

MEMORANDUM

TO: The File
FROM: Barbara West
DATE: February 11, 1987
RE: Summary of the Deposition of W. B. Papageorge
Taken on June 25, 1987

<u>Page</u>	<u>Topic</u>	<u>Description</u>
2		Appearances
3 - 3A		Exhibits

EXAMINATION BY MR. KARAGANIS:

4	Monsanto Person	Mr. Papageorge is designated as the Monsanto corporate representative most likely to have knowledge regarding all the categories listed in Notice 30(b)6.
5	Name/Address	William B. Papageorge, 321 Pebble Valley Drive, St. Louis County, Missouri 63141.
6	Employment	He is employed by Monsanto Company, 800 North Lindbergh Boulevard, Louis, Missouri 63167.
6	Birth/Education	He was born September 7, 1922. In 1943 he received a B.Sc. Degree in chemical engineering from Washington University, St. Louis, and in 1947 a Master of Science degree in chemical engineering from Washington University. He has also taken postgraduate courses in chemical engineering at Oklahoma State University, Stillwater, Oklahoma.
7	Monsanto Employ	He began work for Monsanto in 1951.
7	Prior Employ	He was employed by Phillips Petroleum Company, Bartlesville, Oklahoma from 1947 to 1951, first as a research engineer in secondary recovery of spent oil wells and drilling mud. He then became a design engineer involved in designing equipment used in processing petroleum products.

- 8 **Monsanto History** Initially he was employed at John F. Queeny Plant, St. Louis, Missouri, as a design engineer of chemical processing. After 2 years, he was made a supervisor in chemical producing units. After 3 years he became a maintenance supervisor responsible for construction and maintenance of the entire plant. After 2-3 years he was made a superintendent in the plant engineering department or plant technical services department. In 1960 or '61 he was assigned as a general superintendent of services support functions, including steam generation and distribution, trash pick up, shipping and receiving, until 1964.
- 10 **Sauget, Ill.** In 1964 he was assigned as general superintendent of manufacturing in the Sauget plant.
- 10 **Anniston, Ala.** In 1965, he was assigned as plant manager in the Anniston plant.
- 10 **St. Louis, Mo.** In 1970, he returned to St. Louis as manager environmental control assigned to the pcb issue. In 1971, the title changed to manager environmental protection with no job change. He began receiving assignments for products other than pcb's and in 1973, the title again changed to manager of product acceptability, covering a variety of products, which he retained until 1977 when his involvement with pcb's terminated. He was then made director environmental operations for the Monsanto Chemical Intermediates Company, an operating unit. In 1983 he retained the title but with a new operating unit, Monsanto Industrial Chemicals Company.
- 11 **Current Title** On January 1, 1986, following another reorganization, he was made manager of occupational health for Monsanto Chemical Company, the chemical operating unit within the Monsanto Company, a position he still holds.
- 12 **Organization** Monsanto Company is the controlling entity. Within that entity, the operating units or divisions have

evolved into companies. Currently there is the chemical company unit and the agricultural products unit. In addition, there are subsidiaries such as Fisher Control Company, Farmers Hybred Company, Monsanto Research Corporation and the recently acquired Searle Company.

- 13 His Function He has always worked for a Monsanto operating unit and it was the operating units that dealt with pcb manufacture, disposal and management as opposed to the subsidiaries.
- 14 Operating Units 1951/Mid-50's In addition to the chemical company unit and agricultrual products unit, at one time there was the plastics division, the phosphate division, the organic chemicals division, the Texas division and West Coast division.
- 15 Products Div. The products division had overall responsibility for planning, purchasing, marketing, advertising, profit responsibilities.
- 15 Texas Div. They were a manufacturing-oriented group responsible to the products division.
- 15 West Coast Div. They were primarily a marketing service to the product divisions.
- 16 Geographic Div. A more accurate description is that the Texas Division and the West Coast Division provided services to the product divisions at their request and reported to the senior officials of the company.
- 17 1951/Mid-50's In the early fifties, there was a vice president for each different function; such as a vice president of marketing, of engineering; of manufacturing. General managers headed the different divisions. He believes the general managers were assigned to one of the vice presidents but doesn't recall which division was assigned to which vice president.
- 18 PCB The pcb's were in the phosphate division since they were originally

manufactured in Anniston, Alabama, the phosphate division headquarters at that time. The other Monsanto pcb unit in Sauget, Illinois, was a plant managed by the organic chemicals division but the product itself was managed by the phosphate division. Sauget began pcb manufacturing in 1934, 1935.

- 19 Mid-50's Change The organization changed to consist of the organic chemicals division, the inorganic chemicals division, plastics division. Monsanto also acquired the Lyon Oil Company which was operated as a subsidiary. The same structure with each division general manager reporting to a functional vice president was still in existence under the change.
- 20 Medical Dept. Prior to the organization change, matters that pertained to environment and health were handled by the corporate medical department. It dates back to the 1930's and was located in the St. Louis world headquarters. Originally considered a personnel function, in the 1950's it reported to the vice president of technology.
- 21 1951/Mid-50's The medical department consisted of Dr. R. Emmett Kelly, the director who was an M.D.; J.R. Garrett an industrial hygiene manager; Elmer P. Wheeler, an environmental health manager and nurses. Dr. Kelly was the only medical doctor in the department.
- 22 PCB's In the mid-fifties, pcb's were manufactured and distributed by the organic chemicals division which had been the phosphate division.
- 23 General Mgr. Robert Morris was general manager of the organic chemical division in the mid-fifties to 1971. He doesn't recall to whom he reported nor does he remember the names of the plant managers prior to the early fifties.
- 24 Anniston Mgr. Beginning in the mid-fifties, Desmond Hosmer was the plant manager at Anniston.

- 24 Sauget Mgr. Joseph Cresce was the plant manager at Sauget.
- 24 PCB Waste In the early fifties, the supervisor of the operating unit, his superintendent and the plant manager were responsible for pcb emission control and waste disposal. They were not handled any differently than all other chemicals.
- 25 Health Notes The medical department was responsible for any health messages applied to labels or to product literature that was issued.
- 25 1971 Reorganize About 1971 they reorganized and referred to the units or divisions as companies: Monsanto Industrial Chemicals Company, Monsanto Agricultural Chemicals Company, Monsanto Polymers(Plastics) and Resins Company and Monsanto Textiles Company.
- 26 PCB The pcb's became part of the industrial chemicals company.
- 26 Corporate Title Those heading the individual companies had the dual title of vice president and managing director.
- 26 Ind. Chem. V.P. C. Preston Cunningham was vice president and managing director of pcb manufacture and distribution after 1971. He reported to Edward Bok, Monsanto President and CEO. Prior to 1971, the CEO was Charles Sommers.
- 28 Robert Morris Mr. Morris was ultimately but not personally and directly responsible for the marketing and distribution of pcb.
- 29 PCB Mfg. Dir. Howard Minckler was manufacturing director of all chemicals, including pcb's, assigned to the organic chemicals division. Mr. Hosmer of Anniston and Mr. Cresce of Sauget reported directly to him.
- 29 Marketing PCB Monte Throdahl from the fifties to 1971 was director of marketing for pcb's and director of research within the organic chemical division. He reported to Mr. Morris.

- 30 Medical From the fifties to 1971, Dr. Kelly, the medical director, Mr. Garrett and Mr. Wheeler had responsibility for medical effects re pcb's. In 1965, William Hunt, a toxicologist was added to the staff.
- 32 PCB Disposal From the mid-50's to the late 60's, the disposal of pcb's was not perceived to require particular attention other than that given other industrial chemicals. There were no specific instructions for disposal of pcb's given during that time, nothing in writing.
- 32 Chemical Dump There was an understanding among chemical industry people that chemicals were not dumped anywhere, that they were to be careful of them. That was the message generally conveyed. It was the same with pcb's as with sulfuric acid, battery acid. It wasn't poured down the sewer.
- 34 PCB/Landfills The understanding was it should be put in a landfull permitted by local authorities at that time but the state of the art didn't specify what the engineering or geologic characteristics of the landfill should be.
- 34 Gravel Pit Gravel pits would not be used to dispose of industrial chemicals. Most gravel pits have fractures and breaks where water could percolate through them, reach the chemicals and move them. That is also true of landfills with sink holes.
- 35 Disposal Info Information about proper disposal was not communicated to customers by Monsanto. Discussions of that kind in the 50's were most unusual.
- 36 Disposal Info Starting around 1969, Monsanto marketing representatives began talking to customers about disposal and better control.
- 37 Environs Samples In the mid to late 60's, Monsanto began receiving info that pcb's were being discovered in environmental samples. They started sending out the message to their customers that while the effect

of pcb's on the environment was unknown, all should prevent their discharge into the environment.

- 38 Check Customers Prior to the late 60's, Monsanto did not check the disposal practices of their customers.
- 38 Reprocess PCB Prior to the late 60's, the only reprocessing he knows of was done on a shipment rejected by the customer which didn't meet specifications. That is the only program he knows of regarding return of pcb's to Monsanto.
- 40 Dr. Levinskis Dr. Levinskis didn't join Monsanto until 1971. He can't recall the name of the other medical doctor assisting Dr. Kelly with human medical problems or issues.
- 40 Paul Benignus Mr. Benignus was manager of marketing for pcb's. Mr. Throdahl was director of marketing in the 50's. Mr. Benignus had been involved with pcb's from the beginning through 1971 but did not become manager until the late 50's, early 60's.
- 42 PCB Control The people involved with pcb contamination and control in the late 60's were those in the medical department; Paul Benignus; Randall Graham, the field representative and James Bryant.
- 42 James Bryant Mr. Bryant was technical specialist for dielectric fluids in the late 60's, early 70's. He reported to Mr. Benignus in marketing.
- 43 PCB Uses In addition to the dielectric application, there was also a plasticizer application for pcb's.
- 43 PCB/Plasticizer Walter Schalk was director of marketing for plasticizer applications and under him was Cumming Paton, chemist doctor.
- 44 PCB/Hydraulic They had a hydraulic fluids application and in the late 60's, the manager of marketing for that application was Norman Johnson.

- 44 PCB/Heat Trans For pcb's, they also had a heat transfer application. The name of the marketing manager was Jack Fallon.
- 44 Others Involved Others involved in pcb release control were Roger Hatton, associated with hydraulic fluids, and Don Rausch, associated with heat transfer, who were part of the marketing, customer service, technical service team. He, himself, became involved in 1970-71.
- 45 Decision Making Howard Bergen was director of the business group responsible for functional fluids which included dielectric, hydraulic and heat transfer fluids.
- 47 Business Groups Sometime in the early 60's the organic chemicals division was organized into business groups, each managed by a director who reported to the general manager of the organic chemicals. Within each business were individuals assigned different functions: marketing, manufacturing, research, planning, distribution.
- 47 Function Fluid One of the business groups was called functional fluids, Howard Bergen was its director, responsible for both manufacturing and marketing of pcb's. Mr. Bergen reported directly to Robert Morris until Mr. Morris left in 1965. Then he reported to Mr. Minckler.
- 49 Reorganize 1971 Instead of one manufacturing director for the whole division, each business group had its own manufacturing director.
- 49 Function Fluids In 1971, Howard Bergen was business director of functional fluids, Don Olson was director of marketing but was replaced by Thomas Gossage in the late 70's.
- 50 Director Mfg. Initially it was William Kuhn, followed by James Savage.
- 50 Research The director of research for functional fluids was Dr. William Richard.

