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December 8, 1975

William B. Papageorge
Monsanto Industrial Chemicals
Company
800 N. Lindbergh Blvd.
St. Louis, Missouri 63166

Dear Bill:

There are two areas that I wish to bring to your attention which are of some significance to Monsanto. First, with respect to PCB's I have previously informed you that I have various contracts with the US Army Corps of Engineers to look at the significance of chemical contaminants in sediment. Currently I am funded at the rate of about $350,000 per year to take samples from various waterways across the country in an attempt to evaluate the significance of contaminants in sediments as related to dredging and dredged material disposal. One of the contaminants of concern is PCB's. As noted, we will soon have a report coming out published by the Corps of Engineers which will show for what are considered relatively clean sediments of the Galveston Entrance Channel, for the Gulf of Mexico taken some five miles into the Gulf, the PCB content of the sediments is readily measurable and most importantly the PCB's are released to some extent upon shaking the sediments with the overlying water. This means that there would be a tendency for release of these sediments in association with dredging operations. We have not found this on more classically categorized contaminated samples and it appears that it is related to the oil and grease content of the sediments with the highest oil and grease content tending to keep the PCB's associated with the sediment particles.

We have done some full scale studies at Galveston in which the Corps of Engineers used one of their 300 foot dredges to dredge the Entrance Channel and dispose of the material in a normal manner in the open Gulf of Mexico. We have taken samples of this material in the

water column at the time of disposal in order to determine the PCB content. Thus far, we have not completed the analyses of these samples. This is the real test, not whether there is a tendency for release, but the actual magnitude of release associated with normal dredging. I will be surprised if we can find any measurable PCB's above background under these conditions. However, we will have to wait until we see what is the actual situation during the disposal operation.

I bring this to your attention because we are now going to do two additional studies on PCB's in sediments. One of these is the Duwamish River near Seattle, Washington. Evidently the US Army Corps of Engineers had a load of PCB's in a barge which sunk some time ago and has contaminated the sediments for a large area. The Corps is going to dredge these sediments and transport them to deeper water for disposal. The disposal is supposed to be in about 200 feet of water in Puget Sound. I have been asked to assist the Corps in evaluating the release of PCB's during the dredging operation. We probably will be working in that region shortly after the first of the year on this project.

Recently I was in Wausau, Wisconsin, and saw a newspaper clipping, a copy of which is enclosed, concerning PCB's in the upper Mississippi River which indicates that dredging of the sediments may result in PCB release. I am attempting to obtain a copy of this report and also I have contacted several of my colleagues within the State of Wisconsin and within the Corps to see if this is an area where we should also do some studies on PCB release from sediments.

I am still interested in working with Monsanto in any of these areas where they are encountering potential problems with PCB's. I know that this has become a very hot issue on a national scale and I am reasonably certain that it is just a relatively short time before PCB's are banned. Several of my colleagues, both in industry and in the federal government, feel that the PCB situation that had developed recently on the Hudson River as well as the Mississippi and some other locations may be the impetus to pass the toxic substances act requiring prescreening of all new chemicals. This is another area that is of interest to me. I have continued to work with several other firms in getting the passage of this act. I would be interested in exploring the possibility of doing work either on a consulting or university basis with Monsanto in this area as well.

The final point that I wish to raise with you is that in connection with our Galveston studies, we have been taking samples of sediments in the Texas City Channel. This channel has several industries located on it, one of the largest of which is one of the Monsanto plants. I bring this to your attention since recently the sediment that we obtained from in front of the Monsanto plant in the ship channel contained the highest concentrations of ammonia nitrogen that we have seen at any location around the country. Typically, we get 20 to 30 mg/l ammonia nitrogen in sediments. For these sediments we got well over 100 mg/l-N. Ultimately, when our data is published I am sure the state and federal EPA will be looking to Mosanto as the potential source of this material. Based on my experience in the field there is presumptive evidence that this is the case. There are apparently substantial discharges of materials in that region which are contaminating the sediments very badly with ammonia. The significance of the ammonia stems from the fact that of all the contaminants in sediments, ammonia is the only one that we have found thus far which could be released during dredged material disposal in sufficient concentrations to be toxic to aquatic life. This toxicity would be in the form of acute toxicity where organisms would be killed in a short time after exposure during the dredged material disposal operation.

Please call me to answer any questions you may have about any of the above comments.

Sincerely yours,

G. Fred Lee

G. Fred Lee, PhD
President

GFL/lgl

Enclosure