JERRY BROWN [12-08-95]

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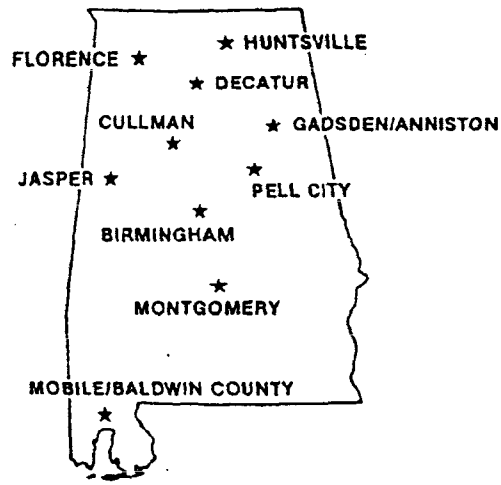

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Page 0001

IN THE CIRCUIT COURT OF TALLADEGA COUNTY, ALABAMA

CASE NUMBER: CV-94-104

J. A. WILSON, et al.,
Plaintiff,
vs.

MONSANTO COMPANY, et al.,
Defendants.

STIPULATION

IT IS STIPULATED AND AGREED, by and between the parties through their respective counsel, that the deposition of JERRY BROWN may be taken before Maurice Lapidus, Commissioner and Notary Public, at 300 Financial Center, Birmingham, Alabama, on December 8, 1995.

IT IS FURTHER STIPULATED AND AGREED that the signature to and the reading of the deposition by the witness is waived,

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the deposition to have the same force and effect as if full compliance had been had with all laws and rules of Court relating to the taking of depositions.

IT IS FURTHER STIPULATED AND AGREED that it shall not be necessary for any objections to be made by counsel to any questions, except as to form or leading questions, and that counsel for the parties may make objections and assign grounds at the time of the trial, or at the time said deposition is offered in evidence, or prior thereto.

IT IS FURTHER STIPULATED AND AGREED that notice of filing of the deposition by the Commissioner is waived.

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IN THE CIRCUIT COURT OF TALLADEGA COUNTY, ALABAMA

CASE NUMBER: CV-94-104

J. A. WILSON, et al.,
Plaintiffs,
vs.

MONSANTO COMPANY, et al.,
Defendants.

BEFORE: Maurice Lapidus, Commissioner

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APPEARANCES

BURR & FORMAN, by Ms. Pamela M. Arenberg, 3011 SouthTrust Tower, Birmingham, Alabama 35203, appearing on behalf of the Plaintiffs.

BURR & FORMAN, by Mr. Gary L. Howard, 3011 SouthTrust Tower, Birmingham, Alabama 35203, appearing on behalf of the Plaintiffs.

LIGHTFOOT, FRANKLIN, WHITE & LUCAS, by Mr. Adam Peck, 300 Financial Center, Birmingham, Alabama 35203, appearing on behalf of the Defendants.

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I, Maurice Lapidus, a Court Reporter of Birmingham, Alabama, acting as Commissioner, certify that on this date, as provided by the Alabama Rules of Civil Procedure and the foregoing stipulation of counsel, there came before me at LIGHTFOOT, FRANKLIN, WHITE & LUCAS, 300 Financial Center, Birmingham, Alabama 35203, beginning at 9:45 a.m., JERRY BROWN, witness in the above cause, for oral examination, whereupon the following proceedings were had:

JERRY BROWN,

being first duly sworn, was examined and testified as follows:

COURT REPORTER: Usual stipulations?

MR. PECK: That's fine. Let me say that we're offering or designating Jerry Brown today as a Rule 30(b)(6) representative to the extent he has knowledge on categories two and seven of a

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deposition notice that was originally served on August 2nd, 1995 in the Wilson versus Monsanto Company case. He's being offered for that limited purpose, because he's already been deposed in this case both as a designated representative on different categories, and as a personal deposition.

And as usual, the deposition is usable in the Dyer versus Monsanto case, too.

EXAMINATION BY MS. ARENBERG:

Q. Mr. Brown, I'll just have you state your name for the record, please.

A. My name is Jerry L. Brown.

Q. And do you understand that you are here today speaking for the Monsanto Company, is that correct?

A. Yes, I do.

Q. The topics that Monsanto has designated you to speak on are public and press relations relating to pollution from January 1st, 1970 to the present at the

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Anniston plant. Do you understand that?

A. Yes.

Q. The other topic is any and all efforts by Monsanto to warn any persons concerning PCB pollution in Lake Logan Martin, Choccolocco Creek, or Snow Creek. Do you understand that topic?

A. Yes.

Q. Any reason that your answers today will not be forthcoming? In other words, are you on any medication or anything that would affect your answers today?

A. I have a sore throat.

Q. I can relate to that one. Tell me please what you did to prepare for this deposition.

A. I spent a few minutes with Mr. Peck.

Q. Was that this morning?

A. Yesterday afternoon.

Q. Was that at the Anniston plant or in his --

A. Yes.

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Q. The Anniston plant?

A. Yes.

Q. Did you review any documents in connection with giving this deposition?

A. Yes.

Q. What were those documents?

A. It's really difficult for me to remember. It was some documents that dated back in the early '70s relating to the PCB situation.

Q. Did those documents refresh your recollection as to what happened in the 1970's?

A. To some degree.

MS. ARENBERG: Adam, do you have those documents?

MR. PECK: No.

MS. ARENBERG: I think since he used them to refresh his recollection, we would like to see those.

MR. PECK: Disagree. They have all been produced in this case. I don't have them segregated. There is no way I can

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get them to you.

MS. ARENBERG: There is no way you can get them to me; is that what you said?

MR. PECK: I don't have them segregated in a way I can easily get them to you right now.

MS. ARENBERG: Well, I think we are entitled to see what documents he used to refresh his recollection.

MR. PECK: Ask him. I don't think I have to produce them to you.

MS. ARENBERG: So you're refusing to do that?

MR. PECK: They were not requested that I produce them this morning. I don't have them available to me right now. I'm not going to go get them for you.

MS. ARENBERG: I'm not asking in connection with the document request. I'm entitled to look at documents that he used to refresh his recollection.

MR. PECK: I disagree. You're entitled to ask him about it. You didn't

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request I bring them here and I don't have to produce them.

MS. ARENBERG: Okay. We will move forward and we can take that up later if need be.

MR. PECK: You can do that. You can ask him all you want about it. You can ask him as you show him documents whether he's seen that document before. But I do not have an obligation to bring in here or produce for you what I use to prepare my witness. Some courts rule I don't even have an obligation to let you ask him about them. So I'm certainly not going to go get them for you and spend 30 minutes trying to locate exactly what it was that I showed him.

MS. ARENBERG: I understand your position. I believe I'm entitled to see them.

MR. PECK: We disagree.

Q. (BY MS. ARENBERG) Mr. Brown, have you ever issued a press release?

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A. No, I have not.

Q. Have you ever talked to a newspaper reporter?

A. Yes.

Q. Do you know the name of that reporter?

A. Yes.

Q. Who was that?

A. Sean Reilly.

Q. What newspaper did Sean Reilly represent at that time?

A. The Anniston Star.

Q. What did Sean Reilly ask you?

A. He asked a number of questions relating to environmental work that had gone on at the plant historically.

Q. When did that conversation take place?

A. Roughly a year ago.

Q. Is that the only --

A. Maybe a little longer. It's hard to remember.

Q. So are we talking about one

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conversation with Sean Reilly? Is that the only conversation you've had with Sean Reilly?
A. Yes.
Q. Can you tell me what any of his questions were? Do you remember any of his questions?
A. Not specifically, no.
Q. Do you remember any of your answers?
A. I remember the subject matter that I discussed with him. If I don't remember the questions, I certainly don't remember the answers.
Q. Tell me about the subject matter.
A. The subject matter that we addressed was the ground water studies that started in the late '70s through the '80s leading up to pump and treat program that's been on for a number of years in certain areas of the property.
Q. Did he ask you any questions, or did he discuss with you Snow Creek?

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A. I do not recollect any, no.
Q. Did he ask any questions or discuss with you Choccolocco Creek?
A. There again, I do not recollect that being a topic of discussion that day.
Q. Do you recall any discussion about Lake Logan Martin?
A. No.
Q. Do you recall any discussion about fish studies?
A. No.
Q. So as far as you recall, you spoke to Mr. Reilly about ground water contamination?
A. That's what I remember, yes.
Q. Did he publish a story that reflected that conversation in any way?
A. Yes, he did.
Q. Did you read that story when it appeared in the Anniston Star?
A. Yes, I did.
Q. Did you telephone Mr. Reilly after you read that article?

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A. No.
Q. Did you ask for a retraction on that article?
A. No.
Q. Have there been any other newspaper reporters that you've spoken with during your tenure at Monsanto?
A. Yes, I have.
Q. Do you know the names of any of those reporters?
A. I'm trying to remember the name of the reporter prior to Sean. I simply can't remember the names of them.
Q. Was this an Anniston Star reporter that you are recalling now?
A. Yes.
Q. And it was prior to your conversation with Sean Reilly?
A. Yes.
Q. Do you know what year it might have taken place in?
A. You know, I've spoken to reporters on different years.

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Q. Let's start with the earliest that you can recall. And I know that may be difficult, but if you can give me at least a ballpark of when you maybe made your first contact.
A. Probably in the '70s. Mid '70s.
Q. Mid '70s. As you recall, would that have been a contact with the Anniston Star?
A. Yes.
Q. Do you recall a name from that contact?
A. That would have been Judy Johnson.
Q. Would she have called you or would you have called her?
A. It was really not necessarily her calling me or me calling her. It was me responding to specific questions that she may have asked that were referred to me to be answered.
Q. Would she have contacted the plant itself?
A. Yes.

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Q. And then those questions would have been referred to you for answers?
A. Yes.
Q. Did you speak with her directly in person or on the phone?
A. Not in person.
Q. Did you speak with her on the phone?
A. Yes.
Q. Have you ever met her in person at all?
A. No. I've seen her but I have not personally met her.
Q. So you would have spoken with Judy Johnson in the mid '70s?
A. Uh-huh.
Q. Do you recall only one instance in which you spoke with Judy Johnson?
A. That's really difficult for me to answer, because I simply don't remember.
Q. Could have been once or it could have been more?
A. Yes.

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Q. It was at least once I guess, correct. Do you recall any other instances in which you communicated with the Anniston Star aside from the two conversations we've discussed with Judy Johnson and with Sean Reilly?
A. Yes.
Q. Tell me about them, the next conversation and time that you would recall.
A. I guess what I could describe to you would be the kind of conversations that occurred then from the early '80's through the mid '80's. Typically when plant permits were filed and out for public comment, they would typically call and ask questions.
Q. Okay.
A. At one particular permitting event, I believe in 1986, there was a public hearing that was held -- this was a RCRA permit. They asked questions as a part of that.
Q. They asked questions at the

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hearing itself, is that your recollection, or following?
A. Primarily after.
Q. Okay. Do you know what reporter you were speaking with at that time?
A. I do not remember the names.
Q. Was it a male or a female?
A. Typically female. They had two or three female environmental reporters in a row. I simply cannot remember the names.
Q. Did a reporter attend the RCRA -- I'm sorry, the permit hearing that you just mentioned?
A. It's my recollection that yes, they did.
Q. Did they publish a story about that permit hearing?
A. Yes, they did.
Q. Did you call the Anniston Star after that story was published to make any comments about that story?
A. No.
Q. What other conversations might you

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have had with the Anniston Star in the 1980's?
A. Generally speaking, most of the reporters would simply call up and want to come out and learn what was at the facility. We had an open door policy. They were always welcome to come. We gave them a complete tour and complete details of our activities. And so I was involved in at least two of those, maybe three of those kinds of visits.
Q. Is it your understanding that there were more than two or three visits, but you were involved in only two or three visits by reporters?
A. That's all I remember through the '80's.
Q. You told me that Monsanto had an open door policy. Are you speaking with respect to the news media?
A. I'm speaking in respect to the community.
Q. What did someone need to do in

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order to gain access to the Anniston plant?
A. Call and ask for a tour. We typically have chemistry classes, physics classes, high school teachers. It's very common to have people through the plant.
Q. When Monsanto would have people through the plant, would they show them the PCB facilities -- production facility?
A. There were no PCB facilities there.
Q. I realize there is none there now, but there were in the early years. Was it through '72?
A. Right.
Q. Were there tours at that point?
A. I do not know. I was not involved prior to that.
Q. Would Monsanto's policy have been to show people the PCB production facility?
A. If they were touring the plant, yes.
Q. Does a plant tour include a tour of landfills?

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A. Certain cases, yes. For the reporters, always.
Q. Tell me what you would tell a reporter if they asked to see a landfill.
A. I would say okay -- if I answered that question today, we do not have an active landfill. We would go show them the closed landfill area.
Q. How many landfills would you be able to point out on the Monsanto property to a reporter?
A. I guess the correct answer would be two. I say that because sometimes if you speak of a cell or a landfill, I mean the answer is a little bit -- but there are two areas, two specific areas that have been used historically.
Q. I know you call one of those the west end landfill, is that right?
A. That's correct.
Q. Do you have a name for the other landfill area?
A. I've just always called it the

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Monsanto landfill.
Q. That would be the landfill that's on the south side of Highway 202?
A. That's correct.
Q. And you said if you gave that tour today, you would tell reporters that these are not active landfills and that they are capped? I'm not trying to --
A. That's correct.
Q. But I think that's what you said.
A. That's correct.
Q. When you say capped, tell me what you mean.
A. Capping is a procedure whereby for final closure a layer of clay is placed over it, typically four feet. It's compacted. And in some cases there are other membranes -- typically a four foot cap covered with topsoil and grass for erosion prevention was the normal capping procedure.
Q. So if a reporter toured a landfill area today, they would see a grassy cover --
A. Yes.

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Q. -- over clay, would that be correct?
A. Yes.
Q. Is there grass covering the west end landfill today?
A. That piece of property is now undergoing capping with a synthetic membrane.
Q. So that landfill, the capping is not complete today, is that correct?
MR. PECK: Object to the form of the question.
MS. ARENBERG: I'm sorry, I didn't hear your objection.
MR. PECK: I said I object to the form of the question. Go ahead.
WITNESS: That property is being recapped today.
Q. (BY MS. ARENBERG) Okay. Has any reporter toured the west end landfill in the past year?
A. That's available for anybody to look at, simply by riding down the road. I

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have not personally even been on the property myself. So I don't know.
Q. Okay. You told me earlier that Monsanto's policy is to give a complete tour when people ask for a tour of the plant. And you told me that you give complete details of Monsanto's activities. Can you describe whether that involves a presentation of facts or whether you simply respond to questions?
A. Both.
Q. And when the tour is over, is it Monsanto's policy to have given full disclosure of what is going on in the Monsanto plant?
A. To the best of our knowledge at that time.
Q. In general then, would you say that Monsanto is very open with the public?
A. Yes.
Q. And in general then, would Monsanto's policy be one of complete disclosure?

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A. You've got to understand now that there are certain things that are for technical areas, for running our products. That's basically the reason we're in business.
Q. You're right, Mr. Brown. I asked a bad question.
A. We're not going to divulge that to to our competitor when they walk in the door.
Q. Let me try to ask you a better question, because I realize that you have to keep certain trade secrets. I guess my question is when it comes to pollution matters and the release of PCB's is Monsanto's policy one of full disclosure to the public?
MR. PECK: Right now?
Q. (BY MS. ARENBERG) Right now.
A. Based on the best knowledge that we have, yes.
Q. Was that Monsanto's policy in 1970?

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A. I do not know.
Q. Was it Monsanto's policy in 1980?
A. It was our -- yes.
Q. Do you know of any time when full disclosure was not Monsanto's policy? Let me rephrase that question. Strike that.
Has Monsanto's policy always been one of full disclosure?
MR. PECK: Object to the form of the question.
WITNESS: I don't know. I've not worked --
Q. You're here today to speak as Monsanto from 1970?
MR. PECK: He's here today to address your notice to the extent he has knowledge. He can't do better than that.
Q. (BY MS. ARENBERG) My point, Mr. Brown, is that Monsanto has allowed you to speak for them. And the notice is from '70 to present. So I'm not asking you about anything prior to that. But has Monsanto's policy been one of full disclosure during that time period?
MR. PECK: Let me clarify. We've designated him to the extent he has knowledge. The noticed says from 1970 to the present. But he's been designated to the extent he has knowledge, and that's the best he can do.
WITNESS: I do not know.
MS. ARENBERG: Adam, the only other person you've designated on this topic is Mr. Mayausky, is that correct?
MR. PECK: I don't think so. What did we designate Papageorge on? We've designated him on a number of categories.
MS. ARENBERG: It was a number of categories.
MR. PECK: Y'all chose not to take that. So all I can do is designate people to the extent they have knowledge. People die. People aren't around. Mr. Brown, I've designated him to the extent he has knowledge, and he's doing the best he can.
MS. ARENBERG: I realize he is,

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and I appreciate that. And I have no problems with Mr. Brown's answers.
MR. PECK: That's fine. Let's continue then.
Q. (BY MS. ARENBERG) We were talking about Monsanto's policy, and you have told me that, I believe, to the best of your knowlege, Monsanto has continued with a policy of full disclosure --
MR. PECK: Object to the form.
Q. (BY MS. ARENBERG) -- from some point prior to 1980 to the present, is that correct?
MR. PECK: Object to the form of the question. You can answer.
WITNESS: The policy in the years that I've been involved has been, one, to address questions and be as open as possible to the best of our ability.
Q. Okay. Thank you, I think that clarifies it. Now, I was asking you questions about reporters that you have spoken to, and we were pretty much limiting

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this to the Anniston Star. Now let me have you think back and see if there were any other newspaper reporters from any other newspapers that you can recall talking to?
A. I have not spoken to any others.
Q. What about television reporters or Associated Press reporters?
A. You said Associated Press reporters? You mean the AP?
Q. Yes, sir.
A. No.
Q. Was there any other media person that you recall speaking to?
A. I'm trying to remember if any of the radio stations or the local TV station attended the public hearing that was held, and I simply don't remember, but that's a possibility.
Q. Okay. Do you recall any information being given to any magazines or technical publications? I guess that would be more the professional press.
A. We have internal magazines that

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things have been published in quite often.
Q. By an internal magazine, do you mean a magazine circulated within Monsanto?
A. Well, it's published primarily for Monsanto, but is available to anybody. But not sold or put on any retail outlet.
Q. Okay. Do you recall that internal publication ever discussing the pollution of Snow Creek?
A. No.
Q. Do you recall that internal publication ever discussing Choccolocco Creek or the pollution of Choccolocco Creek?
A. No.
Q. Do you recall that internal publication ever carrying information about the pollution of Lake Logan Martin?
MR. PECK: Object to the form of the question.
WITNESS: No.
Q. (BY MS. ARENBERG) Who is E. V. John?
A. I have no idea.

