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

JUN 09 1983

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

TO: Henry Jacoby
            Product Manager 21
            Registration Division (TS-767)

Thru: Raymond Matheny, Head, Section 1 $R\omega^\gamma$
            Ecological Effects Branch
            Hazard Evaluation Division (TS-769)

Thru: Clayton Bushong, Chief $\widehat{CB}$
            Ecological Effects Branch
            Hazard Evaluation Division (TS-769)

Subject: Estimated Environmental Concentrations (EEC) for Nemacur
            (EPA Reg. # 3125-283/3125-286)

The Ecological Effects Branch (EEB) requested an EEC for fenamiphos from
the Exposure Assessment Branch (EAB) on April 21, 1983. The subject docu-
ment (see attachment) was hand delivered to my office on June 7, 1983. The
SOP requires that all registration actions be forwarded to this Branch via
the HED tracking system.

If you want this information integrated into a hazard assessment for the
conditional registration of Nemacur on tobacco and nonbearing deciduous
fruit trees please forward your request to MSS. Your help in expediting
this matter would be greatly appreciated as we would like to complete this
action as soon as possible.

Charles A. Bowen
Fishery Biologist
Ecological Effects Branch
Hazard Evaluation Division (TS-769)

cc: L. Touart

(1) Attachment - EAB Estimated Environmental Review of 3125-283, 3125-237,
                 3125-236

1 page w/Attachment (7 pages)

Shaugh. No. _____ 100601 _____

EAB Log Out Date: **MAY 2 0 1983**

Init.: ⟨signature⟩ for RVM

To: Jacoby/Beavers
     Product Manager #21
     Registration Division (TS-767)

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

Attached, please find the estimated environmental concentration
review of:

Reg./File No.: _____ 3125-283, 3125-237, 3125-236 _____

Chemical: _____ Fenamiphos _____

Type Product: ___ I _____

Product Name: ___ Nemacur _____

Company Name: _____

Submission Purpose: _____ EEC _____

ZBB Code: _other___   Action Code: ___ 316 ___

Date In: _4/27/83_   EFB#: _3333-3335, 3366- 3368_

Date Completed: _____   TAIS (Level II) ___   Days

Deferrals To: 61   10

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

MAY 20 1983

MEMORANDUM

TO: Charles A. Bowen
            Ecological Effects Branch
            Hazard Evaluation Division   (TS-769)

SUBJECT: EEC's for Fenamiphos (Nemacur) EPA Registration No.
            3125-283/3125-286

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

      You requested on April 20, 1983, estimated environmental
concentrations (EEC's) for two different formulations
(3EC and 10G/15G) of Fenamiphos in both lentic and lotic
environments. The models we use do not currently differentiate
the amount of runoff from various formulations. In general,
the runoff model inputs use the application rate (lb a.i./A)
of the active ingredients in the formulation.

      As per the discussion in my office we agreed (1) to use
the lowest and highest calculated average runoff values per inch
of rainfall based on Mobay's runoff study (pesticide petition
#26849) and (2) to provide exposure analyses via EXAMS50 (steady-
state simulation) model using four different drift loads (DRFLD)
which are calculated from the lowest and the highest average
runoff values after application of fenamiphos at the rate
of 20 lb a.i./A and 6 lb a.i./A.

Runoff Calculation

      The calculated runoff values based on Mobay's study
(petition #26849) and the input data for the EXAMS50 drift
load (DRFLD) are shown in Table 1.

      The results of the Exposure Analysis Modeling System (EXAMS50)
for fenamiphos in the lentic and the lotic environments are shown
in Table 2 and 3 repectively.

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Under the steady-state assumption of the EXAMS50 model, the maximum concentration in the water and in the sediment is a linear function of the amount of input load, entered as drift, to the small pond of 15 hectares and small river flowing adjacent to a crop field.

The maximum concentrations in the lentic water are 1.6 ppt and 0.65 ppt for 1% and 0.4% runoff at the application rate of 20 lbs a.i./A, and 0.49 ppt and 0.19 ppt for 1% and 0.4 runoff at the application rate of 6 lbs a.i./A. The maximum concentrations in lentic sediment deposits on a dry weight basis are 1.4 ppt and 0.55 ppt for 1% and 0.4% runoff at the application rate of 20 lbs a.i./A, and 0.17 ppt for 1% and 0.4% runoff at the application rate of 6 lbs a.i./A. The recovery time (2 half-lives or 75% removal) is 12 hours and self-purification (5 half-lives or 97% removal) is 64 hours in all four cases of the input load.

The maximum concentrations in the lotic water are 0.02 ppt and 0.0086 ppt for 1% and 0.4% runoff at the application rate of 20 lbs a.i./A, and 0.0065 ppt and 0.0026 ppt for 1% and 0.4% runoff at the application rate of 6 lbs a.i./A. The maximum concentrations in the lotic sediment deposits on a dry weight basis are 0.00062 ppt and .00025 ppt for 1% and 0.4% runoff at 20 lbs a.i./A and 0.00019 ppt and 0.000074 ppt for 1% and 0.4% runoff at the application rate of 6 lbs a.i./A. The recovery time (2 half-lives or 75% removal) is 12 hours and self-purification (5 half-lives or 97% removal) is 2 hours in all four cases of the input load.

As per our discussion you agreed with me that the fenamiphos (Nemacur) registration package has the following important data gaps: (1) rate of photolysis, (2) rate of neutral hydrolysis, (3) rate of oxidation, (4) octanol-water partition ratio, (5) runoff experimental data for the soil-incorporated pesticide (6) all environmental fate and process data pertaining to the major metabolites or degradation products (sulfoxide and sulfone).