- 50 Report Channel Mr. Benignus of dielectric; Mr. Johnson of hydraulic fluids; Mr. Fallon of heat transfer fluids: all reported to Don Olson, Director of Marketing, Functional Fluids.
- 51 Kuhn/Savage Although they were directors of manufacturing before 1971, they had no staffs. The business groups at that time did not have plants assigned to them.
- 51 Plant Reports The plants reported to Mr. Minckler.
- 52 Business Groups The business groups had marketing, research, plus marketing and manufacturing technology responsibility.
- 52 Late 60's In the dielectric fluids, Benignus was manager of marketing. Working for him was Bryant and Graham. Benignus reported to Olson, later to Gossage. They, in turn, reported to Howard Bergen who reported to Minckler who reported to Mr. Bok, the president.
- 54 Mid 50's-1971 There were discussions between customers' representatives and Monsanto research people that could have involved discussions regarding disposal and handling of pcb's.
- 54 Research For dielectric fluids, the research people reported specifically to one key person: Dr. Ralph Munch who was in contact with Monsanto customers' technical people as well as to Dr. William Richard.
- 55 PCB Research Those involved in chemical analysis of pcb's in wastewaters and soil were Dr. Robert Keller and reporting to him was Dr. E. Scott Tucker. Their group was independent of Dr. Richard's.
- 56 Research For the plasticizer group, the director of research was Dr. Martin Farrar. He can't remember names of other members of this team. The plasticizers is a totally different business group under organic chemicals. Transfer fluids was part of functional fluids, also part of organic chemicals, and came under Dr. Richards as di d dielectric. No other

- business group was involved in the manufacture and sale of pcb's.
- 58 Plasticizers The head of the plasticizer group was James E. Springate. The head of marketing within the group was Walter Schalk, assisted by Dr. Cumming Paton.
- 58 Manufacturing In the functional fluids group, Kuhn and Savage headed manufacturing. He doesn't recall who was in charge of manufacturing in the plasticizer group; Richard and Munch headed research; Benignus, Johnson and Fallon reported to Olson or Gossage in marketing for their respective groups.
- 59 1971 The president and CEO was Edward Bok. The pcb activities were within Monsanto Industrial Chemicals.
- 61 Cunningham The vice president for Industrial Chemicals was C. Preston Cunningham.
- 61 Fitzgerald F. J. Fitzgerald was general manager of functional fluids and specialty chemicals.
- 61 Corey Under Fitzgerald was Wendell Corey but he can't remember his title.
- 61 Bergen Under Corey was Howard Bergen, director of manufacturing and marketing, functional fluids group. This group was not reorganized.
- 62 1973 The 1971 reorganization lasted until 1973 at which time the functional fluids and specialty chemical business groups were combined.
- 62 Specialty Chem. Previously, there were two separate groups with the specialty chemicals group managing such chemicals as water treating, paper and fire fighting chemicals, but nothing to do with pcb.
- 63 PCB Mr. Bergen continued to be responsible for pcb's. However, Mr. Graham left Monsanto about 1972 and Mr. Bryant replaced him to a great degree.
- 64 Post 1973 Somewhere between 1973 and 1976 there was another restructuring of the

business groups. The functional fluids group was not basically restructured, but some of the individuals, such as Mr. Fallon and Mr. Johnson, were reassigned. Bryant and Benignus remained involved.

- 64 Plasticizers The plasticizer group ceased being involved with pcb's in 1971.
- 65 1976 Another reorganization took place in 1976. There was still a Monsanto Industrial Chemicals Company, a Monsanto Textiles Company and a Monsanto Agricultural Chemicals Company. There was also a new unit called Monsanto Chemical Intermediates Company and a new Monsanto Plastics and Polymers Company.
- 66 1976/PCB The pcb's were still within the Monsanto Industrial Chemical Company, now in the specialty chemicals business group. He can't recall who was in charge of this group.
- 66 PCB Robert Potter replaced Corey and was now responsible for pcb's.
- 67 Retirements Bergen left about 1974 but he doesn't recall who replaced him in charge of functional fluids. Gossage remained head through 1975 but he can't recall who replaced him. Benignus retired in 1974 and David Wood replaced him in Dielectrics. There was no one under Wood because business had shrunk considerably. Bryant left Monsanto about 1975.
- 68 His Supervisors When he came aboard in 1970 as manager of environmental control, he reported to Mr. Bergen through 1973. He then reported to Mr. Corey. After Mr. Corey, he reported to Mr. Potter regarding pcb's. After all the reorganizations, he reported to Dr. Lee Miller.
- 69 Dr. Lee Miller Dr. Miller was the business director of the process chemicals business group.
- 69 PCB Contact He retained his pcb contact until 1976 although he was now reporting to a

- business group having nothing to do with pcb's.
- 70 Assignment He got out of pcb's in 1976 because he told Potter he wanted a change. He had been on pcb's for 7 years and was intellectually fatigued.
- 70 J. C. Webber Mr. Webber took over the pcb assignment in 1976, held it 2 years and then pcb control was turned over to David Wood in 1978.
- 71 Dr. Craddock About 1980, pcb control was assigned, and is today, to Dr. John Craddock.
- 71 Report Line Mr. Webber reported to Mr. Potter, Mr. Wood reported to some individual, whom he doesn't remember, in specialty chemicals.
- 72 Organization Charts Organizational Charts are produced for the relevant periods.
- 74 Monsanto He assumed his responsibilities for environmental control for pcb's at Monsanto, St. Louis, on January 1, 1970 and continued to sometime in 1976.
- 75 Customers He was not in charge of Monsanto customers' activities regarding pcb's. His assignment was advisory. He is not aware of anybody at Monsanto being responsible for their customers' behavior. They were responsible for communicating.
- 75 Return PCB's They began a program for taking back spent or other pcb materials other than those not meeting specifications.
- 76 Responsibility The ultimate responsibility for the program would be the business director's, Mr. Bergen.
- 76 Involved Dr. Richard; Elmer Wheeler; he, himself; Ed John, Public Relations; depending on the time, either Mr. Olson, Mr. Gossage or Mr. Savage, and the attorney, Mr. Phocian Park with the Monsanto corporate counsel's office. Mr. Minckler would be informed of the consensus opinion of the group and would approve the action. The group

- would advise Mr. Bergen what action to take and he would have his marketing staff having primary customer contact implement the plan.
- 78 Scrap Materials other than pcb's that failed to meet customer specifications, he thinks they called scrap pcb's or scrap askarel, scrap Aroclor. Scrap Aroclor would be Aroclor that prior to 1970 had not been returned to Monsanto. He has no idea how it was being disposed of.
- 78 Speculation He doesn't know where the scrap Aroclor was disposed of prior to 1970. He can only speculate that some of it could have gone down sewer systems, some was buried in chemical landfills, some in sanitary landfills. Some was probably sold into the used oil market by dealers.
- 79 Group Advice It would be fair to say that in 1970 the group described advised Monsanto corporate leadership that it was not sound environmental practice to dispose of scrap Aroclor in sewers and landfills and that it should be returned to Monsanto for destruction.
- 79 PCB Destruction The approval to construct the destruction device was given by the corporate management committee consisting of the chief executive officer, Mr. Bok, and his staff of vice presidents, Mr. Throdahl, Mr. Gilles and Mr. Bible.
- 80 Mr. Gilles Mr. Gilles was vice president of marketing.
- 80 Monte Throdahl Mr. Throdahl was vice president of technology.
- 80 Harold Bible Mr. Bible was vice president of manufacturing.
- 80 Committee He believes there were 6 or 8 on the committee, but he doesn't remember nor does he remember other names.
- 81 Group The group giving corporate leadership advice consisted of Dr. Richards, Mr. Wheeler, Mr. Olson, Mr. Savage, Mr.

Bergen, Mr. Benignus, Mr. Schalk and Mr. Springate. As a group, they advised corporate management on pcb matters.

- 81 Limit PCB's Regarding the specific decision to withdraw pcb's from certain applications and to limit its sale to certain specific applications in 1969 or 1970, the group advised Mr. Bergen, Mr. Bergen advised Mr. Minckler, general manager of the organic chemicals division. Mr. Minckler then advised the corporate management committee. The ultimate decision was then made by the corporate management committee.
- 82 Westinghouse Indemnification He was not involved in the decision to sell to customers such as Westinghouse who would provide an indemnification, but his understanding is that it started with the marketing people represented by Mr. Gossage. The attorneys, represented by John Stapleton, advised Mr. Bergen who advised Mr. Minckler who made the decision. He doesn't recall any discussion regarding the reason for requesting indemnification.
- 83 PCB Effects Within Monsanto, Dr. Kelly was responsible for identifying, evaluating, analyzing and investigating the effects of pcb's on human or animal life. Dr. Kelly is retired and, last he knew, was living in the St. Louis area.
- 84 PCB Effects He was kept informed and participated in communicating the status of the studies.
- 84 Studies Elmer Wheeler was the project manager representing Monsanto in the studies and briefly was assisted by Dr. Hunt. Dr. Levinskis became involved with pcb's about 1975.
- 84 Paul Wright Mr. Wright became involved as part of the medical department about 1974. He understands Mr. Wright had been a part of Monsanto's agricultural company,

then left and rejoined Monsanto's medical department.

- 85 Retirement At Monsanto, they can retire from 55 on. The mandatory retirement is at 70 for nonexecutives. He hasn't thought about his own retirement but probably plans to retire in 1988 when he is 65.
- 86 Before Deposed He was deposed in a case in North Carolina, in the Holly Farms chicken and egg case; the Bethlehem Mink case in New Hampshire; the Waukegan harbor case in Chicago; the transformer case in Knoxville; the contaminated river in South Carolina; the transformer case in Florida; the Massachusetts Harbor pollution case; the Pierce Packing case in Montana; the Halley case in Michigan and a dairy case in Indianapolis.
- 88 Reviewed Docs In preparation for his deposition, he reviewed copies of Westinghouse memoranda, copies of Monsanto's letters to customers, some invoices.
- 91 Documents The documents were presented to him by Mr. Fruehwald but he doesn't have them in his possession.
- 92 Westinghouse He did not talk with any attorneys or personnel of Westinghouse prior to his deposition.
- 92 Monsanto He talked with Monsanto attorney Thomas Bistline, his secretary and to Gale Turner, a paralegal, regarding dates and schedules regarding his being available for deposition. He did not have any conversations with any Monsanto employees regarding historical material.
- 93 Documents Other than the stack of documents discussed, he has not conducted any investigation on his own nor has he requested any investigation as to documents in response to the 30(b) 6 request. He has seen documents covering the complaint, but has not seen Monsanto answers.
- 94 Westghouse Spec He doesn't recall the specifics of the specification for the material Monsanto

delivered to Westinghouse. He does recall that the pcb Monsanto sold them was initially Aroclor, the equivalent to Monsanto's Aroclor 1242. Later it was replaced with Monsanto's 1016.

