.00	1.12	0.75	0.05						
160877	0	2	0.00	1.12	0.75	0.05						
010678	0	2	0.00	1.12	0.75	0.05						
090778	0	2	0.00	1.12	0.75	0.05						
160878	0	2	0.00	1.12	0.75	0.05						
010679	0	2	0.00	1.12	0.75	0.05						
090779	0	2	0.00	1.12	0.75	0.05						
160879	0	2	0.00	1.12	0.75	0.05						
010680	0	2	0.00	1.12	0.75	0.05						
090780	0	2	0.00	1.12	0.75	0.05						
160880	0	2	0.00	1.12	0.75	0.05						
010681	0	2	0.00	1.12	0.75	0.05						
090781	0	2	0.00	1.12	0.75	0.05						
160881	0	2	0.00	1.12	0.75	0.05						
010682	0	2	0.00	1.12	0.75	0.05						
090782	0	2	0.00	1.12	0.75	0.05						
160882	0	2	0.00	1.12	0.75	0.05						
010683	0	2	0.00	1.12	0.75	0.05						
090783	0	2	0.00	1.12	0.75	0.05						
160883	0	2	0.00	1.12	0.75	0.05						
***record 17												
	0.00		3		0.00							
***record 18												
	0.00		0.00		0.50							
Soil Series: Loring silt loam; Hydrogic Group C												
***record 20												
	155.00		0.00		0		0		0		0	
***record 26												
	0.00		0.00		00.00							
***record 33												
	6											
*** record 34												
	1		13.00		1.400		0.385		0.000		0.000	
*** record 36												
			.0122		.0122		0.00					
			0.100		0.385		0.151		2.180		213.3	
2			23.00		1.400		0.370		0.000		0.000	
			.0122		.0122		0.00					
			1.000		0.370		0.146		0.490		47.9	
3			33.00		1.400		0.370		0.000		0.000	
			.0122		.0122		0.00					
			1.000		0.370		0.146		0.160		15.7	
4			30.00		1.450		0.340		0.000		0.000	
			.0122		.0122		0.00					
			1.000		0.340		0.125		0.124		12.1	
5			23.00		1.490		0.335		0.000		0.000	
			.000097		.000097		0.00					
			1.000		0.335		0.137		0.070		0.7	
6			33.00		1.510		0.343		0.000		0.000	
			.000097		.000097		0.00					

	1.000	0.343	0.147	0.060	0.6				
0									
WATR	YEAR	10	PEST	YEAR	10	CONC	YEAR	10	1
1									
1	-----								
7	DAY								
PRCP	TSER	0	0						
RUNF	TSER	0	0						
INFL	TSER	1	1						
ESLS	TSER	0	0	1.E3					
RFLX	TSER	0	0	1.E5					
EFLX	TSER	0	0	1.E5					
RZFX	TSER	0	0	1.E5					

ATTACHMENT 2: β -endosulfan PRZM Input File

```

*** PRZM 3.1;File modified 10/25/99 from mscottn1.inp ***
*** Modified 10/25/99 ***
*** Location: Yazoo County, Mississippi; MLRA: O-134 ***
*** Weather: MET131.MET Jackson, MS ***
*** Manning's N: Assume fallow surface with residues not more than 1 ton/acre
*** See MSCOTTN1.wpd for scenario description and metadata ***
Chemical: endosulfan (beta)
Location: Mississippi; Crop: cotton; MLRA: O-134
*** record 3
  0.76  0.15      0  17.00      1      1
***record 6
  4
***record 7
  0.49  0.40      0.75  10.00      5.80      4      6.00  354.0
***record 8
  3
***record 9
  1      0.20  125.00  98.00      3  99  93  92      0.00
120.00
  2      0.20  125.00  98.00      3  94  84  83      0.00
120.00
  3      0.20  125.00  98.00      3  99  83  83      0.00
120.00
  1      3
0101 2109 2209
0.63 0.16 0.18
0.02 0.02 0.02
  2      3
0105 0709 2209
0.16 0.13 0.13
0.02 0.02 0.02
  3      3
0105 0709 2209
0.16 0.13 0.09
0.02 0.02 0.02

```

6

***record 10

20

***record 11

01 564	07 964	220964	1
01 565	07 965	220965	2
01 566	07 966	220966	3
01 567	07 967	220967	1
01 568	07 968	220968	2
01 569	07 969	220969	3
01 570	07 970	220970	1
01 571	07 971	220971	2
01 572	07 972	220972	3
01 573	07 973	220973	1
01 574	07 974	220974	2
01 575	07 975	220975	3
01 576	07 976	220976	1
01 577	07 977	220977	2
01 578	07 978	220978	3
01 579	07 979	220979	1
01 580	07 980	220980	2
01 581	07 981	220981	3
01 582	07 982	220982	1
01 583	07 983	220983	2

