

Questions to which Jackie Gaul will respond

1. Has Monsanto Company operated a plant at Texas City, Texas from 1951 to the present?

   Response: Yes.

2. Did Monsanto Company do air monitoring in its styrene monomer facility at the Texas City plant to determine whether or not workers were exposed to benzene in the air?

   Response: Yes.

3. If your answer to the preceding question is affirmative, please state by year the average eight hour time weighted exposures to benzene for all workers monitored for benzene exposure in the styrene monomer unit at the Texas City plant.

   Response: Please see attached chart.

4. If your answer to question no. 2 is affirmative, please state by year the average eight hour time weighted exposures to benzene for pipefitters monitored for benzene exposure in the styrene monomer unit at the Texas City plant.

   Response: Please see attached chart.

5. Did Monsanto Company do air monitoring at its barge unloading docks at the Texas City plant to determine whether or not workers there were exposed to benzene in the air?

   Response: Yes.

6. If your answer to the preceding question is affirmative, please state by year the average eight hour time weighted exposures to benzene for all workers monitored for benzene exposure at the barge unloading docks at the Texas City plant.

   Response: Please see attached chart.

7. If your answer to question No. 5 is affirmative, please state by year the average eight hour time weighted exposure to benzene for pipefitters monitored for benzene exposure at the barge unloading docks at the Texas City plant.

Response: Please see attached chart.

8. Did Monsanto Company prepare from time to time manuals of safe practices or safety guides which it distributed to workes, including pipefitters, at its Texas City plant.

Response: Yes.

9. Can you identify Exhibit "A" attached hereto?

Response: Yes. It appears to be an old copy of the "Manual of Safe Practices" which was distributed within Monsanto at Texas City. This appears to be published between the years 1942 and 1955.

10. Was Exhibit A distributed to pipefitter employees of Monsanto Company at its Texas City, Texas plant?

Response: Yes.

11. During what period of time was Exhibit A distributed to pipefitter employees of Monsanto Company at Texas City, Texas.

Response: On the basis of Mr. Eckert's signature on the preface, it would have been distributed sometime during the period of 1942 to 1955.

12. In the late 1940's and early 1950's, was benzene sometimes referred to by the name "Benzol"?

Response: Benzol would likely have been used as a synonym for benzene in the late 1940's and early 1950's.

13. Did Monsanto Company warn its workers at its Texas City, Texas plant, including pipefitters, who worked there from 1943 to 1955 that:

The handling of Benzol or other coal tar products presents additional hazards to those of the ordinary petroleum hydrocarbons. In addition to vapor inhalation, there is a danger of their being absorbed by skin contact. Care should be taken to avoid skin contact and in such cases the material should be immediately washed off with soap and water. Extra precautions as set out by the Supervisor must be followed when gauging or sampling these products. Before entering any closed area where these products have been stored, proper tests must be made to make certain they are safe to enter.

Response: Yes. See Page 35, Paragraph 107 of Exhibit "A".

14. Can you identify Exhibit B?

Response: Exhibit B is a later version of the "Manual of Safe Practices".

15. Was Exhibit B distributed to pipefitter employees of Monsanto Company at its Texas City, Texas plant?

Response: Yes.

16. During what period of time was Exhibit B distributed to pipefitter employees of Monsanto Company at its Texas City, Texas plant?

Response: On the basis of Mr. Putnam's signature on the manual, it would have been distributed during the period of 1955 to 1960.

17. Did Monsanto Company warn its workers at Texas City, Texas, including pipefitters, from 1955 to 1960:

The handling of benzene or other coal tar products presents additional hazards to those of the ordinary petroleum hydrocarbons. In addition to vapor inhalation, there is a danger of their being absorbed by skin contact. Care should be taken to avoid skin contact and in such cases the material should be immediately washed off with soap and water. Extra precautions as set out by the

supervisor must be followed when gauging or sampling these products. Before entering any closed area where these products have been stored, proper tests must be made to make certain the area is safe to enter.

Response: Yes. See Page 24, Paragraph 6 of Exhibit B.

18. In Exhibit B, did Monsanto Company include a "Table of Chemical Hazards" for its workers?

Response: Yes. See Pages 25, 26 and 27.

19. If so, how did Monsanto Company rate or describe the hazard of benzene exposure to its workers, including pipefitters?

Response: It was described as a systemic toxicant which might cause serious injury if one was exposed to a small quantity on a continous basis. This information is presented in a tabular form with the associated hazard rating from 1 to 4, one (1) being the most hazardous. Both the definition of a systemic toxicant and the explanation of a hazard rating is given in the table.

20. Can you identify Exhibit C?

Response: Yes. It is a portion of a manual entitled "Toxicity, Hazards and handling Precautions Associated with Chemicals Handled in the Texas City Plant".

21. Was Exhibit C prepared by Monsanto Company or its employees?

Response: Yes. It was prepared by John Fox, who was the plant Industrial Hygienist.

22. When was Exhibit C distributed to various persons at the Monsanto Company, Texas City, Texas plant?

Response: Yes. The distribution list is on Page iii of Exhibit C.

23. Was a copy sent to the superintendent of pipefitters?

Response: Yes. Copies 9 through 15 were sent to maintenance superintendents throughout the plant.

24. Was a copy of Exhibit C sent to the supervisor of each manufacturing department?

Response: Yes. Copies 26 through 42 were sent to manufacturing supervisors throughout the plant.