- 95 Aroclor/Askarel The difference is, Aroclor is Monsanto's trademark for chlorinated aromatic chemicals. Askarel is the electrical industry's generic term to describe fluids used in electrical equipment that are fire resistant.
- 95 PCB It is possible there can be askarels that do not contain pcb's and not all Aroclors contain pcb's. Monsanto had a series of Aroclors that were designated by 4-digit numbers in the 5,000 and 6,000 series that did not contain pcb's.
- 96 Westghouse He is not knowledgeabout everything Westinghouse at Bloomington purchased. They could have purchased the other Aroclors. However, between 1957 and 1977, it would be very likely that the large majority of Aroclors sold for use at Bloomington contained pcb's.
- 97 Aroclor 1232 This was another mixture of pcb's sold by Monsanto and was a blend of Aroclor 1221 and 1242. As sold to Westinghouse, it did not have any other major chemical component to his knowledge.
- 97 Chlorobenzene To his knowledge, he doesn't recall Monsanto selling the Westinghouse Bloomington plant an Aroclor containing chlorobenzene as a major component.
- 98 Dielectrics While all askarels are a dielectric, all dielectrics are not necessarily askarels. Askarel is the generic description for fluids used for fire resistance. The fluids sold for capacitors are not askarels and were not fire resistant. Those were not sold to the Westinghouse Bloomington facility.
- 99 Monsanto Fluids Those fluids Monsanto sold Bloomington for capacitor manufacture were both askarels and dielectrics.

- 99 Brochures Monsanto published a brochure called Askarel Inspection and Maintenance Guide designed for dielectric applications; another for plasticizer applications and a third describing Aroclors in general. He does not recall the title, "The Proper Handling of Aroclors and Their Mixtures in the Electrical Industry".
- 100 Mr. Benignus Mr. Benignus' office was responsible for preparing booklets, brochures and literature but he doesn't recall any document that had his name attached to it.
- 100 Brochures Mr. Karaganis requests finished, published copies of the original and updated versions of any application booklets or bulletins regarding Aroclors, their physical properties and appropriate handling characteristics.
- 103 Exhibit 84 Bloomington Exhibit No. 84 is marked. It is a document entitled, "The Proper Handling of Aroclors and Their Mixtures in the Electrical Industry" and its apparent author is P. G. Benignus, revised January 1960.
- 104 Distribute Docs He has not seen Exhibit 84 before. He personally did not cause to be distributed any written material relating to Inerteen or pcb disposal and control but he did participate in the drafting or revision of a brochure on Aroclors, Monsanto publication L306, and in the revision of the earlier version on proper handling of askarels. Only those two.
- 106 PCB Disposal He is not aware of any communications between Monsanto and its customers as to the proper methods for disposing of pcb's prior to his coming in as head of environmental management in 1970. Their disposal was kind of a general knowledge within the industry.
- 106 Elmer Wheeler Mr. Wheeler is retired.
- 106 Tankcars Monsanto shipped pcb's in Monsanto owned or Monsanto leased tankcars to Westinghouse Bloomington. They were

not labeled with Monsanto's name unless they were Monsanto owned.

- 107 American Hygiene It is his understanding from Elmer Wheeler that Monsanto's role in the production of the document, "Hygienic guide series for the American Industrial Hygiene Association on Chlorobiphenyls" was the sharing of some test data with the panel or committee putting together the document. He doesn't know of his own personal knowledge. He had asked Mr. Wheeler about it in the past, but not for this deposition.
- 108 Exhibit 85 Bloomington Deposition No. 85 is marked. It is a letter dated January 11, 1966 from H. L. Gray of Monsanto to Westinghouse Bloomington enclosing a tankcar lease dated January 11, 1986. The documents are stamped Monsanto 14 & 15.
- 109 Exhibit 85 He is not familiar with that document but is familiar with the car leasing arrangement described in the document.
- 109 Car Leasing It would be fair to say that transportation of pcb's from Monsanto to Westinghouse would be done on a trip lease between Monsanto as lessor and Westinghouse as lessee; that the lessor had title to and control of the car and leased it to Westinghouse for the trip and Westinghouse agreed to indemnify.
- 110 Exhibit 86 Bloomington Exhibit No. 86 is marked. It is a memorandum describing pcb's contaminated with mineral oil.
- 111 Contamination Westinghouse was seeking Monsanto's help in trying to recover, if they could, the pcb's from a large batch of contaminated mineral oil. This was perceived as a special problem. It did not involve specifications nor the return of scrap Aroclor to Monsanto.
- 112 Purify Oil He recalls they were able to purify the pcb's, but not to dielectric grade. They went into hydraulic fluid.

- 115 Exhibit 87 Bloomington Exhibit No. 87 is marked. It is a memorandum dated September 27, 1967, from Bryant to a list of Monsanto employees, including the deponent. Attached is a memo from Benignus and an agenda from Bryant for the Westinghouse visit. (Monsanto 1110)
- 115 Meeting He recalls the meeting. Westinghouse at Bloomington were having some problems with their employees and as part of Monsanto's customer relations program, they considered it a good opportunity to visit the plant and address a specific problem.
- 116 Inerteen Monsanto's instruction or advice to Westinghouse regarding Inerteen was, don't be sloppy, treat it with respect, don't spill it all over, don't get it on your clothes and change clothes when appropriate. Otherwise, they were going to see problems with dermatitis or respiratory irritation. Other effects they were previously told of via labels and product literature.
- 117 HM&W Haupt, MacPherson and Ward mentioned in the agenda are people who worked for Monsanto.
- 117 Anniston Plant They had a control program at Anniston plant to avoid pcb's getting in the drain. They had two pits of crushed limestone. Any effluent from the pcb process went first to those pits and be trapped there so it would not overflow into the city sewer system.
- 118 Pit Material The free pcb's would be stored in the on plant property. Eventually the sludge would be scooped from the pits and be put in containers and deposited in that landfill. There were no sink holes or cracked rock strata on that landfill to allow travel of pcb's into the water. They designed it that way.
- 119 Problems They knew as early as September 1967 that the Bloomington plant had problems with sloppy control of pcb's that affected their people. They had no way of knowing what it did to the sewers or

- whether they allowed it to leak into the sewers.
- 119 Exhibit 88 Bloomington Exhibit No. 88 is marked. It is a letter dated November 1, 1967 from Garrett of Monsanto to Spiecher of Westinghouse purporting to enclose a copy of the Inerteen label. (Monsanto #1136)
- 120 Letter He is familiar with the letter.
- 120 Government During the period of 1967 to 1968, he was not aware of governmental concern with respect to pcb's nor was he made aware of it by any Monsanto official.
- 121 General Concern He first became aware of general concern over release of pcb's into the environment in mid 1969 through his supervisor informing him that he had been told about studies and results of these studies concerning pcb's in the environment.
- 122 Stratmeyer His supervisor was Raymond J. Stratmeyer, director of manufacturing, the organic chemicals division, St. Louis. He reported to Mr. Minckler, general manager. He did not report directly to Bergen.
- 123 PCB/Environment Th essence of what Mr. Stratmeyer told him was that some laboratories, in analyzing pesticides, DDT particularly, were finding an interfering chemical that could be Aroclors. He said Monsanto was trying to get the methodology and do their own studies and he would keep him posted.
- 123 PCB/Environment In November 1969, Mr. Stratmeyer was at the Anniston plant and said the situation was becoming more involved. They needed someone in St. Louis to coordinate Monsanto's efforts and suggested he interview for the job.
- 124 Exhibit 89 Bloomington Deposition Exhibit No. 89 is marked. It is a letter dated January 16, 1968 from Richard A. Wilson, research chemist with the U.S. Dept. of Interior, Monsanto #3390.

- 125 Dept Interior He doesn't recall seeing the letter although it would indicate the government is making inquiry into pcb contamination in January 1968.
- 125 Exhibit 90 Bloomington Exhibit No. 90 is marked. It is a letter from Cumming Paton of Monsanto to W. R. Richard, Monsanto.
- 125 Paton Letter He is not familiar with it. Mr. Paton was in plasticizers marketing. Mr. Richard headed functional fluids research.
- 126 Wheeler Memo He recalls a memo Elmer Wheeler wrote to customers around 1969 describing the Swedish pcb findings and mentioning the known toxicity information which cautioned against discharge to the environment.
- 127 Exhibit 91 Bloomington Exhibit No. 91 is marked for identification. It is a contract between Westinghouse and Monsanto for the sale of Aroclor 1242 electrical grade for January 2, 1967 - December 31, 1967.
- 127 Contract He doesn't recall this document.
- 129 Exhibit 92 Bloomington Exhibit No. 92 is marked. It is entitled, "A statement from Monsanto Company, St. Louis, Missouri, March 3, 1969.
- 129 Press Release He is familiar with the contents, but not the press release form. It reads like the letter Elmer Wheeler prepared and sent to customers mentioned earlier.
- 129 His Knowledge It would be fair to say that until he came on board in January 1970, his knowledge of pcb's as an environmental problem came from his two communications with Mr. Stratmeyer as well as interviews with Mr. Bergen and Mr. Springate when he interviewed for the position in December 1969.
- 130 Interviews During the interviews, they added to Mr. Stratmeyer's information that they were getting more questions from customers and requests for samples, for analytical methodology.

- 130 Exhibit 93 Exhibit 93 is marked. It is a letter from Mr. Meyer of Monsanto to Keith Kelly dated November 5, 1968.
- 130 Exhibit 94 Exhibit 94 is marked. It is a letter from Benignus, Monsanto, to Mr. Innis, Westinghouse, dated December 26, 1968.
- 131 Exhibits 93/94 He is not familiar with either exhibit.
- 131 Sauget The statement is accurate that, prior to these two exhibits, it appears Monsanto was not shipping from Sauget to Bloomington but began shipping after the two letters.
- 131 Kummrich That is the name of the plant at Sauget, Illinois
- 131 Findett Findett is located in St. Charles County, Missouri, and is a small chemical company.
- 132 Exhibit 95 Bloomington Exhibit No. 95 is marked. It is a letter from W. Benignus dated February 28, 1969.
- 132 Exhibit 95 He is not familiar with that letter. Based on his interpretation of the document, it is a correct statement that Westinghouse had begun shipping some form of Aroclor back to Monsanto as early as February 28, 1969.
- 132 Disposal Program He is not aware of any program for disposing of Aroclor.
- 133 Scrap Aroclor He is speculating that scrap Aroclor is unusable liquid resulting routinely from an operation which is generated at a predictable rate. He can't tell from the letter whether the material came from an unforeseen incident different from routine waste.
- 134 Exhibit 96 Bloomington Exhibit 96 is marked. It is a letter dated March 3, 1969 indicating addressee Robert T. Innis of Westinghouse.
- 134 Letter He is familiar with the document but had nothing to do with the deliberations that went into its drafting or with the policies developed.

