



## SHELL CHEMICAL COMPANY

A DIVISION OF SHELL OIL COMPANY

P. O. BOX 2633  
DEER PARK, TEXAS

April 23, 1964

The Director  
Division of Licensing and Regulation  
United States Atomic Energy Commission  
Washington 25, D.C.

Dear Sir:

We are interested in using license exempt quantities of carbon-14 labeled carbon dioxide as a tracer in one of our chemical manufacturing plants and are uncertain as to the procedural protocol involved. Specifically, we wish to measure by isotopic dilution techniques the rate of by-product carbon dioxide formation during manufacture of acrolein at our Norco, Louisiana plant. The estimated rate of carbon dioxide production is 3000 pounds per hour. The entire amount of carbon dioxide is formed from petroleum derived dead carbon and is wasted by continuous venting to the atmosphere.

In our proposed tracer application we would limit the total amount of carbon-14 used during any one hour to 500-microcuries, which when diluted by the estimated hourly production of non-radioactive carbon dioxide would give a carbon-14 concentration of  $7.4 \times 10^{-7} \mu\text{C/ml}$  at the point of discharge. This concentration is less than the tolerable concentration of  $1 \times 10^{-6} \mu\text{C/ml}$  presented by the AEC Regulations in Table II, Appendix B of Part 20. We expect to make no more than one or two separate 500-microcurie injections of radioactive carbon dioxide into the plant.

We would appreciate receiving authorization to conduct this work. We currently have a state of Texas broad type by-product materials license for research and development, No. 4-274. Previously, we had a similar AEC license, No. 42-1501-2. If you require further information, please let us know.

Sincerely,

L. H. Griffin, Research and  
Development Laboratory  
Industrial Chemicals Division

LHG:sfp

cc - Mr. Ralph G. Griffin, P.E., Supervisor  
Licensing and Regulation  
Radiation Control Program  
Texas State Department of Health