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

JUL 22 1983

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

TO: Richard Balcomb  
Wildlife Biologist  
Ecological Effects Branch  
Hazard Evaluation Division (TS-769)

SUBJECT: Estimated Environmental Concentrations (EEC) for  
Dyfonate (fonofos) by the SWRRB, EXAM 50, and EXAM  
Pulse Models

THRU: Carolyn K. Offutt, Chief *Carolyn K. Offutt*  
Environmental Processes and Guidelines Section  
Environmental Assessment Branch (TS-769)

Your December 27, 1982, memo to Dr. David Severn requested that the Environmental Assessment Branch estimate aquatic concentrations of fonofos in a small pond adjacent to a cornfield and a flowing stream draining a corn-growing area.

As per our discussion, you agreed that EEC's using models could not be provided in time due to lack of pertinent data, specifically partition coefficient ( $K_{ow}$ ). I received the octanol/water partition coefficient from the registrant on February 18, 1983.

On March 14, 1983, we completed the estimation of environmental concentrations in a small pond using the SWRRB, EXAMS 50, and EXAMS pulse model; however, the results were not officially transmitted to you because (a) we did not complete the EEC's for the Lotic (river) environment and (b) questions were raised about the effect of soil incorporation of pesticides, including fonofos, on runoff and aquatic concentrations. In addition, we also reevaluated the chemical and environmental parameters used in the EXAMS models after receiving comments and suggestions from Jim Falco in ORD's exposure assessment group regarding our EEC memo on Terbufos dated December 10, 1982, using the EXAMS pulse model. Jim Falco's comments were in response to our request for review of the Terbufos EEC. We have now incorporated the following revisions to our former estimated environmental concentrations for fonofos.

We have modified the application rate to evaluate soil incorporated fonofos for runoff in the SWRRB model and subsequently used the runoff data for estimation of environmental concentrations in lentic (a small pond) and lotic (a small flowing river) environments by EXAMS 50 and EXAMS pulse models.

The daily runoff was estimated by the SWRRB model in the basin Coshocton, Ohio (COSH 115) for corn crop grown in three consecutive years (1968, 1969, 1970). The maximum application rate of granular Dyfonate 20G (fonofos) of 1.3 lbs a.i./A, which is typically applied at planting of corn was suggested in your memo of December 27, 1982. We understand from Dr. E. David Thomas, ASIB/BUD, that the maximum application rate of granular fonofos (Dyfonate 20-G) allowed on corn is 1.2 oz. a.i./1,000 linear feet of row with 7" band treatment over the row. If the rows are spaced 30" apart, the minimum specified in the label directions for corn, then the maximum application rate is 1.3 lbs a.i./A. Based on the soil incorporated data of granular insecticide published by Erback and Tollefson, approximately 15% of the applied granular fonofos should then residue on the surface of the soil. If one assumes that the remainder 85% will be incorporated uniformly in the top 2.54 cm of the soil at planting time, then the top 1 cm will contain ca 50% of the originally applied fonofos (15% on the surface + ca 35% in the top 1 cm of the soil), which is equivalent to 0.66 lb a.i./A (50% of 1.3 lbs a.i./A).

One application in early May of this maximum application rate of granular fonofos (0.66 lb a.i./A) was used to estimate the daily runoff values (details of the application date are in Attachments). The daily runoff values were estimated by the SWRRB model in the years 1968, 1969, and 1970 for COSH 115. The frequency of the daily runoff estimated by the SWRRB model in the basin (COSH 115) is between 0.001 to 0.008 lb a.i./A for one to five days per year, when measurable runoff occurred. (See attached Table 1).

The typical, moderate and worst daily runoff values for the basin COSH 115 in the three-year period estimated by SWRRB/model to be 0.001 lb/A, 0.002 lb/A, and 0.008 lb/A, respectively. These values (lb/A) were converted to EXAMS input load parameters and are equivalent to  $4.6 \times 10^{-5}$  kg/hectare/hr,  $9.2 \times 10^{-5}$  kg/hectare/hr and  $3.8 \times 10^{-4}$  kg/hectare/hr, respectively. These converted EXAMS load parameters were used in the EXAMS 50 steady-state version (Exposure Analysis Modeling System) for the calculation of environmental concentrations of fonofos. The results of the EXAMS 50 - for the estimation of environmental concentrations in the water column and the benthic sediment and for the calculation of dissipation time of fonofos in the aquatic environments of a

pond whose drainage area is 15 hectares and a small flowing river adjacent to a corn field - are summarized in Table 2 and 3.

Under the steady state assumption of EXAMS 50 model, the maximum concentrations in the water and in the sediment is a linear function to the amount of input load as runoff to the pond or the river adjacent to the corn field. In the typical, moderate, and worst load cases, the maximum concentrations in the water column are 0.71 ppb, 1.4 ppb, and 5.9 ppb (for pond) and 0.05 ppt, 0.091 ppt, and 0.38 ppt (for river), respectively. The maximum concentration in the sediment deposits on a dry weight basis are also similar. The recovery time (2 half-lives or 75% removal) is 216 days (for pond) 12 hours (for river) and the self-purification (5 half-lives or 97% removal) is 25 months (for pond) and 67 days (for river) in all three cases of the input load.

The EXAMS-V2.0: Mode 2 (Exposure Analysis Modeling System) pulse version was used for the estimation of the environmental concentrations of fonofos in the water column and in the benthic sediment of a pond or a river. The model was run using fonofos application in Coshocton, Ohio in 1969. The results are shown in Table and graph forms (attached) for your information.

Under the given assumptions, the maximum concentration of fonofos expected on a short-time basis in a year as a result of runoff would be as follows:

(a) no higher than around 0.45 ppb dissolved in the water column and around 5 ppb adsorbed to the sediments in the pond whose drainage area is 15 hectares. The concentration of fonofos in the water column will decline rapidly to 0.03 ppb in 5-7 days and the concentration adsorbed to the sediments would decline slowly to around 4.8 ppb in 20 days.

(b) no higher than around 10 ppt dissolved in the water column and around 4 ppt adsorbed to the sediments in the flowing small river. The concentration of fonofos in the water column will decline rapidly to 0.00009 ppt in 1 or 2 days and the concentration adsorbed to the sediments would decline slowly to around 1.6 ppt in 25 days.

I understand that the estimated runoff data from the SWRRB model and estimated environmental concentrations (EEC's) from the EXAMS pulse model version 2.0 Mode 2 will be used as a part of the fonofos Registration Standard. We consider that the model predictions using the pulse loadings more realistically represent environmental circumstances than the steady state loadings.

If you have any questions, please contact me or Carolyn Offutt at 557-7347.

*P.R. Datta*  
P.R Datta  
Exposure Assessment Branch  
Hazard Evaluation Division (TS-769)

Shaugh. No. 041701

EFB Log Out Date: \_\_\_\_\_

Init.: 22 88

To: Balcomb/Craven  
Product Manager # 17  
Registration Division (TS-767)

From: Carolyn K. Offutt *Carolyn K. Offutt*  
Head, Environmental Processes and Guidelines Section  
Exposure Assessment Branch, HED (TS-769)

Attached, please find the estimated environmental concentration review of:

Reg./File No.: \_\_\_\_\_

Chemical: Fonofos

Type Product: Insecticide

Product Name: Dyfonate

Company Name: Stauffer Chemical Company

Submission Purposes: EEC's

ZBB Code: \_\_\_\_\_

Action Code: \_\_\_\_\_

Date In: \_\_\_\_\_

EFB#: \_\_\_\_\_

Date Completed: \_\_\_\_\_

TAIS (Level II) Days

42

Deferrals To:

\_\_\_\_\_ Ecological Effects Branch

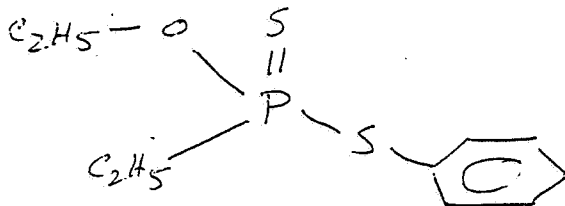
\_\_\_\_\_ Residue Chemistry Branch

\_\_\_\_\_ Toxicology Branch

Common Name: Fonofos (Dyfonate)

Chemical Name: O-Ethyl-S-phenylethylphosphonodithioate

Structure:



Chemical Properties:

Molecular Weight: 246.3 Solubility (ppm): 13 @ 20°C

Partitioning:  $K_d = K_{abs} = K_{ps}$  30 Soil Type 1.0 %OC

$K_{ow}$  8000 ( $8 \times 10^3$ )

$K_{oc}$  3162

Hydrolysis (half-life hrs.)