- 135 Responsible The group responsible consisted of Mr. Wheeler, Dr. Richard, Bill Kuhn, Ed John, the public relations man and Dr. Keller in medical research, and Mr. Park, the attorney. Mr. Wheeler told him of this informal meeting in which the document was developed when he arrived in January 1970.
- 135 Pg.2/Swedish He first heard of the work of Swedish scientists Wiedmark and Jensen from Mr. Stratmeyer and later from both Mr. Bergen and Mr. Springate. After being assigned the job January 1st, Mr. Wheeler repeated the information.
- 136 Pg.3/Program The reclamation program for used pcb's was associated with hydraulic fluids and heat transfer business where the material would, if possible be cleaned up and reused for the customer.
- 136 Findett The material would not come back to Monsanto but would go to service companies like the Findett Company which was not a Monsanto company. It is an independent little company doing chemical work for anybody. Findett tried not only to recover pcb's but other chemicals.
- 137 Third Party The material came from Monsanto, went to Westinghouse and then was shipped to a third party, in this case, Findett.
- 137 Reclaim Program There was an attempt to get such a program going and parts were in place in heat transfer at the time of Exhibit 96 but there was no program in place for reclamation of used capacitor dielectric fluid either at Monsanto or at a third party processor at that time.
- 139 Returns Prior to January 1970, he is not aware of any pcb product that came back to a Monsanto plant on a routine basis as a result of customers' operations as part of a disposal or recycle program or, for dielectrics, to a third party.
- 139 Exhibit 95 This could be a possible exception, but he doesn't know the details.

- 139 Exhibit 96 The program mentioned as being carried out in the functional fluids market for several years to reclaim used pcb's and to avoid disposal of these valuable materials doesn't apply to Bloomington or to the capacitor manufacturing industry.
- 140 Exhibit 9 Exhibit 9 is the March 3, 1969 letter from Mr. Wheeler to various customers and is the memorandum to which he previously referred.
- 140 Files When he returned to St. Louis, he was not given a file on scrap Aroclor in respect to environmental containment of pcb's. Those who had been working on the program were Dr. Richard and his subordinates, plus Mr. John, Mr. Park, Mr. Bergen, Mr. Schalk, Paul Benignus, and Bill Kuhn.
- 141 Exhibit 97 Bloomington Exhibit No. 97 is marked. It is a memorandum dated July 24, 1969.
- 141 Bryant List The memorandum is from Bryant to a list of people. He is not familiar with that document.
- 142 Memorandum It appears from reading the document that an opportunity was given some dielectric pcb customers to return scrap material to the Findett Company who would try to recover a pcb acceptable for use in hydraulic fluids application.
- 143 Scrap Credit It is his understanding that the customer would receive a credit for acceptable scrap Aroclor returned. In effect, Monsanto was buying back scrap from the customer that Findett could technically improve and put in usable form.
- 144 Findett Process Findett was able to separate free water and filter and remove particulate matter. They generally filtered with clay and would ship the acceptable finished Aroclor to Monsanto.
- 144 Disposal Findett paid a company mentioned on stamped numbered page 2555, reference to scientific chemical treatment, to

dispose of the unrecyclable material. He believes Monsanto was charged back the disposal cost.

- 145 Exhibit 97 The first page of Exhibit 97, first sentence says the scrap Aroclor recycle program started in 1969. That entailed Monsanto sending the Aroclor to Westinghouse, Westinghouse sending scrap Aroclor to Monsanto for further processing and disposal of the unusable material.
- 145 Recycle Program This memo is his first awareness of the program.
- 147 Recycle Program To his knowledge, prior to the program of 1969 described in Exhibit 97, Westinghouse was not sending back scrap to Monsanto. That is the way it reads.
- 147 No. 2556 This memo stamp numbered 2556 indicates Bloomington was generating 15,000 pounds of this scrap material a month which suggests that prior to the recycling program, they were disposing of 15,000 pounds of liquid a month.
- 149 Burning This program did not continue under his supervision when he came aboard. They were talking about incinerating when he arrived. They did not have an incinerator in place but were actively pursuing a design of one.
- 149 Landfills His plant visits indicated they were sending the scrap to landfills. No one mentioned the Findett program in mid 1970. Either it had come to a halt or was ongoing without his knowledge.
- 150 Exhibit 98 Exhibit No. 98 is marked. It is a memorandum dated January 12, 1970 from P.G. Benignus to H. S. Bergen.
- 150 Exhibit 98 He has not seen it before. The second paragraph indicates Monsanto took back 130,000 pounds of liquid scrap pcb throughout 1969 and paid Westinghouse for that material.
- 152 Deletions It is noted that other customer names were deleted from Exhibit 97. The Westinghouse customers are listed and

the remaining non-Westinghouse customers are deleted.

- 153 Exhibit 99 Exhibit No. 99 is marked. The document is from Bryant to a list regarding the scrap Aroclor program and references a letter dated 12-8-69. He did receive a copy and though it lists him in Anniston, he was physically in St. Louis at the time.
- 154 R.M. Kountz Mr. Kountz was the engineer from Monsanto's corporate engineering department assigned to do engineering for the business group.
- 155 Memo In the Exhibit 99 memo, Bryant talks about a recycle program for approximately 1 million pounds a year of scrap Aroclor, with 200,000 pounds coming from Bloomington.
- 155 Findett He doesn't know who made the arrangements with Findett.
- 155 Cutting Scrap Second page of the memo suggests that unless Findett installs another piece of equipment to distill the scrap to get a purified product, he would be forced to dilute the contaminated product with good product to bring it to an acceptable level for reuse.
- 156 Landfill It also says that 15,000 pounds of liquid junk at Findett has been dumped in a landfill.
- 157 Burning He doesn't know about the incineration process mentioned.
- 157 Exhibit 100 Exhibit 100 is marked. It is a letter dated January 29, 1970 from J.G. Bryant of Monsanto to the State of Indiana.
- 158 Advisory He is not familiar with Exhibit 100. Mr. Bryant was not working at his direction and control. He worked for Mr. Benignus. He, himself, was in an advisory capacity reporting to Mr. Bergen. He had no authority over Mr. Bryant.
- 159 Authority Mr. Bergen had authority over Bryant and the whole scrap Aroclor recycle

program just described. Last he heard, Mr. Bergen was with Georgia Pacific Company.

- 160 Exhibit 101 Exhibit No. 101 is marked. It refers to the scrap Aroclor program.
- 161 Exhibit 101 By March 16, 1970, he was aware of the existence of a scrap Aroclor recycle program.
- 161 Pg.1/No.2 Item No. 2 suggests they were taking material back that could not be reprocessed and paying half the cost of disposal. The customer is not identified. Thus Monsanto was treating the disposal of the material as their responsibility as well as their customer's.
- 162 Pg.1/No.3 Paragraph 3 indicates a 75,000 gallon tank is at Findett, 31 drums were put in a landfill and 141 drums of questionable material are still sitting.
- 162 Missing The correspondence between Benignus and the company regarding the maintenance of scrap in clean drums is missing.
- 163 Exhibit 102 Exhibit No. 102 is marked. It is a memorandum dated February 2, 1970 from Bryant to him.
- 163 Disposal According to the memo, Howard Bergen wished to get all customers on a paying basis for scrap Aroclor disposal to minimize costs of the program. The quality of scrap coming from capacitor manufacturers such as Bloomington was pretty good for recycling and it is projected that Westinghouse could ship 200,000 pounds of liquid scrap a year.
- 166 Four Items He vividly recalls addressing the four items listed to meet future needs: 1) a location set up to accommodate various containers of waste (drums and tankcars), 2) recycling processes to recover the various scrap materials, 3) the incineration of waste fluids, 4) the incineration of waste solids.
- 167 Drums The material in drums would be liquid.

- 168 Exhibit 103 Exhibit No. 103 is marked. It is a memorandum from R. M. Kountz to Johnson dated December 8, 1969.
- 168 Exhibit 104 Exhibit No. 104 is marked. It is a memorandum from R. M. Kountz to Vodden dated December 8, 1969.
- 169 Exh.103/104 These are the documents referred to in Exhibit 99 that Bryant was responding to.
- 169 Burning The considered opinion among those trying to manage the pcb issue was that landfills for all chemicals would be temporary because even under the best conditions, the actions taken today with the best technology available could be considered improper at a future date, as the actions they took in the 30's were considered improper in the 70's.
- 170 Landfills The geologists could not assure them the material would never migrate. So from the standpoint of risk, landfills were not a good alternative.
- 170 Burning Today, they believe incineration is the ultimate, best known technology.
- 170 Exhibit 11 He is familiar with Exhibit 11 which is a letter from Olson to Monsanto customers dated February 18, 1970. The letter intends making certain that customers of pcb's on record with Monsanto are aware of the discovery of pcb's in the environment and that Monsanto was aware and was going to pursue the issue.
- 171 Drafting He had a hand in drafting the letter and believes to be correct the quote, "We feel that all possible care should be taken in the application, processing and effluent disposing of these products to prevent them from becoming environmental contaminants. This article reflects that good manufacturing practice in the future may require that no products used by any company should find their way into waterways."

- 172 Exhibit 105 Exhibit No. 105 is marked. It is entitled, "A brief summary of pcb meeting, March 17, 1970."
- 172 Meeting He attended the meeting at the FWPCA lab in Deluth on March 17, 1970 at which Jack Garrett discussed the toxicity of pcb's with respect to rats and beagles. Mr. Garrett was Monsanto's manager of industrial hygiene, a part of Dr. Kelly's medical department.
- 173 Exhibit 106 Exhibit No. 106 is marked. It is a memorandum dated April 1, 1970 from D.A. Olson to W. B. Papageorge re pcb electrical customers.
- 174 No. 1,2,3 Points 1, 2 and 3 in the memorandum were Mr. Olson's who was in charge of sales. Both Mr. Olson and he reported to Bergen and each could appeal to Mr. Bergen. This memo deals with Monsanto taking the lead in pursuing incineration.
- 176 Olson He agreed with Olson that the one alternative was either incineration or recovery of the product, not landfills.
- 177 Exhibit 107 Exhibit No. 107 is marked. It is a document dated April 6, 1970 from Bryant to Papageorge entitled, "status."
- 177 Queeny Item 1 he interprets as 102,000 pounds that came from Westinghouse were located at the Queeny plant in St. Louis for further action.
- 178 New Jersey Item 3 refers to the New Jersey dump.
- 178 Kummrich Item 6 refers to Kummrich, the plant at Sauget, Illinois. The incinerator was not in place at the date of the memo but went on line in 1971.
- 179 Transformer The target date of 6-1-70 to set up a policy for transformer scrap had to deal with the degree of contamination of the material and criteria to determine whether it was recyclable, salvageable or to be discarded.

- 179 Exhibit 108 Exhibit No. 108 is marked. It is a letter from Edward J. Bok of Monsanto dated April 9, 1970.
- 179 Exhibit 109 Exhibit 109 is marked. It is an April 7, 1970 letter from Benignus to Olson setting up a proposed meeting in St. Louis for April 21.
- 180 Exhibit 110 Exhibit No. 110 is marked. It is a letter dated April 7, 1970 from Olson of Monsanto to Kelly of Westinghouse.
- 180 Price Hike Monsanto was raising its prices for pcb's to Westinghouse partially because of costs of environmental control.
- 181 Exhibit 111 Exhibit No. 111 is marked.
- 181 Exhibit 111 He is familiar with the document and was one of several reviewers. E.B. John prepared the various drafts; it was reviewed by Messrs. Bergen, Wheeler, Springate, Park and by Dr. Richard and himself.
- 182 Press Release They didn't describe to the press in response to Congressman Ryan's letter the recycle and disposal program.
- 182 Sole Producer Monsanto nor the government was able to demonstrate one way or the other that aside from Monsanto, Coastal Chemical Company and at least one other produced pcb's. So to the best of his knowledge, Monsanto is the sole manufacturing unit for pcb's in the United States.
- 183 Exhibit 112 Exhibit No. 112 is marked. It is a February 1970 issue of "Environment".
- 183 Page 2 He did not have a hand in developing the section in the article which says, "Monsanto's statement on pcb." Elmer Wheeler was the author, assisted by Messrs. Olson, Park, and Schalk and Doctors Richard and Keller.
- 184 Exhibit 113 Exhibit No. 113 is marked. It is a letter dated 4-27-70 from Papageorge. The enclosure is Exhibit 111, the press release.

