MF500 Savage #4

COPY

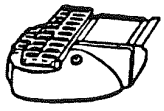
1 IN THE CIRCUIT COURT OF MILWAUKEE COUNTY

STATE OF WISCONSIN

STROH DIE CASTING COMPANY,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	Case No. 639887
	)	
MONSANTO COMPANY,	)	
	)	
Defendant.	)	

DEPOSITION OF JAMES R. SAVAGE

Taken on behalf of Plaintiff
August 11, 1988



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WATER_PCB-SD0000023324

IN THE CIRCUIT COURT OF MILWAUKEE COUNTY

STATE OF WISCONSIN

STROH DIE CASTING COMPANY, Plaintiff,	)	
vs.	)	Case No. 639887
MONSANTO COMPANY, Defendant.	)	

E X H I B I T S

	Page
Plaintiff's Deposition Exhibit Savage No. 1. . . .	29
Plaintiff's Deposition Exhibit Savage No. 2. . . .	30

WATER_PCB-SD0000023325

IN THE CIRCUIT COURT OF MILWAUKEE COUNTY

STATE OF WISCONSIN

STROH DIE CASTING COMPANY,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	Case No. 639887
	)	
MONSANTO COMPANY,	)	
	)	
Defendant.	)	

DEPOSITION OF JAMES R. SAVAGE, produced, sworn and examined on behalf of Plaintiff, August 11, 1988, between the hours of eight o'clock in the forenoon and five o'clock in the afternoon of that day, at the Paul Brown Building, 818 Olive Street, St. Louis, Missouri 63101, before KATHRYN T. O'NEILL, a Registered Professional Reporter and a Notary Public within and for the State of Missouri.

A P P E A R A N C E S

The Plaintiff was represented by Mr. Donald H. Carlson and Mr. John R. Pendergast, Jr. of the law firm of Messrs. Riordan, Crivello, Carlson & Mentkowski, 710 North Plankinton Avenue, Milwaukee, Wisconsin 53203.

The Defendant was represented by Mr. James H. Schink of the law firm of Messrs. Kirkland & Ellis, 200 East Randolph Drive, Chicago, Illinois 60601.

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IT IS HEREBY STIPULATED AND AGREED by and between Counsel for the Plaintiff and Counsel for the Defendant, that this deposition may be taken in shorthand by KATHRYN T. O'NEILL, a Registered Professional Reporter and Notary Public, and afterwards transcribed into typewriting, and signed by the Witness.

o-O-o

JAMES R. SAVAGE,

of lawful age, being produced, sworn, and examined on the part of the Plaintiff, deposes and says:

DIRECT EXAMINATION

QUESTIONS BY MR. PENDERGAST:

Q. Could you please state your full name for the record, and spell your last name.

A. James Richard Savage, S-a-v-a-g-e.

Q. And what is your current residence address?

A. 1461 Oak Bluff Lane, Kirkwood, Missouri.

Q. Where are you currently employed?

A. Monsanto Company in St. Louis.

Q. And what is your current position?

A. Director, technology licensing and acquisition.

Q. And what are your job responsibilities?

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A. I'm involved in the transfer of technology from Monsanto to other companies and vice versa.

Q. For example, what kind of technologies are we talking about?

A. In general, technology to chemical processes and products.

Q. And what entity or persons are you transferring this kind of information to?

A. Other companies, usually in other countries.

Q. You license processes developed by Monsanto to other countries --

A. Yes.

Q. -- or companies in other countries?

A. Right.

Q. How long have you been doing that?

A. Ten years.

Q. Have your job responsibilities changed at all in the last 10 years?

A. The company has been reorganized, so I've had responsibility for different sets of products and technologies, but the basic duties have been about the same.

Q. When was the company reorganized, so to speak?

A. It's been reorganized several times, most

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recently about two years ago.

Q. What was the nature of the reorganization?

A. It was a major restructuring of the company, which included selling off some businesses.

Q. Did Monsanto decide to get out of some markets? Was that the idea at that time?

A. Well, we sold an entire plant in Texas, which included some heavy petrochemicals, and we got out of those businesses.

Q. Other than petrochemicals, were there other areas that Monsanto got out of?

A. Oh, sure. I couldn't name them all. The company has been considerably changed.

Q. As part of that reorganization, did Monsanto shift its emphasis into a certain kind of product line or types of products?

A. Yes. I think in the announcement it was emphasized that we wanted to make fewer commodities which were cyclic in nature and emphasize specialty kinds of products more.

Q. All right. Between 1978 and the present, were there any other -- strike that. During this last reorganization, were the departments themselves, the basic departments of Monsanto, changed?

A. Yes. The organizational unit that I'm in

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now, the Monsanto Chemical Company was formed from some previous divisions.

Q. All right. Prior to that and subsequent to 1978, were there some other major reorganizations at Monsanto?

A. Yes. We have reorganized enough different times that I don't think I could reconstruct those for you. We go through some kind of reorganization every three or four years, I would say.

Q. All right. Approximately in 1978, you took your present position?

A. Right.

Q. Correct?

A. Right.

Q. What did you do prior to that?

A. I was in manufacturing before that. I was called a manufacturing manager.

Q. Have you been in St. Louis for the last 10 years?

A. Yes.

Q. Where were you a manufacturing manager?

A. At the general office.

Q. And what were your duties?

A. Manufacturing manager was responsible to a certain business group for organizing the production of

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the products of that business group and being sure that the products were made on schedule.

Q. Which business group were you affiliated with?

A. Specialty products business group.

Q. Which consisted of what products?

A. The range of products was not exactly the same through the whole existence of that group, but in general, it included functional fluids such as heat transfer fluids, dielectric fluids, hydraulic fluids. We also made paper chemicals.

Q. For how long did you hold the position as manufacturing manager?

A. About eight years, starting in 1970.

Q. As manufacturing manager, who were your direct subordinates?

A. It was, despite the title, more of a staff than my responsibility. At each plant there was a manufacturing superintendent who would be responsible for the production of the products that I was responsible for, but his formal boss would be the plant manager, and I would have what we call a dotted line relationship to each of these people.

Q. Did you have a direct relationship with the plant managers?

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A. No.

Q. What were you doing prior to 1970?

A. I was at the Queeny plant in St. Louis. I was general superintendent of technical services and laboratory.

Q. And what did your job duties entail?

A. The technical services department was a group of about 80 technical people, engineers and technicians. Those engineers did improvement work on the various production processes at the plant. The laboratory was mostly an analytical laboratory that was responsible for the quality of the products, analyzing of the quality of the products made in the plant. We also had a small research section.

Q. How long did you hold that position?

A. About three years.

Q. Dating back to about 1967?

A. Right.

Q. What did you do prior to that?

A. Prior to that I was in the Krummrich plant in Sauget, Illinois. I was a technical services superintendent in a department similar to the one that I later headed at the Queeny Plant. I had a group of about 10 engineers and one draftsman, I think. Our job was to do improvement work on a set of products at the Krummrich

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plant.

Q. When did you take on that job?

A. Formally, probably about 1965. I was in that department, though, earlier than that informally doing the same job.

Q. Since when?

A. About 1963.

Q. What had you been doing prior to that?

A. Prior to that I was at the Anniston plant in Anniston, Alabama.

Q. What was your position there?

A. My last two years there I was a production supervisor.

Q. What were your job responsibilities?

A. For the first of those two years, I supervised the chlorine department. The second of those two years I continued to supervise the chlorine department and, also, the Aroclor department.