(909d) (74d, Phos. buf.)  
 (pH 4) 21,816 hr (pH 7) 1,776 hr (pH 9) 384 (16 d) hr  
 $K$   $3.18 \times 10^{-5}$   $K_{ah}$  0  $K$   $3.9 \times 10^{-4}$   $K_{nh}$   $3.9 \times 10^{-4}$   $K$   $1.8 \times 10^{-3}$   $K_{ph}$  220

Photolysis (half-life hrs.) None

Water          hr  $K_{dp}$           Soil          hr  $K$          

Vapor Pressure: 0.21u @ 25°C Evaporation:         

Degradation (half-life hrs.)

Soil (Aerobic) ( $t_{1/2} > 3 - 16$  weeks) 2,688 hr  $K$   $2.6 \times 10^{-4}$   
 Soil (Field) ( $t_{1/2} = 28 - 40$  days) 960 hr  $K$   $7.2 \times 10^{-4}$

Water (Type         )          hr  $K$          

Bacteriological

Soil (Type Field) 674 hr  $K$  BACW<sub>1</sub>  
 Water (Type         )          hr  $K$  " w<sub>2</sub>" }  $1.03 \times 10^{-8}$

SWRRB - TEST FONOFUS ON COSH115  
PESTICIDE PARAMETERS

PESTICIDE TITLE = FONOFUS

KD = 30.0  
WASH OFF FRACTION = 1.00  
HALF LIFE = 1.0 D  
DECAY CONSTANT = 0.02400  
APPL EFF = 0.60

INITIAL PESTICIDE ON FOLIAGE (LB/AC)

0.0

INITIAL PESTICIDE ON GROUND (LB/AC)

0.0

ENRICHMENT RATIOS FOR PESTICIDE

1.50

PESTICIDE APPLICATIONS  
YEAR DAY LB/AC

|      |     |       |
|------|-----|-------|
| 1968 | 122 | 0.660 |
| 1969 | 121 | 0.660 |
| 1970 | 121 | 0.660 |

Table 1  
 Basin: COSH 115  
 Chemical: Fonofos  
 Application Rate = 0.66 lb a.i./A.

Daily Runoff value in lb a.i /A.

| Year | Julian Day | Daily Runoff | Total Annual Runoff |
|------|------------|--------------|---------------------|
| 68   | 132        | 0.001        | 0.003               |
|      | 148        | 0.001        |                     |
| 69   | 128        | 0.001        | 0.012               |
|      | 174        | 0.001        |                     |
|      | 186        | 0.008        |                     |
|      | 188        | 0.002        |                     |
|      | 208        | 0.001        |                     |
| 70   | 133        | 0.001        | 0.002               |

Three years total annual average runoff = 0.005 lb a.i./A.

\*Based on 50% of 1.3 lb a.i./A; the maximum application rate calculated for soil incorporated granular fonofos (Dyfonate 20 G) typically applied at planting time of corn is 6 oz of 20G./1,000 linear feet of row with 7 inch band treatment over the rows which are spaced 30' apart minimum specified in the label directions for corn.





Table 2

Exposure Analysis Modeling System (EXAMS50) for Three Different  
Runoff Loads To a Small Pond\* Adjacent to Corn Field

| Parameters                                | Typical<br>$4.6 \times 10^{-5}$ kg/hectar/hr | Moderate<br>$9.2 \times 10^{-5}$ kg/hectar/hr | Worst<br>$3.8 \times 10^{-4}$ kg/hectar/hr |
|---|--|---|--|
| Maximum conc in water                     | $7.1 \times 10^{-4}$ mg/l                    | $1.4 \times 10^{-3}$ mg/l                     | $5.9 \times 10^{-3}$ mg/l                  |
| Maximum conc in sediment deposit (dry wt) | 0.23 mg/kg                                   | 0.34 mg/kg                                    | 1.9 mg/kg                                  |
| Total Steady State Accumulation           | 0.17 kg                                      | .34 kg  | 1.4 kg                                     |
| Recovery                                  | 216 days                                     | 216 days                                      | 216 days                                   |
| Self purification                         | 25 months                                    | 25 months                                     | 25 months                                  |

\*Small pond whose drainage area is 15 hectares

EXAM50. Mode-1

AERL-ESB MODEL OF FATE OF ORGANIC TOXICANTS IN AQUATIC ECOSYSTEMS  
CHEMICAL: FONOFOS PRD 7/6/83. Load  $4.6 \times 10^{-5}$  kg/hr.  
ECOSYSTEM: POND, AERL DEVELOPMENT PHASE TEST DEFINITION

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TABLE 17. EXPOSURE ANALYSIS SUMMARY.

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EXPOSURE:

- A. MAXIMUM CONC. IN WATER COLUMN:  $7.1 \times 10^{-4}$  MG/L DISSOLVED,  $7.2 \times 10^{-4}$  TOT  
MAX. CONC. IN BOTTOM SEDIMENT:  $7.0 \times 10^{-4}$  MG/L DISSOLVED IN PORE WATER
- B. BIOSORPTION - MAX. CONCENTRATION - PLANKTON: .0 UG/G  
BENTHOS: .0 UG/G
- C. MAXIMUM TOT. CONC. IN SEDIMENT DEPOSITS: .23 MG/KG (DRY WEIGHT)

FATE:

- A. TOTAL STEADY-STATE ACCUMULATION: .17 KG; 8.45% IN WATER COL.,  
91.55% IN BOTTOM SEDIMENTS.
- B. TOTAL LOAD:  $1.1 \times 10^{-3}$  KG/DAY - DISPOSITION: 19.05% VIA CHEMICAL  
TRANSFORMATIONS, 32.23% BIOTRANSFORMED, 7.06% VOLATILIZED,  
41.67% EXPORTED VIA OTHER PATHWAYS.

PERSISTENCE:

- A. AT THE END OF A 216. DAY RECOVERY PERIOD, THE WATER COLUMN HAD  
LOST 73.99% OF ITS INITIAL TOXICANT BURDEN; THE SEDIMENTS HAD  
LOST 61.14% OF THEIR INITIAL BURDEN ( 62.22% REMOVAL OVERALL).
- B. SYSTEM SELF-PURIFICATION TIME IS ROUGHLY 25. MONTHS.

AERL-ESB MODEL OF FATE OF ORGANIC TOXICANTS IN AQUATIC ECOSYSTEMS  
CHEMICAL: FONOFOS PRD 2/23/83. Load  $9.2e-5$   
ECOSYSTEM: POND, AERL DEVELOPMENT PHASE TEST DEFINITION

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TABLE 17. EXPOSURE ANALYSIS SUMMARY.  
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EXPOSURE:

- A. MAXIMUM CONC. IN WATER COLUMN:  $1.4E-03$  MG/L DISSOLVED,  $1.4E-03$  TOT  
MAX. CONC. IN BOTTOM SEDIMENT:  $1.4E-03$  MG/L DISSOLVED IN PORE WATER  
B. BIOSORPTION - MAX. CONCENTRATION - PLANKTON: .0 UG/G  
BENTHOS: .0 UG/G  
C. MAXIMUM TOT. CONC. IN SEDIMENT DEPOSITS: .46 MG/KG (DRY WEIGHT)

FATE:

- A. TOTAL STEADY-STATE ACCUMULATION: .34 KG; 8.45% IN WATER COL.,  
91.55% IN BOTTOM SEDIMENTS.  
B. TOTAL LOAD:  $2.2E-03$  KG/DAY - DISPOSITION: 19.05% VIA CHEMICAL  
TRANSFORMATIONS, 32.23% BIOTRANSFORMED, 7.06% VOLATILIZED,  
41.67% EXPORTED VIA OTHER PATHWAYS.