Application schedule: XX (appl. method) apps @ XX.XXkg/ha @ XX% eff w/ X% drift

60 1 0 0
Chemical: Koc=13582 (beta) ; AESM t1/2 = XX days

010664	0 2 0.00	1.12 0.75 0.05
090764	0 2 0.00	1.12 0.75 0.05
160864	0 2 0.00	1.12 0.75 0.05
010665	0 2 0.00	1.12 0.75 0.05
090765	0 2 0.00	1.12 0.75 0.05
160865	0 2 0.00	1.12 0.75 0.05
010666	0 2 0.00	1.12 0.75 0.05
090766	0 2 0.00	1.12 0.75 0.05
160866	0 2 0.00	1.12 0.75 0.05
010667	0 2 0.00	1.12 0.75 0.05
090767	0 2 0.00	1.12 0.75 0.05
160867	0 2 0.00	1.12 0.75 0.05
010668	0 2 0.00	1.12 0.75 0.05
090768	0 2 0.00	1.12 0.75 0.05
160868	0 2 0.00	1.12 0.75 0.05
010669	0 2 0.00	1.12 0.75 0.05
090769	0 2 0.00	1.12 0.75 0.05
160869	0 2 0.00	1.12 0.75 0.05
010670	0 2 0.00	1.12 0.75 0.05
090770	0 2 0.00	1.12 0.75 0.05
160870	0 2 0.00	1.12 0.75 0.05
010671	0 2 0.00	1.12 0.75 0.05
090771	0 2 0.00	1.12 0.75 0.05
160871	0 2 0.00	1.12 0.75 0.05

010672	0	2	0.00	1.12	0.75	0.05
090772	0	2	0.00	1.12	0.75	0.05
160872	0	2	0.00	1.12	0.75	0.05
010673	0	2	0.00	1.12	0.75	0.05
090773	0	2	0.00	1.12	0.75	0.05
160873	0	2	0.00	1.12	0.75	0.05
010674	0	2	0.00	1.12	0.75	0.05
090774	0	2	0.00	1.12	0.75	0.05
160874	0	2	0.00	1.12	0.75	0.05
010675	0	2	0.00	1.12	0.75	0.05
090775	0	2	0.00	1.12	0.75	0.05
160875	0	2	0.00	1.12	0.75	0.05
010676	0	2	0.00	1.12	0.75	0.05
090776	0	2	0.00	1.12	0.75	0.05
160876	0	2	0.00	1.12	0.75	0.05
010677	0	2	0.00	1.12	0.75	0.05
090777	0	2	0.00	1.12	0.75	0.05
160877	0	2	0.00	1.12	0.75	0.05
010678	0	2	0.00	1.12	0.75	0.05
090778	0	2	0.00	1.12	0.75	0.05
160878	0	2	0.00	1.12	0.75	0.05
010679	0	2	0.00	1.12	0.75	0.05
090779	0	2	0.00	1.12	0.75	0.05
160879	0	2	0.00	1.12	0.75	0.05
010680	0	2	0.00	1.12	0.75	0.05
090780	0	2	0.00	1.12	0.75	0.05
160880	0	2	0.00	1.12	0.75	0.05
010681	0	2	0.00	1.12	0.75	0.05
090781	0	2	0.00	1.12	0.75	0.05
160881	0	2	0.00	1.12	0.75	0.05
010682	0	2	0.00	1.12	0.75	0.05
090782	0	2	0.00	1.12	0.75	0.05
160882	0	2	0.00	1.12	0.75	0.05
010683	0	2	0.00	1.12	0.75	0.05
090783	0	2	0.00	1.12	0.75	0.05
160883	0	2	0.00	1.12	0.75	0.05