Q. How about prior to 1961?

A. For about three years before that, I was at the Anniston plant working as a technical services engineer in the parathion department.

Q. What's parathion?

A. Parathion is an insecticide.

Q. Is that a trade name?

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A. No. It's a generic name.
Q. That would take us back to about 1958?
A. Right.
Q. What were you doing prior to that?
A. Prior to that I was at the Queeny plant here in St. Louis as a technical services engineer.
Q. And what were your job responsibilities?
A. Doing improvement work on certain processes.
Q. What kind of processes?
A. Primarily salicylic acid in aspirin, some related products.
Q. And when did you begin that work?
A. In February, 1957, that was when I joined the company.
Q. What had you been doing prior to that?
A. I graduated in engineering in January, 1957. I was in school before that.
Q. What degree did you receive in '57?
A. B.S. in chemical engineering.
Q. From what school?
A. University of Wisconsin.
Q. Good school. When you first came on with Monsanto in 1957, you were working only with aspirin and those type products?
A. Well, I was part of a group which had

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responsibility for a number of different products in the plant, and I was assigned probably in the course of that year to five or six different departments to work on various small problems.

Q. Okay. During those two years at Queeny, did you become involved with any processes where PCB-containing products were being manufactured or used to your knowledge?

A. No. It was one year, either '57 to early '58, but --

Q. Did you have any contact with any chemicals or products which you understood to be hazardous chemicals?

A. Well, yes. Most industrial chemicals are generally considered hazardous from the standpoint that they have to be handled according to certain good practices.

Q. And which chemicals fell into that category back in 1957, that you worked with?

A. I don't know that I can enumerate all of them, but I can certainly think of a few: phenol, caustic soda, sulfuric acid, methanol.

Q. How was the -- is it phenol?

A. Yeah.

Q. Is that p-h-e-n-o-l?

WATER_PCB-SD0000023335

A. Right.

Q. How was that used at the Queeny plant in 1957?

A. I'm sure it was used in several processes. The one that I was involved in was salicylic acid. It's one of the raw materials.

Q. As technical service engineer, you were involved directly in production?

A. Well, production was the direct responsibility of a production organization. What we did was to provide assistance to them and do small projects to make improvements in the operation.

Q. Were you involved at all in making improvements in systems for waste disposal?

A. No, not during that time.

Q. Okay. At the Queeny plant in 1957, '58, do you know what kind of system was in use with respect to waste disposal in the areas you worked?

MR. SCHINK: Excuse me. You said '57, '58, at Anniston?

MR. PENDERGAST: No, at Queeny.

A. I had no direct involvement with waste treatment systems at that time. That was the responsibility of a specialist group. I don't recall what the practices were at that time.

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Q. (BY MR. PENDERGAST) All right. In 1958, you moved to the Anniston plant; is that correct?

A. Right.

Q. And you became production supervisor?

A. No. When I first arrived there, I had the same title of technical services engineer.

Q. Okay. Was that seen as a promotion?

A. No. I went down there as part of a start-up of the parathion department.

Q. In 1958, Monsanto was starting production of parathion insecticide?

A. We were starting up a new unit at Anniston.

Q. Okay. And were you, during the three years that you were a technical services engineer down there, were you only working with the parathion?

A. Yes.

Q. In connection with your work with the insecticide, what was expected of you on a day-to-day basis?

A. Well, part it was troubleshooting, since it was a new operation, and there were minor bugs to be worked out. Part of it was to implement small improvement projects to increase capacity or improve more raw material consumption.

Q. What were the raw materials used in that

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process?

A. Phosphorus pentasulphide, ethanol, methanol, chlorine, paranitrophenol, soda ash.

Q. And in what were these raw materials combined to form the finished product?

A. It was a very complicated process. Methanol was reacted with phosphorus pentasulphide. That intermediate then was chlorinated. The resulting intermediate from the chlorination was distilled. A separate stream soda ash was reacted with paranitrophenol. Those two intermediates then were combined. The finished product was then purified and dropped.

Q. Was there any waste by-product from that?

A. Yes.

Q. What was done with the waste by-product?

A. There were two different streams. One was an organic residue. That stream was incinerated at the plant. The other stream was aqueous waste which went through an activated sludge treatment plant inside our plant boundary, and then was discharged to the city sewer, where it was treated again at a city plant.

Q. While you were at Anniston in those first three years, was the discharge into the municipal sewer ever monitored?

A. Yes.

WATER_PCB-SD0000023338

Q. Okay. What were you looking for in there?

A. Well, my concerns were with the waste from the parathion department, so I'm aware of what we monitored in that respect. I'm not aware of what we might have monitored with respect to other operations.

Q. Okay.

A. In the case of the parathion department, there were certain by-products which we tracked very carefully.

Q. What were the by-products you tracked carefully?

A. The most identifiable one was unreactive paranitrophenol, which was a yield loss from parathion. That would be part of a very visible color to the waste. That served as a good indicator of how good a job we were doing in general of treating the waste.

Q. What was the fear in letting that get out?

A. The concern was that the city treatment plant, which was relatively new, was marginal in capacity, and if we allowed too much oxygen demand in the waste that we put in the sewers, then it would overload the city plant, and then they would have trouble getting good treatment of the domestic waste.

Q. Was there any other reason you were concerned with the waste from the parathion formulation?

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A. We analyzed for parathion itself, since that was very toxic material, but never had any serious discharge of parathion.

Q. What were you using to test for the presence of parathion in the waste water?

A. I don't know. Samples were taken of the waste water, and the laboratory had specialized methods, but I'm not not a specialist in that subject myself.

Q. Would it be fair to say during that three years your job had more to do with more efficient utilization of raw materials and greater efficiency in the system?

A. Yes. I would say that was the biggest task we had at the time.

Q. You were still kind of refining that system? Is that part of it?

A. Yes, although the work on controlling effluent and the work of improving were really the same, because if your raw material efficiency was better, then the waste load was small.

Q. Okay. During those first three years were you involved at all with any projects or processes that used or created any PCB-containing materials?

A. No.

Q. Were you familiar with PCBs in the late

WATER_PCB-SD0000023340

1950's?

A. Well, first, that expression "PCB" was not in use at the time, but I was casually familiar with the chlorinated biphenyl products that were made on the other side of the plant.

Q. Okay. At that time did you understand anything about the particular properties of the chlorinated byphenyls?

A. No.

Q. At some point in time you discontinued your work on the parathion and shifted into production supervision; is that correct?

A. Right.

Q. What precipitated that?

A. That was considered a promotion.

Q. Okay. Did the parathion work continue after that?

A. Yes. There were some other engineers that would have taken that.

Q. Is parathion still manufactured?

A. No. It was shut down sometime in the last couple of years.

Q. Do you know what the reasoning for the shutdown was?

A. I don't know.

WATER_PCB-SD0000023341

Q. While in production, what were your -- as production supervisor at Anniston, what were your job responsibilities?

A. Well, production supervisor is responsible for operating a certain production unit responsible for labor relations, supervising a crew of workers, responsible for really all aspects of that operation, production, raw material consumption, safety of the workers, production control.