PERSISTENCE:

- A. AT THE END OF A 216. DAY RECOVERY PERIOD, THE WATER COLUMN HAD  
LOST 73.99% OF ITS INITIAL TOXICANT BURDEN; THE SEDIMENTS HAD  
LOST 61.14% OF THEIR INITIAL BURDEN ( 62.22% REMOVAL OVERALL).  
B. SYSTEM SELF-PURIFICATION TIME IS ROUGHLY 25. MONTHS.

Exams50.Mode-1

AERL-ESB MODEL OF FATE OF ORGANIC TOXICANTS IN AQUATIC ECOSYSTEMS  
CHEMICAL: FONOFOS PRD 7/6/83. Load  $3.8e-4$  kg/hr  
ECOSYSTEM: POND, AERL DEVELOPMENT PHASE TEST DEFINITION

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TABLE 17. EXPOSURE ANALYSIS SUMMARY.  
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EXPOSURE:

- A. MAXIMUM CONC. IN WATER COLUMN:  $5.9E-03$  MG/L DISSOLVED,  $5.9E-03$  TOT  
MAX. CONC. IN BOTTOM SEDIMENT:  $5.8E-03$  MG/L DISSOLVED IN PORE WATER
- B. BIOSORPTION - MAX. CONCENTRATION - PLANKTON: .0 UG/G  
BENTHOS: .0 UG/G
- C. MAXIMUM TOT. CONC. IN SEDIMENT DEPOSITS: 1.9 MG/KG (DRY WEIGHT)

FATE:

- A. TOTAL STEADY-STATE ACCUMULATION: 1.4 KG; 8.45% IN WATER COL.,  
91.55% IN BOTTOM SEDIMENTS.
- B. TOTAL LOAD:  $9.1E-03$  KG/DAY - DISPOSITION: 19.05% VIA CHEMICAL  
TRANSFORMATIONS, 32.23% BIOTRANSFORMED, 7.06% VOLATILIZED,  
41.67% EXPORTED VIA OTHER PATHWAYS.

PERSISTENCE:

- A. AT THE END OF A 216. DAY RECOVERY PERIOD, THE WATER COLUMN HAD  
LOST 73.99% OF ITS INITIAL TOXICANT BURDEN; THE SEDIMENTS HAD  
LOST 61.14% OF THEIR INITIAL BURDEN ( 62.22% REMOVAL OVERALL).
- B. SYSTEM SELF-PURIFICATION TIME IS ROUGHLY 25. MONTHS.

Table 3

Exposure Analysis Modeling System (EXAMS 50) for Three  
Different Runoff Loads To a Small Flowing River Adjacent  
To Corn Field

| Parameters                                | Typical<br>$4.6 \times 10^{-5}$ kg/hectar/hr | Moderate<br>$9.2 \times 10^{-5}$ kg/hectar/hr | Worst<br>$3.8 \times 10^{-4}$ kg/hectar/hr |
|---|--|---|--|
| Maximum conc in water                     | $4.6 \times 10^{-8}$ mg/l                    | $9.1 \times 10^{-8}$ mg/l                     | $3.8 \times 10^{-7}$ mg/l                  |
| Maximum conc in sediment deposit (dry wt) | $1.4 \times 10^{-5}$ mg/kg                   | $2.8 \times 10^{-5}$ mg/kg                    | $1.1 \times 10^{-4}$ mg/kg                 |
| Total Steady State Accumulation           | $2.3 \times 10^{-4}$ kg                      | $4.5 \times 10^{-4}$ kg                       | $1.9 \times 10^{-3}$ kg                    |
| Recovery                                  | 12 hours                                     | 12 hours                                      | 12 hours                                   |
| Self-purification                         | 67 days                                      | 67 days                                       | 67 days                                    |

Exams50.Mode-1

AERL-ESB MODEL OF FATE OF ORGANIC TOXICANTS IN AQUATIC ECOSYSTEMS  
CHEMICAL: FONOFOS PRD 7/6/83. Load  $4.6e-5$  kg/hr.  
ECOSYSTEM: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION

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TABLE 17. EXPOSURE ANALYSIS SUMMARY.

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EXPOSURE:

- A. MAXIMUM CONC. IN WATER COLUMN:  $4.6E-08$  MG/L DISSOLVED,  $4.6E-08$  TOT  
MAX. CONC. IN BOTTOM SEDIMENT:  $4.5E-08$  MG/L DISSOLVED IN PORE WATER
- B. BIOSORPTION - MAX. CONCENTRATION - PLANKTON: .0 UG/G  
BENTHOS: .0 UG/G
- C. MAXIMUM TOT. CONC. IN SEDIMENT DEPOSITS:  $1.4E-05$  MG/KG (DRY WEIGHT)

FATE:

- A. TOTAL STEADY-STATE ACCUMULATION:  $2.3E-04$  KG; 18.19% IN WATER COL.,  
81.81% IN BOTTOM SEDIMENTS.
- B. TOTAL LOAD:  $4.6E-05$  KG/HOUR - DISPOSITION: 0.04% VIA CHEMICAL  
TRANSFORMATIONS, 0.46% BIOTRANSFORMED, 0.04% VOLATILIZED,  
99.47% EXPORTED VIA OTHER PATHWAYS.

PERSISTENCE:

- A. AT THE END OF A 12.0 HOUR RECOVERY PERIOD, THE WATER COLUMN HAD  
LOST 100.00% OF ITS INITIAL TOXICANT BURDEN; THE SEDIMENTS HAD  
LOST 2.11% OF THEIR INITIAL BURDEN ( 19.92% REMOVAL OVERALL).
- B. SYSTEM SELF-PURIFICATION TIME IS ROUGHLY 67. DAYS.

AERL-ESB MODEL OF FATE OF ORGANIC TOXICANTS IN AQUATIC ECOSYSTEMS  
CHEMICAL: FONOFOS PRD 2/23/83. Load  $9.2e-5$   
ECOSYSTEM: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION

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TABLE 17. EXPOSURE ANALYSIS SUMMARY.  
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EXPOSURE:

- A. MAXIMUM CONC. IN WATER COLUMN:  $9.1E-08$  MG/L DISSOLVED,  $9.2E-08$  TOT  
MAX. CONC. IN BOTTOM SEDIMENT:  $9.0E-08$  MG/L DISSOLVED IN PORE WATER
- B. BIOSORPTION - MAX. CONCENTRATION - PLANKTON: .0 UG/G  
BENTHOS: .0 UG/G
- C. MAXIMUM TOT. CONC. IN SEDIMENT DEPOSITS:  $2.8E-05$  MG/KG (DRY WEIGHT)

FATE:

- A. TOTAL STEADY-STATE ACCUMULATION:  $4.5E-04$  KG; 18.19% IN WATER COL.,  
81.81% IN BOTTOM SEDIMENTS.
- B. TOTAL LOAD:  $9.2E-05$  KG/HOUR - DISPOSITION: 0.04% VIA CHEMICAL  
TRANSFORMATIONS, 0.46% BIOTRANSFORMED, 0.04% VOLATILIZED,  
99.47% EXPORTED VIA OTHER PATHWAYS.

PERSISTENCE:

- A. AT THE END OF A 12.0 HOUR RECOVERY PERIOD, THE WATER COLUMN HAD  
LOST 95.70% OF ITS INITIAL TOXICANT BURDEN; THE SEDIMENTS HAD  
LOST 2.11% OF THEIR INITIAL BURDEN ( 19.14% REMOVAL OVERALL).
- B. SYSTEM SELF-PURIFICATION TIME IS ROUGHLY 67. DAYS.