***record 17

0.00 3 0.00

***record 18

0.00 0.00 0.50

Soil Series: Loring silt loam; Hydrogic Group C

***record 20

155.00 0.00 0 0 0 0 0 0 0 0 0

***record 26

0.00 0.00 00.00

***record 33

6

*** record 34

1 13.00 1.400 0.385 0.000 0.000 0.000

*** record 36

.0033 .0033 0.00

8

	0.100	0.385	0.151	2.180	296.1				
2	23.00	1.400	0.370	0.000	0.000	0.000			
	.0033	.0033	0.00						
	1.000	0.370	0.146	0.490	66.6				
3	33.00	1.400	0.370	0.000	0.000	0.000			
	.0033	.0033	0.00						
	1.000	0.370	0.146	0.160	21.7				
4	30.00	1.450	0.340	0.000	0.000	0.000			
	.0033	.0033	0.00						
	1.000	0.340	0.125	0.124	17.0				
5	23.00	1.490	0.335	0.000	0.000	0.000			
	.0033	.0033	0.00						
	1.000	0.335	0.137	0.070	.95				
6	33.00	1.510	0.343	0.000	0.000	0.000			
	.0033	.0033	0.00						
	1.000	0.343	0.147	0.060	0.8				
0									
WATR	YEAR	10	PEST	YEAR	10	CONC	YEAR	10	1
1									
1	-----								
7	DAY								
PRCP	TSER	0	0						
RUNF	TSER	0	0						
INFL	TSER	1	1						
ESLS	TSER	0	0	1.E3					
RFLX	TSER	0	0	1.E5					
EFLX	TSER	0	0	1.E5					
RZFX	TSER	0	0	1.E5					

ATTACHMENT 3: α -endosulfan

These results are normalized to an application rate of 1 lb/acre. To obtain the actual concentration for α -endosulfan, these values must be multiplied by the fraction of α -endosulfan in the application solution (i.e., 70 % for α -endosulfan).

WATER COLUMN DISSOLVED CONCENTRATION (PPB)

YEAR	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
----	----	-----	-----	-----	-----	-----
1964	7.975	5.806	3.171	2.521	2.359	1.151
1965	7.025	5.108	2.689	1.854	1.644	1.264
1966	3.871	2.854	1.760	1.300	1.175	.876
1967	4.022	2.836	1.898	1.388	1.273	.844
1968	3.171	2.486	1.412	1.061	.986	.710
1969	4.204	3.049	1.600	1.068	.929	.594
1970	3.405	2.705	1.703	1.537	1.458	.842
1971	3.824	2.852	1.554	1.285	1.272	.911
1972	3.177	2.303	1.191	.977	.929	.665
1973	3.436	2.551	1.327	.979	.913	.616
1974	3.400	2.747	1.580	1.137	1.055	.766
1975	4.879	3.527	2.078	1.741	1.587	.938

1976	3.695	2.860	2.048	1.626	1.483	1.013
1977	3.511	2.559	1.402	1.249	1.163	.892
1978	3.162	2.294	1.194	.990	.923	.649
1979	7.494	5.546	3.338	2.608	2.435	1.309
1980	3.425	2.556	1.427	1.261	1.230	1.010
1981	3.677	2.594	1.465	1.142	1.080	.709
1982	4.457	3.208	2.299	1.941	1.670	1.075
1983	3.581	2.660	1.564	1.259	1.196	.959

SORTED FOR PLOTTING

PROB	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
.048	7.975	5.806	3.338	2.608	2.435	1.309
.095	7.494	5.546	3.171	2.521	2.359	1.264
.143	7.025	5.108	2.689	1.941	1.670	1.151
.190	4.879	3.527	2.299	1.854	1.644	1.075
.238	4.457	3.208	2.078	1.741	1.587	1.013
.286	4.204	3.049	2.048	1.626	1.483	1.010
.333	4.022	2.860	1.898	1.537	1.458	.959
.381	3.871	2.854	1.760	1.388	1.273	.938
.429	3.824	2.852	1.703	1.300	1.272	.911
.476	3.695	2.836	1.600	1.285	1.230	.892
.524	3.677	2.747	1.580	1.261	1.196	.876
.571	3.581	2.705	1.564	1.259	1.175	.844
.619	3.511	2.660	1.554	1.249	1.163	.842
.667	3.436	2.594	1.465	1.142	1.080	.766
.714	3.425	2.559	1.427	1.137	1.055	.710
.762	3.405	2.556	1.412	1.068	.986	.709
.810	3.400	2.551	1.402	1.061	.929	.665
.857	3.177	2.486	1.327	.990	.929	.649
.905	3.171	2.303	1.194	.979	.923	.616
.952	3.162	2.294	1.191	.977	.913	.594
1/10	7.447	5.502	3.123	2.463	2.290	1.253

MEAN OF ANNUAL VALUES = .890
STANDARD DEVIATION OF ANNUAL VALUES = .207
UPPER 90% CONFIDENCE LIMIT ON MEAN = .959

ATTACHMENT 4: β -endosulfan

These results are normalized to an application rate of 1 lb/acre. To obtain the actual concentration for β -endosulfan, these values must be multiplied by the fraction of β -endosulfan in the application solution (i.e., 30 % for β -endosulfan).