25. In 1969, did Monsanto Company warn its own employees through their supervisors and superintendents by distribution of Exhibit C that

Repeated exposure to benzene concentrations above 25 parts per million over a prolonged period may cause bone marrow damage and reduce the blood forming function. Many serious illnesses and fatalities have occurred in association with chronic exposure to benzene. Symptoms may occasionally occur after exposure has ceased. It is not recommended that exposures to 100 parts per million or more be practiced or condoned for even brief periods without the use of respiratory protection.

Response: Yes. That warning is provided in Exhibit C, Benzene Section, Part B, Subpart 1 entitled Inhalation, Paragraphs 1 and 2.

26. In Exhibit C, did Monsanto Company in 1969 warn its employees that chemical gloves should be worn to avoid skin contact?

Response: Yes. In Exhibit C, Benzene Section, Part B, Subpart 2, entitled Skin Contact.

27. In 1969, through Exhibit C, did Monsanto Company warn its employees that "clothing contaminated with benzene should be removed and the skin washed with soap and water" and also "in cases of chronic exposure, immediate removal of the employee from further exposure is essential.

Response: Yes. In Exhibit C, Benzene Section, Part C, Paragraph 2.

28. What was the title of John E. Fox of Monsanto Company at the Texas City, Texas plant in 1969?

Response: In 1969 his title was Safety Engineer II.

29. Prior to the commencement of Monsanto Company's air monitoring program for benzene at the Texas City, Texas plant, did Monsanto Company perform any biological monitoring of its workers at its Texas City, Texas plant to determine whether or not they had been exposed to benzene in the course of their employment at that plant and at what level?

Response: Yes.

30. If such biological monitoring for benzene exposure occurred, please state the name of the program or nature of the monitoring.

Response: Urinary Phenol.

31. Please explain when and why such biological testing or monitoring for benzene exposure was done at the Monsanto Company Texas City, Texas plant so that the jury will understand what was done and why it was done.

Response: The examination of the urine for phenol is done preferably 2 to 4 hours after suspected exposure to benzene. Benzene is metabolized to phenol conjugates and excreted in the urine. The reason for the time range rather than a specific time is because the rate of benzene metabolism is both dose related and a function of the metabolic processes of the individual.

Phenol is a normal constituent in human urine. When a worker is exposed to benzene, his urinary phenol will increase as benzene is metabolized to phenol and excreted in the urine. Work related benzene exposure is not the only thing which will cause elevated urine phenol levels. Medications such as Darvon, Oranate and phenol-containing drugs such as fungicides can cause elevated urinary phenol levels. Additionally, off the job

exposure to gasoline, kerosene, some solvents and some paints can have the same effect.

The procedure followed in the studies done in 1975 was to have each worker electing to participate in the study to give urine samples at the beginning and end of each shift for five consecutive days. After collection, the samples were analyzed for phenol content in Industrial Hygiene lab.

A control group was also selected and was comprised of 15-20 plant workers having no benzene exposure and who were not taking any medications which might affect their urinary phenol levels.

In cases other than the aforementioned, study in which benzene exposure was suspected, the workers were asked to give a urine sample in the Medical Dept. 2-4 hours after the suspected exposure. The same analytical procedure was used to determine urinary phenol levels.

32. With regard to the biological monitoring that you have described for benzene exposure, please state whether or not it was generally established and accepted that a biological finding could be equated to exposure to benzene at some level in the near past before the sampling or monitoring was performed.

Response: Various studies have been reported in the professional literature which establish the acceptance by the profesions that phenol in the urine can be equated quantatively to benzene exposure but not necessarily qualitatively to benzene exposure. That is to say, a given exposure to benzene will result in a proportional rise in urine phenol. However, the reverse may not be said because many other things can also cause an elevated urine phenol. See answer to question 31.

33. Based upon generally accepted industrial hygiene practices, what biological monitoring level, as found in these tests, would be the equivalent of no exposure to benzene for the person tested.

Response: According to generally accepted industrial hygiene practices, a urinary phenol level of 15 mg/l or less would be the equivalent of no benzene exposure.

34. Based upon generally accepted industrial hygiene practices, what biological monitoring level, as found in these tests, would be the equivalent of an exposure of 10 parts per million eight hour time weighted average of benzene in the air for the person tested.

Response: Upon the basis of generally accepted industrial hygiene practices and studies reported in the NIOSh Criteria Document for Occupational Exposure to benzene (1974), the National Institute for Occupational Safety and Health has recommended a level of 75 mg/l of phenol in urine be equated to a time weighted average of 10 ppm of benzene in the air.

35. If you have answered question No. 29 in the affirmative, please state the date of the pre-air sampling when Monsanto Company did such biological monitoring of any or all of its employees at the Texas City, Texas plant to determine whether or not they had been exposed to benzene and the results of those tests.

Response: The biological monitoring study was done in September and October of 1975. Several other samples have been done on suspected benzene exposures since then.

36. Were any pipefitters tested in the biological monitoring program you have described in response to the preceding question to see whether or not they had been exposed in their work at the Texas City plant to benzene in the atmosphere?

Response: Yes, many pipefitters were tested for urinary phenol.

37. If so, what was the result of the biological monitoring of pipefitters to determine whether or not they had been exposed to benzene and in what year was tht test work performed?

Response: The result of the biological monitoring done at the Texas City plant on pipefitters indicates that they did not have exposures to benzene in excess of 10 ppm 8 hour TWA. The main study was done in 1975 and we have data as recent as 1983.

38. Does the biological monitoring work done by Monsanto Company at its Texas City, Texas plant which you have described in response to the preceding questions indicate that pipefitters at that plant were exposed in the course of their work to benzene in the work place environment in excess of 10 parts per million over an eight hour time weighted average?

Response: It does not.