Q. What did your working with chlorine, what did the chlorine department do?

A. Chlorine department brought in salt or potassium chloride as a raw material, and using electricity, produced chlorine and caustic soda from those raw materials, or caustic potash in the case of potassium chloride raw material.

Q. Were polychlorinated biphenyls used in any of the processes or created by any of the processes which you were involved in in Anniston prior to 1963?

A. Prior to when?

Q. 1963 is when you said you left there.

A. Yes. After I had supervised the chlorine department for one year, then the responsibility for the Aroclor department was added to my responsibility. I continued to run the chlorine plant, but also the Aroclor

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department. I continued that for about a year.

Q. Was one of the primary purposes for the chlorine production for aid in the production of the Aroclors?

A. Yes. The Aroclor department used essentially all of the chlorine that we made.

Q. At that time when you first became involved with the Aroclors, were you provided with -- what kind of information were you provided with concerning the Aroclors?

A. Well, I had to learn the process, which meant chlorinating, all the important parameters having to do with the proper operation of the unit. I was provided with various documents describing the operation.

Q. Were you given any information regarding the toxic properties of the products?

A. Certainly. Part of the basic documentation for each of our processes included information about any hazardous properties of raw materials of unfinished goods.

Q. And do you recall at all when you first became involved with Aroclors, what you were told their particular hazardous qualities were?

A. I can't recall any detail. We would have usually a one-page sheet on each product describing its general properties and any special precautions that would

WATER_PCB-SD0000023343

be associated with it, but as to specific content of the documents for those products at that time, I couldn't tell you.

Q. Do you remember at that time whether, when you were introduced to the Aroclor production, whether the basic message was, "This is something more dangerous than, say, a lot of the other things we are working with around here"?

A. No, I don't think so. We understood Aroclors to be a fairly ordinary industrial chemical. By that I mean it was not intended to be ingested, or skin contact was to be avoided, generally treated with respect as any chemical product would be, but I don't think we understood it to be of any unusual hazard.

Q. Were the workers advised to take any particular precautions in working with the Aroclors?

A. No. We would give them instructions similar to what we would give them about any industrial chemical.

Q. At that time were you familiar with any studies that had been conducted by Monsanto concerning the toxicity of the Aroclors?

A. Only to the extent that we had these data sheets on the products, so I presume that there was some work behind those, but I was not familiar with the work.

Q. Okay. Did the workers take any or were the

WATER_PCB-SD0000023344

workers advised to take any special precautions with respect to the Aroclors?

A. Yes. We had a regular safety training routine for every department, and so we did have such a routine for the Aroclor department, and we would instruct the workers in proper practices to protect themselves. The most severe routine hazard of that operation was just that it was a very hot process, and so we would instruct them about protecting themselves from burns.

Q. Were the workers told about the risk of inhalation of fumes from that process?

A. Yes. We would advise them to avoid exposure to fumes, and in situations where there was any possibility of that, we provided fume hoods and whatever apparatus was required so that it was not necessary for them to be exposed to fumes.

Q. Were they also advised of the potential for development of what has been termed chloracne when coming into contact with the Aroclors?

A. No. I don't think that we had any evidence at the time that chloracne was associated with Aroclor.

Q. Were the workers told anything in particular about disposal of clothing which had come in contact with Aroclors?

A. No.

WATER_PCB-SD0000023345

Q. In that process did workers' clothes become covered with these substances, or was it kind of a hands off process?

A. Well, like any chemical process, it was certainly a closed system. The only place that the product was used, would be exposed in the open, would be in the drumming operation or sampling, something like that. Perhaps they would actually get a little on their clothing, but it wasn't a major issue.

Q. Okay. Did you also supervise as production supervisor the drumming of the Aroclors?

A. Yes. That was part of the operation.

Q. How was that done?

A. I really don't recall the details. I have worked in a lot of different processes, many of which had drumming operations, and I don't remember anything special about that one.

Q. Generally then can you describe to me how that happens?

MR. SCHINK: You mean generally in the chemical plant how a product is drummed?

MR. PENDERGAST: Well, he said he didn't remember anything special about this one.

So I guess generally, what was your recollection what was done?

WATER_PCB-SD0000023346

A. Small scale drumming operations are usually done in a more or less manual way. There's usually some kind of roller or conveyor that rolls away the empty drum, some kind of flexible line which allows filling of the drum to a certain weight, and then it's closed up with a wrench and rolled away.

Q. In the drumming area, did the floor of that area become damp with, I guess, excess Aroclor fluid that might have gotten on the floor?

A. I don't remember.

Q. Okay. To your knowledge -- strike that. Briefly explain to me how the Aroclors were produced.

A. The term "polychlorinated biphenyls" almost describes the process. The chlorination is a reaction between biphenyl and chlorine. A catalyst is used. We used ferric chloride for that purpose. Chlorine gas is bubbled through biphenyl in which a catalyst has been dissolved. We did that in several different systems, some of which were continuous. Some were batch-wise. When the chlorination was completed, we would call that intermediate crude Aroclor.

The next step was to bubble air through the crude material to remove dissolved HCL, which was a by-product of a reaction. After that there was a distillation step in which pure Aroclor was boiled away from heavier tarry

WATER_PCB-SD0000023347

material, which was also a by-product, and a distilled Aroclor was then given a treatment using some kind of a special clay which absorbed more impurities, and the result of that was Aroclor, which could be used for the various purposes it was intended for.

Q. All right. One of the by-products was hydrochloric acid?

A. Right.

Q. What was done with that?

A. There was a separate department for recovery of hydrochloric acid.

Q. Was that hydrochloric acid ever tested for the presence of PCBs?

A. Yes. That was an undesirable impurity as far as the hydrochloric acid was concerned.

Q. In 1962, were you testing hydrochloric acid for the presence of PCBs?

A. Yes.

Q. How were you doing that?

A. That was done in the analytical laboratory. I don't know exactly how.

Q. But it was your understanding that they could detect the presence of PCBs in the hydrochloric acid?

A. I think at the time they were simply testing for the presence of organic materials, because that was

WATER_PCB-SD0000023348

undesirable in muriatic acid or hydrochloric acid.

Q. Had they established a level of tolerance for organic materials in the HCL?

A. I think there was a specification.

Q. What was done if the batch exceeded that specification?

A. Well, normally it would not exceed that. We had a system for removing organics from the hydrochloric acid. If it did, we would rework it.

Q. All right. Now, you also referred to a tarry substance that was deposited as part of the process. What did that tarry substance consist of?

A. Pardon me? Which one?

Q. We might have to go back through the process.

A. Okay. Oh, I think we are back at the distillation where the Aroclor product is distilled away from a tarry residue.

Q. Okay. What was done with the tarry residue?

A. At the end of the distillation batch, the tarry residue would be in the bottom of the still pot, and we will drain that off to drums.

Q. Do you know what was in that tar?

A. The tar was chemically really not different than the Aroclor, except that it was more highly chlorinated than the part that had been distilled away

WATER_PCB-SD0000023349

from it.