AERL-ESB MODEL OF FATE OF ORGANIC TOXICANTS IN AQUATIC ECOSYSTEMS  
CHEMICAL: FONOFOS PRD 7/6/83. Load  $3.8e-4$  kg/hr.  
ECOSYSTEM: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION

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TABLE 17. EXPOSURE ANALYSIS SUMMARY.  
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EXPOSURE:

- A. MAXIMUM CONC. IN WATER COLUMN:  $3.8E-07$  MG/L DISSOLVED,  $3.8E-07$  TOT  
MAX. CONC. IN BOTTOM SEDIMENT:  $3.7E-07$  MG/L DISSOLVED IN PORE WATER
- B. BIOSORPTION - MAX. CONCENTRATION - PLANKTON: .0 UG/G  
BENTHOS: .0 UG/G
- C. MAXIMUM TOT. CONC. IN SEDIMENT DEPOSITS:  $1.1E-04$  MG/KG (DRY WEIGHT)

FATE:

- A. TOTAL STEADY-STATE ACCUMULATION:  $1.9E-03$  KG; 18.19% IN WATER COL.,  
81.81% IN BOTTOM SEDIMENTS.
- B. TOTAL LOAD:  $3.8E-04$  KG/HOUR - DISPOSITION: 0.04% VIA CHEMICAL  
TRANSFORMATIONS, 0.46% BIOTRANSFORMED, 0.04% VOLATILIZED,  
99.47% EXPORTED VIA OTHER PATHWAYS.

PERSISTENCE:

- A. AT THE END OF A 12.0 HOUR RECOVERY PERIOD, THE WATER COLUMN HAD  
LOST 99.60% OF ITS INITIAL TOXICANT BURDEN; THE SEDIMENTS HAD  
LOST 2.11% OF THEIR INITIAL BURDEN ( 19.84% REMOVAL OVERALL).
- B. SYSTEM SELF-PURIFICATION TIME IS ROUGHLY 67. DAYS.

EXAMS -- Exposure Analysis Modeling System -- V2.0: Mode 2  
 Ecosystem: POND, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOFOS A.R = 0.66 lbs a.i./A. Year 1969.  
 Basin: COSH 115.

TABLE 16. Simulation results -- time-trace of chemical concentrations.

| Time<br>Days | Average Chemical Concentrations |            |                  |            | Mass of Chemical |           |
|--------------|---------------------------------|------------|------------------|------------|------------------|-----------|
|              | Water Column                    |            | Bottom Sediments |            | Water Col        | Sediments |
|              | Free(mg/L)                      | Sed(mg/kg) | Pore(mg/L)       | Sed(mg/kg) | Total kg         | Total kg  |
|              | Initial Mass Input 0.000001 kg. |            |                  |            |                  |           |
| 123.         | 4.951E-08                       | 1.624E-05  | 0.000            | 0.000      | 1.0000E-06       | 0.000     |
| 124.         | 2.989E-08                       | 9.804E-06  | 5.136E-10        | 1.685E-07  | 6.0372E-07       | 1.139E-07 |
| 125.         | 1.796E-08                       | 5.892E-06  | 8.210E-10        | 2.693E-07  | 3.6280E-07       | 1.820E-07 |
| 126.         | 1.086E-08                       | 3.562E-06  | 9.991E-10        | 3.277E-07  | 2.1936E-07       | 2.215E-07 |
| 127.         | 4.376E-09                       | 1.435E-06  | 1.161E-09        | 3.807E-07  | 8.8384E-08       | 2.574E-07 |
|              | Runoff Mass Input 0.0011 kg.    |            |                  |            |                  |           |
| 128.         | 5.447E-05                       | 1.787E-02  | 1.200E-09        | 3.935E-07  | 1.1000E-03       | 2.660E-07 |
| 129.         | 3.285E-05                       | 1.078E-02  | 5.670E-07        | 1.860E-04  | 6.6348E-04       | 1.257E-04 |
| 130.         | 1.987E-05                       | 6.517E-03  | 9.014E-07        | 2.957E-04  | 4.0131E-04       | 1.998E-04 |
| 131.         | 1.208E-05                       | 3.961E-03  | 1.097E-06        | 3.597E-04  | 2.4393E-04       | 2.432E-04 |
| 132.         | 7.403E-06                       | 2.428E-03  | 1.209E-06        | 3.964E-04  | 1.4953E-04       | 2.680E-04 |
| 133.         | 4.502E-06                       | 1.477E-03  | 1.273E-06        | 4.176E-04  | 9.0932E-05       | 2.823E-04 |
| 134.         | 2.661E-06                       | 8.727E-04  | 1.309E-06        | 4.294E-04  | 5.3739E-05       | 2.903E-04 |
| 135.         | 1.731E-06                       | 5.678E-04  | 1.321E-06        | 4.333E-04  | 3.4963E-05       | 2.929E-04 |
| 136.         | 1.070E-06                       | 3.509E-04  | 1.326E-06        | 4.349E-04  | 2.1605E-05       | 2.940E-04 |
| 137.         | 7.286E-07                       | 2.390E-04  | 1.322E-06        | 4.337E-04  | 1.4716E-05       | 2.931E-04 |
| 138.         | 5.795E-07                       | 1.901E-04  | 1.313E-06        | 4.308E-04  | 1.1704E-05       | 2.912E-04 |
| 139.         | 4.669E-07                       | 1.532E-04  | 1.304E-06        | 4.277E-04  | 9.4307E-06       | 2.891E-04 |
| 140.         | 4.284E-07                       | 1.405E-04  | 1.292E-06        | 4.239E-04  | 8.6521E-06       | 2.865E-04 |
| 141.         | 4.193E-07                       | 1.375E-04  | 1.280E-06        | 4.199E-04  | 8.4677E-06       | 2.838E-04 |
| 142.         | 6.945E-07                       | 2.278E-04  | 1.261E-06        | 4.135E-04  | 1.4027E-05       | 2.795E-04 |
| 143.         | 6.665E-07                       | 2.186E-04  | 1.249E-06        | 4.097E-04  | 1.3461E-05       | 2.770E-04 |
| 144.         | 6.143E-07                       | 2.015E-04  | 1.239E-06        | 4.063E-04  | 1.2407E-05       | 2.746E-04 |
| 145.         | 5.364E-07                       | 1.759E-04  | 1.229E-06        | 4.030E-04  | 1.0833E-05       | 2.724E-04 |

EXAMS -- Exposure Analysis Modeling System -- V2.0: Mode 2  
 Ecosystem: POND, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOFOS A.R = 0.66 lbs a.i./A. Year 1969.  
 Basin: COSH 115.

TABLE 16. Simulation results -- time-trace of chemical concentrations.