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Q. That's not a name that you are familiar with?
A. No.
Q. Have you ever seen a press release issued by Monsanto?
A. Yes.
Q. Who would that have come from?
A. Most press releases are released out of St. Louis.
Q. Do you know any person in St. Louis that would have done that?
A. Currently?
Q. Let's start with currently.
A. Yes. I know some people who are involved in the PR department.
Q. Would you mind telling me their names?
A. One person that comes to mind is Rita Hartman.
Q. Hartman?
A. Uh-huh.
Q. Do you know what her title is?
A. No, I do not.

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Q. Who else do you know in the public relations department in St. Louis?
A. I cannot recall any other names at the present time.
Q. If you think of one later, just toss it out for me. You told me in your previous deposition that there is no public relations department at the Monsanto plant. Is that still correct today?
A. You mean the Anniston plant?
Q. Yes.
A. No. That is still correct, there is not.
Q. Have you ever taken any member of the press or public to the west end landfill?
A. I have not, no.
Q. If you were giving a tour, and the people wanted to walk onto the west end landfill, would that be permitted?
A. I cannot answer that question.
MR. PECK: Right now?
WITNESS: I don't know.

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Q. (BY MS. ARENBERG) Have you ever seen anyone touring the west end landfill?
A. Yes.
Q. Who was taking that tour? In other words, who were the members of the public?
A. Let me explain my earlier question. Construction is underway. So I do not know the activities.
Q. So whether or not someone was allowed on the west end landfill might depend on the construction activity going on at that time?
A. That's correct.
Q. How long has construction been going on at the west end landfill, or the present construction been going on?
A. Probably four months.
Q. Was there a grassy cover on that landfill prior to this four-month construction project?
A. The property had been owned by Alabama Power Company, and had been

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typically overgrown for many, many years, in vegetation.
Q. But since Monsanto acquired the property, did they immediately begin this construction project immediately upon acquiring the property from Alabama Power?
A. Immediately began a design or a study to design what needed to be done.
Q. Did any reporters tour that facility or that landfill in connection with the recapping project, or to determine information about the recapping project?
A. I do not know. I don't know of any. I do know that Sean Reilly looked at it the day he was out there.
Q. You know that Sean Reilly was actually on the landfill property?
A. He basically looked through the fence at the property. He didn't actually walk onto the property.
Q. Was he alone or was he with a Monsanto employee?
A. He was with me and Mr. Mayausky as

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part of the riding tour, riding around. We had gone up to tour the landfill, and he looked at it as part of that tour.
Q. Was this during the conversation with Mr. Reilly that you described to me earlier that took place?
A. Yes.
Q. I don't have a year for that. Did that take place in 1995?
A. I think I earlier described it as being a little bit over a year ago. So it would have been in 1994.
Q. Did Sean Reilly ever ask you if PCB's were leaching out of any landfills on the Monsanto property?
A. No.
Q. Did any reporter ever ask you if PCB's were leaching out of any landfill on the Monsanto property?
A. No.
Q. Did any reporter ever ask you if you had any reason to believe that PCB's might be leaching from any landfill on the

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Monsanto property?
A. No.
Q. Did any reporter ever ask you if PCB's are currently being released from the Monsanto property?
A. No.
Q. So, Sean Riley's visit in 1994, did he ask you anything about PCB pollution?
A. I do not recollect anything, no.
Q. Do you recall talking about the chemical PCB, the product?
A. Typically, as part of the review of the history of the plant, we do, yes. I cannot specifically remember the details of that conversation.
Q. Do you typically reveal the fact that PCB's are buried in Monsanto landfills?
A. No.
Q. If you were asked whether PCB's are buried in those landfills, what would your answer be?
A. There are some disposal cells that were used for years, and I would expect that

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there are some residues buried in those cells.
Q. Would your policy be to disclose that fact?
A. It always has been.
Q. But you've never been asked?
A. You asked by a reporter.
Q. Okay. You've never been asked by a reporter?

(Whereupon, a discussion was held off the record.)

A. That's correct, I have not been asked by a reporter.
Q. Has any other member of the public – and let me define that as a person outside of Monsanto – asked you whether PCB's are buried in any Monsanto landfill?
MR. PECK: Federal agencies, state agencies? Would that include them?
MS. ARENBERG: That would include them.

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A. Yes.
Q. Your answer is yes, you've been asked.
A. Yes.
Q. Who asked?
A. Representatives of the EPA is one I remember.
Q. Who else?
A. Representatives from ADEM.
Q. Who else?
A. That's all I recollect at the moment.
Q. Has any resident of Anniston ever asked the question that I just –
A. No.
Q. Has any resident of Anniston ever said what is buried in those landfills?
A. We've had that question associated with the RCRA permitting. And that process was addressing what was current at that point in time. Wastes that were being buried at that point in time.
Q. By that do you mean that during a

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RCRA permitting hearing, people may have asked about what is in those landfills?
A. Yes. Or what was to be buried in the cells that were undergoing permitting.
Q. But you do not recall any questions about what was buried there in the past –
A. No.
Q. – prior to that. If a resident of Anniston called the plant and said what do you have buried in your landfills, what would Monsanto's policy be concerning answering that question?
A. We answer the question the best we can.
Q. Would full disclosure be a policy?
A. Yes.
Q. Does that same policy apply to the testing of sediment or water or fish? I'm sorry, does that same policy of full disclosure to the public apply to the results of testing of water, fish, or sediment?

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MR. PECK: Right now?
WITNESS: Today, yes.
Q. (BY MS. ARENBERG) So if Monsanto refused to disclose results of testing, that would be contrary to Monsanto policy?
MR. PECK: In the present time frame?
WITNESS: In the present time frame, yes.
Q. (BY MS. ARENBERG) Has that ever happened?
A. Not to my knowledge.

(Whereupon, Plaintiff's Exhibit 1 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, if you will look at the document marked Plaintiff's Exhibit 1 – let me ask you first if you've ever seen this document before?
A. I do not remember seeing this document.

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Q. During your tenure at Monsanto, were you generally aware of results that did show the presence of PCB in the mud of Choccolocco Creek?
A. I was generally aware of some of the work that was being done back in, shall I say, the early days.
Q. My question, then, was just with regards to Choccolocco Creek. But you were similarly aware of test results relating to Snow Creek, would that be correct?
A. Yes.
Q. I'm going to refer you to this document in the left-hand column the numbers 131 and 132. Would it appear to you that these two sections of this document refer to findings of PCB's in mud from Snow Creek?
MR. PECK: Object to the form.
WITNESS: Yes.
Q. (BY MS. ARENBERG) And the levels that are reported in this document at those particular locations of Snow Creek are 1,430 parts per million, and 411 parts per million

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of two different types of aroclors. Would that be your interpretation of that document?
A. Yes.
Q. And then the next location on Snow Creek, which is numbered 132, has slightly higher results at 1656 and 537 parts per million. Would that be correct?
A. Yes.
Q. Would Monsanto's policy be to fully disclose the contents of these testing results?
MR. PECK: Object to the form of the question.
WITNESS: I have no knowledge to answer the question for this time frame.
Q. (BY MS. ARENBERG) Okay. So your answer is that in 1970, you don't know what Monsanto's policy was?
A. I do not know.
Q. And who would know that?
A. The only person that readily comes to my mind is Mr. Papageorge that Mr. Peck

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referred to originally.
Q. Well, he has testified on these subjects many times. So what he would say you would think would be authoritative?
MR. PECK: Object to the form of the question. That's not a proper question to ask him to comment on the testimony of another witness.
WITNESS: I don't know what he -- I've not seen him in many, many years. I would simply be guessing.
Q. (BY MS. ARENBERG) But in 1970, he was the authority on that as far as you know?
A. Yes.
Q. If in 1980, Monsanto received these test results, would their policy have been one of full disclosure?
MR. PECK: Object to the form of the question.
MS. ARENBERG: He's already testified that he knows about this.
WITNESS: The policy relating to

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something like this is full disclosure to the regulatory agencies who work with the issue at hand, and --
Q. (BY MS. ARENBERG) Okay. Is the -- I'm sorry.
A. That's what I described as full disclosure there.
Q. Is a policy of full disclosure limited to disclosure to regulatory agencies?
A. It's not limited if somebody asks, no.
Q. If somebody asks, you would also fully disclose these test results?
A. Yes.
Q. If there were no inquiry made, would there be any disclosure to anyone other than regulatory agencies?
MR. PECK: Object to the form of the question. I don't think she's given you enough information.
WITNESS: I think what you're getting at is every piece of data that we

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ever generate made public or published in a newspaper? The answer is no. Because we generate many, many, many pieces of data routinely over the years. And this has always been provided to the regulatory people who were dealing with a specific issue at hand.
Q. So you would give it to the regulatory agencies?
A. Yes.
Q. But it was not Monsanto's policy to give it to anyone else?
MR. PECK: Object to the form of the question.
Q. (BY MS. ARENBERG) Unless they asked?
A. Yes.
Q. Are you familiar with documents that are titled progress reports? And I'll show you one. Technical Services Department, Anniston plant.
A. Certain documents, yes.
Q. I'll find you one that you can

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look at.

(Whereupon, Plaintiff's Exhibit 2 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, if you would take your time and review Plaintiff's Exhibit Number 2 titled progress report dated July 21, 1970. And my question is going to be whether you know generally what this sort of a document is?
A. Yes.
Q. Can you tell me what the progress reports are? Is that too confusing?
A. Are you asking a general question?
Q. Yes, sir. I'm asking you what was the -- there is more than one of these in existence, is that correct?
A. Well, everything was reported through this mechanism.
Q. Were these monthly reports?

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A. Not necessarily, no.
Q. Were these regularly generated reports?
A. They were normally project related. In other words, typically at the conclusion of a project, or at some reporting interval of a project.
Q. Okay. So they usually had to do with one subject matter, or one project that was ongoing at that time?
A. Yes.
Q. And this was produced by Monsanto employees, was it not?
A. Yes.
Q. And it appears to have been distributed to you along with Gerald Miller and several other people?
A. Yes.
Q. Were all of the people who this was distributed to Monsanto employees?
A. Yes.
Q. Were these progress reports reported to any regulatory agencies?

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A. As this document here?
Q. Yes.
A. I do not know.
Q. But as far as you know, this document was not given to regulatory agencies?
MR. PECK: Object to the form of the question.
WITNESS: I do not know.
A. This progress report was a typical kind of report generated throughout the Technical Services Department. So there were numerous reports in this format.
Q. So would it be fair to say that its purpose was to inform internal people about what was going on?
A. Document and communicate.
Q. And in fact, this document is stamped company confidential, is it not?
A. All progress reports were at that time. That was typical. All progress reports carried a confidential stamp.
Q. Would that indicate to you that it

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was not to be distributed outside of Monsanto?
A. No. It would indicate that distribution needed to be looked at -- it was to not go out without some review beforehand. In other words, most of these reports were strictly technical documents.
Q. Yes, sir. Do you know of any reports that were stamped company confidential that were released to the public?
A. Yes.
Q. Can you identify or specify any of those.
A. The ones that I specifically remember are the ones that we included as part of permitting processes.
Q. And documents submitted as part of the permitting process would have been submitted to state or federal government agencies, is that correct?
A. That's correct.
Q. Do you recall any Monsanto

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documents marked company confidential that were submitted or released to the press?
A. Not that I'm aware of.
Q. Do you recall any Monsanto documents marked company confidential that were released to the public? And by that I mean not a press representative, and also not a regulatory agency representative.
A. Not that I'm aware of.
MR. PECK: Can we take a quick break?

(Whereupon a brief recess was had in the deposition.)

Q. (BY MS. ARENBERG) Mr. Brown, did you review either of those documents in preparation for your deposition today?
A. No.
Q. The document marked Plaintiff's Exhibit 2, on the front page states that aroclor losses from the Anniston plant for the period April 15th through June 30th,

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1970 average 16 pounds a day. Do you know if that figure was ever reported to any regulatory agency?
MR. PECK: If you want, you can read as much of the document if you went. I don't know if you read it because initially y'all were just talking about what type of document it was.
WITNESS: Okay. Your question was whether or not I knew if this was reported to regulatory agencies? I do not have firsthand knowledge of what was reported at that time.
Q. (BY MS. ARENBERG) Is it your understanding that that would have been routine to report that figure?
MR. PECK: Object to the form of the question. No foundation.
WITNESS: I would be guessing, but I would expect it to be.
Q. (BY MS. ARENBERG) At what point in time would you have had knowledge as to what was reported to state regulatory

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agencies?
A. From late '74 forward.
Q. Okay. If you will look at the sentence that follows the one we just read, the document states this is a considerable improvement over losses of greater than 250 pounds a day for a comparable period during 1969. Have you ever seen any documents that reported to state agencies that 250 pounds a day had been lost during 1969?
MR. PECK: Object to the form of the question. No foundation. You can answer.
WITNESS: You've got to understand that during this period of time, the technology for measuring was being developed and put in place. In 1969, there was a great deal of estimation being done. And sometime in '69 and '70, analytical methodology was developed and put in place that had improved the numbers. I really don't know anything about this 250 pounds a day more than what is stated here.

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Q. (BY MS. ARENBERG) When you talk about analytical technology, are you talking about the ability to detect the presence of PCB's in soil or water?
A. That's correct.
Q. But the figure reported in this document refers to losses, is that correct?
MR. PECK: Object to the form. The document speaks for itself.
WITNESS: That's what the document says.
Q. (BY MS. ARENBERG) And is losses different than analytical results?
A. Totally different.
Q. Losses would refer to the product itself, is that correct?
MR. PECK: Object to the form of the question. No foundation.
WITNESS: I really don't know specifically. But it's my guessing that it's estimate of losses from the department.
Q. (BY MS. ARENBERG) I don't want you to guess, because I know you have at

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least a very educated idea of how this worked. So what is your understanding that losses would mean?
MR. PECK: Object to the form of the question. No foundation. All he can do is guess.
WITNESS: It's my recollection that when this issue was one that identified that needed a lot of work in the late '60s, we immediately started working on buying equipment and working on analytical method development. I don't remember specifically when that was. But concurrently with that, there were attempts to do physical kinds of measurements of what might be leaving the department. Not necessarily what was emitted with the water, but leaving the department. When the analytical work started, it was on water actually being discharged from the plant, and the other media as described. But I have no knowledge of the 250 pounds, other than a study to attempt to determine what physically might

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have been leaving the production department itself.
Q. (BY MS. ARENBERG) Yes, sir. I think that explains it. Because if I understand you, you're saying that the figure of losses refers to an actual quantity of material?
A. Yes.
Q. And the analytical results would refer to a ratio of that material in another substance, water or soil?
A. No. Analytical results are not a ratio. The analytical results are a direct measurement of what's there in the media being analyzed.
Q. Would it be true that a high loss would result in a higher analytical result of plant effluent?
MR. PECK: Object to the form of the question.
WITNESS: It's theoretically possible, but not necessarily the case.
Q. What would be the reason that it's

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not necessarily the case?
A. Because there was a limestone bed where a portion was removed before it actually -- before the water actually left the plant.
Q. Yes, sir. So you're saying that some of the material that would constitute the loss might be captured before it escapes from the plant?
A. That's correct.

(Whereupon, Plaintiff's Exhibit 3 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I'm going to show you a letter that's marked Plaintiff's Exhibit 3. Take your time to review it if you need to.
A. (Witness complies.)
Q. Did you review that letter in preperation for your deposition today?
A. Yes, I did.
Q. Had you ever seen that letter

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before your preperation for your deposition today?
A. No.
Q. You will see that I have highlighted the words submit weekly summaries?
A. Yes.
Q. Are you familiar with weekly summaries that are referred to in that letter?
A. No.
Q. Do you know what those weekly summaries mean?
A. I can assume that they are referring to weekly summaries of data generated during that particular week.
Q. Well, but you have no knowledge as to whether weekly summaries were or were not submitted?
A. No. I do not know what was worked out at that point in time.
Q. During your time at Monsento, do you ever recall the reports of any spills of

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arocior fluids? And this could be any kind of report, internal, external?
A. No.
Q. Do you think that spills ever occurred? Do you recall spills ever occurring?
A. I would assume that there were some internal departmental spills.
Q. You were at the plant in 1969, weren't you?
A. Yes.
Q. Do you remember a spill of 1500 gallons of arocior?
A. No, I do not.