- 185 Exhibit 10 This exhibit refers to a meeting. He only recalls that Mr. Wheeler covered the activities prior to his arrival in his new assignment. Later he talked about such things as the Swedish work and the Dr. Risebrough report. He then spoke about plans to pursue this information personally by going to Europe; visiting customer sites and reviewing Monsanto's marketing policies regarding which Aroclors to sell and to whom. It was kind of a forecast.
- 187 Dr. Richard The topic of scrap Aroclor was assigned to Dr. Richard who discussed keeping pcb's out of the environment. Dr. Richard is now retired from Monsanto.
- 188 Exhibit 114 Exhibit No. 114 is marked. It is a memorandum dated 4-29-70 from Graham to Olson and Benignus with a copy to Papageorge.
- 188 Exhibit 114 This memo reflects the reprocessing and disposal program for Aroclor.
- 190 Exhibit 115 Exhibit No. 115 is marked. It is Monsanto reference document 341, a letter from Mr. Papageorge to Mr. Gelberman dated May 25, 1970.
- 190 Burning This letter referred to a program for the inventorying of scrap material for incineration when they installed an incinerator. The scrap came from manufacturers of capacitors.
- 192 1970 Program Starting 1970, their program was to receive the material, store it in storage tanks or in sound drums until they could install the incinerator and burn it.
- 192 Landfill They had stopped landfilling liquids because they didn't think it a good practice. They wanted to incinerate solids as well.
- 193 Exhibit 116 Exhibit No. 116 is marked. It is a letter dated April 8, 1970 from Bert Bloomenthal of the FDA.
- 194 Exhibit 116 He has not seen this letter before. He does agree that as of April 8, 1970,

Monsanto "was committed to a program which would allow the future use of Aroclors only in those applications where escape to the environment can be prevented."

- 194 Exhibit 117 Exhibit No. 117 is marked. It is a letter from Papageorge to Wilburn of Westinghouse dated June 5, 1970.
- 194 Burning Exhibit No. 117 deals with the minimum temperature required to burn pcb's. They had conducted studies and they arrived at 800 degrees centigrade or 1600 degrees fahrenheit. To build a safety factor, they recommended 2000 degrees Fahrenheit.
- 195 Landfills Pending incineration, they were either storing it or using authorized landfills, chemical landfills for which the authorities granted permits. It was not the typical landfill.
- 197 Exhibit 118 Exhibit No. 118 is marked. It is a document from Keller of Monsanto to Mr. Tabri of the Federal Water Pollution Control Administration dated June 4, 1970.
- 197 Keller Dr. Keller was in charge of the analytical chemistry group that did research on analytical methods.
- 198 PCB Toxicity He was in possession of summaries prepared by Mr. Wheeler and could mail them to individuals requesting that information. He did not have expertise nor had he worked with the development of toxicity information on pcb's but has an understanding of what that data indicates.
- 198 Exhibit 119 Exhibit No. 119 is marked. It is a memorandum from Benignus to Mr. Day dated 6-5-70.
- 199 Mr. Day Mr. Day was a member of the organic chemicals division responsible for production planning of the group of products, amongst which were pcb's.
- 199 Exhibit 119 Exhibit 119 lists the predicted needs for 1970 for Westinghouse sites in

- drums and tankcars of the different Aroclors
- 199 Exhibit 120 Exhibit No. 120 is marked. It is a letter.
- 199 His role He was asked to comment on a draft prepared by Mr. Mason.
- 200 Mr. Mason His normal duties had no relationship to pcb. He was an assistant general manager of the organic chemicals division reporting to Mr. Minckler. The role Mr. Mason played was limited to communication with Mr. Ryan. He wrote this letter and visited Mr. Ryan.
- 201 Exhibit 121 Exhibit No. 121 is marked. It is a letter dated July 6, 1970 from Papageorge to Wilbur.
- 201 South Boston He reviewed the process specification for the South Boston plant and said it was a good document and met with his approval. He indicated concern if the temperature was not high enough, they could generate dioxins or furans. He would be concerned and would not consider acceptable practice the stacking of capacitors and parts, pouring liquid pcb's over them and lighting them. That could result in the generation of dioxins and furans.
- 202 South Boston He visited the South Boston plant to check their various measures for controlling the discharge, spillage and leakage of pcb's. His basic response was that they could achieve a bone-dry plant and he espoused that goal.
- 203 Exhibit 122 Exhibit 122 is marked. It is a letter dated July 8, 1970 from Papageorge to Mr. Pool.
- 204 Exhibit 123 Exhibit No. 123 is marked. It is a letter dated June 18, 1970 from Congressman Ryan to Mr. Mason.
- 204 Exhibit 124 Exhibit No. 124 is marked. It is a letter dated June 30, 1970 from Mr. Mason to Congressman Ryan.

- 204 Program The program discussed in the June 10 letter was approved by the corporate management committee in early May. The key points made were: 1) Sale of pcb's for those uses that led to easy entry into the environment would be terminated beginning August 30, 1970 and as quickly as feasible, the program would be completed; 2) The sale to closed, sealed systems would continue; 3) They would pursue studies of pcb's as to their toxicity and the improving of analytical methodologies; 3) They would run their own operations as tightly as possible to prevent escape of pcb's into the air or water; 4) They would share all information with their customers world-wide.
- 206 Presentation He made a presentation to the committee in late April covering all the above points. The Management Committee was dissatisfied with some of the dates he had proposed and requested they accelerate the program. Mr. Minckler asked Mr. Mason to make the second presentation in his absence in early May when it received approval.
- 206 Original Draft He worked on the initial draft with the assistance of an ad hoc committee consisting of Doctors Richard, Kelly and Keller and Messrs. Olson, Bergen, Springate, Schalk, John, Park and Wheeler.
- 209 Plasticizers By Monsanto's definition, plasticizer applications were perceived to be the kind where the materials were eventually going into the environment. The plastic article, floor tile or coating or paint eventually gets into the environment so those uses Monsanto was discontinuing. The only one continued for a brief spell was carbonless copy paper which was terminated in 1971.
- 211 Hydraulic Fluids Mr. Mason's letter further stated they were not satisfied it was possible to control usage and eventual disposal; therefore they have decided to work with their customers to change over to

new formulations. He had recommended that program.

- 212 Capacitors/
Heat Transfer He felt at that time it was possible to control the usage and eventual disposal of pcb's in the area of transformers, capacitors and heat transfer fluids to insure there was no possible escape to the environment.
- 212 Control Means of control would be through reprocessing or incinerating scrap and by maintenance of equipment using pcb. Monsanto's definition of "control" is very much the way the government regulatory people control discharges into the environment. It is not intended to be zero. It is a feasible control, what is technically and economically feasible to control.
- 213 Anniston At the Anniston facility they could control pcb's by collecting it and preventing it running down the sewer.
- 214 Sewage Treatment That which did get into the sewer would be subjected to the municipal treatment system. Some of the pcb's would be destroyed by the bacterial action, the rest are entrapped in the sludge and the proper disposal of the sludge becomes the next step.
- 215 Sludge Disposal The disposal of pcb sludge containing several hundred parts per million is an economic challenge because of cost and can be a major environmental problem if the sludge is put in the wrong place.
- 217 Program The program essentially was to continue sales if no acceptable alternative was available and if they could capture, recycle or destroy the liquids and ultimately the solid waste and, in the meantime, store them in a chemical waste landfill. However, they would only continue sales in those situations where they could either recover and process or destroy the liquids and the solids. In 1970, it was technically feasible to recover the liquids and put the solids in a licensed chemical waste landfill. The whole goal was to

prevent the release of this material into the environment.

- 218 Exhibit 125 Exhibit No. 125 is marked. It is a letter from Randall Graham.
- 219 State Indiana He recalls getting a response from the State of Indiana on July 16, 1970 which basically stated that liquid or hazardous wastes are not acceptable for disposal by the landfill method.
- 220 Exhibit 125 The letter indicates that he and Mr. Graham visited the Bloomington plant on July 22, 1970, similar to his visit to the South Boston plant, and recommended clean-up procedures.
- 221 Cleanup At the Bloomington plant he saw a unique use of saw dust. There was a loss of pcb fluid from the conveying system in which the capacitors were conveyed by basket to the point where they were sealed. Some of the drip pans to collect the fluid were missing. Others had shifted so all the oil wasn't trapped. The entire area under the conveyors had several inches of saw dust to help absorb the free liquid. The concern in mixing water with pcb's is that it makes recovery of pcb's difficult particularly if detergents are added. Then the recovery becomes extremely difficult if not impossible.
- 222 Sewer Inlet Bloomington had no recovery system in the washing step. He was shown where the pcb waste in the washing water entered a sewer inlet. He was not told where that sewer went. There was no treatment or capture procedure at all, not that he saw or heard.
- 223 Recommendation He recommended they get their concrete floor to the point where it appeared to the everyday observer as bone dry and revise the drip system so none escaped onto the concrete floor.
- 223 Soggy Sawdust The day he visited, all he saw was soggy saw dust from liquid dropping off the capacitors on the conveyor belt.

Outside they had boxcars of saw dust ready. It was unique.

- 224 Unacceptable He cannot support the environmental practice of soaking up pcb's with saw dust then taking that saw dust to a landfull not licensed for chemical waste or built on sink holes and fractured limestone.
- 225 Landfills He has seen some reference to landfills built on fractures. In fact, he recalls some correspondence with Westinghouse regarding one of the landfills where he expressed his concern. The landfill they referred to was a quarry. He personally relied an awful lot on the local authorities who issued permits to establish the proper ecological environment for chemical waste landfills.
- 226 Exhibit 126 Exhibit No. 126 is marked. It is a document dated July 27, 1970.
- 227 Exhibit 126 In the document he talks about landfills, not the municipal-type sanitary landfill but the licensed industrial or chemical waste landfill. The landfill should not be near water.
- 228 PCB Pcb's cling tenaciously to sand and if the sand moves, the pcb goes with it. Pcb will dissolve in water up to a point; 1242 has a solubility limit of 200 parts per billion; but it is more likely the water will move the sand on which clings the higher concentration of pcb into the environment where a fish might digest it or into the public water supply.
- 231 Exhibit 77 Exhibit 77 is a sales contract dated June 22, 1970 signed by Donald Olson of Monsanto and Kenneth Tyson of Westinghouse. He had no hand in its drafting and is not familiar with it.
- 232 Exhibit 77 This contract is a mechanism to control the situation. If the customer was operating under sloppy practices, they could pull the product.