WATER COLUMN DISSOLVED CONCENTRATION (PPB)

YEAR	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
1964	7.985	5.232	2.693	2.245	2.040	1.042
1965	9.696	6.441	2.887	1.851	1.645	1.273
1966	3.846	2.611	1.719	1.248	1.139	.927
1967	4.318	2.753	1.769	1.311	1.234	.907

10

1968	3.295	2.408	1.364	1.080	1.046	.882
1969	4.677	3.042	1.466	.980	.864	.625
1970	4.509	2.997	1.967	1.690	1.587	.919
1971	5.602	3.708	1.791	1.410	1.370	1.148
1972	3.171	2.105	1.073	.920	.901	.759
1973	3.524	2.389	1.233	.962	.890	.735
1974	3.571	2.745	1.613	1.326	1.199	1.088
1975	6.312	4.060	2.175	1.732	1.654	1.058
1976	4.132	3.145	2.109	1.641	1.482	1.109
1977	3.757	2.533	1.427	1.274	1.214	1.106
1978	3.154	2.096	1.111	.932	.897	.749
1979	8.049	5.503	3.221	2.544	2.425	1.531
1980	3.696	2.633	1.907	1.629	1.608	1.293
1981	3.953	2.532	1.536	1.151	1.079	.794
1982	5.256	3.984	2.445	1.878	1.750	1.216
1983	3.733	2.620	1.741	1.586	1.537	1.312

SORTED FOR PLOTTING

PROB	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
.048	9.696	6.441	3.221	2.544	2.425	1.531
.095	8.049	5.503	2.887	2.245	2.040	1.312
.143	7.985	5.232	2.693	1.878	1.750	1.293
.190	6.312	4.060	2.445	1.851	1.654	1.273
.238	5.602	3.984	2.175	1.732	1.645	1.216
.286	5.256	3.708	2.109	1.690	1.608	1.148
.333	4.677	3.145	1.967	1.641	1.587	1.109
.381	4.509	3.042	1.907	1.629	1.537	1.106
.429	4.318	2.997	1.791	1.586	1.482	1.088
.476	4.132	2.753	1.769	1.410	1.370	1.058
.524	3.953	2.745	1.741	1.326	1.234	1.042
.571	3.846	2.633	1.719	1.311	1.214	.927
.619	3.757	2.620	1.613	1.274	1.199	.919
.667	3.733	2.611	1.536	1.248	1.139	.907
.714	3.696	2.533	1.466	1.151	1.079	.882
.762	3.571	2.532	1.427	1.080	1.046	.794
.810	3.524	2.408	1.364	.980	.901	.759
.857	3.295	2.389	1.233	.962	.897	.749
.905	3.171	2.105	1.111	.932	.890	.735
.952	3.154	2.096	1.073	.920	.864	.625
1/10	8.043	5.476	2.868	2.208	2.011	1.310

MEAN OF ANNUAL VALUES = 1.024
STANDARD DEVIATION OF ANNUAL VALUES = .234
UPPER 90% CONFIDENCE LIMIT ON MEAN = 1.102

ATTACHMENT 5: SCIGROW INPUT AND RESULTS

RUN No. 1 FOR alpha-endosulfan		INPUT VALUES		
APPL (#/AC) RATE	APPL. URATE NO. (#/AC/YR)	SOIL KOC	SOIL AEROBIC METABOLISM (DAYS)	

// 3

.700 3 2.100 8971.0 (median) 49.0 (mean)

GROUND-WATER SCREENING CONCENTRATIONS IN PPB

.013436

A= 44.000 B= 8976.000 C= 1.643 D= 3.953 RILP= .077
F= -2.194 G= .006 URATE= 2.100 GWSC= .013436

RUN No. 2 FOR **beta-endosulfan** INPUT VALUES

APPL (#/AC) APPL. URATE SOIL SOIL AEROBIC
RATE NO. (#/AC/YR) KOC METABOLISM (DAYS)

.300 3 .900 12039.0 (median) 99.0 (mean)

GROUND-WATER SCREENING CONCENTRATIONS IN PPB

.006000

A= .000 B= .000 C= .000 D= .000 RILP= .000
F= .000 G= .000 URATE= .900 GWSC= .006000

12