(Whereupon, Plaintiff's Exhibit 4 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I'm going to ask you to look at Plaintiff's Exhibit Number 4. Mr. Brown, this is a memo from Mr. Wright, I believe. And it details a spill of

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arocior. Does this refresh your memory about any spill during your tenure at Monsanto?
A. No, it does not.
Q. Do you know if spills such as the one described in this memo were disclosed to the public?
A. I do not know.
Q. Was Monsanto --
A. I was working on a totally different project at that point in time. I simply was not involved.
Q. At any point in time would it have been Monsanto's policy to disclose spills of this sort to the public?
A. Yes.
Q. How was that disclosure made? How would that disclosure have been made?
MR. PECK: At any point in time?
MS. ARENBERG: At the point in time which he says it was Monsanto's policy.
MR. PECK: At the point in time when he knows it's Monsanto's policy; is

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that your question?
WITNESS: The first thing is the 1-800 number is called. That's a national response center. ADEM is called. And the locate LEPC is called. Then if it has the potential to involve anybody else, they are notified.
Q. Do you know what LEPC stands for?
A. That's the emergency -- local emergency planning commission.
Q. Is that an Anniston or a Calhoun County --
A. Calhoun County.
Q. Now, when you say that these three agencies would be notified, or these three entities, are you speaking today, from a present day standpoint?
A. Yes.
Q. Do you know how long ADEM has been in existence?
A. Oh, it's my memory that ADEM was formed in perhaps '77, '78, plus or minus.
Q. Prior to the formation of ADEM, to

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whom would notification of this sort of a spill be made?
A. To the Alabama Water Improvement Commission.
Q. And at that point in time, which would be prior to the formation of ADEM, was anyone other than the Alabama Water Improvement Commission notified of a spill of this sort?
A. Not to my knowledge. Unless there was some potential way to impact the POTW, publicly owned treatment works, city waste treatment.
Q. And that's what we call the sewage treatment plant, or the water plant?
A. The city municipal treatment plant. That would have involved only a spill that had the potential to go -- a major portion of our discharge goes to the, quote, POTW.
Q. Through the sewer system?
A. Yes. Anything that might have created a change from our permit limits was

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always communicated to them in addition.
Q. And is that in compliance with regulations regarding such releases? Is the reason you make those disclosures to comply with regulations?
A. Again, you've got to put this in -- our relationship with them had always been such that that was a practice. I don't know if it was driven by regulations specifically or not.
Q. Okay.
A. Back in the early days.
Q. But it would be Monsanto's policy to make that disclosure?
A. Yes.
Q. Do you ever know of any instance when Monsanto failed to make that disclosure?
A. No.
Q. During the time you've been at Monsanto, has it been Monsanto's policy that disclosures to the public regarding the pollution of Snow Creek, Choccolocco Creek

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or Lake Logan Martin are made by disclosure to public agencies?
A. That's correct.
Q. So Monsanto considers telling the state to be telling the people of the state of Alabama. Would that be a correct statement?
A. That's their job, yes. That's what they are in place for.
Q. So is Monsanto's position that it's the state's job to notify the people who live on Snow Creek of pollution in Snow Creek?
A. It's our position to notify them of our activities. They have to make that decision.
Q. And Monsanto has made the decision that they will not notify the people who live on Snow Creek directly concerning pollution in Snow Creek, is that correct?
MR. PECK: Object to the form of the question.
WITNESS: I can't answer that

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question. I do not know.
Q. (BY MS. ARENBERG) Do you know of any time that Monsanto has ever warned people that live on Snow Creek directly of pollution in Snow Creek?
A. No.
Q. Do you know of any time that Monsanto has ever warned anyone who lives on Choccolocco Creek of pollution in Choccolocco Creek?
A. No.
Q. And do you know of any time that Monsanto has ever directly warned the people who live on Lake Logan Martin of pollution in Lake Logan Martin?
A. No.
Q. And would that be consistent with Monsanto policy to make those disclosures to the state only?
MR. PECK: Object to the form of the question as a mischaracterization of his testimony.
WITNESS: Well, I think I've

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already described the policy of communicating with the regulatory authorities. That's basically all I can say.
Q. (BY MS. ARENBERG) So failing to warn the people directly would be consistent with the policy, as you described it, of giving warning to public agencies?
MR. PECK: Object to the form of the question.
WITNESS: The policy is to notify the agencies in charge.
Q. (BY MS. ARENBERG) The policy is not to notify the people directly?
MR. PECK: Object to the form of the question.
Q. (BY MS. ARENBERG) Or is it? I'm asking.
A. I know of nothing that -- no.
Q. Mr. Brown, the last document you looked at during this deposition was Plaintiff's Exhibit Number 4. And I don't believe I asked you, did you review that

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document in preparation for your deposition today?
A. I believe so.
Q. Mr. Brown, I know you've given me a general date, and I can never keep it straight. Can you tell me when Monsanto's Anniston plant stopped producing PCB's?
A. 1971.
Q. Do you know what time during 1971?
A. No, I don't.
Q. So in 1974, the Anniston plant had not been producing PCB's for at least three years, or for approximately three years?
A. That's correct.
Q. Let me ask you to look at the document we're marking as Plaintiff's Exhibit Number 5. And again you can take your time and review it. I'll first want to know if you reviewed it in preparation for your deposition today.
A. No, I did not.

(Whereupon, Plaintiff's Exhibit 5

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was marked for identification and copy of same is attached hereto.)

Q. Have you ever seen this document before?
A. No, I have not.
Q. It's dated September 13th, 1974, I believe. You can correct me if that's wrong.
A. It's correct.
Q. And what was your position at that time?
A. That was about the time that I assumed the title of chief chemist.
Q. And as chief chemist, would laboratory results of PCB's in fishes from Snow Creek or Choccolocco Creek or Lake Logan Martin have been of interest to you?
A. No. Not at that point in time.
Q. At what point in time would you have become interested in those results?
A. Well, the PCB laboratory had been closed down at Anniston in 1971 or '2.

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Q. Yes, sir.
A. I was in a totally different operating company. And PCB's had been shut down. My scope of work at that time was on products that were in production.
Q. So once PCB's stopped being manufactured, there was less concern about PCB pollution; is that a fair statement?
A. No.
Q. There was more concern about PCB pollution after production stopped?
A. I'm not saying there is more or less.
Q. Okay. Tell me about the level of concern on the part of Monsanto concerning PCB pollution.
A. I can't answer for Monsanto. All I can answer for is what my job was.
Q. Well, today you represent Monsanto.
MR. PECK: On certain categories. I think you're probably drifting away from those categories.

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MS. ARENBERG: Well, I think until we understand their concern, it's hard to address their public relations and their warning standpoint, so that's where --
MR. PECK: I'm just clarifying the record. I'm not stopping you yet.
Q. (BY MS. ARENBERG) And I realize you can only do the best you can do. But to the best of your knowledge, I would like for you to describe the level of concern, on the part of Monsanto Company, concerning pollution of Snow Creek, Choccolocco Creek, or Lake Logan Martin. And we can start with 1970.
A. In 1970, there was a tremendous amount of work -- this entire problem was identified when analytical technology was developed that could detect PCB's. When that happened, Monsanto immediately started a very intensive program to identify and quantitate. The concern was such that they shut the plant down, tore it down, got out of the business, withdrew from the

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marketplace. That was the level of concern. People were laid off, fired, terminated. Those jobs went away.
Q. So obviously that's a very high level of concern?
A. That's about as high a level of concern as Monsanto could exhibit, you know, at that point in time. The work with ADEM continued to a point -- and I was not directly involved at that point in time -- where all questions or concerns had been satisfied, and the routine -- that detailed routine work was stopped, under not ADEM, but AWIC.
Q. You lost me when you said the routine work. I'm not sure what you were referring to.
A. I'm talking about this routine analyzing the water and mud.
Q. Do you know at what time that routine testing stopped?
A. I'm guessing in the '72, '73 time frame.

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Q. I don't want you to guess. But to the best of your knowlege, do you know?
A. To the best of my knowledge.
Q. Do you know why that testing stopped?
A. The plant was shut down. Everything was gone. And AWIC indicated there was no need to continue it.
Q. Did Monsanto ever tell AWIC there is no need to continue?
A. I do not know.
Q. In your experience, did AWIC look to Monsanto for advice on these matters?
A. I do not know. I did not deal with AWIC directly.
Q. At any point during your tenure?
A. No. Unless it was the -- let me requalify that. In 1974 I started dealing with AWIC.
Q. Did AWIC, in late 1974, ever seek Monsanto's advice?
A. No.
Q. Did AWIC consider Monsanto the

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expert when it came to PCB's?
A. I did not deal with them on PCB's. I dealt with them on plant permits, water permits.
Q. And you were not permitted to discharge PCB's at that time?
A. No.
Q. Because you were not producing PCB's at that time?
A. Right.
Q. Do you know if there were any PCB's in the stormwater runoff from the Monsanto plant at that time?
A. I do not know.
Q. Do you know if there were any PCB's detected in the plant effluent at that time?
A. I do not know.
MR. PECK: What time frame are we talking?
MS. ARENBERG: We're talking about Late 1974.
Q. Who do you know at AWIC?

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MR. PECK: Who did he know?
Q. (BY MS. ARENBERG) Yes. Are there any people at AWIC that you know by name?
A. Well, there were a number of people that I learned through the years in dealing with them. One name is Charles Horne.
Q. Do you know what his position was when you dealt with him at AWIC?
A. He was head of industrial permitting.
Q. Do you know if he's still alive?
A. Yes, he is.
Q. Do you know what he's doing these days?
A. He's still with ADEM.
Q. Still in permitting?
A. I don't know. I've not seen him in ten years.
Q. Who else did you know at AWIC?
A. Let's see. Bill Lott is another name.
Q. Do you know what his title was?

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A. He was either -- he was in the permitting compliance section. I'm not sure exactly. But he was an engineer.
Q. Do you know if he's now at ADEM?
A. I do not know.
Q. Who else did you know at AWIC?
A. Well, I knew Jim Warr somewhat, but I didn't deal, you know, very much with him.
Q. And Mr. Warr is now at ADEM, isn't he?
A. Yes.
Q. What was his job at AWIC?
A. I believe Jim was head of AWIC at the time AWIC merged with the other agencies to form ADEM.
Q. When Monsanto disclosed information to AWIC, did it always go to the same person, or did it depend on what the subject matter of that --
A. It depended on the subject matter. There are a lot of different people involved, depending on the topic or subject.

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Q. Do you know who disclosures relating to PCB pollution would have gone to?
A. No. Typically, there would have been a direct contact, but I think most letters are normally addressed to the chief of the agency, or the department.
Q. Well, referring you back to Plaintiff's Exhibit Number 5, this is a letter addressed to a Dr. Gunning. Do you know who that is?
A. I'm familiar with him, and I have, if I remember correctly, met him back in the early '70s.
Q. Is he a Monsanto employee, or was he at that time?
A. No. He was a consultant.
Q. Did he do consulting work for Monsanto at that time?
A. Yes.
Q. And the letter appears to have come from a Edward Stewart. Do you know who that is?

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A. I do not know. I've never heard the name.
Q. Now, attached to that letter are some fish study results, fish testing results, I believe. And just to be clear, have you ever seen these fish study results before?
A. I have not.
Q. Mr. Brown, I would like to draw your attention to the third paragraph of the letter on the front page of this document, where Mr. Stewart apparently states I am somewhat concerned in that in most cases the recent data would indicate higher levels than previous data. Is that what that says?
A. Best I can tell. It's very difficult to read.
Q. It is hard to read, I agree with you. If you will -- I think you've had a minute to review it. But feel free to review it some more. And my question is, does this appear to be studies of fish from June of 1974 taken from Choccolocco Creek?

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I think they are all from Choccolocco Creek, and tributaries of Choccolocco Creek.
MR. PECK: Object to the form of the question. No foundation for this witness to discuss it. The document speaks for itself.
WITNESS: That's what it appears to be.
Q. (BY MS. ARENBERG) And you've seen fish studies before, haven't you?
A. Yes.
Q. Do you know of any warnings ever made by Monsanto to any people directly on Choccolocco Creek concerning these findings?
A. I'll repeat what I said before. I know of no warnings.
Q. And it would be Monsanto's policy to report these findings to the state and not to the people directly, is that correct?
A. That's correct.
Q. Were these results reported to the state?
A. I do not know.

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Q. And these results are marked -- I'm looking at page 14018 -- and note that these are marked company confidential.
A. Which is what went on on all data basically that were generated at that point in time. Standard procedure.
Q. So it would be standard procedure for Monsanto to mark fish studies company confidential, is that correct?
A. All studies.
Q. All studies?
A. Yes.
Q. Sediment studies as well then?
A. I can look at this document and assume where it was generated.
Q. Okay. Tell me where you would assume it's generated.
A. At what was called W. G. Krummrich plant.
Q. And that is based on your knowledge that Krummrich plant does what?
A. It's based on my knowledge that's what it says.

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Q. What page are you referring to?
A. The cover letter.
Q. Okay. It would not have been out of the ordinary for the Krummrich plant to generate this sort of data, would it?
A. That was the other plant that produced PCB's in the history of Monsanto.
Q. Okay.
A. So they obviously still had laboratory facilities set up. And this was a report of technical data that was generated. And all technical data typically carried a company confidential statement.
Q. Okay. Would it be your understanding that these fish -- strike that.
When you say this was generated by Krummrich, do you also mean that the fish would have been studied at Krummrich?
A. Yes.
Q. Do you know how they were delivered from Alabama to Illinois?
A. No.

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Q. Well, I think there's a PS that says we still have your cooler in use. So I guess somehow or another they took them up there on ice.
Now I'm going to refer you back to the cover page, the front page of this document, Plaintiff's Exhibit 5. And the sentence that we read earlier which states that the data would indicate higher levels than previous data. Would Monsanto expect the fish study data levels to increase after production stopped?
MR. PECK: Object to the form of the question.
Q. (BY MS. ARENBERG) I'm sorry, that was probably a very confusing question. Let me try to rephrase it.
A. I suggest you read the second question, too -- I mean the second sentence.
Q. Do you want to read it for me? Can you see it?
A. He is guessing that his laboratory method and equipment may be more so

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sophisticated than previous methods and equipment.
Q. Do you believe that that accounts for the higher levels?
MR. PECK: Object to the form of the question. No foundation for this witness to answer.
WITNESS: I have no idea.
Q. (BY MS. ARENBERG) In your experience, does that account for higher levels to be found later at later times?
MR. PECK: Same objection.
WITNESS: I've never personally compared the methodology. So I cannot answer that question.
Q. Okay. But you have told me that you do understand that the analytical result testing abilities got better over time?
A. And getting better means that the level of detection was dropping.
Q. I don't understand that statement. Explain that to me.
A. With one particular set of

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methodology, you could detect a hundred parts per million. As the methodology improves and gets better, you could drop it down to 50 parts per million. Continuing to improve, drop it down to ten parts per million. Continuing to improve, drop it down to one part per million. This is really what was happening that allowed technology to tell us what chemicals were actually persistent. As this technology developed, it allowed us to see lower and lower levels. And that's what I mean.
Q. So the technology enabled you to detect the presence of PCB's in amounts that were smaller than could have been detected previously?
A. That's correct.
Q. Did the change in technology affect your ability to detect PCB's in amounts over a hundred parts per million?
MR. PECK: Object to the form of the question. No foundation for this witness to answer.

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WITNESS: That would depend on the -- best way I can describe it would be the state of validation of that method at that particular level, if you can understand what I mean.
Q. (BY MS. ARENBERG) I think I do.
A. It would be what degree of confidence that you know that that's exactly it, and there is no more there, or no less there.
Q. Okay. Did the degree of confidence that Monsanto had in results increase over time?
A. As you do, that's typical of method development work, yes.
Q. Yes, sir. And that would have been --
A. And way back in the early days, you're dealing with an unknown confidence. And the more you learn, typically the more confident you get in methodology.
Q. Is this a true statement, then, that it would be more difficult to detect

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small amounts of PCB's in fish in 1969 than it is in 1995?
MR. PECK: Object to the form of the question. No foundation for this witness.
MS. ARENBERG: I'm just trying to clarify his previous testimony. That would be a result --
WITNESS: Generally speaking, that would be an expected result.
Q. (BY MS. ARENBERG) And I understand kind of how it works on that bottom level, the low levels. And I guess what I'm trying to understand is does it also work in the high levels? Are readings of 500 parts per million anymore accurate when done in 1995 technology than that reading would have been had it been obtained through 1969 technology?
A. I would expect the level of method validation to be much higher than in 1969 or '70, simply because of the state of technology. And that does not mean it would

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be higher or lower. It may be either or both. We're talking variability.
Q. Testing methods --
A. That's the kind of thing that you develop more knowledge and more confidence as time goes on.
Q. Okay.

(Whereupon, Plaintiff's Exhibit 6 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I'll ask you to look at the paper marked Plaintiff's Exhibit 6. And my first question will be did you review that page in preparation for your deposition today?
A. No.
Q. Do you know what this document is?
A. Yes.
Q. Tell me about it.
MR. PECK: If you need to take a minute to look at it, feel free.

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WITNESS: This document originated in St. Louis. It's basically a communication of rules and regulations involving PCB transformers that were in service at that point in time.
Q. And these rules and regulations would apply to Monsanto employees, would that be correct?
A. No. It would apply to PCB transformers.
Q. My question I guess is that the rules are internal rules within Monsanto?
A. No. These are rules under TSCA.
Q. And that's the Toxic Substances Control Act?
A. That's correct.
Q. What was purpose of this memo?
A. A communication document to the four plants involved in the operating division at that point in time.
Q. Was it to inform those four plants how to handle PCB's in their transformers?
A. It was to inform the plants that

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these are the rules, and you've got to check your compliance against these rules.
Q. And Monsanto's policy would be to follow these rules, would it not?
A. Sure. Part of it is guidelines from corporate supporting the rules.
Q. Part of it. Do you mean some of those rules, or what part?
A. Let's see -- these are straight rules here.
Q. Okay. So in essence, this memo is quoting or otherwise relating --
MR. PECK: Do you have anymore to this memo? Usually if it's a one page memo, it doesn't say one.
MS. ARENBERG: I don't have anything connected to this.
WITNESS: There would normally be a second page to this at least since a signature is not on here.
Q. (BY MS. ARENBERG) Well, I want to ask you about the rule designated number five, cleanup of PCB leaks in 48 hours. Do

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you have any understanding of what that rule refers to?
A. That referred to leaks from PCB transformers.
Q. Would the result of that mean that if a PCB transformer in a Monsanto plant leaked, company policy would be to clean it up within 48 hours?
A. Yes.
Q. Did Monsanto have any policy concerning how quickly they would clean up leaks of PCB's into Snow Creek?
A. You're asking me something here that went from a period of 1930 to 1971. And I simply can't answer that.
Q. Let me define it as of the time of this memo. At the time when this memo came out and you had a rule that you would clean up PCB leaks internally within the plants within 48 hours, was there any similar rule that applied to a PCB leak in Snow Creek?
MR. PECK: Object to the form of the question.