- 233 Recommendations His recommendations to the Bloomington plant involved the washer system. He suggested there should be no contact with water if possible; they should consider using an organic solvent which can be incinerated along with any pcb's washed off and he discussed possible techniques for treating or filtering the wash water.
- 234 Follow Up Randy Graham was assigned the primary contact; there were discussions between Monsanto's analytical people and the Westinghouse people regarding centrifuging. We didn't think it was good enough. We sent copies of a Monsanto report on effectiveness of carbon beds in treating water. But he never went back to follow up his recommendations.
- 236 Carbon Filter He talked to Westinghouse about low levels of pcb emissions with respect to carbon filtration. He was not told that they ever did install the carbon filtration.
- 237 Incinerator The incinerator finally got into operation at the Kummrich plant in 1971.
- 237 Exhibit 127 Exhibit No. 127 is marked. It is a document written by Mr. Papageorge.
- 238 Exhibit 127 His advice then and today was "dumping into sewers or in the waste water system must be avoided. Page 2 says they had an incineration program underway for the destruction of waste solids and that though they had a research and engineering program underway, a solution was not anticipated for a year.
- 239 Destruction They did develop a solid waste destruction system but it is not in operation because they could not find enough support from customers to justify building it. They demonstrated it was technically feasible, however.
- 239 Exhibit 128 Exhibit No. 128 is marked. It is a trip report of a meeting in Washington dated September 15, 1970.

- 240 D.C Meeting He attended the meeting with the FDA regarding health studies done on rats and dogs to decide if they had adverse effects which would indicate adverse effects on humans.
- 240 Exhibit 129 Exhibit No. 129 is marked. It is a letter from Randall Graham to Hanson of Westinghouse dated October 12, 1970.
- 241 Exhibit 129 He is not familiar with the document.
- 241 Disposal Fee About mid-1970 when the plans for building an incinerator were approved and final, they informed all customers, including Westinghouse, that the fee would be 3 cents a pound for disposing of the scrap, as mentioned in the letter.
- 241 Findett The Findett recovery application was limited to a few, including Westinghouse. However, in October 12, 1970, he doesn't think it was still in operation.
- 242 Exhibit 130 Exhibit No. 130 is marked. It is a letter written by Papageorge to Stalling and dated October 12, 1970, concerning the control program
- 243 Exhibit 131 Exhibit No. 131 is marked. It is a document from Randall Graham dated October 16, 1970 enclosing a letter sent to Monsanto customers.
- 243 Graham Memo Attached to the Graham cover memorandum is one letter stating that Monsanto will deal with the disposal problem using an incinerator at a charge per pound. The second letter states that scrap or spent transformer askarel can no longer be dumped down the sewer. For that reason, Monsanto is building an incinerator.
- 244 Incinerator Prior to that time, no one perceived the need to incinerate the scrap and second, until they conducted the tests, they weren't sure it was technically feasible. In hindsight, they could have conducted the tests earlier. There was nothing that prevented them.

- 245 Early Disposal At a minimum, liquids could have been stored and solids could have gone to licensed chemical waste landfills.
- 245 Prevention Once the need was understood, had that program been intalled earlier, the material would not have been poured down sewers or disposed of in municipal landfills.
- 246 Prior to 1969 Prior to the 1969 period, Monsanto never gave advice regarding the disposal of Aroclors or askarels to his knowledge. However, it would not have been sound practice at any time to pour pcb's down the drain or send them to the municipal landfill. It would have been sound practice to contain those fluids the same as all industrial chemicals at any point in time.
- 247 Exhibit 61 He recalls attending a meeting with Westinghouse personnel in St. Louis on October 29th and 30th of 1970. Discussed were pcb's, pollution problems and the need for control as well as the new pcb 1016 to be introduced. The technical people talked about scientific matters relating to capacitors. Not raised was the contract wording saying if the customer didn't exercise control Monsanto would stop selling.
- 240 Plant Visits Those at the meeting knew about his plant visits to initiate control procedures. They were part of that.
- 240 Exhibit 44 Exhibit 44 is a letter dated November 9, 1970 from Gossage to Kelly which confirms that the existing contract was expanded from 1242 to include 1232. However, he only saw the letter in preparation for his deposition and speculates the subject came up at dinner the night before the meeting, not at the meeting.
- 250 Monsanto Policy He cannot say if it was Monsanto's policy at the time to "prevent the product from entering into the environment through spills, leakage, disposal, vaporization or otherwise." It was not his policy. It was Mr.

Gossage's policy in the November 9, 1970 letter. It was the company position.

- 251 Bloomington He did not go back after his initial visit at the Bloomington plant.
- 252 Exhibit 132 Exhibit No. 132 is marked. It is a handwritten memorandum dated 11-4-70 from Pickett to Rissinger regarding Monsanto personnel associated with Inerteen visiting Westinghouse November 10 to see the F 30 area and control conditions at Bloomington.
- 252 Visit He did not participate in that visit. He believes Randall Graham and Mr. Gossage, in place of Mr. Benignus, did attend. Mr. Gossage had been given the assignment of customer visits.
- 253 Visit Report The report came back to him that improvements had been made, the plant was working on better control but had a way to go.
- 254 Improvements The saw dust was no longer used; the drip pans were better maintained and performed their function.
- 254 Problems Their wash water system needed improvement and there were questions regarding the land disposal sites.
- 254 Reports He received telephone reports and also believes there was something written, either a call report or a letter from a Monsanto person to the plant. One or the other.
- 255 Carbon Beds Monsanto suggested Westinghouse consider the use of carbon beds and were willing to share some test results from the Anniston plant. They had not installed the carbon beds at Anniston. They had a test unit in the laboratory testing feasibility.
- 255 Visits He recalls there was continuing contact by Monsanto personnel to check pollution control and progress.

- 256 Exhibit 133 Exhibit No. 133 is marked. It is a memorandum from Seifert to Kountz and Papageorge.
- 256 Robert Siefert He was a Monsanto engineer working in Monsanto's corporate engineering department reporting to Robert Kountz, his supervisor.
- 256 Incineration The memo supports incineration as feasible.
- 257 Ligett/Vadden He is familiar with a paper by Ligett and Vadden of Monsanto entitled, "Askarels, environmental pollution"?
- 258 Exhibit 134 Exhibit No. 134 is marked. It is a memo dated January 26, 1971 from Randall Graham to Papageorge.
- 258 Exh.134/pg.2 With reference to the Bloomington plant, six categories of scrap are listed: 1) reclaimable, high purity shown as 9,900 gallons liquid; 2) nonreclaimable, 3,300 gallons; 3) Fuller's earth listed under solids, 42,000 pounds. (The others are not mentioned.)
- 259 Interpretation Reclaimable could go through something like the Findett process and be used again. Nonreclaimable would be liquid for storage and ultimate incineration; solids would be incinerated.
- 260 Stop Sales He was never informed that he, personally, had the authority or that the company had the authority to cease supplying product to Westinghouse if they continued to leak into the environment.
- 264 Exhibit 63 Exhibit 63 is a letter of April 5, 1971 from Bergen to Kelly. He doesn't recall it nor does he know what is being referred to concerning an internal draft of policies and procedures for environmental compatibility referred to.
- 265 Exhibit No. 135 Exhibit No. 135 is marked. It is a copy of a Chemical Week article from April 21, 1971.

- 265 Pollution Cop It would not be fair to characterize his work as that of a pollution cop. His job was to advise other Monsanto people on how they in turn could relate to their customers. He worked through a team of people but was not in charge of them, only a part of the team whose job it was to see whether their customers were releasing unacceptable levels of pcb's into the environment.
- 267 City Permit He has no personal knowledge that the City of Bloomington allowed Westinghouse and/or Monsanto to contaminate the Lemon Lane landfill and/or the Winston Thomas sewage treatment plant with pcb's.
- 268 Contamination He has no knowledge that Westinghouse, prior to late 1975, informed the City of Bloomington that the plant was contaminating the Winston Thomas sewage treatment plant with pcb's or that lack of care by the city or its employees contributed to the contamination of the Lemon Lane landfill or Winston Thomas sewage plant.
- 269 Control Program The control program here discussed stayed in place from 1970 when it was announced through the cessation of pcb manufacture in 1977.
- 269 Restrictions He is not aware of a requirement that Monsanto customers meet any kind of standard to continue getting pcb's. They did not announce that policy at a press conference or in a letter to Congressman Ryan.
- 270 Announcement The press release says Monsanto won't sell unless they control. It says they will sell where it is possible to control and where they have evidence that efforts are being made to control.
- 270 Curtail Sales They never said they wouldn't sell if they failed to control. That was left silent. They were not in the regulatory business.
- 271 Contract He doesn't know of the formation of the contract or the discussions with Westinghouse.

- 271 PCB/Cancer He doesn't have any knowledge or information that pcb's cannot cause cancer. No one has. He is aware of one study in which investigators report they saw evidence of cancer.
- 272 Cancer Report The findings of the study conducted by Dr. Ranata Kimbrough, at that time with the Center for Disease Control, Atlanta, Georgia, showed pcb's had the potential for causing cancer.
- 273 Registration He is aware that Monsanto has to go through various product registrations before it puts a new chemical out into the environment and that the chemicals are tested on animals before human exposure to the chemicals is allowed.
- 274 Indemnification He is not familiar with the events that lead to the indemnification policy of Monsanto. He is aware that beginning 1972, continued sales to the dielectric industry was contingent upon the purchaser signing an agreement, referred to as a special undertaking.
- 275 Involved Group Those who developed the agreement were Mr. Bergen, Mr. Gossage, several Monsanto attorneys, John Stapleton, for one.
- 275 Exhibit 136 Exhibit No. 136 is marked. It is a memorandum dated July 22, 1971 from Benignus to Curtis relating to a change in the askarel inspection and maintenance guide.
- 276 Standards The group never compiled any kind of an evaluation, any standard. They couldn't get any.
- 277 Containment The releasing of material into the sewer which could be contained was against Monsanto recommendations.
- 278 Monsanto Policy Monsanto's policy says they will sell pcb's to those applications that are controllable. It says nothing about a specific plant or a specific customer.
- 278 Plant Visits The visits to Westinghouse were as an aid to a good customer, to share with

them what they had gone through and which they, perhaps, could use.

- 279 Plant Reports He has reported the lack of pcb control and their release into the environment to his superiors with recommendations. The report would go to Mr. Gossage, the director of marketing or to Mr. Bergen. It would be along the lines of the customer not doing all he can and appears to be disinterested. We suggest you take action.
- 279 Bloomington He did not write such a report about Bloomington. It was making progress and was doing what it should with respect to controlling that which it could control. He got reports that things were improving, the attitude was good.
- 231 Reports He had some numbers he could look at, analytical results that were reported to him. He had frequent telephone calls from Randall Graham and other indications that particular site was improving.
- 281 Monsanto Report He remembers a report from Monsanto's laboratory that analyzed some water samples and the amounts of pcb's reported were, to him, acceptable. They were in the parts per billion, not million, range. Low parts per million are several thousand parts per billion and would concern him.
- 282 Parts/Billion He is not aware of a discharge standard of .1 parts per billion ultimately adopted or of the discharge standard of the City of Bloomington's treatment plant established by state and federal authority. That is an emotional number not based on fact.
- 283 Control System He does not recall any such discussion by Monsanto representatives about putting in a control system, a carbon system that would have resulted in 10 parts per billion for the washing water on the Westinghouse washing systems.
- 284 Feasibility He would consider 10 parts per billion to be a reasonable number to expect off

a carbon filter system, but he doesn't remember that the effluent from that plant could be treated with carbon to that low level because of the detergent in it.