Q. And was that by-product also sold?

A. Some of it was.

Q. What product name was that sold under?

A. It was called Montar, and there was a number. I don't remember the numbers anymore, but there were various Montars that represented the distilled residue from various Aroclors.

Q. Do you know how that material was used ultimately?

A. No, I don't.

Q. Finally, you mentioned a clay was used as part of the final process.

A. Right.

Q. How was that used again?

A. As an absorbent.

Q. And the clay was intended to absorb impurities?

A. Right.

Q. Was that clay ever disposed of?

A. Yes.

Q. Was that done periodically?

A. Every batch was taken to a landfill.

Q. Was that clay ever tested for PCBs?

A. Well, it wouldn't be necessary. I'm sure it

WATER_PCB-SD0000023350

was saturated with PCB.

Q. And that material was taken to a landfill?

A. Yes.

Q. Did the Anniston plant have a landfill on the property?

A. Yes.

Q. Was that the landfill it was taken to?

A. Yes.

Q. Did anybody, while you were at Anniston, prior to 1963, ever express a concern with disposing of that PCB-containing material in the landfill area?

A. No.

Q. How close was the landfill to the nearest body of water?

A. I guess I don't know exactly. I don't remember the geography that well.

Q. Were there any rivers or streams in the area?

A. There was no stream nearby.

Q. Was the saturated clay placed in any kind of containers before being taken to the landfill?

A. Yes. I think we put it in drums.

Q. At the time you were shipping the Aroclors, were you also putting labeling on them?

A. Yes.

Q. Did those labels contain any kind of

WATER_PCB-SD0000023351

warnings?

A. Yes.

Q. Do you remember what those warnings said?

A. No.

Q. At Anniston, were you manufacturing all the Aroclors there?

A. No.

MR. PENDERGAST: Mark that.

[Plaintiff's Deposition Exhibit Savage No. 1 marked for identification.]

Q. (BY MR. PENDERGAST) Let me show you what's been marked as Savage Exhibit No. 1. Do you recognize that?

A. Not specifically. It has the general style that we used, but I couldn't tell you whether that's exactly what we used at the time.

Q. Okay. Looking at just the way the label is set up, is that the kind of format that was used in 1962, 1963?

A. I really don't remember that.

Q. Okay. Does the language on there after the word "Caution," does that ring a bell as to what was on the labels you were using?

A. That would be normal language for a product like that.

WATER_PCB-SD0000023352

Q. Okay. When you shipped out your Aroclor products, they had the Monsanto label on them; is that correct?

A. Yes.

MR. PENDERGAST: Mark that.

[Plaintiff's Deposition Exhibit Savage No. 2 marked for identification.]

Q. (BY MR. PENDERGAST) I show you Savage Exhibit No. 2. Does that one strike you as any more or less possible as one of the labels that might have been used?

A. Yes. This one seems more familiar.

Q. That's Exhibit No. 2?

A. Yes.

Q. Now, back in 1962, '63, you were familiar with this label. You had read it; is that correct? Let's assume that.

A. I really can't tell you when I first saw that label.

Q. Okay.

A. This one is obviously older. It has an older logo, and we stopped calling ourselves Monsanto Chemical Company at some point. So, this is clearly older than that one.

MR. SCHINK: The "this" you are referring to

WATER_PCB-SD0000023353

is number 1?

A. Number 1 is clearly older, but when it would have been replaced by the other one, I don't know.

Q. (BY MR. PENDERGAST) Okay. The general language on Exhibit No. 2, do you remember that being on your drums in the early '60s, when you were at Anniston?

A. I don't know whether that's what was on the drums at that time or not.

Q. Okay. Regardless, there was some warning on the drum?

A. Oh, sure.

Q. Okay. Was there anything in that warning that raised suspicions in your mind as to whether you should be taking that PCB-saturated clay out to that landfill?

A. No. I don't see any connection.

Q. Okay. In 1963, you moved on to the Krummrich plant in Sauget, Illinois?

A. Right.

Q. And your title there was technical services supervisor, at least became that after a while?

A. Technical services superintendent.

Q. Superintendent. Was that also considered a promotion?

A. Yes.

WATER_PCB-SD0000023354

Q. And what were your job responsibilities there?

A. I supervised a small group of engineers whose job it was to do group projects in various operations of the Krummrich plant.

Q. The Krummrich plant was also a production facility for Aroclors?

A. Yes. That was one of the products that was made there.

Q. Were you working with Aroclors at Krummrich?

A. A couple of my engineers were.

Q. You were not directly?

A. That's right.

Q. Did you oversee the entire technical services aspect of the Krummrich plant at that time?

A. No. There were three others with jobs like mine.

Q. Concerning different products?

A. Right.

Q. And what were your products?

A. Chlorine, Aroclor, nitroanilines, several others.

Q. Was the Krummrich production process for Aroclors similar to that at Anniston?

A. Yes.

WATER_PCB-SD0000023355

Q. Basically the same system?

A. Yes.

Q. Did the system also have -- let me strike that. Let's back up. We talked about the batching system at Anniston. Were the by-products of the continuous system different?

A. No.

Q. Okay. Were the same machines used in both or --

A. They are very similar.

Q. And the by-products were disposed of in the same way as with the batch system?

A. Yes.

Q. Krummrich, did the Krummrich Aroclor process also have the same by-products?

A. Yes.

Q. Was the hydrochloric acid also sold?

A. Yes.

Q. Was it also tested for PCBs?

A. It was tested for organic content.

Q. Okay. Up through 1967, did there come a time when they decided, "We can test for PCBs," or, "We're going to start testing for PCBs"?

A. Yes, but not during the time I was at the Krummrich plant.

WATER_PCB-SD0000023356

Q. So it was subsequent to '67, in your mind?
A. Yes.
Q. Okay. The tarry residue was still drained into drums and sold as Montar?
A. Yes.
Q. And did the Krummrich plant also have a landfill on site?
A. Yes.
Q. Okay. And was the PCB-saturated clay also put in drums and taken to the landfill there?
A. Actually, at that point it would be a matter of speculation.
Q. You don't know?
A. I don't know.
Q. Was the landfill at Krummrich near a body of water or a stream?
A. I don't think I can answer that accurately, because the Krummrich plant used more than one landfill. One of those is near the Mississippi River, but I don't know whether a specific waste went to that one.
Q. Okay. Was that landfill owned by Monsanto?
A. Yes.
Q. At the Anniston plant, are you familiar with Snow Creek?
A. Yes.

WATER_PCB-SD0000023357

Q. Is that near the plant?

A. Yes.

Q. Is it apparently not near the landfill, though?

A. It's not too far from the landfill. In response to your previous question, I didn't think of Snow Creek as a natural body of water, since it's just a very small ditch, essentially.

Q. Okay. Does Snow Creek, is that a tributary of the water system there?

A. I'm sure that Snow Creek eventually joins a larger body of water.

Q. Okay. Monsanto then operated two landfills somewhere around the Krummrich plant, true?

A. Well, more than one. I don't know how many.

Q. Okay. How about at Anniston? More than one landfill there that they owned?

A. We operated one landfill on our own property. We may have used others, but I don't know.

Q. Krummrich, you operated one landfill on the property, and then there was --

A. There were others.

Q. There were others that were owned by Monsanto, though?

A. I don't know that.

WATER_PCB-SD0000023358

Q. Would it be fair to say that between '61 to '67, as far as the production processes for Aroclors in Monsanto between the Anniston and the Krummrich plants, remained fairly static?