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WITNESS: In 1985, the policy was that if you spilled anything, it had to be cleaned up immediately before it reached the receiving waters.
Q. Does that mean that PCB's never escaped into Snow Creek in 1985?
A. Now, you've got to keep in mind that PCB is defined.
Q. Yes, it is defined as I believe a substance involving more than 500 parts per million of PCB's.
A. For PCB transformers, that's correct.
Q. But my question is broader than that. My question is if PCB containing substances leaked into Snow Creek in 1985, did you have any policy concerning cleaning them up?
MR. PECK: Object to the form of the question. Assumes facts not in evidence.
WITNESS: Our policy had already been to phase out all PCB's. So your

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question is totally not applicable in 1985. Other than PCB transformers.
Q. (BY MS. ARENBERG) Because Monsanto's position would be if we're not producing PCB's, then they can't be getting into Snow Creek, from us? Is that the policy?
A. You asked me a Monsanto policy. The policy had been, number one, to quit making it. Number two, everywhere we use it, get rid of it, clean it out. The last use of PCB that remained were PCB transformers, and the direction was to phase all of them out, as they could be. They could continue to be used under these rules and regulations until such time they were phased out. And all of them were phased out of our plant. All of them were changed out.
Q. (BY MS. ARENBERG) That's fine. But my question is -- or maybe you're telling me that because you didn't produce PCB's and because you only used PCB's in transformers, that there were no escapes of

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PCB's from the Monsanto plant into Snow Creek in 1985. And if that's what you're telling me, then give me a yes, that's what you're telling me.
A. What I'm telling you is everything that meets the definition of PCB's had been phased out of all Monsanto operations in 1985.
Q. Did you have substances that meet what you call the definition of PCB's in your landfills at that time?
A. I would suppose so, yes.
Q. And do you know whether any of those PCB's that you suppose might have been in your landfill were leaching at that time?
MR. PECK: 1985?
Q. (BY MS. ARENBERG) 1985.
A. I've been personally involved with studies from that landfill from 1979 forward.
Q. So you have knowledge of that subject?

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A. And during all those studies, no PCB's were seen, detected, or whatever leaching from that landfill.
Q. So if they were leaching, Monsanto did not know about it? Is that a correct statement?
MR. PECK: Object to the form of the question.
WITNESS: I'll simply state it once again. We did many, many tests, and we never at one time detected, through either sight or any other method, any leaching of PCB's from that landfill.
Q. You say that landfill as if there is only one. Which landfill are you talking about?
A. I'm talking about the Monsanto landfill. In 1985, I had no knowledge of anything more than the Monsanto landfill.
Q. In 1985, you had no knowledge of the west end landfill?
A. I did not.
Q. Was it in operation in 1985?

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A. No. That land was transferred to Alabama Power Company in the early '60s, and was never operated during that period of time.
Q. So all of the testing that you just referred to was done on the Monsanto landfill?
A. That's correct.
Q. But there may be PCB's in the west end landfill?
A. I had absolutely no knowledge of the west end landfill in 1985.
Q. Today do you believe that there may be PCB's in the west end landfill?
A. I've not seen any direct results, but I've been told that PCB's have been detected in that landfill. And that's the reason capping -- or the recapping process with the state of the art cap is now underway.
Q. Okay. And it would be impossible for Monsanto to say that neither one of those landfills ever leached. Would that be

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correct? Leached PCB's?
A. Again, you're asking me to answer something from a time frame of the '20s or the early '30s until now, and I simply can't do it. I do not know.
Q. Okay. You can't make that representation that they've ever leached?
A. I cannot.

(Whereupon, Plaintiff's Exhibit 7 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, would you look at the document marked Plaintiff's Exhibit 7, please, and tell me if you've ever seen that before?
A. Yes.
Q. Did you receive a copy of this document in 1985?
A. Yes.
Q. Tell me what you understood this to be communicating to you at that time.

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A. Requirements of the regulations that were cited in this memo, 40CFR761.30.
Q. And it would be Monsanto's policy to meet the requirements of that regulation, would it not?
A. It's Monsanto's policy to comply with all regulations.
Q. So it was Monsanto's policy -- and I am referring to the warning label that's attached -- to require the wearing of gloves during the maintenance of systems containing less than 50 PPM's of PCB's. Is that a correct statement?
A. Yes.
Q. Do you know what the word system in that warning label is referring to? Is that a transformer?
A. This particular label is for a heat transfer or hydraulic system.
Q. So this would be a label you would put on a heat transfer system within your plant, would that be correct?
A. If you had PCB's at levels less

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than 50 parts per million.
Q. Do you know why gloves were required -- other than the fact that the regulation required it, is there any other reason that Monsanto would want its employees to wear gloves during maintenance of these systems?
MR. PECK: Object to the form of the question. No foundation for this witness to answer that question.
WITNESS: I can answer it differently. We phased out all systems that contained PCB's. This was a regulatory manager that communicated regulatory requirements to the plant.
Q. [BY MS. ARENBERG] I think you're telling me that your plant didn't have any need for these warning labels?
A. That's correct.
Q. But nevertheless, these warning labels did evidence Monsanto's policy concerning the wearing of gloves, if it had applied. It evidenced our intent to comply

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with all rules and regulations.
Q. Okay. And that included the wearing of gloves --
A. Yes.
Q. -- pursuant to this label. In 1985, after you received a copy of this memo, did Monsanto ever warn people along Snow Creek that they might need to wear these gloves if they touched the sediment of Snow Creek?
A. No.
Q. Was there any disclosure to the public or the press concerning the need to wear gloves when in contact with the sediment in Snow Creek?
A. Not that I'm aware of.
Q. And that would be consistent also with Monsanto's policy regarding the disclosure of warnings?
MR. PECK: Object to the form of the question.
WITNESS: This particular regulation applied to heat transfer and

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hydraulic systems. You're really confusing things here. You're trying to extrapolate this to sediment, and this regulation applied to heat transfer and hydraulic systems.
Q. Is there something special about a heat transfer system that makes the PCB's in it more hazardous than the PCB's in sediment?
A. No.

(Whereupon, Plaintiff's Exhibit 8 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, did you review the document marked Plaintiff's Exhibit Number 8 in preparation for your deposition today?
A. No, I did not.
Q. I think I forgot to ask you that question with reference to Plaintiff's Exhibit Number 7. If you would glance back at it and see if you reviewed it in

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preparation for your deposition today.
A. No, I did not.
Q. Have you ever seen Plaintiff's Exhibit Number 8?
A. Yes, I have.
Q. Tell me where or when you saw that.
A. I saw it in late '84. Where I saw it -- I was in the plant when I saw it.
Q. So in the course of your position at Monsento, this data was made available to you?
A. Yes.
Q. And is it your understanding that this reflects samples of -- is it sediment from Snow Creek?
A. It's my recollection that these were grab samples of sediment.
Q. Do you know who conducted the test on these samples?
A. The analytical work?
Q. Yes, sir.
A. UAB.

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Q. Did you have any reason to think that these results were incorrect when you received them?
A. Well, I think I mentioned that it was a grab sample. So the question is what does that really represent.
Q. Okay. Do you feel that there is a better way of sampling than grab sampling?
A. There are statistical methods generally regarded by scientists as being more accurate and more representative of what you would expect to find.
Q. I'm not meaning to put words in your mouth. But you didn't doubt their accuracy, you doubted how representative they were of Snow Creek. Would that be fair?
A. Yes.
Q. After you received this information, did you issue any warnings to the people on Snow Creek that the PCB levels in the sediment might be as high as 408 parts per million?

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A. No.
Q. Did you issue any press release or any kind of notification to anyone other than a state or regulatory agency that the level of PCB's in Snow Creek might be as high as 408 parts per million?
A. No.
Q. Was that consistent with Monsanto policy?
A. I think I've stated before, it was our policy to communicate with the regulatory agencies directly on issues pertaining to the environment.
Q. Do you know if those results were given to any regulatory agency?
A. Yes.
Q. Which agency were those reported to?
A. ADEM.
Q. Did you personally report those?
A. Yes. I don't know if I personally was the first one to report these or not. But yes, after these results were available.

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we had a meeting in Montgomery to discuss these results.
Q. *Who would have called that meeting?*
A. We requested the meeting to be held.
Q. *Why did Monsanto want to have a meeting concerning these results?*
A. To develop a plan for assessing more and more detail of these findings.
Q. *Would this report then have triggered a desire to know more about the sediment of Snow Creek?*
A. Yes.
Q. *Did these results come as a surprise to Monsanto?*
A. You say as a surprise to Monsanto. I can't represent Monsanto as a whole. I can represent some individuals within Monsanto. And yes, they were somewhat of a surprise.
Q. *Let me refer you to what appears to be sample number one. And it's*

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identified as having come from Snow Creek at highway overpass under construction. Do you konw what location that refers to, what highway?
A. Yes.
Q. *Is that Highway 202?*
A. Yes.
Q. *Have you ever been to the spot -- or nearby the spot where this sample might have been taken?*
A. Yes.
Q. *Is that on Monsanto property?*
A. No.
Q. *Is that on private property?*
A. That would have been state right-of-way.
Q. *And sample number five, Snow Creek at the confluence of the Monsanto discharge. Do you know generally the area that that refers to?*
A. Yes.
Q. *Can you explain to me where that would fall?*

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A. That would have been on the edge of Monsanto property.
Q. *Is that the eastern edge?*
A. At that particular point, I would classify it kind of northeasterly edge.
Q. *Is it in the vicinity of the railroad tracks that run to the north of the plant? Or is there any landmark you can kind of point towards that this would be near?*
A. The railroad tracks are still in a more northerly direction.
Q. *Okay. So this discharge point, if that's a correct nomenclature for that, would be north of Highway 202?*
A. No, no, no -- yes, excuse me, yes.
Q. *But it would be south of the railroad tracks?*
A. Yes.
Q. *And it would be to the eastern side of the plant?*
A. Yes.
Q. *Would it be east of Clydesdale*

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Avenue, or Clydesdale Boulevard, or Clydesdale?
A. Yes.
Q. *Do you know where the nearest house to that point would be located in 1984?*
A. I can't think of which exact house might be the nearest. I've got a general recollection of the area.
Q. *Be within a hundred yards, the best of your recollection?*
A. That would be a pretty good estimate.
Q. *And was this point also south of 10th Street?*
A. Yes.
Q. *Would this point be in the neighborhood that is known as Cobb Town?*
A. I don't know what Cobb Town is.
Q. *And again, in reference to number five, it's your understanding that this is a point at Snow Creek and not merely at a ditch that's a tributary to Snow Creek?*

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A. No, no, no, it's a tributary.
Q. *Oh, okay. We're talking about what would look like a ditch, not what would look like a creek?*
A. Right.
Q. *And is that discharge point still in existence?*
MR. PECK: Object to the form of the question.
WITNESS: You say discharge point. It was a ditch.
Q. *Is that ditch still there, to the best of your knowlege?*
A. Yes.
Q. *Is there still any flow of water from the Monsanto plant into that ditch, to the best of your knowledge?*
A. Yes.
Q. *And it's not a ditch that you've covered up, put pipe in?*
A. Well, there's a great deal of dredging and clean out and piping of the section there. And I'm having a little bit

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of trouble remembering exactly if this is out of the section where the culvert was actually installed, or still a little bit upstream. But it was in that vicinity.
Q. *Where was a culvert installed? Can you describe the area where there was a culvert installed?*
A. Running north-south between 10th Street and the church.
Q. *Of First Missionary Baptist Church? Mars Hill Baptist Church?*
A. There are two churches there, and I can't keep them separate.
Q. *Would it have been the church closest to the Monsanto landfill?*
A. No.
Q. *It would have been the church closer to 10th Street but still south of 10th Street?*
A. Yes.
Q. *You talked about the placement of a culvert. Did that take place in the 1980's?*

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A. Yes.
Q. Do you know what year?
A. I believe '89.
Q. And what was purpose of that culvert?
A. It was part of the remediation program that we proposed following the next study that was done after these results were generated.
Q. You've told me that this generated some new interest. As a result of this, did Monsanto conduct more studies?
A. We did a sampling that was three agencies, three parts of EPA, ADEM, the attorney general's office, and Monsanto all reviewed this.
Q. This being Plaintiff's Exhibit Number 8?
A. Yes. And reviewed a sampling plan that we had some sampling experts to propose for a program to further define this area.
Q. And that sampling program did take effect? In other words, samples were taken,

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is that correct?
A. Yes.
Q. And that would have been between 1984 and 1989?
A. Yes.
Q. And did that involve removing soil or sediment from private property in the area of these effected ditches?
A. The sampling program?
Q. Yes. Was that sediment sampling?
A. Yes, it was sediment sampling in the ditches.
Q. But not all of that sediment was on Monsanto property, a lot of it was on private property, is that correct?
A. Part of it was state right-of-way, part of it was railroad right-of-way, and part of it was private property.
Q. And those samples were taken, and those samples were tested for the presence of PCB's, is that correct?
A. That's correct.
Q. And Monsanto at some point

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received results of those tests?
A. Yes.
Q. Did the results of those tests show the presence of PCB's in those samples?
A. Yes. Some of them.
Q. Were those results disclosed to the public?
A. I'll repeat once again, these results were communicated with the attorney general's office, representatives of ADEM, and at this point in time, the EPA had withdrawn, pulled out and deferred regulatory action to ADEM. They were discussed with some local residents there, particularly when we moved to the phase of remediation.
Q. Okay. And we'll get there. But in reference to -- if I understand you correctly, when the results -- when the samples were analyzed, the results of that analysis was sent I guess probably simultaneously to Monsanto and the agencies that you named?

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A. Basically we split the samples three ways. The AG's office took a set, we took a set, and ADEM took a set. We had our set analyzed. ADEM had their set analyzed. The AG's office did not. When the results were available, we exchanged results and compared results.
Q. Do you know why the AG's office did not have their samples tested?
A. They were basically waiting to check the agreement on the other two samples and not spend any money unless they felt it was necessary.
Q. Did Monsanto's samples and ADEM's samples, were the results of those samples consistent?
A. They were consistent with the types of variability that you normally see in these kind of samples.
Q. Now, the results that Monsanto obtained you told me were shared with ADEM and were shared with the AG's office.
A. That's correct.

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Q. Those same results that Monsanto obtained, were they, at that time, provided to residents of that neighborhood where the samples had been taken from?
A. No.
Q. Were they provided to the Anniston Star at that time?
A. No.
Q. Were they provided to any newspaper or television station or news organization that you know of?
A. No.
Q. Now, I think you were about to tell me that they were eventually shared with some of those residents of that neighborhood.
A. Yes.
Q. Do you know what point in time those were revealed to those residents? Those test results?
A. We put together a remediation protocol. Presented it to the agency, meaning ADEM, and the attorney general's

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office in this case. And discussed them with a contractor who was actually adjacent to the property that we're talking about. And the closest residents involved in this.
Q. Okay. And by closest, do you mean the residents nearest in proximity to the actual remediation work?
A. Yes.
Q. Do you recall the names of any of those residents?
A. No.
Q. Would you know those houses if you saw them, or those buildings?
A. Yes.
Q. Were they homes?
A. Yes.
Q. Do you know what street they were on?
A. I could take you to it, but I can't call it.
Q. If you hear some of the street names, would that ring any bells, do you think?

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A. No. Because I've never really associated names with the streets.
Q. Okay. And that's not a neighborhood that you drive through regularly?
A. That's correct.
Q. The document that we've been looking at, Plaintiff's Exhibit Number 8, is dated 1984. Do you know how quickly after that the samples were taken?
A. My recollection was early '85.
Q. And those results came back how soon after the samples were taken?
A. I would estimate a month.
Q. So at some point, probably early to mid 1985, you had results from the sediment samples that had been taken in connection --
A. Somewhere in the mid '85 era.
Q. The remediation work that you told me about began in 1989, is that correct?
A. That's what I remember.
Q. So the notification to those

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residents who are closest in proximity to the remediation work would have been made in 1989?
A. No. It was discussed earlier than that.
Q. Well, was it discussed in 1988, do you think?
A. My recollection is 1986 when we were proposing to do this. Late '85, '86, somewhere along there is when the protocol was put together. I think it was done in late '85. So we started discussing with a contractor the need to do this program, and early plans to do it.
Q. When you tell me that you disclosed your testing with those residents -- those may not have been your words, but you told me you communicated with those residence about testing results. Did you reveal to them that their property had been tested, and revealed the presence of PCB's?
MR. PECK: Object to the form of the question.

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WITNESS: We revealed to them that we had tested the ditch.
Q. Did you reveal to them that PCB's had been detected in that ditch?
A. We revealed that we had picked up -- so far as specific levels of PCB's, I don't remember the details of that.
Q. So --
A. Basically you refer to -- there is residual contamination that we propose to remediate, clean up.
Q. So that would be basically what they were told, there is residual contamination by PCB's? Did you name the chemical?
A. We did to the contractor and at least one of the residents.
Q. Would that have been a resident who asked you what chemical was in there?
A. No.
Q. You just voluntarily told him what that chemical was?
A. Uh-huh.

