Inveresk Research International

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8th March, 1972

H.A.Vodden, Esq.,
Monsanto Chemicals Ltd.,
Ruabon Works,
Cefn Mawr,
Wrexham,
Denbighshire.

Dear Mr. Vodden,

P-1372 B.S.

Following our meeting at your Ruabon Works on 18th February, 1972, we now have pleasure in submitting for your approval, our proposal for "Environmental Persistence Studies with PCB's."

BACKGROUND

In response to mounting criticism that PCB's are a potential environmental hazard, Monsanto have ceased selling PCB's prior to more intensive investigation of their properties.

Studies have been undertaken by you and others which would suggest that PCB's with a low degree of chlorination do not persist in tissues as long as the more highly chlorinated ones and on the basis of this evidence, Monsanto have produced a PCB, Aroclor 1016, which has the desirable commercial properties yet contains only low-chlorinated PCB's.

Before marketing this product, evidence of its non-persistence in the environment must be produced.

Evidence has already been generated of Aroclor 1016's degradability by micro-organisms, and we propose to establish self-supporting fresh-water and marine ecosystems to determine its persistence under such circumstances in both the living and non-living components of the systems.

PROCEDURE/.....

PROCEDURE

a. TOXICITY

Initially, some toxicological studies will have to be carried out on the most sensitive organisms (crustacea) in the ecosystems to determine the concentration which will not kill off organisms essential for the integrity of the system. Once these levels have been established, then we intend studying the effects of two dilutions of each Aroclor at x mg/l and x/10 mg/L (where x will be determined on the basis of the toxicity studies as lying below the threshold for toxicity).

b. ANALYTICAL DEVELOPMENT

A certain amount of analytical development will be needed to insure that the tissue extraction techniques which we have used to date are capable of extension to Aroclor 1016.

It will be necessary to be sure that an acceptable degree of reproducibility exists between the technique currently in use in your laboratories and our own. While we feel competent to provide quantitative data on tissue levels using GLC techniques developed in our own laboratory in conjunction with Mr. A. Holden, we may require to look to you for assistance should it prove desirable to improve the resolution of the material extracted.

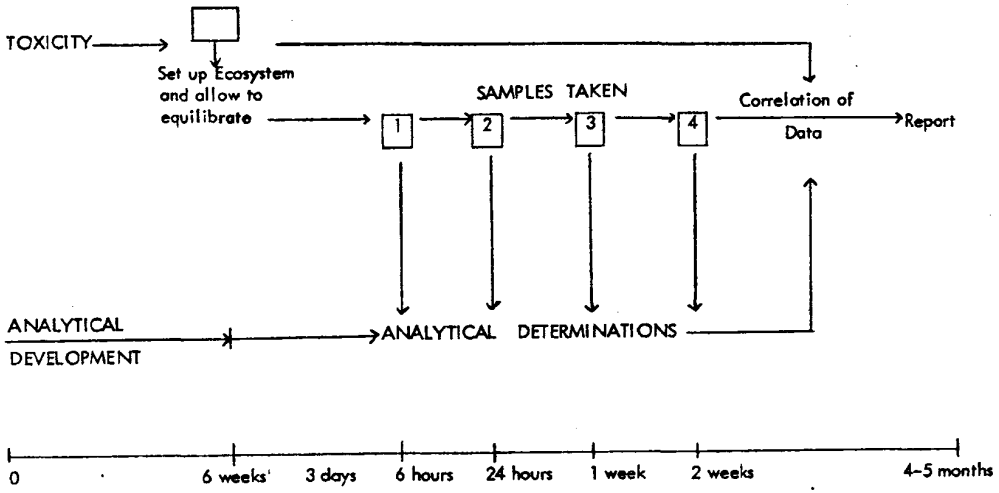
We propose to give known amounts of Aroclor 1016 to test animals used in the systems and then extract them to establish the best extraction technique for the analysis of the test samples.

c. PERSISTENCE STUDIES

The aquatic ecosystems we have designed contoin the smallest number of species to provide a dynamic self-supporting environment. These systems will contain sand, detritus, plants, crustacea, molluscs and fish. These organisms will be present in sufficient numbers to be removed for analytical determinations where necessary yet still maintain a self-supporting system.

The system will be set up and allowed to equilibrate, the different PCB's then added and sampled at set time intervals, we propose running Aroclors at two different concentrations, plus control systems, in parallel, using marine and fresh-water ecosystems. The procedure for one determination, i.e. one level of one Aroclor in one system, is shown on the following flow sheet.

FLOW SHEET


TOXICITY
Set up Ecosystem and allow to equilibrate
SAMPLES TAKEN
1
2
3
4
Correlation of Data
Report
ANALYTICAL DEVELOPMENT
ANALYTICAL DETERMINATIONS
0
6 weeks
3 days
6 hours
24 hours
1 week
2 weeks
4-5 months

Samples taken will be as follows:

1.	Water, Marbles, Sand,	(6 hours)
2.	Water, Marbles, Sand, Plants.	(24 hours)
3.	Water, Marbles, Sand, Plants, Molluscs, Crustacea and Fish	(1 week)
4.	As 3, after 2 weeks.	

Marbles are included in the system to investigate the absorption of PCB's on to glass in such a system, the simulated environments being contained in siliconed glass tanks.

COST AND DURATION

We estimate the ecosystems could be established approximately one month from the signing of the proposal, and all samples gathered within four months. An overall duration of no longer than six months.

We estimate that the cost for professional services for the work outlined will not exceed the sum of £2,880 (Two thousand, eight hundred and eighty pounds, sterling).

Our charges for professional services are based upon the actual time spent by our staff on your case. Expenses, which include the cost of equipment, consumables, etc. will be invoiced separately at cost to us and are estimated at £380 (Three hundred and eighty pounds, sterling).

Invoices are rendered monthly and are payable on receipt.

GENERAL PROVISIONS

Our work for clients is conducted on a confidential basis and we will treat information developed hereunder in accordance with our established professional standards.

Reports resulting from this assignment become your property; however, our authorisation in writing is required if our reports are reproduced in whole or in part for use outside your organisation. It is understood that the name of Inveresk Research International is not to be used for advertising or promotional purposes without prior written permission.

We will use our best endeavours to carry out the work specified, but we cannot be held responsible for failure to carry out any of the commitments due to a cause or causes beyond our control.

STAFF RESPONSIBILITY

Mr. R.J.Odey will be responsible for carrying out this work. He will be assisted by members of the staff of this organisation. We understand that we should look to you for general direction and policy decisions on behalf of Monsanto Chemicals Ltd.

ACCEPTANCE

If this proposal meets with your approval, please sign and return the enclosed copy as authorisation for us to proceed with the work.

For the purpose of staff scheduling, this proposal is made subject to acceptance within thirty days. If you require an extension of this time, would you please inform us in writing prior to 10th April, 1972.

We look forward to working with you on this project and will devote our best efforts to complete the programme outlined above.

Yours sincerely,

R.J. Odey

R.J.Odey
for and on behalf of
Inveresk Research International

Approved for
Inveresk Research International

By _____
Secretary

Accepted for
Monsanto Chemicals Ltd.

By _____

Title _____

Date _____

MCNS 072119