| Time<br>Days | Average Chemical Concentrations |            |                  |            | Mass of Chemical |           |
|--------------|---------------------------------|------------|------------------|------------|------------------|-----------|
|              | Water Column                    |            | Bottom Sediments |            | Water Col        | Sediments |
|              | Free(mg/L)                      | Sed(mg/kg) | Pore(mg/L)       | Sed(mg/kg) | Total kg         | Total kg  |
| 146.         | 6.180E-07                       | 2.027E-04  | 1.215E-06        | 3.985E-04  | 1.2481E-05       | 2.693E-04 |
| 147.         | 5.180E-07                       | 1.699E-04  | 1.206E-06        | 3.955E-04  | 1.0462E-05       | 2.673E-04 |
| 148.         | 4.374E-07                       | 1.435E-04  | 1.196E-06        | 3.924E-04  | 8.8349E-06       | 2.653E-04 |
| 149.         | -2.680E-08                      | -8.791E-06 | 1.197E-06        | 3.927E-04  | -5.4130E-07      | 2.655E-04 |
| 150.         | -1.019E-08                      | -3.343E-06 | 1.186E-06        | 3.889E-04  | -2.0582E-07      | 2.629E-04 |
| 151.         | 5.613E-08                       | 1.841E-05  | 1.173E-06        | 3.846E-04  | 1.1337E-06       | 2.600E-04 |
| 152.         | -2.352E-07                      | -7.715E-05 | 1.169E-06        | 3.835E-04  | -4.7508E-06      | 2.592E-04 |
| 153.         | -9.386E-08                      | -3.079E-05 | 1.154E-06        | 3.786E-04  | -1.8957E-06      | 2.559E-04 |
| 154.         | 5.336E-08                       | 1.750E-05  | 1.140E-06        | 3.738E-04  | 1.0778E-06       | 2.526E-04 |
| 155.         | 5.789E-07                       | 1.899E-04  | 1.115E-06        | 3.656E-04  | 1.1693E-05       | 2.471E-04 |
| 156.         | 6.368E-07                       | 2.089E-04  | 1.102E-06        | 3.616E-04  | 1.2860E-05       | 2.444E-04 |
| 157.         | 6.338E-07                       | 2.079E-04  | 1.092E-06        | 3.581E-04  | 1.2801E-05       | 2.421E-04 |
| 158.         | 5.601E-07                       | 1.837E-04  | 1.083E-06        | 3.553E-04  | 1.1313E-05       | 2.402E-04 |
| 159.         | 1.092E-06                       | 3.582E-04  | 1.059E-06        | 3.472E-04  | 2.2057E-05       | 2.347E-04 |
| 160.         | 9.125E-07                       | 2.993E-04  | 1.053E-06        | 3.454E-04  | 1.8429E-05       | 2.335E-04 |
| 161.         | 7.197E-07                       | 2.361E-04  | 1.048E-06        | 3.437E-04  | 1.4536E-05       | 2.324E-04 |
| 162.         | 3.367E-07                       | 1.104E-04  | 1.048E-06        | 3.438E-04  | 6.7998E-06       | 2.324E-04 |
| 163.         | 2.093E-07                       | 6.865E-05  | 1.042E-06        | 3.416E-04  | 4.2269E-06       | 2.309E-04 |
| 164.         | 1.567E-07                       | 5.140E-05  | 1.033E-06        | 3.388E-04  | 3.1652E-06       | 2.290E-04 |
| 165.         | -6.008E-07                      | -1.970E-04 | 1.043E-06        | 3.423E-04  | -1.2133E-05      | 2.314E-04 |
| 166.         | -4.722E-07                      | -1.549E-04 | 1.030E-06        | 3.379E-04  | -9.5378E-06      | 2.284E-04 |
| 167.         | -2.897E-07                      | -9.504E-05 | 1.016E-06        | 3.332E-04  | -5.8519E-06      | 2.252E-04 |
| 168.         | -4.171E-07                      | -1.368E-04 | 1.010E-06        | 3.312E-04  | -8.4233E-06      | 2.238E-04 |
| 169.         | -2.108E-07                      | -6.913E-05 | 9.946E-07        | 3.262E-04  | -4.2566E-06      | 2.205E-04 |
| 170.         | -2.485E-08                      | -8.152E-06 | 9.802E-07        | 3.215E-04  | -5.0194E-07      | 2.173E-04 |
| 171.         | 1.079E-07                       | 3.539E-05  | 9.674E-07        | 3.173E-04  | 2.1794E-06       | 2.145E-04 |
| 172.         | 5.705E-07                       | 1.871E-04  | 9.458E-07        | 3.102E-04  | 1.1523E-05       | 2.097E-04 |
| 173.         | 5.706E-07                       | 1.872E-04  | 9.366E-07        | 3.072E-04  | 1.1524E-05       | 2.077E-04 |
| Runoff       | Mass Input                      | 0.0011 kg. |                  |            |                  |           |
| 174.         | 5.498E-05                       | 1.803E-02  | 9.292E-07        | 3.048E-04  | 1.1103E-03       | 2.060E-04 |
| 175.         | 3.327E-05                       | 1.091E-02  | 1.489E-06        | 4.883E-04  | 6.7185E-04       | 3.300E-04 |

EXAMS -- Exposure Analysis Modeling System -- V2.0: Mode 2  
 Ecosystem: POND, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOFOS A.R = 0.66 lbs a.i./A. Year 1969.  
 Basin: COSH 115.

TABLE 16. Simulation results -- time-trace of chemical concentrations.

| Time<br>Days | Average Chemical Concentrations |            |                  |            | Mass of Chemical |           |
|--------------|---------------------------------|------------|------------------|------------|------------------|-----------|
|              | Water Column                    |            | Bottom Sediments |            | Water Col        | Sediments |
|              | Free(mg/L)                      | Sed(mg/kg) | Pore(mg/L)       | Sed(mg/kg) | Total kg         | Total kg  |
| 176.         | 2.023E-05                       | 6.634E-03  | 1.816E-06        | 5.956E-04  | 4.0850E-04       | 4.026E-04 |
| 177.         | 1.240E-05                       | 4.066E-03  | 2.003E-06        | 6.571E-04  | 2.5039E-04       | 4.442E-04 |
| 178.         | 7.701E-06                       | 2.526E-03  | 2.107E-06        | 6.911E-04  | 1.5553E-04       | 4.672E-04 |
| 179.         | 4.782E-06                       | 1.569E-03  | 2.163E-06        | 7.096E-04  | 9.6585E-05       | 4.796E-04 |
| 180.         | 2.926E-06                       | 9.599E-04  | 2.191E-06        | 7.188E-04  | 5.9104E-05       | 4.859E-04 |
| 181.         | 1.991E-06                       | 6.530E-04  | 2.195E-06        | 7.200E-04  | 4.0207E-05       | 4.867E-04 |
| 182.         | 1.323E-06                       | 4.340E-04  | 2.192E-06        | 7.188E-04  | 2.6727E-05       | 4.859E-04 |
| 183.         | 9.800E-07                       | 3.214E-04  | 2.180E-06        | 7.149E-04  | 1.9792E-05       | 4.832E-04 |
| 184.         | 8.290E-07                       | 2.719E-04  | 2.163E-06        | 7.094E-04  | 1.6744E-05       | 4.795E-04 |
| 185.         | 7.145E-07                       | 2.344E-04  | 2.145E-06        | 7.036E-04  | 1.4432E-05       | 4.756E-04 |
| Runoff       | Mass Input                      | 0.009 kg.  |                  |            |                  |           |
| 186.         | 4.463E-04                       | 0.146      | 2.126E-06        | 6.972E-04  | 9.0136E-03       | 4.713E-04 |
| Runoff       | Mass Input                      | 0.0022 kg. |                  |            |                  |           |
| 187.         | 3.784E-04                       | 0.124      | 6.735E-06        | 2.209E-03  | 7.6419E-03       | 1.493E-03 |
| 188.         | 2.290E-04                       | 7.512E-02  | 1.058E-05        | 3.470E-03  | 4.6253E-03       | 2.346E-03 |
| 189.         | 1.393E-04                       | 4.570E-02  | 1.283E-05        | 4.207E-03  | 2.8139E-03       | 2.844E-03 |
| 190.         | 8.550E-05                       | 2.805E-02  | 1.411E-05        | 4.629E-03  | 1.7269E-03       | 3.129E-03 |
| 191.         | 5.326E-05                       | 1.747E-02  | 1.482E-05        | 4.862E-03  | 1.0756E-03       | 3.286E-03 |
| 192.         | 3.399E-05                       | 1.115E-02  | 1.518E-05        | 4.981E-03  | 6.8643E-04       | 3.367E-03 |
| 193.         | 2.227E-05                       | 7.305E-03  | 1.535E-05        | 5.033E-03  | 4.4984E-04       | 3.402E-03 |
| 194.         | 1.531E-05                       | 5.023E-03  | 1.538E-05        | 5.045E-03  | 3.0931E-04       | 3.410E-03 |