- 284 Tests He doesn't remember any carbon results, but he does remember some centrifuge tests. He doesn't know that anybody analyzed anything to determine what the plant could achieve. They analyzed samples sent to them and reported back some numbers but he doesn't know where they came from or whether they represented a typical outfall or any details.
- 285 Bloomington He doesn't know what they finally achieved except they were making progress toward a lower and lower effluent level.
- 287 Environment It is true of any chemical that it is all right to pour pcb's into any location as long as it is not having an effect on the immediate environment and no decision is made not to until it has a demonstrated effect or impact on where it winds up. If pcb's were poured into a steel tank or into a natural clay formation, the equivalent of the steel tank, there is no problem. They're not going anywhere. If they are poured into a fractured formation, he is introducing the unknown and he wouldn't want to take that risk.
- 293 Exhibit 137 Exhibit No. 137 is marked. It is the 1970 press release earlier referred to.
- 294 Sole Producer The press release was issued before he determined Monsanto was the sole U.S. producer of pcb's.
- 294 Restrict Sales The unilateral action to restrict its use referred to in the 2nd paragraph refers to the discontinuance of sales to the plasticizer users and the hydraulic fluid users and that action was taken before the press release was issued.
- 295 Birth Defects On the 2nd page, 1st paragraph, the birth defects refer primarily to the

work of Dr. Risebrough concerning the inability of bird's eggs to hatch, soft shells and other defects.

- 295 Monsanto Tests As of July 16, 1970, date of the press release, Monsanto made three tests using Aroclor 1242, Aroclor 1254 and Aroclor 1260. Animals used were rats, dogs and chickens. The levels of exposure, as he recalls, were 10, 100 and 1000 parts per million. There was a range of exposures.
- 296 Test Results With regard to the rats and dogs, the livers were larger in the exposed animals than in the unexposed or control group. The weight gain of the exposed animals was not as large as those in the control group. The dogs exhibited a gastric irritation. Their stomach and intestines were affected by exposure to high levels of the higher chlorinated pcb's. The chickens showed a problem in reproduction. At about 3 parts per million and above, the chickens laid thin egg shells and the eggs would not hatch as well as those of the control group.
- 297 Safe Control Page 3 of Exhibit 137, Mr. Minckler is quoted regarding pcb's: "With rigid control over where the product goes, how it is handled and disposed of, we believe the safety function of the product can continue to serve society and the environment can be protected."
- 298 Policy He doesn't know that he would call it a policy as much as a conclusion after knowing the application, knowing the product and knowing the need for the product. He would say it represented a statement of Monsanto's intention that such rigid control be exercised.
- 299 Press Release He doesn't know of any specific article or incident other than the approval of the plan that triggered this.
- 299 Congressman Ryan Congressman Ryan had been critical of Monsanto almost on a regular basis. He doesn't know of any particular action on his part that triggered this release.

- 300 Initiation When he first became involved in the pcb in the environment, he talked one on one to Doctors Kelly, Richard, Paton, Keller, Munch and Messrs. Bergen, Wheeler, Springate, Benignus, Johnson, Fallon, Randy Graham, James Bryant. No one had held his position before him.
- 302 PCB Studies Dr. Kelly, Mr. Wheeler and the medical department were the principal individuals involved in the medical and animal studies.
- 302 Communication The marketing people had primary responsibility for customer communication.
- 302 Press Mr. John had primary responsibility for dealing with the press re pcb's. By 1974, it was Dan Bishop.
- 304 Press Mr. Minckler and the public relations people drafted the press release, not the P.R. department alone. He doesn't recall any specifics of what the press wanted following the press release.
- 305 Federal Agencies The medical department was responsible for communicating the results of Monsanto's toxicity studies to the various federal agencies. The department of agriculture was concerned at one time, the EPA had an interest The National Institute of Environmental Health Science, The Center for Disease Control, Fish and Wildlife Service, FDA, OSHA, and he believes a part of the Department of Commerce.
- 307 PCB/Pesticide He believes the Department of Agriculture reported on a study made by their people in Beltsville, Maryland, regarding the use of pcb's in a pesticide for indoor use where the active ingredient would be effective longer because pcb's were present. That was a permitted or registered formulation approved by their pesticide regulators.
- 308 Monsanto Answer When Dr. Kelly learned of it, he wrote someone in the Department of Agriculture recommending that that use

not be permitted. It was not a use promoted by Monsanto.

- 309 Promoted Uses Hydraulic fluids use was promoted by Monsanto. The electrical use was promoted by the electrical equipment manufacturers.
- 309 Exhibit 138 Exhibit No. 138 is marked. It is a memorandum dated March 23, 1970 to Mr. Wheeler from Mr. Garrett. It refers to a meeting of some scientists and others in Duluth, Minnesota.
- 310 Duluth Meeting He went to that meeting with Mr. Garrett, Dr. Keller. The subject was the presence of pcb's in the environment and analytical methods that could be applied to water species, to analyze their tissues for the presence of pcb's.
- 311 PCB Presence In the late 1960's, the presence of pcb's in wildlife tissues was first reported. Eventually Monsanto was in the best position to make available appropriate analytical techniques to other researchers, but they had to work at it. Looking for pcb's in animal tissue requires a different analytical approach than quality control in a plant.
- 313 Animal Tissue The technique ultimately developed involved an extraction process whereby the chemical of interest is concentrated in a solvent and Monsanto recommended hexane as the extractant. After various steps, the extractant concentrate is put into a gas liquid chromatograph which plots on graph paper the presence of certain chemicals. Each peak isolates material identified by the research analyst as being associated with a specific kind of molecule. This is confirmed by a mass spectrogram. The chart is then compared to a chart deliberately made with known material and a match is made by the analyst. By matching the peaks and valleys, he can tell the quantity as well as the identity. The most accurate is the total area under the curve. That gives the total amount of

pcb's. But other factors can influence the results from a laboratory.

- 318 Exhibit 10 Exhibit 10 is a one-page memo dated April 17, 1970 to Mr. Olson from Mr. Benignus regarding a meeting.
- 318 Meeting He was present at the meeting of Monsanto people and representatives from various Westinghouse facilities.
- 319 Exhibit 139 Exhibit No. 139 is marked. It is a memo regarding a meeting with Congressman Ryan re the ongoing dialogue between Monsanto and the Congressman. He received a copy of it.
- 320 Congressman Ryan He never dealt face to face with Congressman Ryan. That was John Mason's assignment, according to Mr. Bergen. John Mason had not been Monsanto's lobbyist and had no prior dealings with the Congress of the United States on behalf of Monsanto.
- 321 John Mason Mr. Mason had just arrived from Europe where he had been with Monsanto for 20 years or more. He was a European and commented unfavorably on the U.S. way of doing things compared to the European way regarding his assignment.
- 322 D.C.Meeting Before Mason left for Washington to meet Congressman Ryan, he was briefed by Mr. Bergen, Dr. Kelly, Mr. Wheeler and himself. They also debriefed him when he returned. Mason talked to him before he wrote the memo. Writing the memo is the option of the individual, but they do have the responsibility of letting management know what happened.
- 323 Normal Course This memo is a record kept in the ordinary course of business at Monsanto.
- 324 Proprietary Info It is Monsanto's policy that exists today that customer lists and quantities of products purchased are considered business trade secrets and they are willing to release them if the recipient assures them they will treat the information as such.

- 325 325 Monsanto sold pcb's to customers in competition with each other in the electrical industry.
- 326 Exhibit 140 Exhibit No. 140 is marked. It is a letter dated August 17, 1970 from Mr. Viland of Westinghouse to him.
- 326 Letter 8-17-70 Mr. Viland was seeking to enlist his aid in convincing regulators in Pennsylvania that it was okay to dispose of pcb wastes in a sanitary landfill. He talked to the Pennsylvania representatives and learned they would not approve any disposal unless tests were conducted with soils from Pennsylvania. He informed Mr. Viland that they would not accept general geological data.
- 328 Tests No tests were ever done, to his knowledge. The letter referred to disposal of solid wastes. At this time, Monsanto's incineration program was not designed to deal with solid wastes. He doesn't know the ultimate resolution of Mr. Viland's problem.
- 328 Exhibit 141 Exhibit No. 141 is marked. It is a memorandum dated November 4, 1970 to Dr. Richard concerning biodegradation testing of 1242 and 1016.
- 329 Concern One of the environmental concerns with pcb's was their persistence in the environment. In looking for substitute products, one of Monsanto's considerations was to find one that was more biodegradable.
- 329 Biodegradable Product 1016 was more biodegradable, but not totally so. Monsanto told Westinghouse it shouldn't tell customers it was biodegradable.
- 330 Persistence If one equates persistence with Aroclor 1254 which was constantly being reported as present, the lack of any such reports on 1242, one can go back and determine how many of the pcb's were removed from 1242 that would have looked like 1254. Assuming the remainder would not persist, one could make a calculation regarding

persistence. He doesn't remember how much was removed.

- 331 Persistence Some investigators use the half life concept as a persistence measurement. Monsanto just reported the absence or presence of the different pcb's after a given period of time during the test. The industry and the regulatory people never came up with a measure acceptable to everybody.
- 332 Chlorine the last two digits in the numbers for the pcb mixtures in the 1200 series represent the percentage of chlorine by weight in the mixture. Product 1016 was numbered by chance but was designed to have 42 percent chlorine.
- 333 1016 Tests Sample lots of 1016 were supplied to Monsanto customers to test in their applications. Animal tests and tests for biodegradability were also done.
- 334 1016/1242 The two are different mixtures. There are several documents describing the differences. One is a narrative description; the other describes the difference chemically by gas chromatograph charts. There is also a table showing the side-by-side comparison.
- 335 1016 To keep the chlorine percentage, they had to remove the higher chlorinated isomers to get rid of persistence but had to remove the lower to keep the chlorine at 42 percent.
- 335 Animal Study There was not difference in the animal studies between 1242 and 1016. The basic achievement was less persistence in the environment.
- 336 Exhibit 142 Exhibit No. 142 is marked. It is a memo of a more detailed discussion of the relative persistence or biodegradability of 1242 and 1016. On the first page of the memo itself is a confidential stamp which was as he received it.

- 337 Policy Formal reports of their research function are all considered confidential.
- 337 Comparison The memo indicates 1016 is at least 10 times better than 1242 in terms of persistence and 75 times better than 1254, or disappear from the environment 10 times or 75 times faster. Or only 10 percent of 1016 will remain as compared to the 1242. It is a measure of relative persistence, not comparative toxicity.
- 339 Exhibit 143 Exhibit No. 143 is marked. It is a status report to Congressman Ryan as to the steps Monsanto has taken since the last discussion. The information in the letter dated March 24, 1971 is accurate as of that date.
- 339 Exh.143/Pg.2 Mr. Mason's statement regarding excellent cooperation from customers that has enabled Monsanto to establish collection, reclamation and disposal of spent fluids refers both to the reclamation programs and later the incineration program for scrap liquid.
- 340 Exh.143/Pg.2 Development of more environmentally acceptable polychlorinated biphenyl fluids refers to Aroclor 1016 and closing the loop refers to the reclamation and disposal program for spent liquids. The only program to "close the loop" on solid waste contaminated with pcb's was the testing in the pilot unit, the destruction of some solid wastes.
- 341 Solid Waste Destruction of solid wastes was demonstrated to be technically feasible but economically unfeasible.
- 341 Police There is nothing beyond what they discussed yesterday that Monsanto was doing to police its customers' operations.
- 342 Exhibit 143 What Mr. Mason is referring to as policing was a program of technical assistance and advice, plant visits and discussions to assist Monsanto's customers in whatever engineering

changes were necessary to control and contain pcb's in their own plants and the collection and incineration of scrap liquids and recycling what liquids could be recycled.