A. I would say yeah, fairly static.

Q. Okay. Was there any, to your knowledge, any procedure for cleaning the areas in which the Aroclors were manufactured?

A. There were normal housekeeping procedures for those operations, yeah.

Q. Okay. Both the production area in Anniston and Krummrich for production of PCBs were basically an open air area; is that true?

A. No. There were buildings involved.

Q. Okay. I guess I was led to believe that at least part of the production area had a roof over it, but didn't necessarily have walls going all the way around.

A. That's true.

Q. Okay.

A. Some was in the open. Some was inside the building.

Q. Okay. Was it similar at both plants?

A. No. Structurally they were quite different.

Q. Okay. What portions of the Anniston plant were outdoors?

WATER_PCB-SD0000023359

A. Chlorinators at Anniston were outdoors.

Q. This is where the chlorine was added to the biphenyl?

A. Right.

Q. Was there an accepted practical reason for having that outside?

A. Outdoor construction was considered more modern, I think. It was just a matter of evolution.

Q. What benefit was derived from the outdoor construction?

A. Most chemical plants are built outdoors. It's considered to be safer.

Q. Why would it be safer?

A. Because in the event of any accident, there's less likelihood of confining a worker in a place where there might be fumes or flames or some hazardous material.

Q. Okay. With respect to the cleaning of the outdoor portion of the Anniston production area, what was the procedure as far as cleaning is concerned?

A. Normally, it was a matter of wiping up spills. If there was some kind of leak, by the time it had been fixed, it would normally be some materials spilled on the floor, and we would clean it up with rags or scrape it up. Some of these materials would solidify at ordinary temperatures, and so it's possible to simply

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scrape the material up and put it in the drum.

Q. Was there ever a time where the whole outside facility at Anniston was hosed down or scrubbed down or anything like that? Did you have a periodic cleaning like that?

A. Yeah. That would probably be the last step of cleaning up.

Q. Okay. Were there drains in the outdoor production area?

A. Yes. There would be storm drains.

Q. Do you know where those led?

A. No. I don't remember.

Q. Okay.

A. I just don't remember whether there was a separate storm drain system or not.

Q. At that time that you were at Anniston, did you have any concern whatsoever that PCB-containing materials might be going down those drains and out of the plant?

A. No. At that time we didn't consider the Aroclor department had any serious pollution potential.

Q. Why was that?

A. Two reasons, one being that we could close the material balance, which means in chemical engineering terms that we could account for where the raw materials

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had gone. The other reason is that chlorinated biphenyl materials are almost completely insoluble in water, and, therefore, it's unlikely that any significant amount would be found in a water stream, or so it seemed at the time.

Q. Okay. Back to my question. Was there a time periodically where it was time to scrub down the whole production area or not?

A. We had periodic housekeeping inspections, and the workers would make a special effort to clean up the plant at that time.

Q. Okay. Were cleaning materials, to your knowledge, used in -- ever swept off the production area into the surrounding ground?

A. Not into the surrounding ground. We would use floor dry compounds, which are kind of like sawdust or kitty litter or something, to soak up a spill, but that would be swept up and put in the drum.

Q. What about during the cleaning?

A. No. These are fairly sticky materials. Some are solid. Some are very sticky liquids, and it was necessary to literally scrape the floor to get it off if there was any significant deposit. And so we scraped off and swept up, put in a drum.

Q. Okay. What was then done with those drums?

A. Those drums would go to a landfill.

WATER_PCB-SD0000023362

Q. Would it go to the landfill on the Anniston site?

A. I'm not sure.

Q. Okay. Was the cleanup procedure pretty much the same at the Krummrich plant?

A. As far as I know, but I was not directly responsible for the manufacturing responsibility to take care of housekeeping.

Q. Okay. As technical services superintendent, were you involved at all in monitoring where the waste from the plant was going?

A. Well, speaking of the plant in general, we had some work on pollution problems at that time, but I don't recall any special concern at the time about the waste from the Aroclor department.

Q. What kind of pollution problems did you have that you had to address?

A. That would have been liquid waste from other operations.

Q. And where was that ending up?

A. Krummrich plant at the time had a very complex sewer system that was interconnected, and all the waste eventually would go to the Sauget Village treatment plant.

Q. And what problems developed in connection

WATER_PCB-SD0000023363

with that?

A. The problems that I was concerned with at the time were specific to one or two departments, and it related to raw material consumption problems in those departments. I don't recall that the wastes, per se, were causing any particular problem.

Q. That is, you weren't so concerned about the fact that you were having this waste getting into the sewer system as you were that your system, processing system, wasn't being run as efficiently as it could have been running? Is that what you're saying?

A. Well, waste problems and raw material efficiency problems are really opposite sides of the same coin.

Q. Okay. You made the statement, though, that you didn't think it was so much a waste problem?

A. I don't recall that we had specific problems with those wastes at that time.

Q. You left the Krummrich plant in 1967?

A. Yes.

Q. Prior to that, do you remember while being at Krummrich any startling new discoveries announced concerning PCBs or Aroclors?

A. Well, I remember something that was startling to me that occurred approximately at that time, although I

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don't know exactly when. Perhaps it was a year or so later, but I remember the reading of the work of Dr. Risebrough on peregrine falcons and claiming that he had discovered PCBs as creating a problem with the peregrine falcon. This was not something I learned through any particular company channel. It was just something I saw in technical literature.

Q. In what technical literature did you see that? Do you recall?

A. I don't recall.

Q. What kind of literature were you receiving while you were at Krummrich?

A. I read a lot of different magazines. I have no idea. It would have been the regular trade press associated with chemical or scientific subjects.

Q. Okay. Do you remember -- and all I know, my only reference point is the Bar Association, and I know I get one from the American and one from the Wisconsin. Were there some organizations you remember that you received publications from?

A. It could very well have been a little later than this particular period. I have been for a long time reading magazines like "Scientific American," the journal of the American Institute of Chemical Engineers, which is called "Chemical Engineering Progress," "Chemical Week."

WATER_PCB-SD0000023365

So, you know, I have no idea where I would have seen something like that.

Q. Are you presently a member of any professional associations?

A. Yes. I'm a member of the American Institute of Chemical Engineers, the Licensing Executive Society.

Q. And how long have you been a member of those organizations?

A. I've been a member of the American Institute of Chemical Engineers, I think, since I was in college. I have been a member of the Licensing Executive Society for about 10 years.

Q. Does the former organization have a regular publication?

A. Yes. It called "Chemical Engineering Progress."

Q. Okay.

A. That's the main journal. Actually, they have several journals.

Q. In 1967, you came back to the Queeny plant?

A. That's right.

Q. And is that located here in St. Louis?

A. That's right.

Q. And again, your title was what?

A. General superintendent of technical services

WATER_PCB-SD0000023366

laboratory.

Q. What were your job responsibilities there?

A. I think that was covered earlier. I had a group of about 80 engineers plus the analytical laboratory.

Q. Okay. And were there other general superintendents of technical service?

A. No. My responsibility covered the whole plant.

Q. Okay. So, you oversaw generally all the products that were produced there then?

A. Technical work associated with all the products, that's right.

Q. When you say "technical work," I just want to be straight on this. Is that as distinguished from some other discipline?