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Q. Do you know his name?
A. No.
Q. Was it a man?
A. It was a lady.
Q. But the other residents you did not specifically tell them that the chemical was PCB's?
A. Well, I did not do the rest of the communicating personally. So I cannot answer that question.
Q. Did you communicate with her personally?
A. Yes.
Q. Was Monsanto's policy to tell them that PCB's were in the ditch?
A. Our policy was to tell our findings. To specifically identify or -- what was typically referred to as aroclor. The PCB terminology is what keeps throwing me off. Because that's something we rarely use.
Q. You used the term aroclor?
A. Yes.

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Q. And by that you meant products that Monsanto produced that contained PCB's?
A. It was a trade name for the product. It's what it was always called.
Q. So in your disclosure to these residents that we've been talking about, was your policy to disclose that aroclors were present in the ditch?
A. Yes.
Q. Was your policy to disclose the amount of aroclor that had been detected in the ditch? And by that I mean the parts per million finding.
A. You know, you keep saying is it your policy. In these communications, we basically communicated the fact that we had found levels of aroclors within these ranges. To go out and say here we found X part per million and here X part per million, we did not. But in the section of the creek, we have found aroclors in levels typically spoken in excess of 50 parts per million. Or between the range of 50 parts

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per million and X parts per million.
Q. So you spoke to people -- you used numbers, but you used ranges rather than specific findings?
A. Yes.
Q. Did anyone ask you specifically how much PCB is on my property?
A. No.
Q. No one ever requested that information?
A. No.
Q. Would Monsanto have given it had it been requested?
A. Yes.
Q. Did anyone get a copy of any test results that had numbers on them at that time?
A. ADEM and the agency -- or attorney general's office.
Q. But none of the residents that you told me about that Monsanto disclosed information to got copies of test results?
A. No.

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Q. Was that consistent with Monsanto policy?
MR. PECK: Object to the form of the question.
WITNESS: These were technical documents. And they were communicated to the agency and attorney general's office.
Q. And that was consistent with Monsanto's policy, wasn't it? That that's what you did with those technical documents? You didn't release them to the public?
MR. PECK: Object to the form of that question.
WITNESS: We didn't walk up to the contractor and say this is a copy of the report. We went up to him and said, look, we have found, through these studies, that arocior is present in this sediment. And we're proposing to remediate it. And this is how we propose to do it.
Q. (BY MS. ARENBERG) I'm sure you gave more information to your contractors

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than you were giving to residents? Would that be logical?
A. The contractor was adjacent to -- so it's a combination.
Q. Who was that contractor?
A. It was Anniston Concrete.
Q. But none of the samples were actually taken on Anniston Concrete property, or were they?
A. Adjacent to it.
Q. Do you know who would have owned that property adjacent to Anniston Concrete that was sampled?
A. That would have been state right-of-way property.
Q. I don't want to get bogged down in too many details. I think that basically you're telling me that the test results were shared with ADEM. They were shared with the AG's office. And they were not otherwise disclosed. Would that be correct?
MR. PECK: Object to the form of the question.

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WITNESS: No. I didn't disclose specific numbers at specific sample locations.
Q. (BY MS. ARENBERG) That's what I meant in my question. The specific test results were not disclosed to anyone other than ADEM and the AG's office?
A. That's correct.
MR. PECK: Let's take a break.

(Whereupon a brief recess was had in the deposition.)

(Whereupon, Plaintiff's Exhibit 9 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, if you would, look at the document marked Plaintiff's Exhibit 9, and my first question will be did you review that in preparation for your deposition today?
A. No, I did not.

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Q. Are you familiar with this document? And take your time to look through it if you need to.
A. Yes, I'm familiar with it.
Q. How did you become familiar with it?
A. These results were taken or developed from the dredged material that was removed after the remediation program was completed.
Q. Would that be the remediation program that you mentioned earlier, the Snow Creek sediment removal project?
A. Yes.
Q. Then this document reflects the results of tests that Monsanto conducted on the soil that had been dredged, is that correct?
A. Yes.
Q. And in general, these samples indicated that PCB's were present in those soil samples, is that correct?
A. Yes.

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Q. And the levels in those samples were generally greater than 50 parts per million and less than 500 parts per million, is that correct?
A. Yes.
Q. And this particular document refers to 50 UG, slash, G. I understand that that means 50 parts per million. Am I correct on that?
A. That's correct.
Q. Did Monsanto provide this document to any regulatory agency?
A. Yes.
Q. Do you know which agencies this was provided to?
A. ADEM.
Q. Do you know if it was provided to any other agency?
A. No.
MR. PECK: You don't know?
WITNESS: It was not.
Q. (BY MS. ARENBERG) Was it provided --

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MR. PECK: By Monsanto?
WITNESS: By Monsanto.
Q. (BY MS. ARENBERG) Did Monsanto provide this document to anyone outside of Monsanto, other than ADEM?
A. No. Well, to Chemical Waste Management.
Q. This document was provided to Chemical Waste Management.
A. Or the results were. I don't know if the entire document was, but the results were.
Q. And Chemical Waste Management was handling that waste sediment for you, is that correct?
A. They did, yes.
Q. Did they transport it for you?
A. Yes.
Q. And so they needed to know what kind of materials they were transporting, is that correct?
A. Well, number one, you had to determine the level to designate it as PCB

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contaminated material or not.
Q. And by these levels, it would be considered PCB contaminated material, wouldn't it?
A. Yes.
Q. These levels would indicate that this sediment has to be disposed of in an authorized PCB disposal site under RCRA, would that be correct?
A. Not under RCRA, under TSCA.
Q. TSCA. The sediment samples revealed in this document are identified as Snow Creek sediment A, B, and C, is that correct?
A. Yes.
Q. Do you know if the sediment was studied before it was dredged out of the creek or after?
MR. PECK: The sediment?
Q. (BY MS. ARENBERG) Yes, or the soil.
A. This was from the pile after removal.

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Q. Okay. That answers my question. It was sampled after it was removed?
A. Yes. That was part of the protocol.
Q. Is there any way to identify where in Snow Creek, what area of Snow Creek sample A would have come from?
A. No.
Q. So sample A could have come from dirt that was closer to the plant or at the farther end of the ditch. It's simply not something you can determine from this study?
A. No.
Q. And so if someone from Snow Creek went to ADEM to look at this document, could they tell where the sediment that had been studied came from?
A. That was not the intent of the sampling. This sampling was -- the protocol specified that this sediment will be dredged. The dredged material will be piled up, then analyzed by a statistical plan that was included in the protocol. And then

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based on the results, would be disposed of accordingly.
Q. So the results were helpful to determine how to dispose of this material?
A. That was the intent of it, yes.
Q. And there was no intent for these samples to provide any information to the public as to the content of Snow Creek sediment?
A. No, not in this sampling.
Q. Do you know of any samples that were taken for the purpose of informing residents along Snow Creek as to the levels of PCB contamination in Snow Creek?
A. I know of a set of sampling that was taken between the data that we discussed earlier and this set of data. That was from the executed protocol that was agreed to by all the agencies.
Q. Okay. And what was the purpose of that sampling?
A. To determine the PCB levels in the sediment in that stream bed.

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Q. Was the purpose of that to disclose it to the public?
A. The purpose of it was to learn the information. The information was disclosed to the agencies, which is public information.
Q. And if the public were to look at that information at ADEM -- let me back up. We've already established that if a Snow Creek resident went to ADEM and looked at this study, they could not tell what the levels of PCB contamination were at any specific point on Snow Creek?
A. That's correct.
Q. The study that you're now telling me was conducted prior to this. If a resident of Snow Creek looked at that study at ADEM, could they determine what the levels of PCB contamination were at any specific point on Snow Creek?
A. Yes.
Q. How could they tell that?
A. In the sampling protocol, there

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was a map that specified sampling locations.
Q. So they would look at the map attached to Monsanto's sediment removal protocol?
A. Yes.
Q. And that would provide them with information?
A. Yes. That specified -- the protocol was developed, reviewed by all the agencies, and agreed to. The protocol specified where and how the samples would be taken.
Q. And do you know when those samples -- do you know the date of that test result?
A. In '86 is my recollection.

(Whereupon, Plaintiff's Exhibit 10 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I'm going to ask you to look at Plaintiff's Exhibit Number 10, which

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appears to be -- which is titled analysis for PCB's in soil samples. This is not the test that you were just describing to me, is it, since this is dated 1985?
A. I'm remembering back ten years. It was '85, '86, and I was remembering it was '86. But yes, this is the report from the sampling that I referred to.
Q. Okay. So you're familiar with this report?
A. Yes.
Q. Can you show me the map that you referred to that would provide information to a Snow Creek resident as to levels --
A. The map was included as part of the sampling protocol.
Q. And it was provided to ADEM?
A. Yes.
Q. But it is not a part of these results?
A. It was the document that was submitted and reviewed prior to this work.
Q. So I think that that means -- and

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correct me if I'm wrong -- that for a person to determine the results of testing, they would have to look at two different documents, the protocol document that you described, and then this which would have test results in it?
A. That's correct.
Q. So for a person on Snow Creek to determine the levels of PCB contamination in a specific portion of Snow Creek would depend on them going to ADEM and looking at at least these two documents, is that correct?
MR. PECK: Object to the form of the question. Calls for speculation.
WITNESS: That would be one way.
Q. (BY MS. ARENBERG) Do you know of any other way?
A. If the person asked to see the data, it would be provided to him.
Q. If they asked Monsanto if they could see the data, Monsanto would provide it to them?

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A. Uh-huh.
Q. Did anyone ever do that?
A. No.
Q. Did any news organization or reporter or TV station ever ask to do that?
A. Not to my knowledge.
Q. But Monsanto's policy would have been to comply and to disclose those documents --
A. It's public information, yes.
Q. -- if they were asked?
A. Uh-huh.
Q. Let me ask you to turn to the second page in that same document, which is Bates stamped 15270.
A. Okay.
Q. Tell me what this page, what it means. Have you ever seen a page like this before in a Monsanto document?
A. If you read where it was done, Environmental Science Center, Dayton laboratory, this was a typical format distribution from the Dayton laboratory for

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all work that they communicated.
Q. The Dayton laboratory compiled these results, and they placed this page on this document?
A. They wrote the entire document.
Q. Okay.
A. They did the analytical work.
Q. They did the analytical work, and this is their report?
A. And wrote the report.
Q. They sent it to people who included you, would that be correct?
A. Yes.
Q. And this page is a note addressed to you that the distribution of this report is restricted?
A. All of this is standard format for reports, except for the distribution, which is added on there for a given report.
Q. Well, when you received this, did this indicate to you that you should restrict to whom you distributed this document?

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A. Absolutely not.
Q. So the fact that it's marked company confidential, and the fact that it says distribution is restricted would not have limited your ability to distribute it?
A. Absolutely not.
Q. And you would have given it out to any member of the public who asked for it?
A. Yes.
Q. But nobody ever did?
A. No.
Q. This is kind of a general question. This report seems to refer to the soil samples taken as Anniston soil samples. The soil samples are actually Snow Creek soil samples I believe you explained earlier.
A. Yes.
Q. Do you know where in this document, if anywhere, it states that these samples are taken from Snow Creek?
A. The people who generated this document know that these samples came from

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Anniston, Alabama. That's all they know. They know a sample identification number.
Q. Okay. So they couldn't have put Snow Creek on here because they probably never heard of Snow Creek?
A. They never heard of it.
Q. Then I'll stop looking for Snow Creek in there.

(Whereupon, Plaintiff's Exhibit 11 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I want you to take a minute and look over Plaintiff's Exhibit Number 11. And I'll first ask you if you reviewed that document in preparation for your deposition today?
A. No, I did not.
MR. PECK: Go ahead, look at it.
Q. (BY MS. ARENBERG) Mr. Brown, you did -- I'm sorry, you've already answered, you did not review this document before, or

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in preparation for deposition. Had you ever seen this document before?
A. No.
Q. Do you have any understanding of what this document is?
A. Yes.
Q. Tell me what it is.
MR. PECK: Object to the form of the question. The document speaks for itself. Go ahead.
WITNESS: In 1971, when the facility was shut down at Anniston, the decision was made to withdraw from all markets immediately where substitutes could be used -- where other products could be used. The only places that Monsanto would consider continuing to sell aroclor products were at closed systems, including primarily transformers and capacitors, until such time a replacement could be found.
Q. And in connection with that decision, did Monsanto send out a series of letters similar to this one?

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A. This letter appears to me to be a response to Chevron that basically states that we absolutely cannot phase out this product at this time. We don't have a replacement product. And this was Monsanto's response to him to supply him until he could find a replacement product, or until such time as we totally quit supplying products altogether.

Q. Would the purpose of this letter also be to warn customers of these products against their discharge?

A. Notify the customer of our knowledge of the -- the reason we're withdrawing from the market, yes.

Q. And it was Monsanto's policy at this point, was it not, to give warnings to those customers concerning the proper use and disposal of PCB's?

A. Provide communication on what we knew about the products and the reason for our actions, yes.

Q. You don't think that was a-

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warning?

MR. PECK: Object to the form of the question. Calls for a legal conclusion.

Q. (BY MS. ARENBERG) I'm not asking for you to define --

A. It's simply communicating the knowledge base at that point in time.

Q. Did Monsanto ever have a policy that we do warn our customers or we don't warn our customers concerning the proper use and disposal of PCB's?

MR. PECK: Object to the form of the question. No foundation for this witness to answer.

WITNESS: If you consider communication of the knowledge about the product a warning, the answer would be yes.

Q. (BY MS. ARENBERG) Did Monsanto consider communication about this a warning?

MR. PECK: Object to the form of the question.

WITNESS: I don't know.

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Q. (BY MS. ARENBERG) You don't know. Okay.

MR. PECK: You need to pause -- when I'm making an objection -- when I start into an objection, you do have to wait until I get done, because he can't type both of us at once.

Q. (BY MS. ARENBERG) Let me drew your attention to the very last lines on the front page of this letter. And it's part of a whole sentence so you may want to read the whole sentence. But relating to that sentence, my question is, was it Monsanto's position that PCB's should be kept out of the food chain?

MR. PECK: Object to the form of the question.

WITNESS: Yes.

Q. (BY MS. ARENBERG) And was it Monsanto's understanding that PCB's could be injurious to some forms of birds, equatic, and animal life?

MR. PECK: Object to the form of

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the question. The document speaks for itself. No foundation for this witness to answer the question.

Q. (BY MS. ARENBERG) I'm not asking if this document says it's Monsanto's position. I'm asking if you understood that to be Monsento's position.

MR. PECK: Same objection.

WITNESS: I didn't know Monsanto's position at that point in time from an official communication standpoint.

Q. Did you ever know Monsanto's position with respect to those two facts?

MR. PECK: Object to the form of the question.

WITNESS: Yes.

Q. (BY MS. ARENBERG) And you've told me that Monsento's position was that PCB's should be kept out of the food chain?

A. Yes.

Q. And my second question is, was it Monsanto's position that PCB's were injurious to some forms of bird, equatic,

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and animal life?

MR. PECK: Object to the form of the question. No foundation for this witness to answer the question.

WITNESS: Yes.

Q. (BY MS. ARENBERG) My next question is, did Monsanto ever warn anyone on Snow Creek, Choccolocco Creek, or Lake Logan Martin that PCB's are injurious to bird, equatic, or animal life?

A. Not to my knowledge.

Q. And did Monsanto ever warn anyone on Snow Creek, Choccolocco Creek, or Lake Logan Martin that PCB's should be kept out of the food chain?

A. Not to my knowledge.

Q. Monsanto knew that PCB's were in the food chain on Snow Creek, Choccolocco Creek, or Lake Logan Martin, didn't they?

MR. PECK: Object to the form of the question. Assumes facts not in evidence. There is no foundation for this witness to answer it.

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WITNESS: Those date were being developed at this point in time, yes.

Q. (BY MS. ARENBERG) And those date revealed the presence of PCB in fish in those three waterways, didn't they?

MR. PECK: Object to the form of the question. Assumes facts not in evidence.

Q. (BY MS. ARENBERG) You've seen those date. Is that what they reveal?

A. Not from those three waterways.

Q. Okay. From Lake Logan Martin?

MR. PECK: Object to the form of the question. Misstates the evidence.

WITNESS: Most of the data I've seen is from Choccolocco.

Q. And those date revealed the presence of PCB's in fish?

A. Yes.

Q. Mr. Brown, have you ever heard of the eroclor ed hoc committee?

A. No.

Q. And you told me earlier I believe

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that you've never heard of E. V. John?
A. I do not know E. V. John, no.
Q. When did Monsanto begin to formulate -- strike that. You told me that it was prior to 1970 that Monsanto -- that the technology allowed Monsanto to be able to detect PCB's?
A. Late '60s is my recollection.
Q. Late '60s. At that point in time -- and I realize you were not a part of that -- but were policies beginning to evolve at that point in time, policies that maybe came into play for you later, when you were involved in the environmental --
MR. PECK: Object to the form of the question. No foundation for this witness to answer the question.
WITNESS: I do not know.
Q. (BY MS. ARENBERG) Well, the policies that you followed when you were -- after 1975, in your position with Monsanto, some of those policies existed before you took that position, did they not?