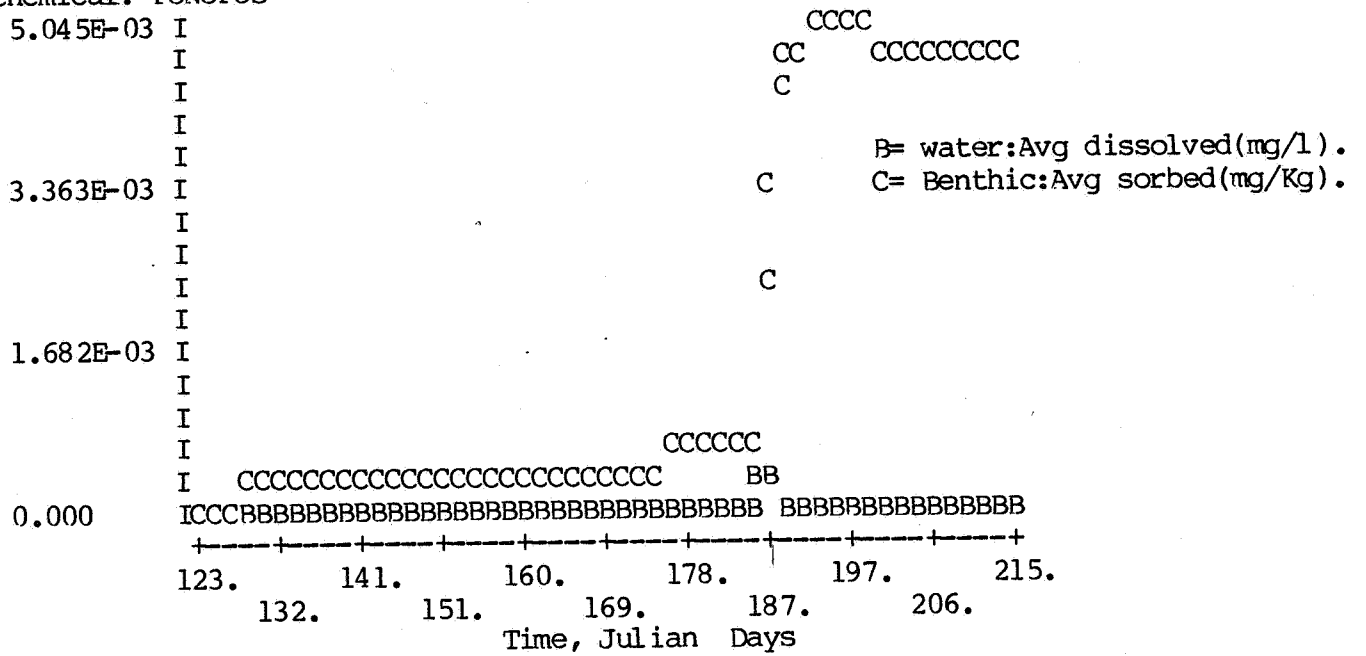
EXAMS -- Exposure Analysis Modeling System -- V2.0: Mode 2  
 Ecosystem: POND, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOFOS A.R = 0.66 lbs a.i./A. Year 1969.  
 Basin: COSH 115.

TABLE 16. Simulation results -- time-trace of chemical concentrations.

| Time<br>Days | Average Chemical Concentrations |            |                  |            | Mass of Chemical |           |
|--------------|---------------------------------|------------|------------------|------------|------------------|-----------|
|              | Water Column                    |            | Bottom Sediments |            | Water Col        | Sediments |
|              | Free(mg/L)                      | Sed(mg/kg) | Pore(mg/L)       | Sed(mg/kg) | Total kg         | Total kg  |
| 195.         | 1.112E-05                       | 3.648E-03  | 1.534E-05        | 5.033E-03  | 2.2460E-04       | 3.402E-03 |
| 196.         | 8.558E-06                       | 2.807E-03  | 1.526E-05        | 5.007E-03  | 1.7284E-04       | 3.384E-03 |
| 197.         | 6.964E-06                       | 2.284E-03  | 1.516E-05        | 4.972E-03  | 1.4065E-04       | 3.361E-03 |
| 198.         | 5.956E-06                       | 1.953E-03  | 1.504E-05        | 4.934E-03  | 1.2028E-04       | 3.335E-03 |
| 199.         | 5.315E-06                       | 1.743E-03  | 1.491E-05        | 4.892E-03  | 1.0736E-04       | 3.307E-03 |
| 200.         | 4.914E-06                       | 1.612E-03  | 1.478E-05        | 4.849E-03  | 9.9246E-05       | 3.277E-03 |
| 201.         | 4.972E-06                       | 1.631E-03  | 1.464E-05        | 4.802E-03  | 1.0042E-04       | 3.246E-03 |
| 202.         | 4.782E-06                       | 1.569E-03  | 1.450E-05        | 4.757E-03  | 9.6588E-05       | 3.216E-03 |
| 203.         | 4.585E-06                       | 1.504E-03  | 1.437E-05        | 4.714E-03  | 9.2594E-05       | 3.186E-03 |
| 204.         | 4.252E-06                       | 1.395E-03  | 1.424E-05        | 4.671E-03  | 8.5877E-05       | 3.158E-03 |
| 205.         | 4.093E-06                       | 1.342E-03  | 1.411E-05        | 4.628E-03  | 8.2661E-05       | 3.128E-03 |
| 206.         | 3.360E-06                       | 1.102E-03  | 1.399E-05        | 4.590E-03  | 6.7851E-05       | 3.103E-03 |
| Runoff       | Mass Input                      | 0.0011 kg. |                  |            |                  |           |
| 207.         | 5.795E-05                       | 1.901E-02  | 1.386E-05        | 4.545E-03  | 1.1705E-03       | 3.072E-03 |
| 208.         | 3.655E-05                       | 1.199E-02  | 1.429E-05        | 4.686E-03  | 7.3817E-04       | 3.167E-03 |
| 209.         | 2.367E-05                       | 7.765E-03  | 1.449E-05        | 4.751E-03  | 4.7811E-04       | 3.212E-03 |
| 210.         | 1.592E-05                       | 5.223E-03  | 1.455E-05        | 4.773E-03  | 3.2163E-04       | 3.226E-03 |
| 211.         | 1.127E-05                       | 3.695E-03  | 1.453E-05        | 4.767E-03  | 2.2754E-04       | 3.222E-03 |
| 212.         | 8.462E-06                       | 2.776E-03  | 1.447E-05        | 4.745E-03  | 1.7091E-04       | 3.208E-03 |
| 213.         | 6.840E-06                       | 2.244E-03  | 1.437E-05        | 4.714E-03  | 1.3815E-04       | 3.186E-03 |
| 214.         | 5.802E-06                       | 1.903E-03  | 1.426E-05        | 4.678E-03  | 1.1717E-04       | 3.162E-03 |
| 215.         | 5.290E-06                       | 1.735E-03  | 1.414E-05        | 4.637E-03  | 1.0683E-04       | 3.135E-03 |

MASS: DAY 123 0.000001 kg.  
 MASS: DAY 128 0.0011 kg.  
 MASS: DAY 174 0.0011 kg.  
 MASS: DAY 186 0.009 kg.  
 MASS: DAY 188 0.0011 kg.  
 MASS: DAY 208 0.0011 kg.

System: POND, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOFOS



EXAMS -- EXposure Analysis Modeling System -- V2.0: Mode 2  
 Ecosystem: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOPOS.A.R= 0.66 lb a.i./A. Year 1969.  
 Basin: COSH 115.

TABLE 16. Simulation results -- time-trace of chemical concentrations.