I hope that you will be able to use these estimated EEC's from the EXAMS50 steady-state version in the final phase of the ecological effects part of the fenamiphos Registration review.

P.R. Datta, Chemist
Exposure Assessment Branch/HED (TS-769)

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TABLE 1

Daily Runoff Data for fenamiphos (Nemacur)
from Mobay's Petition #26849

| Application Rate | Ranges of Average Runoff Values * | |
	0.4%	1.0%
20 lb/A	0.08 lb/A/day	0.2 lb/A/day
	1.50×10^{-3} kg/A/hr (EXAMS50)	3.76×10^{-3} kg/A/hr (EXAMS50)
6 lb/A	0.024 lb/A/day	0.06 lb/A/day
	0.45×10^{-3} kg/A/hr (EXAMS 50)	1.13×10^{-3} lg/A/hr (EXAMS50)

* Based on the runoff study using three different soils (sandy loam, silt loam and organic silt loam). After 37 days of treatment, the percent of the applied Nemacur in the runoff water for per inches of rainfall (irrigation) was 0.4 for sandy loam, 1.0% for silt loam, 0.76% for organic silt loam. The runoff water was collected at 10 ft from the base of treated plots with a slope of 8.3%. Therefore, the range of average runoff values was assumed to be 0.4% to 1.0% of the applied Nemacur.

TABLE 2

Exposure Analysis Modeling System (EXAMS50) for fenamiphos (NEMACUR) in the Lentic (Pond) Environment

EXAMS50 Parameters	Application Rates			
	20 lb a.i./A		6 lb a.i./A	
	Drift Load (DRFLD)		Drift Load (DRFLD)	
	low runoff 1.5×10^{-3} kg/hr	high runoff 3.76×10^{-3} kg/hr	low runoff 0.45×10^{-3} kg/hr	high runoff 1.13×10^{-3} kg/hr
Maximum conc. in water	6.5×10^{-7} mg/l	1.6×10^{-6} mg/l	1.9×10^{-7} mg/l	4.9×10^{-7} mg/l
Maximum conc. in sediment deposit (dry wt)	5.5×10^{-7} mg/kg	1.4×10^{-6} mg/kg	1.7×10^{-7} mg/kg	4.1×10^{-7} mg/l
Total Steady State Accumulation	1.3×10^{-5} kg	3.3×10^{-5} kg	4.0×10^{-6} kg	1.0×10^{-5} kg
Recovery (75% removed)	12 hours	12 hours	12 hours	12 hours
Selfpurification	64 hours	64 hours	64 hours	64 hours

TABLE 3

Exposure Analysis Modeling System (EXAMS50) for fenamiphos (Nemacur) in the Lotic (River) Environment

EXAMS 50	Application Rates				
	20 lb a.i./A			6 lb a.i./A	
	Drift Load (DRFLF)			Drift Load (DRFLD)	
	low runoff	high runoff		low runoff	high runoff
Parameters	1.5×10^{-3} kg/hr	3.76×10^{-3} kg/hr		0.45×10^{-3} kg/hr	1.3×10^{-3} kg/hr
Maximum conc. in water	8.6×10^{-9} mg/l	2.1×10^{-8} mg/l		2.6×10^{-9} mg/l	6.5×10^{-9} mg/l
Maximum conc. in sediment deposit (dry wt)	2.5×10^{-10} mg/kg	6.2×10^{-10} mg/kg		7.4×10^{-11} mg/kg	1.9×10^{-10} mg/kg
Total Steady State Accumulation	2.6×10^{-6} kg	6.5×10^{-6} kg		7.8×10^{-7} kg	2.0×10^{-6} kg
Recovery (75% removal)	12 hours	12 hours		12 hours	12 hours
Selfpurification	2 hours	2 hours		2 hours	2 hours

AERL-ESB MODEL OF FATE OF ORGANIC TOXICANTS IN AQUATIC ECOSYSTEMS
CHEMICAL: FENAMIPHOS(NEMACUR). PRD 5/13/ 83.
ECOSYSTEM: Unspecified Environment

TABLE 1.1.   SH2 (NEUTRAL MOLECULE, SPECIES #1) INPUT DATA.

MWT= 303.0   SOL = 450.0   VAPR= 1.000E-05 HENRY= .0
KVO= .0   ESOL= .0   EVPR= .0   EHEN = .0
KPS= 1.950   KPB = .0   KOC = .0   KOW = .0
KAH1= 3.200   EAH1= .0   KNH1= .0   ENH1= .0
KAH2= .0   EAH2= .0   KNH2= .0   ENH2= .0
KAH3= .0   EAH3= .0   KNH3= .0   ENH3= .0
KBH1= 12.30   EBH1= .0   KOX1= .0   EOX1= .0
KBH2= .0   EBH2= .0   KOX2= .0   EOX2= .0
KBH3= .0   EBH3= .0   KOX3= .0   EOX3= .0
KBACW1= 1.160E-03 OTW1= .0   KBACS1= .0   OTS1= .0
KBACW2= .0   OTW2= .0   KBACS2= .0   OTS2= .0
KBACW3= .0   OTW3= .0   KBACS3= .0   OTS3= .0
KDP= .0   RFLAT= .0   LAMAX=   0.0
QUANT1= .0   QUANT2= .0   QUANT3= .0
ABSORPTION SPECTRUM (ABS):   .0   .0   .0
   .0   .0   .0   .0   .0   .0
   .0   .0   .0   .0   .0   .0
   .0   .0   .0   .0   .0   .0
   .0   .0   .0   .0   .0   .0
   .0   .0   .0   .0   .0   .0
   .0   .0   .0   .0   .0   .0