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A. Yes.
Q. And you were familiar with what those policies or what those objectives of the company would be?
A. When you say those policies and objectives, you know, that opens up a universe. I'm familiar with a lot. Some I was not.
Q. There were some that were in effect when you took your position in 1975, and you were familiar with some of those?
A. Yes.
Q. Was one of those to protect the image of Monsanto?
A. No.
Q. That was not a policy that you ever knew of?
A. No.
Q. Was anyone at Monsanto concerned about the image of the Monsanto Company with relation to the PCB pollution problem?
A. I don't know.
Q. We talked a minute ago about

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notification to customers of PCB products. Were you ever involved in notifying customers about the hazards of PCB's?
A. No.
Q. Is that because there really were no customers for PCB's after 1971?
A. Yes. Customers that I haven't phased with.
Q. Any customers buying PCB's from Monsanto after 1971 would have been buying them from the Krummrich plant, is that correct?
A. That's correct.
Q. When you talked about notifying customers a minute ago, was this something that Monsanto considered to be their responsibility?
MR. PECK: Object to the form of the question. No foundation for this witness to answer that question.
WITNESS: Well, if you intend to stop selling a product, you've got to tell them that you're going to do it, and tell

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them the reasons why.
Q. (BY MS. ARENBERG) Okay. So --
A. Most customers have got to look for an alternative product.
Q. So part of your responsibility to that customer would be to give them that opportunity to look for an alternative product?
A. Well, number one, you tell them that you don't intend to supply them in the future. Number two, you tell them why. Then most of them are automatically triggered into looking for an alternative product.
Q. And the reason why would be the environmental concerns that are detailed in that letter?
A. The reason why we're withdrawing from the market?
Q. Yes.
A. Yes.
Q. Do you know of any effort by Monsanto to inform the public as to why

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Monsanto was withdrawing from the market?
MR. PECK: Object to the form of the question. No foundation for this witness to answer the question.
WITNESS: There were many newe releasees, articles written on this subject.
Q. By Monsanto?
A. Well, by -- I can't remember specifically. I just know there were a lot of publications and newspaper articles on this subject worldwide.
Q. But I'm only asking about what Monsanto did about public relations or press releases by Monsanto.
MR. PECK: Same objection stated previously.
WITNESS: And my answer stands because Monsanto was worldwide. And Monsanto contributed information to a lot of those I'm sure, but I have no direct firsthand knowledge of it.
Q. (BY MS. ARENBERG) So there is no specific instance that you know of that

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Monsanto contributed any information concerning your withdrawing of aroclors from the market?
WITNESS: That I have no firsthand knowledge of.

(Whereupon, a discussion was held off the record.)

Q. Mr. Brown, we reviewed earlier one of the topics that Monsanto has appointed you to speak on is public relations. Let me ask you in general what your involvement in public relations has been.
A. Representing the plant primarily when we've had visitors to come visit the plant and ask questions and learn about our operation.
Q. Anything else?
A. No.
Q. And what years would that have been true?
A. Primarily through the '80's.

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Q. *Not at all in the '70s?*
A. A little bit in the late '70s.
MS. ARENBERG: Well, Adam, we've got a hole here, because it appears to me there's no one that can speak to the public relations question in the mid '70s, and in the early '70s.
MR. PECK: I'm doing the best I can at designating the people who are still at the plant and still employed. I can't create people for you. You've got names of people who are across the country. If you want to get on planes and start flying to different cities, no longer Monsanto employees and talking to them, that's what we suggested a long time ago. We can't control people who aren't employees of the company anymore. There are ways to do this, and y'all want to do it this way. I've given you a list of 20 some-odd people, maybe more than that, in the federal disclosure, of people who I know have information, and you've ignored that. There

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is a way to do it and you don't want to proceed.
MS. ARENBERG: I realize that you would love for us to fly to 20 different cities and --
MR. PECK: I wouldn't love it. But don't complain to me just because I can't produce an employee in 1995 who speaks to everything you want to know in 1970. That's not the way the world works.
MS. ARENBERG: Then I would like for you to go on the record saying that this witness does not have knowledge as to public relations prior to some year.
MR. PECK: I'm not going to go on the record and say that. You've got him here to talk to him about what he knows. He's told you what he knows. You can ask him that question.
Q. *(BY MS. ARENBERG) Do you know what year you would have knowledge of public relations beginning in?*
A. I had absolutely no public contact

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representing Monsanto prior to the mid '70s and the few years thereafter.
Q. *Who would have had that responsibility immediately prior to you?*
MR. PECK: At the Monsanto Anniston plant?
MS. ARENBERG: Yes.
MR. PECK: Thank you.
MS. ARENBERG: That's where he was, wasn't it?
MR. PECK: The question didn't specify it. It could have been all of Monsanto the way the question was asked.
WITNESS: The plant manager in charge at the time, Bill Papageorge, was one.
Q. *He left Anniston prior to 1975, didn't he?*
A. Yes.
Q. *Do you know what year he left in?*
A. I want to guess '71 or so. Gene Jeesee followed him.
Q. *He was the plant manager, wasn't*

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he?
A. Yes.
Q. *But you didn't replace Gene Jessee because your title wasn't plant manager, right?*
A. Yes.
Q. *But Gene Jessee filled all of those?*
A. The plant manager was the ultimate person -- or the first line person, yes.
Q. *Who would have been the second line person under Gene Jessee, do you know?*
A. For environmental matters prior to --
Q. *Who would have handled public relations?*
A. Gerald Miller would have been involved for a period of time. Eugene Wright. And I guess James T. Bell for a short period of time.
Q. *Do you know Eugene Wright's title during that time?*
A. Environmental technician.

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Q. *Would Mr. Bell have had that same title?*
A. Mr. Bell was chief chemist prior to me.
Q. *So you actually took Bell's position?*
A. Yes.
Q. *Do you know where Mr. Bell or Mr. Wright are now?*
A. Mr. Bell is deceased. Mr. Wright is I think at Tennessee someplace.
Q. *Is he retired?*
A. No. He left Monsanto as part of these reductions in force, at that point in time.
Q. *The reductions caused by the aroclor shutdown?*
A. Yes.
Q. *When you were chief chemist, did you do any kind of research into the longevity of PCB's?*
A. No.
Q. *Did you have an understanding as*

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to the longevity of PCB's?
A. No.
Q. *Was that an issue at all when you were chief chemist?*
A. No. PCB's were shut down and torn down at that point in time.
Q. *But it was common knowledge that PCB's were out there in Snow Creek and in Choccolocco Creek, correct?*
A. Yes.
Q. *And I guess what I'm getting at is, did you have some expectation that they would go away?*
A. Yes.
Q. *Was that based on a belief that they were biodegradable, or that they would be cleaned up?*
A. I can give you my personal belief, that they would eventually biodegrade.
Q. *Do you still believe that they will eventually biodegrade?*
A. Yes.
Q. *Do you have any expectation as to*

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how long that takes?
A. No.
Q. Do you agree that they are still there in high levels?
MR. PECK: Object to the form of the question. Where?
WITNESS: I agree they are still there.
MR. PECK: I hope you know where you think they are.
Q. (BY MS. ARENBERG) Do you think they are still in Snow Creek?
A. Yes.
Q. Do you think they are still in Choccolocco Creek?
A. Yes.
Q. And you think they are still in Lake Logan Martin?
MR. PECK: Object to the form of the question. No foundation.
WITNESS: I don't know.
Q. (BY MS. ARENBERG) At any point, were you surprised that PCB's had persisted

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so long?
A. Yes.
Q. Do you recall a specific instance in which you received a report or received information on that subject that surprised you?
A. I was surprised at the data that we learned in 1985.
Q. Was that the UAB study that we already talked about? I think you told me it surprised you.
A. When I say study, it was that and the study that --
Q. The subsequent study?
A. Uh-huh.
Q. And when you say you were surprised, were the other people that you worked with who were knowledgeable on that subject also surprised?
MR. PECK: Object to the form of the question. Calls for speculation.
Q. (BY MS. ARENBERG) If you know.
A. In 1985, nobody else I was working

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with at Anniston, Alabama knew a thing about PCB's.
Q. Okay. You were kind of alone in that area in terms of having to deal with the PCB data?
A. Yes.
Q. Do you remember receiving any information about shrimp in the Escambia Bay?
A. No.
Q. Were you ever told by anybody to avoid bad publicity?
A. No.
Q. Did you ever hear anyone with Monsanto say that the state could shut the Anniston plant down any time they choose to do so?
A. Could you repeat the question.
Q. Did you ever hear anyone at Monsanto say that the state of Alabama could shut down the Anniston plant any time they choose to do so?
A. That is a fairly common statement

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that's made with a qualification attached to it.
Q. What is that qualification?
A. The most typical one is if we violate our right to operate, our operating permits.
Q. Did you ever hear anyone say that in regard to if they monitored the plant outfall, they could shut you down any time they wanted to?
A. No.
Q. Do you think that's a true statement, that if the state monitored the plant outfall, let's say in 1975, that they could have shut down the Anniston plant?
A. In 1975?
Q. Yes.
A. Not without a specific reason to do it.
Q. From what you know of the content of the outfall?
A. In 1975, no.
Q. Any year prior to that?

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A. I don't have knowledge prior to that.
Q. Any year after that?
A. No.

(Whereupon, Plaintiff's Exhibit 12 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, we're going to show you Plaintiff's Exhibit 12. And I'm going to ask you, first of all, if you reviewed that document in preparation for your deposition today?
A. No.
Q. Are you familiar with that document?
A. No.
Q. I would like for you to read the first paragraph. And I'll give you a minute to do that. You can read the whole thing, but I'm going to ask you about the first paragraph.

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A. Okay.
Q. Did you ever experience any -- and I'll quote from the document -- extreme reluctance to report emission figures to any regulatory agency?
A. No.
Q. So if there was extreme reluctance on the part of Monsanto to report emission figures, it occurred before you became involved in 1975 with reporting?
MR. PECK: Object to the form of the question.
WITNESS: Yes.
Q. (BY MS. ARENBERG) In general, when Monsanto released information to the state of Alabama, do you recall any discussions concerning any adverse impact that that might have on Monsanto?
MR. PECK: At what point in time?
MS. ARENBERG: I'm asking at any time that he has knowledge about.
WITNESS: Could you repeat it, please.

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Q. It's a confusing question. Let me see if I can reword it for you. I guess I'm asking as part of your job, you did make disclosures to public agencies, regulatory agencies concerning PCB pollution, is that correct? You were involved in that process. And as a part of that process, did you ever have any discussions with anybody at Monsanto that indicated that you were worried about making those disclosures or that this would cause Monsanto problems?
A. No.
Q. Never in your experience did that occur?
A. Not in my experience, no.
Q. Did anyone at Monsanto ever worry or indicate to you that they were worried that those results would show, like this document said, a lack of control?
A. No.
Q. So y'all just disclosed it and didn't worry about it having any adverse problems for your company?

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MR. PECK: Object to the form of the question.
WITNESS: You've asked two questions there.
Q. (BY MS. ARENBERG) Okay. Y'all disclosed it?
A. Yes.
Q. And after disclosing it or in the process of disclosing it, you didn't worry about any adverse reactions or adverse problems it might create for the company?
MR. PECK: Object to the form of the question.
WITNESS: I'm basically a worrier. I worry about a lot of things. So to say I didn't worry -- no, I worried about many things.
Q. (BY MS. ARENBERG) Okay. Did you ever talk to anybody about that?
A. No.
Q. Did anybody ever talk to you about that and say they had those kind of worries?
A. In relation to reporting?

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Q. Uh-huh.
A. No.
Q. Is that because you were confident that the state was not going to take any action adverse to Monsanto?
A. No.
Q. Why do you think there was no discussion about that?
MR. PECK: Object to the form of the question.
WITNESS: If you generated data that required reporting, we reported it.
Q. (BY MS. ARENBERG) I understand that. And I'm not asking about the act of reporting. I'm kind of asking about internal evaluations of that act of reporting. When Monsanto people talked among themselves about that report that just went out, did they ever say, gosh, those results are really incriminating?
A. No.
Q. Did they ever say, gosh, those levels are higher than we thought they would be?
A. Yes.
Q. Did they ever say this is going to cause us trouble?
A. I can't recollect that statement ever being made.
Q. Okay. Statements similar to that, it's going to cause any kind of problem?
A. Yes.
Q. What kind of problems were discussed?
A. The best example I can use is the '85 study that we've already looked at. What we discussed was the fact that the findings generated knowledge that we felt we needed to respond to. And how to respond to it was the thing that we discussed.
Q. And you were worried that if you failed to respond, there would be some problem?
A. No.
Q. No, you didn't?
A. No. We felt that was the

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responsible thing to do.
Q. Okay. And as far as you know, nobody ever weighed the disadvantage of doing it?
A. No.
Q. Was cost a factor?
A. No.
Q. So it would have been done at any cost, the Snow Creek remediation project?
A. Cost was not even estimated when that remediation protocol was developed.
Q. Was it estimated at some point thereafter?
A. Yes.
Q. Was it a factor in the ultimate decision to go forward with that project?
A. No.
Q. Do you know how much it cost?
A. I know ballpark.
Q. Okay. Give me a ballpark figure on the cost of the Snow Creek remediation program that took place in 1989.
A. Three or four hundred thousand

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dollars.
Q. Do you remember any discussions about legal liability? And I'm not asking about anything your lawyers would have told you, but I'm asking about coworkers. Did you ever speak about legal liability that might be incurred because of the presence of PCB's in Snow Creek, Choccolocco Creek, or Lake Logan Martin?
A. No.
Q. When was the first time that you knew that there had been a lawsuit filed against Monsanto concerning the PCB contamination of Snow Creek, Choccolocco Creek, or Lake Logan Martin?
MR. PECK: Jerry, I just caution you, don't disclose any communications with counsel, either this law firm or any other legal counsel, in-house or outside, you may have spoken to at Monsanto in answering her questions in this area. If you are going to touch on information that may have been provided to you, then I'd instruct you not

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to answer this question. I think you can answer the question without doing that. The next one may be a problem.
WITNESS: A year and a half ago approximately. It's hard for me to remember.
Q. (BY MS. ARENBERG) Do you remember any communications regarding legal liability on the part of Monsanto prior to that date, when you learned about a lawsuit a year and a half ago?
MR. PECK: About anything in the world? Object to the form of the question.
WITNESS: I need the question narrowed down. I mean I've heard of legal liability around the world, yes.
Q. (BY MS. ARENBERG) Prior to that date, do you remember anybody at Monsanto discussing with you or in your presence that there might arise some kind of lawsuit or some sort of legal liability from the pollution of Snow Creek, Choccolocco Creek, and Lake Logan Martin?

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MR. PECK: I'll just repeat the caution about don't discuss any conversations with attorneys.
WITNESS: I cannot recollect anything.
Q. Did you ever hear anybody say we might get sued over this pollution?
A. No.
Q. Mr. Brown, you're familiar with some of the releases of PCB's from the Monsanto plant that occurred prior to 1975, is that correct?
A. I'm familiar with some of the data?
Q. Yes.
A. Yes.
Q. And some of that data would include data like we've looked at today regarding losses of aroclor from the Anniston plant, is that correct?
A. Yes.
Q. From what you know about losses of aroclor from the Anniston plant, do you

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think it would be fair to say that loss of PCB's from the Anniston plant were negligible?
MR. PECK: Object to the form of the question. No foundation for this witness to answer.
WITNESS: Judging in 1970's time frame, yes. 1990's time frame, no.
Q. (BY MS. ARENBERG) Okay. I think you mean that what would have been negligible in 1970 might be considerably more substantial when viewed today?
A. Yes.
Q. What is the largest loss of aroclor in a single day that you ever heard of?
A. I cannot quote a figure. I did not know.
Q. If I quote figures, will you know whether they ring true or not?
A. No. I'm not that familiar with the data.
Q. Did you ever receive any prepared

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replies to specific questions on the issue of PCB pollution? And I mean prepared by Monsanto.
A. Prepared replies to --
Q. To specific questions on the PCB pollution problem.
A. Yes.
Q. Okay. Tell me about those replies.
A. That would have been a general release kind of thing, basically with a Q and A, addressing certain questions.
Q. And you actually received a copy of a document like that?
A. I didn't personally receive it. I have read documents like that.
Q. And you read them at that time, or you read them recently in preparation for your deposition?
A. At that time.
Q. Would that have been in the 1970's?
A. Perhaps, yes.

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Q. Do you know who prepared those Q and A?
A. Would have been somebody in St. Louis.
Q. And did those reflect Monsanto policy as you understood it at that time?
A. I would assume so.
Q. Were you ever instructed to use those replies if you were asked those questions?
A. The Q and A was primarily for educational purposes, in the event that employees had questions, or were asked questions.
Q. Okay. So --
A. Nobody ever said if you get this question, you answer it this way.
Q. It was just a mechanism for providing information?
A. Yes.
Q. Was that information directed to employees at the Anniston plant -- or within Monsanto?

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A. Within Monsanto, yes.
Q. I took out the Anniston plant because I think that you're probably telling me it was a standard form, it wasn't designed for Anniston, it was designed for anybody?
A. That's right.
Q. Was it designed to answer questions from the public as well?
A. Could have been.
Q. Okay. Didn't really say?
A. Right.
Q. And did you ever use those prepared replies?
A. No.
Q. Do you know of anybody at the Anniston plant who ever used those replies in responding to any questions?
A. I cannot answer for other people. I don't know.
Q. You don't know of anybody, though?
A. Right.
Q. At the time when you were

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receiving data that reflected analytical results concerning PCB's, I think you've told me that you received data from UAB. We've looked at some of those. You received some data from ADEM at some point in time, would that be correct?

MR. PECK: Talking about Snow Creek PCB?

Q. (BY MS. ARENBERG) Yes. Snow Creek, Choccolocco Creek, or Lake Logan Martin.

A. Yes.

Q. Is there any other agency or testing lab that you recall receiving results from?

A. Other than Monsanto?

Q. Yes, other than internally.

A. No.

Q. Have you ever heard of biological consultants?

A. No, I have not.

Q. And I think you told me you don't know who Gerald Gunning is.

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A. Yes, I know Gunning.

Q. Oh, okay. You know him personally?

A. I met him on one occasion.

Q. When did you meet him?

A. In the '70s, '71 time frame.

Q. Do you know what his role was at that point, what his position was?

A. He was a consultant to basically take fish samples.

Q. And so even though you did not receive the results of Dr. Gunning's testing, it was your understanding that Monsanto received results from Dr. Gunning, is that correct?

A. Yes.

Q. Did Monsanto ever do any testing to counteract any negative publicity?

A. No.

Q. Did Monsanto ever look for any good news that they could present to the public regarding the pollution of Snow Creek, Choccolocco Creek, or Lake Logan

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Martin?