| Time<br>Days                    | Average Chemical Concentrations |            |                  |            | Mass of Chemical |            |
|---------------------------------|---------------------------------|------------|------------------|------------|------------------|------------|
|                                 | Water Column                    |            | Bottom Sediments |            | Water Col        | Sediments  |
|                                 | Free(mg/L)                      | Sed(mg/kg) | Pore(mg/L)       | Sed(mg/kg) | Total kg         | Total kg   |
| Initial Mass input. 0.000001 kg |                                 |            |                  |            |                  |            |
| 123.                            | 1.104E-09                       | 3.621E-08  | 0.000            | 0.000      | 1.0000E-06       | 0.000      |
| 124.                            | -1.518E-05                      | -4.924E-04 | 7.041E-09        | 2.281E-06  | -1.3750E-02      | 4.625E-05  |
| 125.                            | -2.226E-06                      | -7.283E-05 | 1.052E-09        | 3.387E-07  | -2.0166E-03      | 6.868E-06  |
| 126.                            | 2.595E-06                       | 8.515E-05  | -1.230E-09       | -3.956E-07 | 2.3513E-03       | -8.022E-06 |
| 127.                            | 1.149E-05                       | 3.778E-04  | -5.473E-09       | -1.757E-06 | 1.0413E-02       | -3.563E-05 |
| Runoff mass Input. 0.0011 kg.   |                                 |            |                  |            |                  |            |
| 128.                            | 4.944E-06                       | 1.623E-04  | -1.772E-09       | -5.692E-07 | 4.4784E-03       | -1.154E-05 |
| 129.                            | 1.248E-05                       | 4.053E-04  | -4.173E-09       | -1.491E-06 | 1.1308E-02       | -3.023E-05 |
| 130.                            | 1.021E-06                       | 3.326E-05  | 1.071E-09        | 2.148E-07  | 9.2473E-04       | 4.359E-06  |
| 131.                            | -2.786E-06                      | -9.127E-05 | 2.789E-09        | 7.758E-07  | -2.5240E-03      | 1.574E-05  |
| 132.                            | 9.535E-06                       | 3.124E-04  | -3.116E-09       | -1.117E-06 | 8.6375E-03       | -2.265E-05 |
| 133.                            | -2.672E-06                      | -8.757E-05 | 2.594E-09        | 7.264E-07  | -2.4205E-03      | 1.473E-05  |
| 134.                            | -2.160E-06                      | -7.078E-05 | 2.286E-09        | 6.335E-07  | -1.9563E-03      | 1.285E-05  |
| 135.                            | -3.543E-06                      | -1.161E-04 | 2.880E-09        | 8.302E-07  | -3.2096E-03      | 1.684E-05  |
| 136.                            | 2.210E-06                       | 7.245E-05  | 9.475E-11        | -5.983E-08 | 2.0017E-03       | -1.211E-06 |
| 137.                            | -1.364E-06                      | -4.473E-05 | 1.734E-09        | 4.722E-07  | -1.2357E-03      | 9.577E-06  |
| 138.                            | 1.555E-05                       | 5.101E-04  | -6.342E-09       | -2.119E-06 | 1.4091E-02       | -4.298E-05 |
| 139.                            | 1.406E-05                       | 4.612E-04  | -5.685E-09       | -1.904E-06 | 1.2741E-02       | -3.860E-05 |
| 140.                            | -5.521E-06                      | -1.811E-04 | 3.556E-09        | 1.072E-06  | -5.0014E-03      | 2.173E-05  |
| 141.                            | -1.605E-06                      | -5.265E-05 | 1.655E-09        | 4.642E-07  | -1.4544E-03      | 9.415E-06  |
| 142.                            | -1.411E-06                      | -4.626E-05 | 1.520E-09        | 4.246E-07  | -1.2778E-03      | 8.613E-06  |
| 143.                            | 1.935E-07                       | 6.347E-06  | 7.198E-10        | 1.707E-07  | 1.7532E-04       | 3.463E-06  |
| 144.                            | 3.545E-06                       | 1.163E-04  | -9.079E-10       | -3.493E-07 | 3.2116E-03       | -7.081E-06 |
| 145.                            | 1.289E-05                       | 4.227E-04  | -5.376E-09       | -1.782E-06 | 1.1675E-02       | -3.614E-05 |
| 146.                            | 1.262E-05                       | 4.138E-04  | -5.282E-09       | -1.749E-06 | 1.1431E-02       | -3.547E-05 |
| 147.                            | 3.626E-06                       | 1.189E-04  | -1.048E-09       | -3.858E-07 | 3.2844E-03       | -7.822E-06 |
| 148.                            | -4.601E-06                      | -1.509E-04 | 2.824E-09        | 8.614E-07  | -4.1683E-03      | 1.747E-05  |
| 149.                            | 3.572E-06                       | 1.172E-04  | -1.083E-09       | -3.919E-07 | 3.2360E-03       | -7.946E-06 |
| 150.                            | -2.496E-06                      | -8.186E-05 | 1.768E-09        | 5.267E-07  | -2.2609E-03      | 1.068E-05  |
| 151.                            | 1.007E-05                       | 3.303E-04  | -4.220E-09       | -1.396E-06 | 9.1228E-03       | -2.830E-05 |
| 152.                            | -6.353E-06                      | -2.084E-04 | 3.547E-09        | 1.103E-06  | -5.7553E-03      | 2.236E-05  |
| 153.                            | 5.347E-07                       | 1.754E-05  | 2.554E-10        | 4.652E-08  | 4.8436E-04       | 9.441E-07  |
| 154.                            | 1.196E-05                       | 3.922E-04  | -5.187E-09       | -1.701E-06 | 1.0833E-02       | -3.449E-05 |
| 155.                            | 7.603E-08                       | 2.494E-06  | 4.288E-10        | 1.057E-07  | 6.8873E-05       | 2.145E-06  |
| 156.                            | 1.106E-05                       | 3.627E-04  | -4.802E-09       | -1.574E-06 | 1.0018E-02       | -3.192E-05 |
| 157.                            | 2.199E-12                       | 8.285E-11  | 4.250E-10        | 1.076E-07  | 1.9937E-09       | 2.182E-06  |
| 158.                            | 2.066E-12                       | 7.797E-11  | 4.066E-10        | 1.031E-07  | 1.8738E-09       | 2.091E-06  |
| 159.                            | 1.966E-12                       | 7.419E-11  | 3.893E-10        | 9.882E-08  | 1.7830E-09       | 2.005E-06  |

EXAMS — EXposure Analysis Modeling System -- V2.0: Mode 2  
 Ecosystem: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOFOS.A.R= 0.66 lb a.i./A. Year 1969.  
 Basin: COSH 115.

TABLE 16. Simulation results -- time-trace of chemical concentrations.

| Time<br>Days      | Average Chemical Concentrations |            |                  |            | Mass of Chemical |            |
|-------------------|---------------------------------|------------|------------------|------------|------------------|------------|
|                   | Water Column                    |            | Bottom Sediments |            | Water Col        | Sediments  |
|                   | Free(mg/L)                      | Sed(mg/kg) | Pore(mg/L)       | Sed(mg/kg) | Total kg         | Total kg   |
| 155.              | 7.603E-08                       | 2.494E-06  | 4.288E-10        | 1.057E-07  | 6.8873E-05       | 2.145E-06  |
| 156.              | 1.106E-05                       | 3.627E-04  | -4.802E-09       | -1.574E-06 | 1.0018E-02       | -3.192E-05 |
| 157.              | 2.199E-12                       | 8.285E-11  | 4.250E-10        | 1.076E-07  | 1.9937E-09       | 2.182E-06  |
| 158.              | 2.066E-12                       | 7.797E-11  | 4.066E-10        | 1.031E-07  | 1.8738E-09       | 2.091E-06  |
| 159.              | 1.966E-12                       | 7.419E-11  | 3.893E-10        | 9.882E-08  | 1.7830E-09       | 2.005E-06  |
| 160.              | 1.872E-12                       | 7.061E-11  | 3.728E-10        | 9.475E-08  | 1.6971E-09       | 1.922E-06  |
| 161.              | 1.786E-12                       | 6.738E-11  | 3.577E-10        | 9.101E-08  | 1.6197E-09       | 1.846E-06  |
| 162.              | 1.701E-12                       | 6.417E-11  | 3.427E-10        | 8.729E-08  | 1.5427E-09       | 1.771E-06  |
| 163.              | 1.624E-12                       | 6.127E-11  | 3.289E-10        | 8.386E-08  | 1.4730E-09       | 1.701E-06  |
| 164.              | 1.548E-12                       | 5.838E-11  | 3.151E-10        | 8.044E-08  | 1.4036E-09       | 1.632E-06  |
| 165.              | 1.485E-12                       | 5.600E-11  | 3.035E-10        | 7.753E-08  | 1.3463E-09       | 1.573E-06  |
| 166.              | 1.422E-12                       | 5.362E-11  | 2.919E-10        | 7.462E-08  | 1.2892E-09       | 1.514E-06  |
| 167.              | 1.359E-12                       | 5.124E-11  | 2.802E-10        | 7.172E-08  | 1.2321E-09       | 1.455E-06  |
| 168.              | 1.296E-12                       | 4.887E-11  | 2.686E-10        | 6.882E-08  | 1.1752E-09       | 1.396E-06  |
| 169.              | 1.244E-12                       | 4.691E-11  | 2.588E-10        | 6.634E-08  | 1.1280E-09       | 1.346E-06  |
| 170.              | 1.192E-12                       | 4.495E-11  | 2.490E-10        | 6.387E-08  | 1.0809E-09       | 1.296E-06  |
| 171.              | 1.140E-12                       | 4.299E-11  | 2.391E-10        | 6.140E-08  | 1.0337E-09       | 1.245E-06  |
| 172.              | 1.089E-12                       | 4.105E-11  | 2.294E-10        | 5.895E-08  | 9.8727E-10       | 1.196E-06  |
| 173.              | 1.052E-12                       | 3.966E-11  | 2.222E-10        | 5.711E-08  | 9.5375E-10       | 1.158E-06  |
| Runoff mass Input | 0.0011 kg.                      |            |                  |            |                  |            |
| 174.              | 1.214E-06                       | 3.983E-05  | 2.149E-10        | 5.527E-08  | 1.1000E-03       | 1.121E-06  |
| 175.              | 1.204E-11                       | 4.551E-10  | 1.836E-09        | 4.404E-07  | 1.0920E-08       | 8.935E-06  |
| 176.              | 1.089E-11                       | 4.125E-10  | 1.747E-09        | 4.201E-07  | 9.8778E-09       | 8.523E-06  |
| 177.              | 1.028E-11                       | 3.893E-10  | 1.664E-09        | 4.012E-07  | 9.3233E-09       | 8.138E-06  |
| 178.              | 9.707E-12                       | 3.674E-10  | 1.585E-09        | 3.831E-07  | 8.8021E-09       | 7.771E-06  |
| 179.              | 9.173E-12                       | 3.472E-10  | 1.511E-09        | 3.661E-07  | 8.3183E-09       | 7.426E-06  |
| 180.              | 8.698E-12                       | 3.292E-10  | 1.443E-09        | 3.506E-07  | 7.8872E-09       | 7.112E-06  |
| 181.              | 8.222E-12                       | 3.111E-10  | 1.376E-09        | 3.351E-07  | 7.4561E-09       | 6.797E-06  |
| 182.              | 7.799E-12                       | 2.951E-10  | 1.315E-09        | 3.209E-07  | 7.0720E-09       | 6.510E-06  |
| 183.              | 7.387E-12                       | 2.794E-10  | 1.256E-09        | 3.071E-07  | 6.6985E-09       | 6.230E-06  |
| 184.              | 7.015E-12                       | 2.653E-10  | 1.202E-09        | 2.944E-07  | 6.3610E-09       | 5.972E-06  |
| 185.              | 6.698E-12                       | 2.533E-10  | 1.154E-09        | 2.832E-07  | 6.0742E-09       | 5.746E-06  |



