

ETHYL CORPORATION

INTER-OFFICE CORRESPONDENCE

TO	Mr. W. G. Lovell	ADDRESS	Detroit
FROM	E. B. Rifkin	ADDRESS	Detroit
SUBJECT	Estimate of the effort required to obtain data on the public health aspects of the 4th ml of TEL	DATE	January 29, 1954

In this memorandum we discuss the program on the 4th ml of TEL as suggested in Dr. Kehoe's letter of January 23.

Dr. Kehoe envisions 3 essential phases in the work required to make possible a satisfactory understanding of the public health problems involved in the use of concentrations of TEL in gasoline higher than 3 ml per gallon:

A. A survey of the distribution of automobiles, gasoline consumption, and TEL utilization by cities in the U.S., including, if possible, enough information or speculation to establish trends for these factors. This information could probably be readily obtained by Sales Department or Technical Service personnel in about one man-month.

B. An experimental study, in a number of vehicles in various states of maintenance and in various types of road operation, of the amount, chemical nature, and physical state of the lead compounds discharged into the atmosphere, with particular emphasis on the smaller particles likely to remain airborne. This study would have to be carried out with fuels near the 3 ml TEL level and also at higher levels in order to establish the extent to which hazardous materials are being exhausted into the atmosphere at present, and to estimate what the effect of increasing the lead level would be. Because Dr. Kehoe implies that he would require a good deal of this type of information before he could actually progress very far with his own investigations (see paragraph C, below) we would suggest that this work be planned to be essentially complete within 1 year. We envision the equipment required for this as follows: multicylinder engines on one dynamometer (to investigate the effects of exhaust system surface and temperature and also to test new techniques), 2 road vehicles (to obtain the bulk of the data), availability of other vehicles from time to time for periods of about 1 day (to show, hopefully, that vehicle make is not a very important variable), and apparatus for collection of the total solids exhausted by a vehicle on the road (part of this equipment is already on order). Largely because the size-distribution analysis of the solids to be collected is a tedious undertaking, we would estimate that 10 men (of whom 4 or 5 would be technicians) would be required to obtain the necessary data in 1 year. (This would include analytical time). Allowing \$10,000 for equipment costs, (including precipitators, power supplies, auxiliary controls, and trailer) we would guess that this program could be accomplished with an expenditure of about \$210,000.

C. Surveys and experimentation to be carried out by the Medical Department in the Kettering Laboratory and in the field as follows:

1. Survey of lead in the atmosphere and in human beings, to be carried out in Los Angeles and elsewhere, the exact locations to be specified after further surveys.

2. Review of old data on air pollution by lead compounds and case histories of lead poisoning related to the distribution, use, and ultimate fate of leaded gasolines.

3. Experimental work to determine the maximum non-hazardous level of exposure to, and absorption of, lead compounds, particularly those compounds and those sizes of particles which are exhausted from vehicles. Dr. Kehoe recommends a stepping-up of the present program, and implies a possibility that the work could be completed within two years.

D. Other work, mentioned by Dr. Kehoe, but not regarded by him or by us as definitely necessary or as requiring further study, as follows:

1. Study of the effects on lead concentration in the air caused by handling of gasoline containing higher than 3 ml TEL per gallon. This is thought by us to be a fairly-well understood problem not needing further study. Our conclusions on this matter have been compiled by Mr. Hirschler in RM-104.

2. Occupational hazards, in addition to the above, caused primarily in the manufacture of TEL. Dr. Kehoe regards this as a secondary problem, as do we.

3. A survey of the potential hazard to the public health due to lead compounds from sources other than TEL or its combustion products. If required, this would apparently be in the province of the Medical Department.

We would sum up the cost of the proposed program, including Dr. Kehoe's estimates of the work to be carried out by the Medical Department, as follows, following the outline form use above:

Project	Cost		
	<u>1954</u>	<u>1955</u>	<u>Total</u>
A (Gasoline and TEL consumption survey ---Detroit)	2,000	-	
B (Exhaust product study ---Detroit)	190,000	20,000	
C (Medical Study ---Kettering Laboratory)	120,000	160,000	
Total	312,000	180,000	<u>492,000</u>

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