DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
REGIONAL OFFICE
Region IV

PUBLIC HEALTH SERVICE
Room 404
50 Seventh Street, N.E.
Atlanta 23, Georgia, 30323

July 25, 1963

Mr. A. D. Aldrich, Director
Florida Game and Fresh Water Fish Commission
648 Tennessee Avenue
Tallahassee, Florida

Dear Mr. Aldrich:

On June 11-12, Mr. Eugene Surber, biologist from the Public Health Service's Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, participated in a group conference and investigation concerning fish kills in Lake Apopka, Florida. At that time certain samples were collected and returned to Cincinnati for analysis to determine their insecticide content. The results of these analyses are herewith transmitted.

Dr. Mary L. Schafer, of the Milk and Food research Section, using a procedure developed by herself, K. A. Busch, and J. E. Campbell entitled, "A Rapid Screening Method for DDT in Milk by Gas Chromatography", analysed fish, water surface scum, and lake water. In this procedure p-p'-DDT is dehydrohalogenated to DDE during the isolation of the chlorinated hydrocarbons. The results are reported as DDE and DDT as follows:

Sample	ppm DDT & DDE	ppm TDE
Bass (fat near intestines)	160	50
Bass (flesh)	4	8
Bluegill	7	not detected
Water surface scum from ditch outside lake levee	0.32	not detected
Lake water	not detected	not detected

The last two of the above samples were also assayed using a procedure in which the chlorinated hydrocarbons were isolated by hexane extraction. With this procedure the p-p'-DDT is not converted to DDE but is assayed directly.

It was verified that the scum contained 0.32 ppm p-p'DDT as previously stated, and no detectable quantities of known chlorinated hydrocarbons were found in the lake water sample. The limits of detectability for DDT are not stated for the water analyses done by Dr. Schafer.

Mr. Harvey Boyle of the Chemistry and Physics Section analysed two water samples - one from Lake Apopka and the other from a ditch from which the

scum analysed by Dr. Schafer was taken. These samples were extracted with hexane and analysed by gas chromatography, using an electron capture detector. One minor and one major component peak were detected, but neither matched any of the common chlorinated insecticides or parathion in retention time, and were not identified. The electron capture detector responds to many organic substances, and the reported peaks are not presumptive of unknown pesticides.

Under the conditions of the tests conducted by Mr. Boyle, who extracted a 50 ml quantity of water from each sample, a quantity of DDT equivalent to 2 parts per billion in the water sample would have been identifiable. The solubility of DDT in water is approximately one part per billion, so the possible presence of DDT in solution in the parts per trillion range sometimes encountered is not eliminated.

The presence of DDT and its metabolites DDE and TDE (DDD) in fish and "scum", although remarkable, is not unusual. Recent information indicates the apparent world-wide distribution of these compounds in fish (including marine), and to a lesser extent on or in aquatic vegetation. The mechanism by which this distribution has been accomplished is still a matter of speculation.

The concentrations recovered from the fish examined, although exceeding the concentration that would kill fish on exposure in water, do not necessarily mean that these specimens died from DDT poisoning. DDT is commonly stored in the fatty tissues of fish and other animals where it is not available all at once in the ordinary metabolic processes of the animal. Consequently, concentrations at several hundred parts per million may be present in fish that give every indication of good health.

Sincerely yours,

John R. Thoman
Regional Program Director
Water Supply & Pollution Control