California Environmental Protection Agency
James M. Strock, *Secretary for Environmental Protection*
DEPARTMENT OF PESTICIDE REGULATION
James W. Wells, *Director*
1220 N Street, P.O. Box 942871
Sacramento, California 94271-0001

AP-42 Section 9.2.2
Reference 21
Report Sect.
Reference

State of California
Pete Wilson, *Governor*

Rec'd 12/17/93

December 6, 1993

Mr. Dallas W. Safriet
Environmental Engineer
Emission Inventory Branch (MD-14)
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle, North Carolina 27711

Dear Mr. Safriet:

Thank you for providing us the opportunity to comment on your draft Section 6.2.2, Pesticide Application, supplement to AP-42, Compilation of Air Pollutant Emission Factors.

I am enclosing the technical comments prepared by the staff who are developing our Department's approach to reducing emissions from pesticides. We are particularly interested in making sure that information previously provided to MRI regarding inerts be used in an appropriate context. The memorandum from John Stutz discusses this concern in detail.

I hope these comments are of assistance to you in preparing your final report. We would appreciate receiving the final version of AP-42 when it is published.

Sincerely,

Tobi Jones
Special Assistant
(916) 657-4490

Enclosures

cc: Ron Oshima
Paul Gosselin

State of California

Memorandum

To : Tobi Jones, Special Assistant
Department of Pesticide Regulation

Date: November 17, 1993

Place: Sacramento

Phone: 4-0533

From : **Department of Pesticide Regulation** - John Stutz, Information Systems Analyst
Pesticide Registration Branch

Subject : Review of AP-42 Section 6.2.2

The only sections that I can comment on are Table 4-4 page 4-23, and "Emissions of VOC Inert Ingredients" and "Example Calulation" found on page 6.2.2-5.

Table 4-4 Inert VOC Content By Formulation Type - was developed by MRI using data that I had sent them from the Inerts Database. The data was not product specific, and was very limited in scope. The data excluded any information on water content and only detailed inert chemicals that performed a certain functionality in the product. The functionality data was skewed towards potential for higher volatility and could not be used to average in the non-volatile ingredients. Out of the 100+ function types that we describe in the database, this exercise only included 26. The data was sorted by formulation type, function, chemcode, common name, and percent (found in any product, not product specific). The explanation of their analysis of the data on page 4-23, reference 23 is not sufficient, and we never were provided with the methodologies that I requested (computer programs, etc.).

I have included, on page two of the attachment, the formulation type averages that I calculated using the entire set of inert data. Generally, the volatility factors are lower than those calculated by MRI. This attachment also describes the methodology that I used.

"Emissions of VOC Inert Ingredients" - To properly calculate the inert VOC contribution, you must also use the percent of inerts that are in the formulated product in the calculation. The paragraph should read:

"The total quantity of emissions due to the VOC's in the inert ingredient portion of the formulation can be obtained by using; the percent of the inert portion contained in the formulated product, the percent of VOC's contained in that portion, and the total quantity of formulation applied to the crop. Multiply the percent of inerts by the percent of VOC, in the inerts, by the total quantity of applied formulation to obtain the total quantity of VOC inert ingredients. If the VOC content is not known, use a default value from Table 6.2.2-3 appropriate to the formulation. The emission factor for VOC inert ingredients is

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assumed to be 100 percent within 30 days after application of the formula."

"Example Calculation", Part 3. - These instructions should read:

3. From Table 6.2.2-3, it can be estimated that 42 percent of the inert ingredients in the emulsifiable concentrate(EC) is VOC.

Total quantity of emissions due to inert ingredients:

% Inerts in formulation		% VOC's est. in EC's(6.2.2-3)		Total Lbs. Applied		Total VOC Inerts Applied
0.42	*	0.42	*	8000	=	1,411 lb. (not 3,360)

I would suggest, that the table of Average Inert VOC's by Formulation; calculated from our database be used in lieu of Table 6.2.2-3.