A. No.

(Whereupon, Plaintiff's Exhibit 13 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, we're going to show you what is marked Plaintiff's Exhibit 13. And a letter attached to it are some questions and answers. My first question will be if you reviewed that document in preparation for your deposition today?

A. No.

Q. Take your time and look at it.

A. (Witness complies.)

Q. Have you ever seen any of these questions and answers before?

A. No, not this document.

Q. Are these similar to the questions and answers that you did receive?

A. No.

Q. How are they different?

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A. They are different in that this is very, very early in the, I guess, process of learning. If I had to guess, it would be a document that was specifically for the electrical transformer capacitor market.

Q. That's your understanding from reading who it's addressed to?

A. Yes.

Q. And the questions and answers that you were familiar with were produced later than 1972?

A. Yes. And there are similarities, you know. For example, what is PCB. I mean that's a very common generic type question.

Q. But the answer to that then hadn't really changed over time?

A. No.

Q. What about question number two?

A. That's specific to Askarel, which again is a trade name for dielectric fluid.

Q. In question number three, let me have you look at the answer. And tell me if you agree with the first sentence. In the

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mid 1960's, scientific instruments became sophisticated to the point where parts per million or even parts per billion of a substance could be detected in the environment.

MR. PECK: Are you asking him if he agrees?

Q. (BY MS. ARENBERG) Yes, I'm asking you if you agree.

MR. PECK: Object to the form of the question. No foundation for this witness to answer the question.

WITNESS: If you would have asked me when, I would have stated the late '60s.

Q. (BY MS. ARENBERG) Okay. Let's turn over to question number four. And the question in the letter is how does PCB get into the environment. And the answer begins probably through improper handling, use and disposal. Would you agree with that assessment of how PCB's get into the environment?

A. I would agree that that is a

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mechanism.

Q. Do you know of other mechanisms?

A. Well, I think studies have shown that there are many mechanisms.

Q. Name some of them.

A. Through many of the uses that were so common through the '30s, '40s, and '50s.

Q. Okay. So if they were used in paint, they would escape into the environment?

A. Yes.

Q. And that would be a mechanism. Okay. Do you know of any way that PCB's got into Snow Creek or Choccolocco Creek or Lake Logan Martin other than through their discharge at the Monsanto Anniston plant?

A. Yes.

Q. Tell me what ways you know about.

A. From discharge at Tull Chemical.

Q. And I believe we talked about that back in April.

A. Yes.

Q. Do you know of any other mechanism

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by which they got into Snow Creek, Choccolocco Creek, or Lake Logan Martin, PCB's?
MR. PECK: Object to the form of the question.
WITNESS: There are many other potential mechanisms. I have no firsthand knowledge of what these are.
Q. Would you agree that in most cases PCB's get into the environment through improper handling, uses, and disposal?
A. I would have to qualify that on if you look at what constitutes an improper use.
Q. Okay.
A. What was felt to be a proper use through the '30s, '40s, '50s, and '60s was later determined to be an improper use when more data were developed.
Q. And the addition of it into paints would have been one example of that?
A. Yes.
Q. I'm going to ask you now to look

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at the last page of that document. And the question set forth here is, is the public in any immediate danger. If you were asked that question today concerning the pollution with PCB's in Snow Creek, Choccolocco Creek, and Lake Logan Martin, what would your answer be?
MR. PECK: Object to the form of the question. No foundation for this witness to answer the question.
Q. (BY MS. ARENBERG) I realize you're not a medical doctor, but you are representing Monsanto and I'm saying if someone asked you as Monsanto --
A. I've never seen any danger from PCB.
Q. And is that what you would tell someone who asked you?
A. If somebody asked me, I would probably refer that question to somebody that's more knowledgeable on informing the public on that particular thing today than I am.

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Q. Who specifically could you refer them to? Do you have any names?
A. Bob Kaley.
Q. And he's a Monsanto employee, isn't he?
A. Yes.
Q. Anyone else?
A. I would leave it to him to refer to other people.
Q. Do you know Dr. Brian Forrester?
A. No.
Q. In the answer to number seven, part of the answer is that proper steps were being taken to reduce further escape of PCB which would ultimately reduce even the low levels currently being found in the environment. Do you agree that in 1972 the levels being found in the environment were low?
A. In 1972 terms, sure.
Q. Would you agree today that the levels being found in 1972 were low?
A. I would judge it differently

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today.
Q. Would you judge them to be high?
MR. PECK: Object to the form of the question. It's not clear what we're talking about.
WITNESS: I don't know how to answer it. I mean I don't know what data we're talking about specifically.
Q. (BY MS. ARENBERG) Well, let's talk specifically about any Choccolocco fish studies that you saw in the 1970's. Did you ever see any that you would now judge to be high?
A. Yes.
Q. Do you recall any discussions in relation to fish studies that were available to Monsanto and the effect of those fish studies on commercial fishing?
A. In what time frame?
Q. In the studies that Monsanto received in the 1970's.
A. No.
Q. You don't recall any discussion of

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commercial fishing with relation to those --
A. I was not involved in any discussion, no.
Q. What about in the 1980's?
A. No.
Q. What about in the 1990's?
A. I know what I've read and heard in the last two years.
Q. Would that have to do with the lawsuit?
A. Yes.
Q. And outside of the commercial fishing over which there has been a lawsuit, was there any other discussion of commercial fishing and the effect of PCB contamination on that?
A. Not to my knowledge.
Q. In all your time at Monsanto, did anyone ever ask you if they should be eating the fish out of Snow Creek or Choccolocco Creek or Lake Logan Martin?
A. No.
Q. Did you hear anybody talking about

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eating fish out of any of those three waterways?
A. Yes.
Q. Who was talking about that?
A. Fishermen at the plant.
Q. You had employees who worked at the plant who were also fishermen? Is that what you mean?
A. Yes.
Q. And they had some concern about eating fish that they had caught from those three waterways?
A. No.
Q. What were they discussing?
A. The fact they caught the fish and ate them.
Q. Did they mention PCB's when they talked about eating those fish?
A. No.
Q. Did they talk about any chemical contamination when they talked about eating those fish?
A. No.

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Q. Did you ever hear anyone tell them you might want to not eat those fish?
A. No.
Q. And you never told them that?
A. No.
Q. Do you know any specific Monsanto employees who did fish from Snow Creek, Choccolocco Creek, or Lake Logan Martin?
A. To start with, on Snow Creek, there is no fish there to fish for. And most fishing on Choccolocco Creek would have been downstream after it got deep. And yes, employees did fish in that section and Logan Martin.
Q. Can you name any of those employees?
A. Yes.
Q. Okay. Tell me who those were.
A. Jerry Hopper.
Q. Does he still work there?
A. Yes.
Q. Who else?
A. He is by far the biggest fisherman

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there.
Q. Can you think of any other names?
A. No.
Q. If you think of any, you can just let me know. Does Mr. Hopper still fish as far as you know?
A. Yes.
Q. Does he still eat the fish he catches?
A. I don't know.
Q. Do you know if he ever ate the fish he catches?
A. I don't know.
Q. So he talked about fishing but he never talked about eating fish?
A. Yes, he does, because he's brought fish to lunch with him.
Q. How recently have you seen him bring fish to lunch? When is the last time you saw him bring fish to lunch?
A. Within the last year.
Q. And you understood that to be a fish that he caught?

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A. I didn't specifically ask him at that time, but I assumed it was.
Q. Do you know whereabouts he fishes?
A. Typically in many different areas.
Q. Would those areas include Choccolocco Creek?
A. Today I don't know.
Q. You're aware of the fish advisory that's on Choccolocco Creek right now, I'm sure, aren't you?
A. Yes.
Q. Would Mr. Hopper be aware of it to the best of your knowlege?
A. Yes.
Q. Do you know if Mr. Hopper ever fishes on Lake Logan Martin at the present time?
A. I think he does.
Q. Do you know if he has fished there over a long period of time?
A. Yes.
Q. Any idea how long?
A. 20, 30 years.

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Q. And you've never heard Mr. Hopper mention the PCB content of these fish?
A. No.
Q. And you've never told him that you think those fish may be contaminated with PCB's, have you?
A. Most of the time he's fishing for bass. I don't know if they are contaminated or not.
Q. So you just never said anything about PCB?
A. I had no reason to.
Q. Have you ever seen a test result on bass taken from Choccolocco Creek?
A. I don't specifically remember.
Q. But if bass were included in the fish studies from Choccolocco Creek that were produced to Monsanto in the '70s and '80's, you probably did see them, is that correct?
MR. PECK: Object to the form of the question. Calls for speculation.
WITNESS: There is a chance I saw

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it. I did not see all of the data.
Q. You did not see all of the data?
A. In the '70s, no.
Q. Did you see all of the data after 1975?
MR. PECK: Object to the form. Calls for speculation.
Q. (BY MS. ARENBERG) Did you see all of the fish studies that Monsanto acquired concerning PCB's in fish from Snow Creek, Choccolocco Creek, or Lake Logan Martin between 1975 and 1980?
MR. PECK: Object to the form of the question. It calls for speculation.
WITNESS: I don't really know.
Q. (BY MS. ARENBERG) Would it be your expectation that in your position that you should have seen those documents?
A. No.
Q. Why not?
A. Because the PCB operation had been shut down in 1981 --
MR. PECK: '71?

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WITNESS: -- '71, all permitting, sampling activities had been terminated. In 1975 through '80, whatever, we were in a different operating company, we were a part of Monsanto Agricultural Products Company making totally related product lines. Those product lines and ongoing activity is what my job was directed toward.
Q. So if you weren't producing it and you weren't permitting for it, it wasn't of your concern?
MR. PECK: Object to the form of the question.
WITNESS: My personal concern, the scope of my job --
Q. (BY MS. ARENBERG) The scope of your job.
A. -- it was not part of my job at that point in time.
Q. Do you know anybody who would be concerned at Monsanto?
MR. PECK: Object to the form of the question. Assumes facts not in

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evidence. Calls for speculation.
WITNESS: I don't know.

(Whereupon, Plaintiff's Exhibit 14 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I'm going to ask you to look at a document we're marking Plaintiff's Exhibit 14. I'll ask you first of all if you reviewed that document in preparation for your deposition today?
A. No.
Q. But this is a document that we talked about earlier in this deposition. This is the sediment removal protocol for Snow Creek that you discussed earlier?
A. Yes.
Q. So you're very familiar with this document, is that correct?
A. Well, I'm not currently familiar with it, but ten years ago I was.
Q. You were very involved in this

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particular project?
A. Yes.
Q. And the map that's attached at the page marked 15300, is that the map that you explained to me people along Snow Creek could look at to determine the results of testing?
A. Yes.
Q. Let me ask you to specifically point out on that map, if you would, Snow Creek.
A. Snow Creek is generally accepted to be this tributary, and particularly after these two tributaries come together from here on down. And then it joins another tributary that's also called Snow Creek and flowing on down through the city of Anniston.
Q. Is there anything on this map that's labeled Snow Creek?
A. I don't believe it's identified as Snow Creek on this particular map. The stream itself is --

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Q. There is a line, it's simply not identified, would that be correct?
A. Yes.
MR. PECK: On this map?
WITNESS: On the entire map I'm sure it was.
Q. (BY MS. ARENBERG) Okay. Are the results of any samples -- in other words, the parts per million of PCB's that were found in sediment in any way illustrated on this map?
A. No.
Q. To find those results itself, I would have to refer to a separate document, is that correct?
A. Yes.

(Whereupon, Plaintiff's Exhibit 15 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I'm going to ask you to refer now to Plaintiff's Exhibit 15, and ask

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you first of all if you reviewed that document in preparation for your deposition today?
A. Yes.
Q. Are you familiar with that document?
A. Yes, I am.
Q. Did you attend the Alabama Chemical Association dinner on March 23 that is referenced in this letter?
A. No.
Q. Did you attend the March 29 dinner with the government relations group from Monsanto that is addressed in this letter?
A. I don't remember if I did or not. Sometimes I participated and sometimes I didn't, depending on work schedule.
Q. Have you ever had dinner with Don Siegelman?
A. No. At least I don't think so. I can't remember having --
Q. You've met him, is that right?
A. Uh-huh. But I was not a part of

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the dinner when this was discussed.
Q. Who made up the government relations group from Monsanto that is referenced in this letter?
A. Representatives from all Monsanto facilities across the state. This would involve people from Decatur, Anniston, Loxley, Foley and perhaps even some from Pensacola.
Q. Were you generally included in that group of people?
A. Many times I was included as a second representative from the plant.
Q. Would the plant manager have been the primary representative?
A. Yes.
Q. And who was the plant manager in 1988?
A. Dave Denner.
Q. Do you know what the purpose of the government relations group was?
A. Communications function, primarily interfacing with the representatives of the

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various areas where Monsanto had employees.
Q. What do you mean by interfacing?
A. Meet them and shake their hand and know their face.
Q. So is it fair to say that Monsanto's representatives made an effort to get to know the people in the regulatory agencies that they would be dealing with?
A. This wasn't regulatory agencies, these were elected officials.
Q. Oh, okay. This group was designed to interface with elected officials?
A. Yes.
Q. Name some officials that you can think of that would have been interfaced with.
A. Jimmy Evans.
Q. Okay.
A. Jim Campbell.
Q. Jim Campbell?
A. Yes.
Q. Who else? Are there any governors that you remember who met with the

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government relations group referenced in this letter?
A. I can remember Folsom attending one of our events when he was lieutenant governor. But I don't ever remember any governors.
Q. You don't remember Fob James or Albert Brewer?
A. No.
Q. Guy Hunt, George Wallace?
A. (Shakes head.)
Q. And you attended some of those meetings?
A. Yes.
Q. Is Jim Folsom the only lieutenant governor that you ever remember meeting with the government relations group? And I couldn't name those. Don't ask me to name them. Don Siegelman was one, but not in '88.
A. He's the only one I remember.
Q. Bill Baxley?
A. I don't ever remember meeting with

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Bill Baxley.
Q. George McMillan? And I don't know if he was a lieutenant governor or not.
A. For these meetings, no.
Q. You met with George McMillan on other meetings?
A. I knew George McMillan when he was in college, so –
Q. Do you remember the government relations group ever meeting with an United States senator?
A. No.
Q. Donald Stewart?
A. No.
Q. Do you remember the government relations group meeting with any representatives to the House of Representatives in Washington?
A. No.
Q. How about senators to the state senate?
A. Yes.
Q. Can you name those for me. Don't

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ask me to give you a list, I don't think I can do that.
A. Donald Holmes.
Q. He was a state senator?
A. I think he was senator. I'm having trouble remembering if it's senator or representative.
Q. You can lump them together.
A. I believe he was both, or representative and then he was senator later.
Q. I don't really need to know which offices they held if you can just remember their names.
A. Jim Campbell, Tommy Carter. I'm trying to think of some of the south Alabama people.
Q. Were the three men that you just named, Carter, Campbell, and Holmes, all from the district that would encompass the plant?
A. No.
Q. Do you know what districts they

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represented?
A. Tommy Carter is from north Alabama.
Q. Decatur area?
A. Decatur area. His district didn't actually include Decatur, but the district north of Decatur, if I remember correctly.
Q. And that Monsanto plant is right on the river there, I guess, isn't it?
A. Yes.
Q. Do you know where Mr. Carter is from?
MR. PECK: He just did.
Q. (BY MS. ARENBERG) I'm sorry, Carter is the Decatur area one?
A. The other two were Anniston area ones.
Q. And you were getting to south Alabama. Do you recall any representatives from south Alabama?
A. Perry Hand at one time.
Q. Okay.
A. The other names just totally

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escape me at this point.
Q. If you think of any, please add those in later as we go along. Were there any government representatives on a more local level, county governments?
A. No, not for these meetings.
Q. These meetings had a more state and national focus?
A. More of a state focus.
Q. Other than Don Siegelman, do you remember anyone from the attorney general's office?
A. I think I've already mentioned Jimmy Evans.
Q. Okay. Charlie Graddick?
A. No. Not when I was involved.
Q. Any other state official that you can recall?
A. Not that I can think of. Seems like deGraffenried at some point or another.
Q. But officials who held state treasurer or those kinds of positions would not have necessarily been people that you

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sought to meet with, that the group sought to meet with?
A. I don't ever remember them attending.
Q. Okay.
A. Most of the time this would have been in conjunction with a session of the legislature. So we could actually spend time watching the process.
Q. Would the session of the legislature be dealing with a topic that was of interest to Monsanto specifically?
A. No. It would be a particular date that was pre-selected on the calendar.
Q. What about Jerry Beasley, he was lieutenant governor at some point down there?
A. I don't remember him being present at any meetings that I attended.
Q. Were these meetings more social or more business?
A. More opportunities to meet, shake hands and get to know faces. And then be

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updated on the status of the key business things that were being addressed at that point in time.
Q. Did any of those public officials ask Monsanto for campaign contributions during any of those meetings that you know of?
A. Oh, no.
Q. Do you know if Monsanto ever made any campaign contributions to any of those officials?
A. Not that I'm aware of.
Q. If they had made a campaign contribution, would you have necessarily been aware of it?
A. When you say Monsanto, are you speaking of individuals?
Q. No, I'm speaking of the company.
A. I know of no contributions.
Q. Is it possible that Monsanto made campaign contributions to Alabama officials without your knowledge?
A. Yes. You say Monsanto, the legal

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entity that handles that kind of thing.
Q. Okay.
A. I'm not sure exactly what it's called.
Q. Are you referring to a PAC or to a division within Monsanto?
A. It would be some sort of PAC. I am not sure what it's called.
Q. So is it your understanding that if Monsanto makes a campaign contribution, it does so through a PAC rather than directly to a candidate?
MR. PECK: Object to the form of the question. No foundation for this witness to answer.
Q. (BY MS. ARENBERG) I'm just asking if you know how that would be done.
A. There are no direct contributions to candidates. If it occurs, it's through that PAC.
Q. And it's one specific PAC you believe?
A. Yes.