A. Each plant has a manufacturing organization, production supervisor, production superintendent, production general superintendents. Those people report to the plant manager. I also reported to the plant manager. My people would do improvement work in the production departments or sometimes in the service utility departments, but we were not directly responsible for operating the plant.

Q. Was the maintenance of the plant under the

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technical services department?

A. No. There was a separate general superintendent of maintenance.

Q. Okay. At the Queeny plant did you have any involvement with the production of PCB-containing products?

A. We produced Pydrauls in the central blending and drumming facility. Some of my engineers did project work in that facility.

Q. What kind of project were they working on?

A. Improvement projects of various kinds. Are you referring to that particular department, that particular operation?

Q. Just in the Pydrauls.

A. We did some improvement projects in that department to speed up the drumming, make it more precise.

Q. Was there anything done as far as changing the products at all?

A. The center line drumming and blending facility was a multi-product operation set up to be very flexible, and it was quite routine to change products.

Q. Would this area be used to mix products other than the PCB-containing products?

A. The same department did, but the Pydrauls were blended in a single dedicated blend tank that was not

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used for other things.

Q. Were there any by-products of the blending?

A. No.

Q. Was it kind of a big mixer? Was that the idea?

A. The main piece of equipment is a big mixing tank, that's right.

Q. Okay. Was the blending, Pydraul blending process, indoors at Queeny?

A. Yes.

Q. On a day-to-day basis you were not spending time in this area; is that correct?

A. That's right.

Q. Okay. Were you aware of any problems with leaks or spilling in that area?

A. No.

Q. Were you made aware of any problems with maintenance or anything to that effect in the Pydraul blending area?

A. No. That was a very modern and efficient operation. It gave me very little trouble.

Q. Prior to 1970, did you receive any memorandum, correspondence, other information concerning an increased concern with the presence of PCBs in the environment?

WATER_PCB-SD0000023369

A. We're dealing with events that were quite a long time ago, so it's difficult for me to state with any confidence exactly when I learned of increasing concern about PCBs. It was probably just before 1970 that the company's activities became more visible on the subject of PCBs, and I'm aware of organizational activity of Bill Papageorge's assignment and so forth, but as to whether I received any specific instructions before 1970, I don't remember.

Q. How long have you known Mr. Papageorge?

A. Almost as long as I've worked for Monsanto, because he was at the Queeny Plant when I started.

Q. Okay.

A. I believe he was.

Q. While you were at Queeny, are you aware of any changes made in the procedure for handling PCB-containing products, cleanup or waste disposal changes in those types of procedures that were undertaken at Queeny?

A. It's possible, but I don't remember.

Q. Would it be fair to say prior to 1970 -- when did you leave the Queeny Plant?

A. Early 1970.

Q. If there had been undertaken a company-wide policy to change a procedure for handling of PCBs and

WATER_PCB-SD0000023370

PCB-containing products, do you think you would have been aware of that?

A. Either I would or someone in my organization would have been aware of it, yeah.

Q. Okay. Do you remember any kind of information, instructions given to people at Queeny dealing with the PCBs to modify their behavior in any way in dealing with them?

A. No. I don't remember.

Q. Okay. With respect to any spills at the Queeny plant in the Pydraul area, do you know what was done with that waste?

MR. SCHINK: I'll object to the form of the question. It assumes that there were problems in that area. I think the witness has testified he's not aware of a problem with leaks or spills in that area at Queeny.

Q. (BY MR. PENDERGAST) Okay. Do you have any recollection of that?

A. I don't remember that we had a spill problem. It was a clean operation.

Q. Okay. In 1970, you again were promoted?

A. That's right.

Q. And what was your position?

A. Manufacturing manager, specialty products.

Q. And you moved into the general office then?

WATER_PCB-SD0000023371

A. That's right.

Q. You held that position for eight years?

A. I was specifically involved with the specialty products through 1975. After that I had a somewhat modified assignment where I no longer was connected with that same set of products.

Q. And when was that?

A. Pardon me?

Q. When did that change occur?

A. 1975.

Q. Okay. How did your job duties change then?

A. In 1975, we had a significant reorganization, and the responsibility for the products related to functional fluids, including the PCBs, went to Bob Pohl, who was another one of the manufacturing managers.

Q. Were you involved in the discussions after 1970, relating to the phase-out of PCB-containing products?

A. Yes.

Q. Who else was involved in those discussions?

A. Everybody associated with making the functional fluids based on PCBs was closely involved in the phase-out program. That included Howard Bergen, who was business group director, my boss, Bill Richard, who was research director, Don Olson, who was the marketing

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director, later replaced by Tom Gossage. He had the same assignment. Earl Potter, who was the materials manager, it was his responsibility to schedule the production of shipping and so forth. Various people worked for Gossage and Richard, Bill Papageorge, of course.

Q. How much of your time between 1970 and 1975, was tied up in the discussions of the phase-out?

A. I would say close to half of my time was involved in Aroclor phase-out issues of one kind or another.

Q. Did you become involved in that right away in 1970?

A. I don't think the phase-out program was completely defined at that time. We phased out of plasticizer applications just about that time, but I don't remember exactly when.

Q. Who was your predecessor as manufacturing manager?

A. Bill Kuhn.

Q. What happened to him?

A. The reorganization of 1970 grouped the products differently, and some new business groups were formed, and Bill Kuhn became the manufacturing manager for a different set of products.

Q. What was your input into discussions on the

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phase-out of PCBs?

A. I worked with the research people, specifically Lou Stark, in evaluating Canada replacement fluids and providing cost information on the proposed replacement fluids so that the first cost effective ones could be selected. I provided information on the feasibility of making various kinds of replacement products, developed cost estimates on any capital additions that might be required to make the new products, worked with Earl Potter on scheduling the phase-out of one product and phasing in of another.

Q. In what month of 1970 did you move into the home office?

A. I'm not sure exactly; March or April as I recall.

Q. As of that time was it your understanding that the decision had already been made to phase out all PCB production?

A. No.

Q. What decision had been made along those lines?

A. As I recall it at that time, there was no intention whatever to phase out electrical fluids. I think that by that time a decision had been made to phase out plasticizers. I'm not sure, but that's about the time

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that that decision was made, but there were really a series of decisions, not a single decision to phase out all PCBs.

Q. How about the hydraulic fluids?

A. As I recall it in 1970, we intended to continue to make the hydraulic fluids.

Q. Did you have any input on the decision to discontinue manufacturing hydraulic fluids containing PCBs?

A. No.

Q. As manufacturing manager, were you involved in assessing any changes that had to be made in the manufacturing process based on new information on PCBs?

A. Yes.

Q. Okay. What was the nature of those discussions?

A. In 1970, we were beginning to sample waste streams from the operating departments in a much more sophisticated away. Research people were developing much more sensitive analytical methods, and as we developed information showing that there was some loss of Aroclor in the waste waters leaving the operating departments, I worked with the plants to develop improvements to eliminate those losses as well as we could.

