Monsanto

FROM (NAME & LOCATION) E. S. Tucker - R&D Laboratories - South Second Street

DATE December 23, 1969

cc M. W. Farrar - Res. 1
W. R. Richard - GO
E. P. Wheeler - GO

SUBJECT AROCLOR - WILDLIFE
MONTHLY SUMMARY

REFERENCE

TO R. E. Keller

Initial reports from Ruabon, U.K., indicate that selected isomers in Aroclor 1242 undergo biodegradation when exposed to a bacterial inoculum accumulated to biphenyl. A more detailed report is being prepared. In the meantime, river water biodegradation studies with Aroclor 1221, 1242, 1248 and 1254 have been started here. Visual inspection of the EC chromatograms of these materials after one and two week exposures indicate that Aroclor 1221 is undergoing some biodegradation. The isomers so far effected are the mono and di chloro, unfortunately, the heavier species remain at the same level after two weeks of exposure (see Figures I, II and III). Aroclors 1242, 1248 and 1254 are so far unaffected.

Analysis of five commercial detergents and some of the detergent components manufactured by Monsanto have been completed. The analysis confirmed the presence of low levels of Aroclor in laboratory samples of Finish and Electro-Sol manufactured by Economic Laboratory, Inc., and in All (Lever Brothers). We were unable to make a completely positive identification of Aroclor in the other detergents looked at. These detergents all contained low levels of EC active materials but the chromatographic fingerprints did not match our production material. Five samples of Monsanto Sodium Tripolyphosphate, two Tetrapotassium Pyrophosphate and one sample of NTA did not contain significant levels of any Aroclor. Sterox CD, Sterox AJ, alkylate 230, and ACL-59 are still to be analyzed as time permits.

13

The final round of W.G.K. (19) and Anniston (14) plant monitoring samples have been received. Their analysis is scheduled for completion by the first of the year. Paul Hodges has been advised and indicated he will review future efforts after the first.

Water samples from a N.C.R. plant in Wisconsin have been analyzed. The Aroclor being dis charged, Aroclor 1242, was easily detected at all sampling points and ranged from ~1000 ppm at the plant to ~1 ppm in the effluent from the sewage treatment facilities. The EC/GC indicated that no biodegradation was occurring. A memo discussing the subject was issued.

A review of the results of the Bio-Test feeding studies has been scheduled with our medical department for after the first of the year.

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Suggested analytical support for the determination of static 96 hour (TLMs) for selected Aroclors with blue-gills and bullheads has been outlined. It is expected that this study will be initiated after the first of the year.

The GC/mass determination of the isomer distributions of Aroclors 1221, 1248, and 1254 have been completed, (Spectroscopy Special Study 69-3).

The feasibility studies of S.C.O.T./EC/GC were only partially successful. The initial conditions chosen will have to be altered somewhat. New S.C.O.T. columns have been ordered and further work awaits their arrival. They will not be used to monitor the Aroclor biodegradation studies.

A method for the determination of Aroclors in sediment and water has been written (Analytical Method 69-13).

Informational visits with representatives from the Medical Department and Organic Sales were made to the Michigan Water Resources Commission, General Motors, and Ford. The discussions centered around some misunderstandings of the Aroclor pollution problem.

Future Plans

January review of Bio-Test feeding studies.

Semi-continuous activated sludge biodegradation of Aroclors.

January review of the Aroclor plant monitoring program.

Analysis of remaining detergent components for Aroclor.

EC/GC comparison of Aroclor with competitive PCBs.

Investigation of alternate chemical oxidation techniques for isolating and identifying PCBs.

Completion of S.C.O.T./EC/GC study.