343 Contract Clause The contract clause re termination of supply for lack of control is not policing from his perspective because at no time did his actions or those of others he worked with reflect that kind of approach.

345 Indemnity The indemnity clause was developed and implemented before he was aware of its existence. It never affected their approach regarding helping their customers. When it was implemented, it still didn't change their doing what they thought appropriate.

346 Clause He saw no change regarding customers' efforts to comply with suggestions and recommendations as a result of the indemnification and termination clause.

347 Sawdust He had the understanding that the practice of using sawdust had gone on for quite some time and was Bloomington's way of keeping the material from getting down the sewer. He only saw water on the floor where they degrease the units, not everywhere. He can't remember how much pcb contaminated saw dust they had on an annual or monthly basis or how they disposed of it at the landfill.

340 Exhibit 144 Exhibit No. 144 is marked. It is a document reflecting that Monsanto did an analysis for pcb's of water samples submitted by Westinghouse, but not other environmental type samples. Customers' own laboratories on occasion would ask Monsanto to sample so they could compare results. Any charges were decided on a case-by-case basis. Bloomington was never charged for the water samples.

351 Product Samples Monsanto regularly performed analysis of the product sent Westinghouse.

- 352 Exhibit 145 Exhibit No. 145 is marked. It is a memo dated June 8, 1971. It is a further update on the biodegradation testing program Monsanto had underway. Dr. Keller was in charge of the program of elimination of pcb's by activated sludge. It mimics the bacterial process in the laboratory of the typical municipal sewage treatment plant.
- 353 Test Problems One problem with the sludge testing was the pcb's were adhering to the side of the flasks. It was solved by air bubbling through introduced mechanical agitation. That made a significant difference when compared with an early report.
- 354 Exhibit 146 Exhibit No. 146 is marked. It is a letter dated July 12, 1971 to Dr. Robert Jasper from Papageorge in which he responds to Dr. Jasper's request for technical information on the use of Aroclors in pesticide applications.
- 354 Archive He doesn't know if Monsanto maintains an archive of outdated or discontinued technical literature but suggests he check the Monsanto resource library and the custodians in Monsanto's printing department. Customers are not requested to return old literature.
- 356 Pesticides Since Monsanto didn't recommend Aroclors being used in pesticides, he sent Dr. Jasper general information on the product.
- 357 Exhibit 76 This exhibit is a letter dated September 22, 1977 to Dick Jones of Westinghouse from J. A. Alley of Monsanto.
- 357 J.A. Alley Mr. Alley was a Monsanto employee involved with the pcb dielectric customers at this point similar to the function Mr. Bryant served in the early 70's. Technical advice. He knows nothing further about Mr. Alley.
- 358 Doc Destruction Exhibit 76 suggests customers destroy all copies of "Transformer, Askarel Inspection and Maintenance, Guide

- TIC/FF-(38R-2?). He is not aware of any similar request from Monsanto regarding any Monsanto product before or since September 1977.
- 359 Mr. Alley Since Mr. Alley didn't have the authority on his own, he wrote the letter at the instructions of some superior but he doesn't know to whom he reported.
- 359 1977 He had changed assignments and was replaced by J. C. (Webber?) David Wood was in charge of the division. Dr. John Craddock has that responsibility today.
- 360 Exhibit 147 Exhibit 147 is marked. It is a memo dated August (?), 1971 to Mr. Heisler from Mr. Buckley, both of whom are associated with the Kummrich plant in Sauget, Illinois.
- 361 Mr. Heisler Mr. Heisler was superintendent of manufacturing, responsible for the manufacture and incineration of pcb's.
- 361 Mr. Buckley He was concerned with environmental issues throughout the plant, including pcb's and with any problems associated with incineration.
- 362 Incineration The incineration process gives off, among other things, hydrochloric acid.
- 362 Stack Gasses The acid is scrubbed out of the stack gas and blended with the rest of the Sauget plant's waste which is on the basic side so it helps neutralize the total effluent leaving the plant.
- 363 Emissions Other emissions are listed from the burning of pcb' and mention is made of EPA concerns raised but the pages are illegible.
- 364 Exhibit 148 Exhibit No. 148 is marked. It is a memo dated September 7, 1971 to John Mason from Dr. Richard. It appears to refer to meetings with FDA, Congressman Ryan, analysis of tissue samples done by Scot Tucker at Monsanto, interest of FDA regarding pcb's in food, chicken feed. fish food, food packaging,

electrical equipment near food processing operations but the pages 351 - 377 are virtually illegible.

- 378 Exhibit 151 Exhibit 151 is marked. It is a letter dated August 30, 1972 to Dr. Myronb Mehlman from himself.
- 378 Dr. Mehlman Dr. Mehlman had requested samples of the three Aroclors for use as standards in their laboratory analyzing food at the FDA in order to compare the unknown with the known.
- 379 Exhibit 152 Exhibit 152 is marked. It is a letter dated August 30, 1972 from Papageorge to Major Ralph Vosdingh of the Fifth Army Medical Laboratory in San Antonio.
- 379 Major Vosdingh Major Vosdingh wanted a standard he could use in his laboratories as he analyzed for pcb's.
- 380 Exhibit 153 Exhibit 153 is marked. It is a memo dated September 8, 1972 summarizing a meeting between Monsanto representatives and Westinghouse representatives at Bloomington on August 7, 1972.
- 380 Meeting He talked to Mr. Benignus about the fact that he had arranged for a meeting and he reviewed the topics and facts he was going to share with them. Both orally and with this memo, Mr. Benignus reported back to him.
- 381 Slides The slide presentation refers to overhead transparencies, not 35 mm. slides.
- 381 Benignus Memo The second topic is leaky tankcars used or had been used to deliver pcb's to Westinghouse. There was a period of time when that was a problem and Monsanto's frequency of inspection was dramatically changed. Technically, Westinghouse was responsible for those cars from the time they left Monsanto's plant.
- 382 Negotiations The next subject mentioned in the memo was the ongoing negotiations over the terms of the contract between

Westinghouse and Monsanto for the supply of pcb's. To his knowledge, there was never put into effect a long-term contract with an indexed sales price.

- 383 Exhibit No. 154 Exhibit No. 154 is marked. It is a letter dated September 14, 1972.
- 384 Mr. Shemley He was the field salesman at that time who was selling pcb dielectrics.
- 384 Hen Study He received a copy of the study on pcb's in laying hens and reflected very much the results from Monsanto's studies.
- 385 Exhibit 155 Exhibit 155 is marked. It is a document dated April 23, 1973 and refers to changes in the labeling of pcb drums and tankcars by Monsanto.
- 385 Labels There is a repository of labels in Monsanto's labeling section or department that manages the label programs. He thinks it goes all the way back to the 30's on pcb's, from the beginning of commercial production.
- 386 Label Changes In 1973, there was a color change, not a message change as stated in the document. The message was preprinted in black on the yellow drums and there were, in addition, paper labels which could be used on the tankcars. They would be put in a plastic envelope and tied where the seal is. The big change was from black to yellow drums.
- 388 Exhibit 156 Exhibit No. 156 is marked. It is a letter dated February 21, 1974 to Dr. Sidney Galler of the Department of Commerce.
- 388 Regulations He wrote the letter in response to some proposed regulations on pcb discharges and in response to questions asked by Dr. Galler which were based on EPA's consideration of some standards which, at that time, had been published.
- 389 Reaction Monsanto encouraged its pcb customers to respond to the publication of those proposed effluent regulations.

- 389 Exhibit 157 Exhibit No. 157 is marked. It consists of two letters dated March 7, 1974 and a presentation.
- 390 Effluent Regs Monsanto invited some pcb customers to a meeting to discuss proposed pcb effluent regulations in February 1974.
- 390 Customer Action Several customers formed a pcb committee under the electronic industries association and commented regarding the proposed regulations through that group.
- 391 Hearings Subsequently, there were hearings on those regulations. He was involved in the hearings. He testified and left a copy of the multi-page presentation.
- 391 Exhibit 158 Exhibit 158 is marked. It is the affidavit of James H. Wright and the hearing on it is, "In re proposed toxic pollutant effluent standards for Aldrin/Dieldrin, et al." and one of the et als was pcb.
- 392 James Wright He recalls the name but not the person.
- 393 Exhibit 75 It is one of the attachments to the affidavit that is Exhibit 158. He does not recall Westinghouse requesting Monsanto's permission to use its logo in the cartoon but it could have been done without his knowledge; however, it is a good graphic way of communicating the message concerning scrap Aroclor or Inerteen.
- 394 Exhibit 159 Exhibit 159 is marked. It is a further update on the status of the biodegradability of another Aroclor, 1221 which was much more degradable. Page one notes that over 80 percent of the material disappeared in 28 hours with the activated sludge. At that time, 1221 was not a new product.
- 396 Interest An interest developed in its possible use in capacitors. It had all the dielectric properties, it degrades rapidly, but it didn't have the equivalent fire resistance. However, customers were interested and so they

did the study and 1221 was an additional alternative.

397 Exhibit 160

Exhibit No. 160 is marked. It is a letter from Papageorge forwarding questions to Westinghouse.

397 EPA

Mr. Kopp of EPA was attempting to get information regarding pcb's from transformer operations and asked him to help get them from General Electric and Westinghouse. It was part of EPA's effort to understand pcb's, the electrical industry, the economic impact, the ability and feasibility of control and come up with a supportable standard. This is part of the regulations discussed.

398 Exhibit 161

Exhibit No. 161 is marked. It is a request from Westinghouse for answers to questions about pcb's. He responded.

399 Exhibit 162

Exhibit No. 162 is marked. It is a copy of his response to Exhibit 161.

399 Mr. Wheeler

Only Elmer Wheeler over in the medical department helped him respond in Exhibit 161.

399 Contamination

The reference to shoes and shoe soles being contaminated would indicate there was a source of pcb's on the walking surfaces.

400 South Boston

He had visited South Boston 4 or 5 years before this letter was written. However, he didn't have enough information to make a good judgment regarding its significance nor did he make any inquiry of the letter writer or anyone else.

401 Comparison

South Boston plant was much cleaner, dryer looking than Bloomington when he visited both. Therefore, his response might have been different if the same letter had come from somebody at Bloomington and might have raised more concern.

401 Exhibit 163

Exhibit 163 is marked. It is a document dated April 3, 1975.

- 402 Analyses There were efforts made to get analyses from other laboratories and in general, the results compared favorably with Monsanto's results, i.e., they got numbers that related to each other in a reasonable way. He is referring to the quality of the data.
- 403 Exhibit 164 Exhibit 164 is marked. It is a document dated August 22, 1975 referring to providing its pcb customers assistance in completing the questionnaire.
- 403 Assistance Those involved in providing that assistance would have been Dave Wood, the author of this request who had access to Monsanto records of pcb's sold to customers' sites and himself. On the first page of the exhibit, Mr. Wood is informing him that this activity was underway and ongoing.

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