UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: MAR 10 1981

SUBJECT: Brodifacoum (112701) Field Study Notes.

FROM: John Tice

TO: EEB Registration Files. (112701)

THRU: Harry Craven, Head, Section #2, EEB, HED HTC.

THRU: Clayton Bushong, Chief, Ecological Effects Branch, HED CB

The intent of this memo is to alert the next reviewer of the pitfalls in the data he/she is about to evaluate. The data discussed are the data generated from experimental use permit # 10182-EUP-ER. This memo was written because I foresee many possibilities for truth stretching, half truths and missing pertinent facts. The field study as originally described was of questionable value (i.e., it would not produce the information it was designed to produce). Since less data was taken than originally planned, the study's value is even more questionable.

The test was designed to provide efficacy data and secondary hazard information [hazard to raptors (owls)]. It should be emphasized in the begining that Dr. Byers of VPI, is a very capable field biologist. His work on vole control in orchards is probably among the best in the country. This memo will not attempt to critique Dr. Byers efforts in gathering efficacy data. I will, however, discuss general facts that may shed some light on the study as a whole and discuss in greater detail the secondary hazard portion of this experiment.

Secondary hazard to raptor was to be monitored by capturing and fixing radio transmitters to 4-10 owls one week prior to the application. These birds were than to be monitored periodically so roosting and feeding sites could be identified. Four weeks post treatment the owls were to be collected and residue determinations made. This approach is very symplistic and <u>at best</u> would only give an <u>indication</u> of a problem. By no means can the approach provide specific evidence to prove or disprove the products safety. The number of birds were not sufficient to provide the sample size necessary for a reasonable statistical analysis. The proposed monitoring effort (one or two location/bird/day) was not sufficient to document feeding areas. The residue analysis after 4 weeks is also questionable. The residence time of BFC in birds is unknown.

As conducted, a bird death would lead to one or possibly two pieces of information. The first is that a bird did die. If, after an autopsy, the cause of death was determined to be from anticoagulants (BFC) and the residues in the bird were determined, the second piece of information can reasonably be stated. That is the bird died from the bait. (This of course depend upon the laboratory analysis). The way I see it no other information is possible. The experimental design is such that no

other information or theories can be substantiated. The data to prove or support other points relating to a secondary hazard or a lack of hazard (i.e., safety - assuming it is not possible to prove safety), which this branch wishes to look at, was not taken. How then should this study be analized? Very Carefully!

Look carefully at all facts as they are stated. DO NOT ASSUME ANYTHING. If it is not stated it does not exist.

The number of birds did not turn out to be 10 as hoped. Prior to treatment 3 screech owls were wearing transmitters. One week after treatments began a barn owl was fitted. Three weeks after treatment began a kestral was fitted with a radio. If the study report states, five birds were captured and fitted with radios, one should not assume this happened prior to application.

Application to the 175 acre tract were performed over a 15 day period from 11-11-80 to 11-26-80. Assuming voles carring a lethal concentration of BFC are "available" for two days, (this is only an assumption for illustrative proposes) then raptors would only have a small chance of consuming BFC in this study. The ratio of contaminated voles to the total available vole population would be small.

Considering available alternative food, there was an adjacent orchard (approx. 50 acres) which had an uncontrolled vole population. To my knowledge, with the data available, no one can document the amount of food taken from this area as opposed to the study area.

Radio telemetry was to be used to locate the birds at least twice a day to provide roosting and feeding information. I was told that telemetry was used only 2 nights prior to our visit (approx. 3 weeks after the first applications). Without telemetry data, hunting areas and the percentage of food taken from the study site cannot be determined. This information should be a MUST for any determination of hazard.

In conclusion the reviewer should excercise extreme caution when evaluating the data submitted from 10182-EUP-ER, Meadow Vole Control in Orchards. If there are any questions, Russ Farringer or I would be happy to try to answer them.