E. S. Tucker/J. Litschgi/B. J. Westenberger

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Attach. - 3

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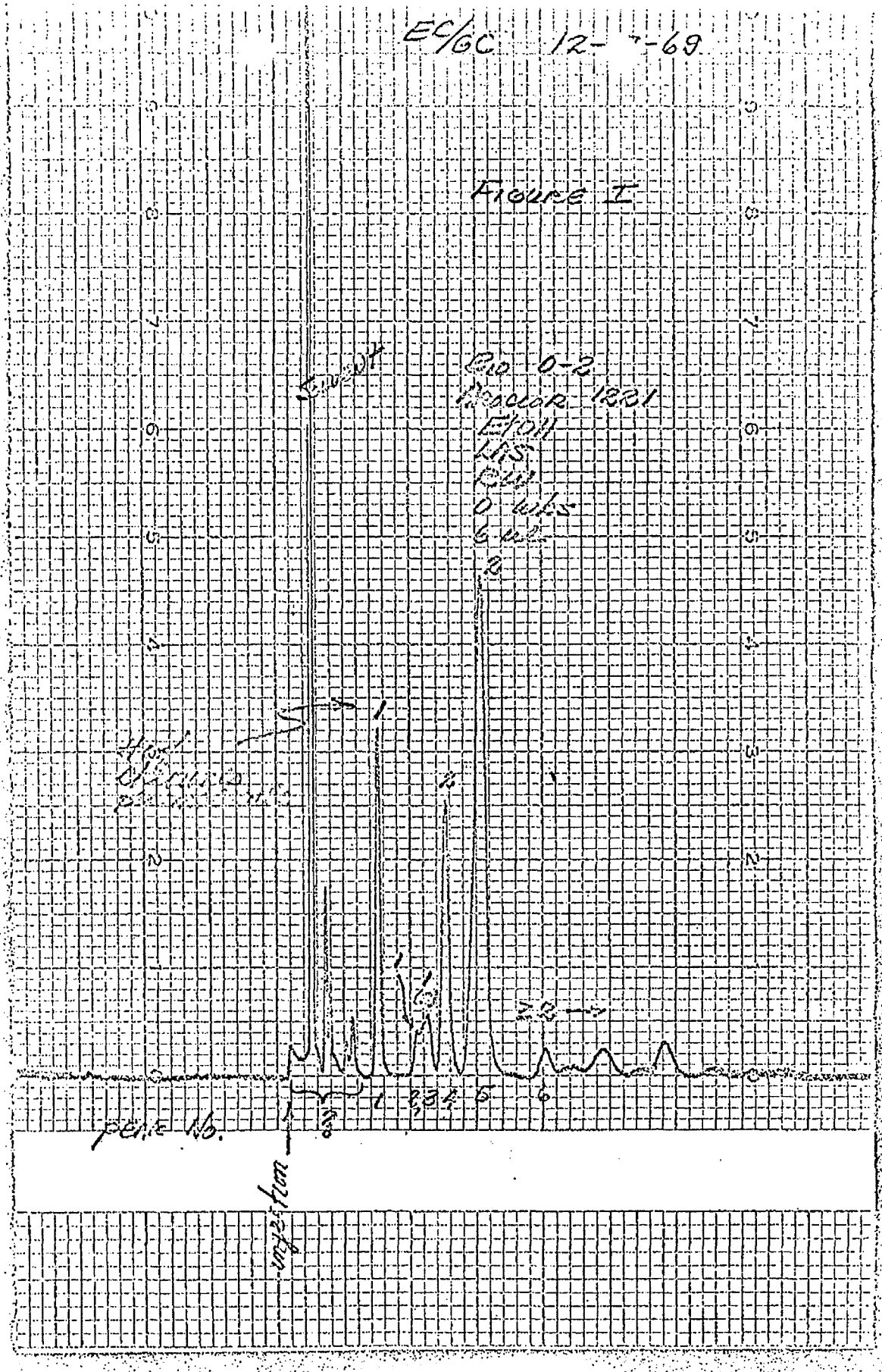