Q. What were those improvements?

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A. They were an accumulation of relatively small changes, quite a large number of them. I don't remember any more the amount of money that was spent, but we did a lot of small projects. Each time we would find the potential source of PCB lost to the sewers, we would implement an appropriate engineering improvement to eliminate it to the extent that it was possible.

Q. Can you give me some examples of where these sources were?

A. An example that comes to mind is that as I mentioned earlier, that one step was a blowing step, was air was bubbled through the crude product to remove HCL, and we discovered that a small amount of PCB was entrained in that air, the air leaving that step. So, we installed a separator to collect it.

Q. Where had that been going?

A. That had been going to the sewer.

Q. What was done with the collected PCBs with the new system?

A. The drum was taken to a landfill.

Q. What were some of the other sources of PCBs into the sewer?

A. I don't remember any others that were inherent in the process itself. We did things like installing separator pits as interceptors in the sewers to

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try to collect anything that might be in the waste water leaving the department, because it was easier to remove it before it was commingled with other wastes from other parts of the plant.

Q. How did the separator pit system work?

A. In general, it's a simple settler with suitable baffles, would be reasonably efficient.

Q. And that hope was the PCB-containing materials would settle to the bottom, and the relatively clean waste water would travel on to the next compartment?

A. That's right. PCBs are much heavier than water, so settling is a reasonably effective way of separating them.

Q. That was implemented after 1970?

A. Yes.

Q. Was that done in both the Krummrich and Anniston plants?

A. Yes.

Q. Any other sources identified and measures taken?

A. I remember that there were a number of small sources and a significant list of small projects, but I don't recall what the others were.

Q. Was the procedure of taking PCB-containing wastes to landfills discontinued at some point in time?

WATER_PCB-SD0000023377

A. No. I don't remember that there was any feasible alternative.

Q. Okay. Was information regarding Monsanto's efforts to test its own waste water and incorporating this holding system ever communicated to any of its customers as being helpful?

A. Most of the engineering measures that I described are rather unique to the requirements of the production process and would have no relevance to a customer. It's my recollection at some point we put together a package of engineering information about things like settling basins, and I recall providing some information like that to marketing for their purposes with customers, but I don't know anything about how it might have been communicated from marketing on to the customers.

Q. What did that package of engineering information consist of?

A. I think it consisted of sketches and some calculation methods showing how to size such a thing.

Q. Okay. Do you have any idea where that information is today?

A. I have no idea.

Q. Were you involved at all in the decision making as to what to tell Monsanto customers about more recent discoveries concerning PCBs?

WATER_PCB-SD0000023378

A. I wasn't directly involved in that.

Q. Tangentially were you involved in some way?

A. Only to the extent of hearing about it and staff meetings over in departmental reports.

Q. Were you aware of any sentiment in Monsanto that the customers not be given information concerning the problems associated and identified with PCBs?

A. No. I know that the policy was that we would tell the customers what we knew.

Q. Were you aware of anyone at Monsanto who felt the customers or the public were not being told enough?

A. No.

Q. Were you or are you aware of any testing around the Monsanto PCB production areas at Krummrich and Anniston revealing levels of PCBs in the ground surrounding those production areas?

A. No.

Q. You haven't seen any of those test results?

A. No.

Q. Would you be surprised to find that high levels of PCBs are found in the soil surrounding the production areas at Anniston and Krummrich?

A. Would it surprise me to learn that? No, I don't think so, because those products were made there for decades.

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Q. And while you were working at those plants, you understood that PCBs, PCB-containing materials were getting off the production facility and into the ground or on the production area?

A. I would say during the time I was associated with those operations, I was not aware that that was going on, but those products were made there for decades, and there is rain. It certainly is possible.

Q. Was any of the hydrochloric acid used in or -- strike that. Was any of the hydrochloric acid which was a by-product of the PCB production allowed to escape into the sewer system?

A. Yes. That was a result of the blowing step for hydrochloric acid.

Q. Was there an effort made at Monsanto to maintain consistent levels of production of PCB-containing materials while substitutes were being developed?

A. Yes. It was our policy to maintain a reliable source of supply to our customers until there was an alternative available.

Q. Okay. Is it fair to say that the decision to discontinue the production of PCB-containing hydraulic fluids was made before a replacement was developed?

A. I guess I have a little trouble with the question. We certainly made a clear decision that we

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wanted to develop replacements, and the purpose of that, of replacements, would be so that we could stop making PCB-containing fluids. So, we certainly wanted to discontinue making PCB-containing fluids.

Q. The production of the PCB-containing fluids was continued until there could be a smooth transition into the non-PCB containing fluids?

A. That's right.

Q. And this was to maintain supply to satisfy the continuing needs of the customers?

A. That's right.

Q. Was there a fear that if the PCBs were removed from the market too soon, Monsanto would lose its large share of the hydraulic fluid market?

A. Yes. We were concerned about that.

Q. The idea being, "If we removed the PCB-containing fluids before we have the replacement, customers are going to have to go elsewhere, and they are going to be less likely to come back to Monsanto once we have our products"?

A. More than that. They would be very angry, because they didn't necessarily have good alternatives at the time.

Q. But that was a component of it?

A. Yes.

WATER_PCB-SD0000023381

Q. In 1975, how did your job change?

A. It was significantly diminished. The reorganization did not require as many people in the manufacturing manager position as we had, and some business groups that formally had been separate were combined, and I was on what's politely called special assignment for about a year.

Q. Okay. Did you continue your involvement with the PCB question after that?

A. No.

Q. Okay. The last time you were involved in the PCB issue with Monsanto was 1975?

A. As I recall again.

Q. What was the reason for the reorganization in 1975?

A. I really don't recall.

Q. Did it have anything to do with the phasing out of the PCB production?

A. Perhaps slightly. The business group was becoming smaller because some products had been phased out. So, perhaps that was part of the logic with the way it was combined with the other organizations, but that would have been a minor factor in the overall reorganization.

Q. To your knowledge, were any inventories of

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hydraulic fluid containing PCBs manufactured by Monsanto ever incinerated, Monsanto's inventories?

A. I don't remember that there were.

Q. When the first replacement for the PCB-containing fluids was developed, I assume there was a day when research comes in and says, "We got something we think we can use." Do you remember who made that announcement?

A. Well, it didn't happen in a single event in that fashion. Lou Stark and some other people in research were working on new formulations. Each one was its own problem, that is, each grade, and so they worked on them one at a time, and they would develop a new 312, a new F-9, a new A-200 or whatever, and over a period of time worked their way through all of the different grades. And it was overlap between these steps because as they would formulate one, they would perhaps be doing fire testing or pump testing on some of the others. The desire was that by some certain date we would have suitable formulations for all of the grades, but that didn't happen on any specific -- that was not any single event.

Q. Okay. For example, when the 312 was reformulated to 312-A, was that product then held until the rest of the product line could catch up with it, or did someone give the order, "Let's go ahead. Let's start

WATER_PCB-SD0000023383

making this stuff and get it out there"?

A. I don't remember the sequence exactly. The intention was that we would bring all of the old grades to a halt at one time and begin all the new ones at one time. The reason for that was that there was common blending equipment for most of the various Pydrauls, and we wanted to do a cleanout in such a way that we could say with confidence that from a certain day forward, there was no PCB in the fluid. And that argued against any advanced introduction of any one, and, in any case, all of the reformulations reached an end point within a reasonable span of time.