EXAMS -- EXposure Analysis Modeling System -- V2.0: Mode 2  
 Ecosystem: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOFOS.A.R= 0.66 lb a.i./A. Year 1969.  
 Basin: COSH 115.

TABLE 16. Simulation results -- time-trace of chemical concentrations.

| Time<br>Days       | Average Chemical Concentrations |            |                  |            | Mass of Chemical |           |
|--------------------|---------------------------------|------------|------------------|------------|------------------|-----------|
|                    | Water Column                    |            | Bottom Sediments |            | Water Col        | Sediments |
|                    | Free(mg/L)                      | Sed(mg/kg) | Pore(mg/L)       | Sed(mg/kg) | Total kg         | Total kg  |
| Runoff Mass Input. | 0.009 kg.                       |            |                  |            |                  |           |
| 186.               | 9.935E-06                       | 3.259E-04  | 1.107E-09        | 2.721E-07  | 9.0000E-03       | 5.519E-06 |
| 187.               | 9.456E-11                       | 3.578E-09  | 1.440E-08        | 3.430E-06  | 8.5744E-08       | 6.958E-05 |
| Runoff mass Input. | 0.0022 kg.                      |            |                  |            |                  |           |
| 188.               | 2.429E-06                       | 7.966E-05  | 1.368E-08        | 3.269E-06  | 2.2001E-03       | 6.633E-05 |
| 189.               | 1.042E-10                       | 3.943E-09  | 1.626E-08        | 3.891E-06  | 9.4452E-08       | 7.894E-05 |
| 190.               | 9.735E-11                       | 3.686E-09  | 1.547E-08        | 3.711E-06  | 8.8278E-08       | 7.529E-05 |
| 191.               | 9.179E-11                       | 3.475E-09  | 1.472E-08        | 3.541E-06  | 8.3239E-08       | 7.184E-05 |
| 192.               | 8.673E-11                       | 3.283E-09  | 1.403E-08        | 3.384E-06  | 7.8651E-08       | 6.864E-05 |
| 193.               | 8.188E-11                       | 3.099E-09  | 1.336E-08        | 3.231E-06  | 7.4252E-08       | 6.555E-05 |
| 194.               | 7.748E-11                       | 2.932E-09  | 1.275E-08        | 3.090E-06  | 7.0258E-08       | 6.269E-05 |
| 195.               | 7.329E-11                       | 2.773E-09  | 1.216E-08        | 2.955E-06  | 6.6456E-08       | 5.994E-05 |
| 196.               | 6.970E-11                       | 2.637E-09  | 1.165E-08        | 2.835E-06  | 6.3208E-08       | 5.752E-05 |
| 197.               | 6.612E-11                       | 2.501E-09  | 1.113E-08        | 2.716E-06  | 5.9960E-08       | 5.509E-05 |
| 198.               | 6.254E-11                       | 2.366E-09  | 1.062E-08        | 2.596E-06  | 5.6711E-08       | 5.267E-05 |
| 199.               | 5.948E-11                       | 2.250E-09  | 1.017E-08        | 2.491E-06  | 5.3939E-08       | 5.054E-05 |
| 200.               | 5.653E-11                       | 2.138E-09  | 9.735E-09        | 2.389E-06  | 5.1266E-08       | 4.847E-05 |
| 201.               | 5.359E-11                       | 2.026E-09  | 9.300E-09        | 2.287E-06  | 4.8594E-08       | 4.640E-05 |
| 202.               | 5.102E-11                       | 1.929E-09  | 8.914E-09        | 2.196E-06  | 4.6261E-08       | 4.456E-05 |
| 203.               | 4.894E-11                       | 1.850E-09  | 8.592E-09        | 2.120E-06  | 4.4377E-08       | 4.300E-05 |
| 204.               | 4.686E-11                       | 1.771E-09  | 8.271E-09        | 2.043E-06  | 4.2493E-08       | 4.145E-05 |
| 205.               | 4.478E-11                       | 1.693E-09  | 7.949E-09        | 1.967E-06  | 4.0609E-08       | 3.989E-05 |
| 206.               | 4.271E-11                       | 1.614E-09  | 7.628E-09        | 1.890E-06  | 3.8726E-08       | 3.834E-05 |
| 207.               | 4.063E-11                       | 1.535E-09  | 7.306E-09        | 1.813E-06  | 3.6842E-08       | 3.678E-05 |
| Runoff Mass Input. | 0.0011 kg.                      |            |                  |            |                  |           |
| 208.               | 1.214E-06                       | 3.983E-05  | 6.984E-09        | 1.737E-06  | 1.1000E-03       | 3.523E-05 |
| 209.               | 4.758E-11                       | 1.798E-09  | 8.297E-09        | 2.048E-06  | 4.3144E-08       | 4.155E-05 |
| 210.               | 4.457E-11                       | 1.685E-09  | 7.918E-09        | 1.959E-06  | 4.0415E-08       | 3.974E-05 |
| 211.               | 4.224E-11                       | 1.596E-09  | 7.562E-09        | 1.875E-06  | 3.8300E-08       | 3.803E-05 |
| 212.               | 4.004E-11                       | 1.513E-09  | 7.224E-09        | 1.794E-06  | 3.6304E-08       | 3.640E-05 |
| 213.               | 3.798E-11                       | 1.435E-09  | 6.905E-09        | 1.718E-06  | 3.4443E-08       | 3.486E-05 |
| 214.               | 3.614E-11                       | 1.365E-09  | 6.615E-09        | 1.649E-06  | 3.2774E-08       | 3.344E-05 |
| 215.               | 3.430E-11                       | 1.296E-09  | 6.324E-09        | 1.579E-06  | 3.1104E-08       | 3.203E-05 |

System: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION  
 Chemical: FONOPOS. A.R = 0.66 lbs a.i./A. Year 1969.  
 Basin: COSH 115.