DEVELOPMENT OF INERT VOC FORMULATION AVERAGES

On page 2 is a list of the formulation types and VOC inert averages used by the California Department of Pesticide Regulation. These averages were calculated using the specific inert formulation breakdowns of the products registered in California. The methodology used for this calculation is as follows: (this is excerpted from the methodology document which describes the emissions inventory development for the three NAA's in California)

Step 1 - Determination of Non-Volatile Chemical Ingredients

Every application reported in the PUR data is based on a specific product, identified by it's USEPA product number. Formulation data on these products, for both active and inert ingredients, are contained in two DPR databases. These are the Product/Label (27,000 products) and the Inert Ingredients (11,000 products) databases. These systems, in turn, are supported by a Chemical Ingredients database that contains information on approximately 3,200 chemicals.

Of these 3,200 chemicals, 981 were flagged as either non-volatile or excluded (CFC's) by the Consumer Products Regulation (CARB). The review of these chemicals was conducted by the Chief Chemist of the Pesticide Registration Branch. The review of this list was cursory, due to the mandated timeframes, and represents an estimate of the precise nature of each ingredient. There was no attempt made to determine the relative volatility of each compound.

When calculating emissions, these **flagged chemicals were excluded** from addition to the emission totals.

Step 2 - Calculation of the Inert Ingredients VOC Contribution

An inert ingredient contribution factor to VOC emissions has been calculated for each individual product. Using a unique factor for each product, rather than an average by formulation type, allows for a more accurate estimate of emissions. The estimate is very conservative, assuming that each ingredient, unless flagged non-volatile, is volatilized 100%.

Because development of the Inert Ingredients database began in the fall of 1991, many products reported in the 1990 baseline year were no longer active and not included in the initial input effort; in fact, many had been inactive for a number of years. This is not unusual or unexpected with an estimated 10-15% turnover of products each year. For those products for which an inert formulation had not been input, an **average factor of emissions potential** was calculated using all of the products in the database. This average, by formulation type, was used to fill the product gaps between the inerts database and the 1990 use data. Future years will yield better correlation between the databases.

The inert contributions were calculated by taking the total use of each product from the extracted PUR data, multiplying this by the total inert percentage in that product, and multiplying that figure by the contribution factor.

Page Two
Formulation VOC Averages

The following table lists the number of products analyzed for each formulation type, and the average VOC emissions developed in the analysis. In addition, the MRI generated average is compared.

Formulation Code	Product Count		DPR Avg.	MRI Avg.	Formulation Name
K0 Count:	2	Avg. :	0.0000	75.0	Pressurized Dust*
Q0 Count:	23	Avg. :	15.0000	—	Suspensions
N0 Count:	172	Avg. :	12.0000	22.0	Soluble Powder
T0 Count:	4	Avg. :	17.0000	8.0	Other Dry
O0 Count:	3149	Avg. :	20.0000	54.0	Solution/Liquid(ready-to-use)
U0 Count:	25	Avg. :	21.0000	50.0	Other Liquid
S0 Count:	688	Avg. :	21.0000	33.0	(Aqueous) Concentrate
L0 Count:	38	Avg. :	29.0000	33.0	Pressurized Gas
C0 Count:	144	Avg. :	21.0000	31.0	Flowable (Aqueous) Concentrate
G0 Count:	11	Avg. :	23.0000	29.0	Microencapsulated
J0 Count:	506	Avg. :	27.0000	16.0	Pellet/Tablet/Cake/Briquet
P0 Count:	344	Avg. :	25.0000	15.0	Wettable Powder
A0 Count:	367	Avg. :	21.0000	13.0	Dust/Powder
R0 Count:	53	Avg. :	28.0000	12.0	Dry Flowable
E0 Count:	1053	Avg. :	25.0000	11.0	Granular Flake
M0 Count:	1279	Avg. :	39.0000	27.0	Pressurized Liquid/Sprays/Fog.
F0 Count:	253	Avg. :	38.0000	18.0	Impregnated Material
D0 Count:	73	Avg. :	40.0000	33.0	Gel, Paste, Cream
B0 Count:	961	Avg. :	56.0000	42.0	Emulsifiable Conc.
I0 Count:	202	Avg. :	64.0000	—	Paint/Coatings
H0 Count:	39	Avg. :	66.0000	95.0	Oil

* There are very few pressurized dusts registered in California. They contain CO_2 and CFC's(exempt ozone depleters), and inert non-voc carriers.