Q. Were the PCB production areas at Krummrich and Anniston ever used for anything other than the production of PCBs?

A. At Anniston and Krummrich? No. They were dumped for that purpose.

Q. Were they evaluated to determine whether they could be used for anything else?

A. No.

Q. Was the assumption that they were so specialized that they couldn't be used for anything else?

A. Yes.

Q. Do you know if any of the equipment at Anniston or Krummrich was salvaged for any purpose?

WATER_PCB-SD0000023384

A. I don't think so.

Q. Do you know what happened to all that stuff?

A. Pardon me?

Q. Do you know what happened to all the production equipment at Anniston and Krummrich?

A. Krummrich was still running at the time that I left the business group. Anniston was not. We dismantled all the Anniston equipment and scrapped it.

Q. Did you supervise that or observe it in any way?

A. Well, it was my responsibility, but I was not at the scene.

Q. The dismantling of the Anniston plant was under your supervision?

A. It was my responsibility. The direct supervision was handled by people at the Anniston plant.

Q. That was one of the jobs you were given in the central office? One day they come in and say, "Jim, your responsibility is to take apart the Anniston production area"?

A. Oh, no. That would just be a normal part of the responsibility of the manufacturing end to see that that was done.

Q. Was that stuff buried, or was it incinerated? What happened to it?

WATER_PCB-SD0000023385

A. Well, the equipment was all made of steel. The instructions at the plant were to decontaminate the equipment, meaning to clean it out as effectively as they could. At this point I don't recall what ultimately was done with it, whether it was scrapped or what.

Q. Do you recall any testing being done of the equipment to see if it contained PCBs after cleaning was attempted?

A. They took some measures so that more of it was cleaned, but I don't know what they were.

Q. Okay. With respect to the production of the substitutes for the PCB-containing products, were new production facilities created?

A. We modified existing production facilities.

Q. How about the terphenyl based products? Where were they manufactured?

A. Terphenyl based products were made in some equipment that had formerly been used to make the PCB-containing products.

Q. The terphenyls themselves, the polychlorinated terphenyls, were they made at Anniston and Krummrich?

A. Only at Anniston.

Q. Okay. And was that using the old PCB production areas?

WATER_PCB-SD0000023386

A. We had been making chlorinated terphenyl for many years. We began making a new and different grade of chlorinated terphenyl for this purpose and utilized equipment which had from time to time been used in common for either chlorinated biphenyl or chlorinated terphenyl.

Q. Do you know what was done to clean that equipment before it was put into production for the terphenyls, if anything?

A. I don't remember.

Q. Why were the terphenyl based products phased out?

A. We discovered shortly after the reformulation that there was a trace of chlorinated biphenyl in the chlorinated terphenyl, and after considerable effort concluded that we could not avoid it.

Q. Okay. What was the source of the PCBs?

A. Biphenyl and terphenyl are made in the same process, and, in fact, the product of -- the crude product of that process is a mixture of biphenyl and terphenyl and higher polyphenyls. The remainder of the process is a distillation system to separate those components, and we were unable to do a perfect separation.

Q. Was the eventual sale of the PCB -- or strike that. Was the ultimate sale of the replacement products timed based on the amount of inventory of the

WATER_PCB-SD0000023387

PCB-containing products remaining?

A. No. It was timed by usually the amount of time it took us to install modifications to be able to produce the new phosphate ester.

Q. Was there any gap or overlap in the sale of the two products?

A. No. We carefully orchestrated a program so that the inventory of the old products would last to a certain exact date, and we could again bring the new products on on that same date in such a way that we could again say with confidence that no fluid produced after a certain point had PCB in it.

Q. Was there ever a time when you had the phosphate ester fluid in barrels, and during the same period of time you had the terphenyl fluid in barrels, and you sold the terphenyl fluid?

A. Maybe a few days.

Q. Was there ever a time when Monsanto had the production capability of making phosphate ester fluids, that they did not put that capability into use because they had inventories of terphenyl containing fluids?

A. No. Our inventories were normally very small. Inventory was usually not an issue.

Q. When did Monsanto begin sale of phosphate ester based fluids? Do you know?

WATER_PCB-SD0000023388

A. I can't tell you any dates. It's too long ago.

Q. Is it before 1975?

A. Yes.

Q. What was Earl Potter's role in coordinating the timing of the availability of the phosphate ester fluids?

A. He did the daily planning of the changeover. I was working closely with him so that I could predict for him exactly when the new phosphate ester would be available, and it was his job to be sure that the other components were on hand when they were needed and to schedule the production of the old fluids in such a way that the inventories would last until the new fluid was available.

Q. During the last five years have you been involved with any licensing of processes that concern production of PCBs?

A. No.

Q. Do you know if Monsanto still has any licensees for those processes?

A. We never licensed any outside company to make PCBs. We did have foreign subsidiaries making PCBs under license from us.

Q. When did that practice discontinue?

WATER_PCB-SD0000023389

A. Our affiliate company in Japan made PCBs for a very short time, and it was before my time as manufacturing manufacturer, actually. Our operation in the United Kingdom made PCBs for many many years and shut down more or less at the same time that Krummrich did.

Q. Were those the only two licensees you're aware of?

A. Yes.

Q. To your knowledge, was the process for manufacturing PCBs maintained as a trade secret by Monsanto?

A. Yes.

Q. Do you personally keep any files concerning your involvement with the PCB?

A. No.

Q. While you were at Monsanto, did you maintain any files concerning the PCB production or phase-out?

A. Well, each of the jobs that I had associated with those products, I had files that described -- I should say that contained records referring to those responsibilities.

Q. Okay. How about once you had come to St. Louis? Did you keep a separate file on the PCB discussions?

A. During the time I was manufacturing manager,

WATER_PCB-SD0000023390

I had an extensive file referring to the various things we were doing for reformulation and phase-out.

Q. Do you have any idea what happened to those files?

A. Yes. They were turned over to my successor.

Q. And that was?

A. Bob Pohl.

Q. Would that be true of your files from the Queeny, Krummrich and Anniston plants? Were they turned over to your successor?

A. Yes.

MR. PENDERGAST: That's all the questions I have. Thank you.

MR. SCHINK: We will read it.

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JAMES R. SAVAGE

Subscribed and sworn to before me this _____ day of _____, 1988.

My commission expires: _____.

_____

[Notary Public]

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NOTARIAL CERTIFICATE

STATE OF MISSOURI)
)
CITY OF ST. LOUIS)

I, KATHRYN T. O'NEILL, a Registered Professional Reporter and a duly commissioned Notary Public within and for the State of Missouri, do hereby certify that pursuant to notice there came before me at the Paul Brown Building, 818 Olive Street, St. Louis, Missouri 63101,

JAMES R. SAVAGE,

who was by me first duly sworn to testify to the truth and nothing but the truth of all knowledge touching and concerning the matters in controversy in this cause; that the witness was thereupon carefully examined upon oath and said examination was reduced to writing by me; that the signature of the witness was not waived by agreement of all parties; and that this deposition is a true and correct record of the testimony given by the witness.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 19th day of August, 1988.

My commission expires June 3rd, 1990.

[Notary Public]

WATER_PCB-SD0000023393