

Medical Department

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I received a copy of the Bionomics proposal for fish work on the new aroclor products from Dr. Ken Macek today. I thought you would like my recommendations for this work so you can make whatever plans are necessary for financing as soon as possible if you agree.

In an effort to get the most useful data for the least money I would propose that we do as follows:

1. Have dynamic acute toxicity studies performed on three (3) compounds on two (2) species each (Bluegill and Channel Catfish) for a total of six (6) studies -- total cost \$3,600.00
2. Have residue accumulation studies done on the three (3) compounds at three (3) levels on the two (2) species mentioned above. These studies should be performed on both the subject compounds in water and in food. This would be in accordance with Dr. Macek's first alternate suggestion. Total cost \$18,000.00 for four (4) weeks.

The studies to determine both residue accumulation and residue clearance after exposure would probably run at least eight (8) weeks. The second four (4) week period and any subsequent period would cost \$2,000.00 per study or a total additional cost of \$12,000.00 for the second four (4) weeks.

The total estimated cost of the study for eight (8) weeks would be \$33,600.00 to Bionomics, Inc.

The analysis of these samples to be done by Monsanto Organic Division Research would represent another appreciable increment of cost. The samples would be shipped by Bionomics to St. Louis within 48 hours of sampling. These samples must then be analyzed with considerable alacrity to be useful to the study and to avoid unnecessary costs (about \$600.00/day).

An examination of Dr. Macek's first alternate recommendation will show that he proposed to run one eight-unit experimental

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system for each compound and each species. Since we have three (3) compounds and two (2) species he consequently proposes to run six (6) such eight-unit systems. Each eight-unit system will have two (2) control units and six experimental units. Three (3) of the experimental units will be for water-borne toxicants at three (3) levels of exposure and the remaining three (3) for food-borne toxicant studies at three (3) levels of exposure. If you combine the two control samples in each of the six experimental eight-unit systems, the total fish sample load would be 42 samples at each sampling run. Dr. Macek proposes ten (10) sampling runs if the experiment runs the full eight (8) weeks. These sample runs would be on the first (1), third (3), seventh (7), fourteenth (14), twenty-first (21), twenty-eighth (28), twenty-ninth (29), thirty-first (31), thirty-fifth (35), forty-second (42), and fifty-sixth (56) day after the experiment starts. This represents ten sampling runs with 42 samples per run for a total of 420 samples in eight (8) weeks. These 420 samples only represent the fish tissue samples and not any water samples.

It appears to me that the limiting factor in this proposal is analytical time. It is essential that we talk to the analytical research people (Dr's. Keller and Tucker) about this problem and see if, in fact, the whole effort must not be limited to our analytical capability. This should be done as soon as it appears that money is available for this type of research. We should give Ken Macek some kind of answer as soon as possible.

Bear in mind that we can run one (1) specie at three (3) concentrations on three (3) compounds with the resultant analytical requirement of 210 samples in eight (8) weeks, or one (1) specie at three (3) concentrations in either the water or food with the production of 140 samples. It is also possible to reduce the sampling runs to appreciably reduce the analytical burden.

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