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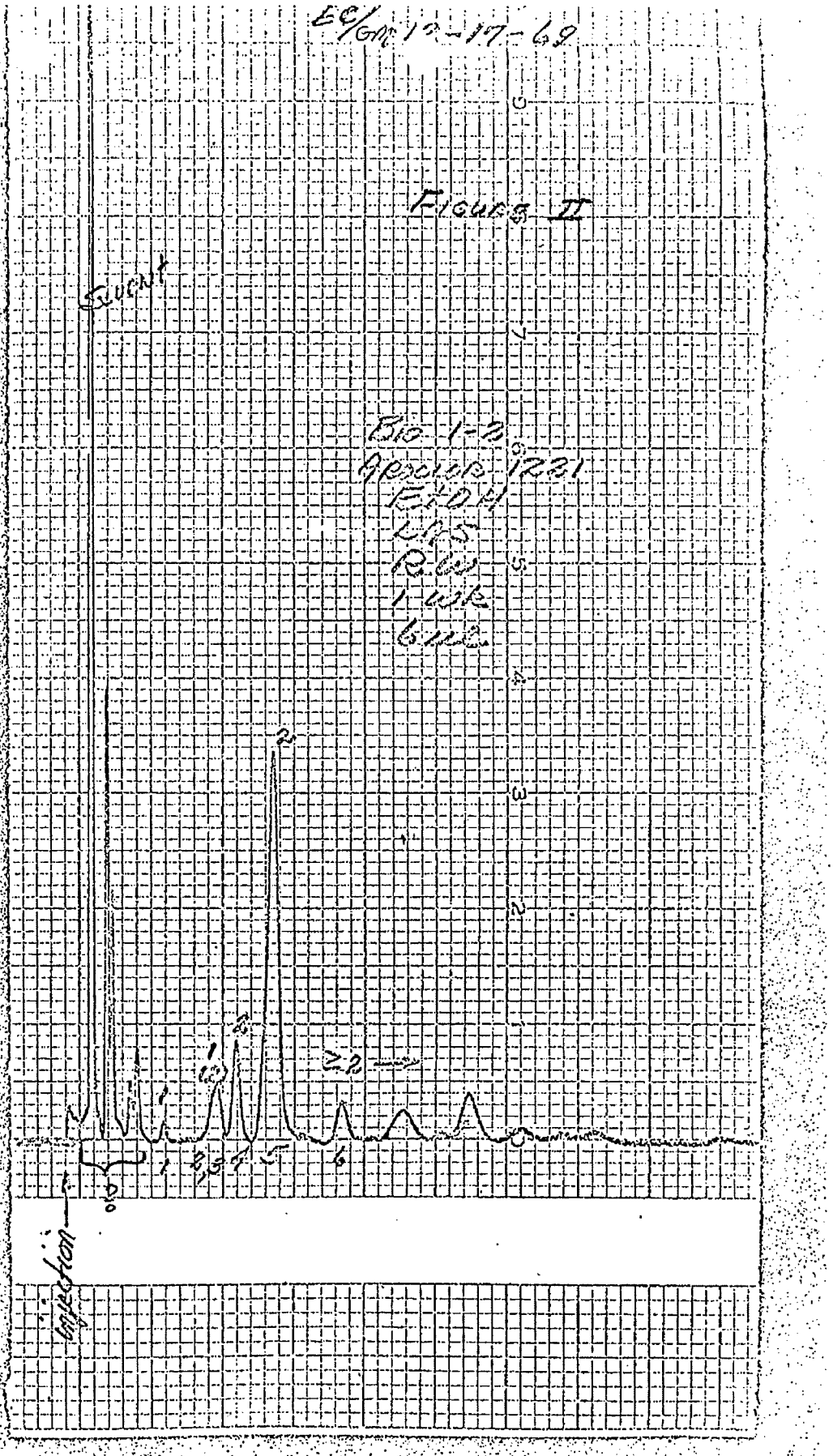
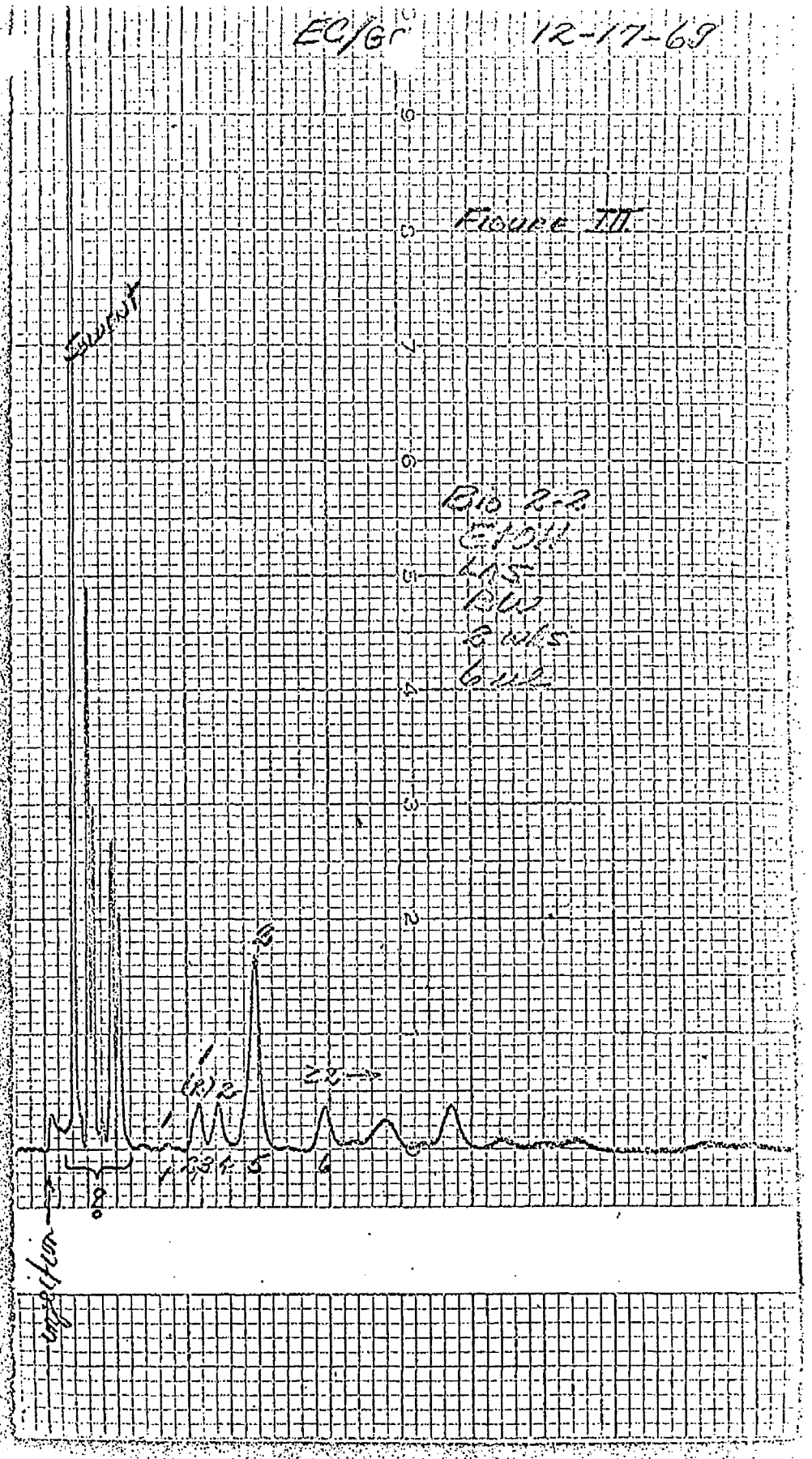

EC/GM 12-17-69
Figure II
Bio 1-2
Aroclor 1221
EtOH
LAS
R.W.
1 wk
6 ul
Solvent
injection
≥2


EC/Gr
12-17-68
Figure III
Aroclor 1254
Aroclor 1260
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260
Aroclor 1262
Aroclor 1268
Aroclor 1221
Aroclor 1232
Aroclor 1016