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Q. And you don't know the name of that PAC?
A. No.
Q. But that's your understanding of how it would take place?
A. Yes. That's the only knowledge I have at all on campaign contributions is through that mechanism.
Q. Is your knowledge limited in time to when you were a member of this group, or does it extend back before that or past that?
A. I make that statement for my entire career with Monsanto.
Q. Does the government relations group still exist?
A. It's been basically dormant for two or three years. There is an attempt now to revitalize the group and get it back together.
Q. When the government relations group met with an elected official, was anyone present besides Monsanto employees

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and the officials?
A. I don't recall any.
Q. And typically, ADEM officials or AWIC officials would not be present at those sorts of meetings?
A. No.
Q. And the reason being that they are appointed officials and not elected officials?
A. Well, yes. This interface was strictly elected officials.
Q. Okay. Do you still have that sampling protocol in front of you, Mr. Brown, Plaintiff's Exhibit Number 15?
A. That's a letter, it's not a sampling protocol.
Q. I'm referring then to Plaintiff's Exhibit 14.
MR. PECK: The Snow Creek sediment removal protocol?
Q. (BY MS. ARENBERG) That's right. And my question is just who did you distribute copies of this to?

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A. To obviously ADEM. Craig Kneisel.
Q. And he was with the attorney general's office?
A. Attorney general's office. Then the others that you see listed there are all Monsanto employees.
Q. Mr. Reddington is in St. Louis?
A. Yes.
Q. Are the other three -- in 1986, were these other people in Anniston?
A. The two middle ones were in Anniston.
Q. Mr. Allen?
A. In St. Louis.
Q. Do you have any knowledge about this protocol being distributed to anyone else?
A. No.
MR. PECK: Let's take a quick break.

(Whereupon a brief recess was had in the deposition.)

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(Whereupon, Plaintiff's Exhibit 16 was marked for identification and copy of same is attached hereto.)

Q. Mr. Brown, I'm going to show you what has been marked Plaintiff's Exhibit Number 16 and ask you if you reviewed that document in preparation for your deposition today?
A. No, I did not.
Q. Are you familiar with that document?
A. I have heard of this document. I've seen it, but I've not studied it in detail.
Q. When you say you've heard of it --
A. I was aware of the assessment that was done.
Q. Was this done in connection with any permitting requirements?

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A. Not specifically connected to any one particular permitting requirement.
MR. PECK: Is this selections from it?
MS. ARENBERG: Right. I think all the appendixes are not attached.
MR. PECK: I just notice it goes from page one to page two to page 28 to page 29 to page 121.
MS. ARENBERG: You're right.
MR. PECK: Page 122.
MS. ARENBERG: I think the entire study is very lengthy.
Q. (BY MS. ARENBERG) Was this study or was this assessment -- is that a more proper way to refer to it?
A. Yes.
Q. Was this conducted at the request of Monsanto by the A. T. Carney Company?
A. No. A. T. Carney was working under, if I remember correctly, contract with the EPA to fulfill some of the requirements of RCRA, which included what is

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called a facility assessment.
Q. So is it your understanding that Monsanto paid for this assessment?
A. No.
Q. That would have been the EPA's responsibility?
A. Yes.
Q. And it's the EPA that wanted this information, would that be correct?
A. Well, it was part of EPA's duties under RCRA to do this kind of assessment.
Q. Why did the Monsanto Anniston plant qualify as a facility that was required to have this assessment, do you know?
A. Because we had a RCRA permit.
Q. And is that a landfilling permit?
A. We had a RCRA identification number.
Q. Would every facility that has a RCRA identification number have to have a facility assessment such as this one?
A. I cannot answer. These facility

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assessments have been underway for many years. And they simply continue to build on what has been done in the past.
Q. Did the Snow Creek sediment removal protocol that we've discussed in any way precipitate this assessment?
A. No, not to my knowledge.
MR. PECK: Did you say you've never seen this before?
WITNESS: I've seen it.
Q. (BY MS. ARENBERG) Let me ask you to refer to the page numbered 28, which is about midway through the pages that are in front of you.
A. (Witness complies.)
Q. According to this RCRA assessment, Monsanto implemented the sediment removal plan in 1978 without approval from state or federal agencies. Do you agree with that statement?
A. Yes.
Q. And during the remediation activities, did Monsanto ship approximately

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a thousand tons of contaminated soil and sediment to Emelle?
A. Yes.
Q. Is it a true statement that sediment sampling, after the removal of that contaminated soil, still indicated greater than 50 parts per million PCB's remaining?
A. I don't know what they are referring to there.
Q. Did you ever see any studies that would make you believe that that's a true statement?
A. If I had these references -- are they included here?
Q. I don't think they are. I can probably get them. I have no idea what they are referring to. Do y'all?
MR. PECK: I've looked at this document before. I think the reference is to help clarify the problem, because I think they refer to various things. And I think this is a misunderstanding by them of the fact that the sampling was done of the

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removed soil. When they refer to this, I think they are confused. They don't understand that the sampling that was done is of the soil removed for shipment to Emelle which you and Mr. Brown discussed earlier.
Q. (BY MS. ARENBERG) I guess a more general question that maybe gets at the heart of that is, was it your opinion at the end of the sediment removal project that that area of Snow Creek had been cleaned up?
A. Yes.
Q. Would it have been your opinion that if PCB levels were above 50 parts per million after the sediment removal protocol project was completed, would it have been your opinion that that project was not a success? I don't know if you can understand that question. I'll be glad to rephrase it if I need to.
A. I think the removal of the contaminated material was a success. Now, does this mean that there were not some

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pockets where sediment remained at 50 parts per million or higher? That's a distinct possibility, simply because of the nature -- a lot of it was rock. And dredging rock was very different.
Q. Okay. So is it a fair statement to say that Monsanto was pleased with the results of the sediment removal project -- let me stop there. That Monsanto was pleased with the results of the project, would that be correct?
A. I can't make that statement, because there has never been any opinion expressed on it.
Q. Okay.
A. I mean, you do it, and it's factual.
Q. Did Monsanto go in after the sediment was removed and do any tests to see what level of PCB's remained in that section of Snow Creek?
A. No.
Q. And to this date, do you know of

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any samples that have been taken that would give Monsanto that information?
A. That I have knowledge of, no. I've not been involved in it.
Q. Who would know if those samples exist? Mr. Jones?
A. Yes.
Q. When you met with the attorney general's office in connection with the findings that led up to this Snow Creek removal protocol, I know Craig Kneisel was one of the people you met with. Can you name any of the other people you contacted at the attorney general's office?
A. Gary Allen.
Q. Is that the same Gary Allen who was a Monsanto employee at some point?
A. No. That was Ronald Allen.
Q. Anyone else in Montgomery at the AG's office that you spoke with in connection with that project?
A. No.
Q. Do you know what Craig Kneisel's

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position or title was?
A. He was the AG's environmental attorney.
Q. We talked a little bit a minute ago about PCB transformers within the Monsanto plant that at some point in time contained PCB materials, is that correct?
A. Yes.
Q. I believe you explained to me that there were federal regulations requiring that you follow certain rules when you handle those PCB containing transformers?
A. Yes.
Q. And a part of the regulations that you followed in respect to those transformers was visual inspection of those, is that correct?
A. Yes.
Q. Was that to determine if they were leaking?
A. Yes.
Q. Is this something that Monsanto did of its own accord, or is this something

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that Monsanto did in order to comply with the regulations?
A. Well, it was a requirement of the regulations.
Q. Prior to those regulations do you know if that ever occurred, the inspection of PCB transformers within the plan?
A. Not in a formal manner where it was documented.
Q. Do you know what year the visual inspection of PCB transformers would have begun?
A. I don't remember.
Q. Would it be fair to say that Monsanto was more concerned about PCB leaks within the plant than the escape of PCB's into Snow Creek?
A. No.
Q. Why is that?
A. If you're asking about inspection and documentation of things that are falling under specific regulations, I think I stated earlier that it's always been Monsanto's

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intent to follow regulations as nearly as possible -- as humanly possible. So those are driven by that set of regulation.
Q. And those regulations require the inspection of PCB transformers, was that on a monthly basis?
A. I don't remember.
Q. There was no monthly inspection of Snow Creek for the presence of PCB, was there?
A. This monthly inspection is a visual inspection of something that's obvious on a transformer. You cannot make that kind of inspection on Snow Creek.
Q. It would require soil sampling and testing to detect PCB's in Snow Creek, is that correct?
A. Yes.
Q. And after 1989, you're not aware of any of those sorts of soil samples on Snow Creek?
A. That's correct, I'm not.
Q. Have you ever heard of a document

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called a PCB annual report?
A. Yes.
Q. Is that something that you helped to prepare?
A. Yes.
Q. Was that a document that was prepared in order to comply with regulations?
A. Yes.
Q. What sort of activities went into -- strike that. What was Monsanto required to do in order to comply with those regulations?
A. Those regulations covered PCB containing primarily transformers. And there had to be an annual report of any disposal activity -- I don't remember all the details, but it had -- it was directed towards a total inventory of the regulated materials.
Q. And in those reports, you actually accounted for virtually every gallon of PCB containing materials that was in those

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transformers, would that be correct?
A. Yes.
Q. But are you aware of any accounting -- are you aware of any attempt to account for every gallon of PCB's that's been disposed of in any Monsanto landfill?
MR. PECK: Object to the form of the question.
WITNESS: You're asking me to compare a set of regulations -- requirements of regulations in a relatively late time frame with what went on for 50 or 60 years. And there is absolutely no way any human being can do that.
Q. (BY MS. ARENBERG) Since 1981, do you know of any efforts to account for the amount of PCB's that are in any of Monsanto's landfills?
A. No PCB's were put in any Monsanto landfills after 1981.
Q. I understand that -- well, is it not true that PCB's were already there in Monsanto landfills?

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A. Yes.
Q. And are you aware of any efforts to calculate the quantity of PCB's that was in those landfills?
A. No.
Q. Are you aware of any time at which any member of the public asked for information regarding the quantity of PCB's in those landfills -- Monsanto landfills?
A. No.
Q. Any member of the press?
A. No.
Q. I believe you told me earlier that Sean Reilly never asked you that question?
A. That's correct.
Q. Did he ever ask you if PCB's were in Monsanto landfills? Would that have been your answer to him?
A. Yes.

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MS. ARENBERG: If y'all give me a minute, we may be ready to wrap up. Or we can talk about documents.
MR. PECK: What documents?
MS. ARENBERG: The documents that Mr. Brown used to prepare for this deposition.
MR. PECK: For the reasons previously stated I'm not going to produce them. I think you're entitled to ask a witness what document he's reviewed and when he last saw it. You're not entitled to get my work product and what I used to prepare the witness. And I'm not going to voluntarily produce them.
MS. ARENBERG: Well, I mean I can bring over my documents, but we're going to be here an awfully long time.
MR. PECK: If you went to go through 40,000 documents, you can do that. If that's how you want to find out, you can do that. I do not have an obligation -- in fact, it would be a waiver of my work

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product privilege for me to do that.
MS. ARENBERG: I'm not saying that you should show me documents that's work product.
MR. PECK: I'm saying that it is my work product how I prepare my witness, and giving you my stack of documents as I've created them would be disclosing work product privilege, it would be waiving it. I can't do that. I will not do it without a court order. If you want to go about it in some other way, if you feel that's what you've got to do, you do what you need to do, but I will not do it and cannot do it without a court order.
MS. ARENBERG: Well, I think it's a simple request.
MR. PECK: I can't do it, Pam. It violates the work product privilege.
MS. ARENBERG: These are documents we're entitled to, Adam.
MR. PECK: You're wrong. You're entitled to ask him, as you're showing him

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documents that you want to show him, whether he's seen that before and when he last saw it. You're entitled to do that. You're not entitled to find out how I prepare my witnesses.
MS. ARENBERG: That sounds like something that Judge Fielding will determine.
MR. PECK: That's something we'll have to take up with the Court, yes, ma'am.

(Whereupon, a discussion was held off the record.)

MR. PECK: Before you get going, I think Jerry does have something to clarify about an earlier question you asked about Exhibit 16.
MS. ARENBERG: Is that the RCRA assessment?
MR. PECK: Yes. Go ahead.
WITNESS: It was really on the protocol.

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MR. PECK: As I recall, Pam asked in April of 1988 -- the document says in April of 1988, Monsanto proceeded to implement the sediment removal plan without approval from the state or federal agencies. Then she asked you if that was correct. My recollection is you answered yes. I believe that that statement needs clarification.
MS. ARENBERG: Okay.
WITNESS: There was never any written approval on carrying out that sampling protocol. We continued, through a series of phone calls and discussions, to try to get some response one way or another. This finally -- I think you could see that through that letter. This finally moved to a certain point to where we called and said, okay, if we don't hear something by this date, we intend to proceed. If I remember correctly, that was with Bill Lott. I believe he's the AWIC person. His response was let me talk to AG once more. I

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called him back later, and I basically said we intend to proceed unless you tell us not to. He said proceed.
Q. (BY MS. ARENBERG) Do you consider that verbal approval?
A. I would consider that verbal approval, but not anything in the way of written approval.
Q. Okay.
A. I just wanted to clarify that issue.
Q. Let me ask you if you are familiar with the neighborhood to the immediate east of the plant? And we've talked about a discharge point in that area before. I guess that would be an area surrounded by Highway 202, Clydesdale, and 10th. Are you familiar with Monsanto's recent property buyout program in that area?
A. I know in general. I do not know any specifics.
Q. Okay. Well, we have talked about Monsanto's policy during the years with

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which you were familiar with it being one of full disclosure to the public. And at the same time, I think -- and I don't guess I asked the direct question. But at the same time, you never went knocking on doors to inform people about PCB pollution, is that correct?

A. That's correct.

Q. Are you aware that Mr. Mayausky, the current Anniston plant manager, has knocked on doors to inform people in that neighborhood about PCB pollution?

A. Yes.

Q. Does that indicate to you that Monsanto's policy has changed in any way?

A. Yes.

Q. Do you know anything about Monsanto's policy changing?

A. No. Policy basically evolves over time.

Q. And at the time that we've been talking about, I guess primarily the '70s and '80s, knocking on doors and informing

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residents of PCB pollution was not Monsanto's policy?

MR. PECK: Object to the form of the question.

WITNESS: It was nothing that was ever identified as something that needed to be done.

Q. And in the 1990's, it has been identified as something that Monsanto needs to do?

MR. PECK: Object to the form of the question. No foundation for this witness to answer that question.

WITNESS: I could assume so.

Q. (BY MS. ARENBERG) Have you ever talked to Mr. Mayausky about that shift in policy?

A. No.

Q. During your tenure at Monsanto, there have been several plant managers under whom you've worked, is that correct?

A. That's correct.

Q. Any idea how many?

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A. Well, I can count them up.

Q. Name them for me while you're counting if you would.

A. Bill Papageorge, Gene Jessee, Vin Boyen, Ed Jurevic, Dave Danner, Bill DeFer, Jack Mayausky.

Q. Does Mr. Mayausky approach community relations differently than past plant managers have approached community relations?

A. Yes.

Q. How so?

A. He is taking a much more active recruitment of getting the community into the plant. Rather than simply having an open door policy, he's out bringing people in.

Q. As far as you know, the policy is still full disclosure, would that be accurate?

A. Yes.

Q. And if the press called Monsanto to ask for any results of soil sampling of

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which Monsanto had the results of, would those be released to the press at the current time?

A. Because of the legal considerations, it would probably be referred to our attorney prior to -- that's my guess. I'm not involved.

Q. Legal considerations, do you mean ongoing lawsuits?

A. Yes.

Q. Do you know of any ongoing lawsuits concerning the neighborhood that we've been discussing where Jack Mayausky knocked on doors and Monsanto was buying out property?

A. No.

Q. Would samples from that area fall into that same category, though?

A. I don't know.

Q. Have you seen the results of any soil samples from the neighborhood where the property buyout program is in effect? Have you seen any of those results be published

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in any newspaper?

A. No.

Q. Have you heard them reported by any news media?

A. I've seen an article or two.

Q. Did those articles contain specific test results?

A. I think in one or two cases, yes.

Q. And those would have been the preliminary results that prompted the land purchase buyout, or the land buyout, would that be correct?

MR. PECK: Object to the form of the question.

WITNESS: I don't know.

Q. (BY MS. ARENBERG) The buyout program began in October, is that your understanding?

MR. PECK: Object to the form of the question. No foundation for this witness to discuss it.

WITNESS: Sometime this fall. I've not been following it that closely.

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Q. (BY MS. ARENBERG) The newspaper articles that you're referring to that had test results in them, did those precede October?

A. Yes.

Q. And have you seen any reports in any newspaper or by any news media about any sampling results that have been taken later than October?

A. No.

Q. Do you know if Monsanto has any results of any testing --

A. I do not know.

Q. Is there anyone other than Mayausky who is involved on a day-to-day basis with that sampling?

A. Not that I'm aware of.

Q. Looking back on the test results that you did review from Snow Creek in the '80s, do you wish you had gone and knocked on doors on Snow Creek?

MR. PECK: Object to the form of the question. Calls for speculation.

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WITNESS: I've wished many times that I had foresight as good as hindsight.
Q. *Don't we all.*
A. I still, at this point in time, don't -- when we did the work, we notified the residents involved. And beyond that, you know, I don't have any -- I don't know anything that could have been gained further than what we did.
Q. *When you say you notified the residents involved, you mean those people whose property you entered to do the work?*
A. Yes.
Q. *You didn't notify the people immediately downstream, did you?*
MR. PECK: Object to the form of the question. The facts might not even be true.
WITNESS: No.
MR. PECK: Don't know of a lot of people that live on Snow Creek is the point.
Q. *(BY MS. ARENBERG) Have you ever walked down Snow Creek, or down along Snow*

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Creek through Anniston?
A. How far?
Q. *To Glenaddie Church?*
A. No.
Q. *Near the First Missionary Baptist Church up close to the plant there?*
MR. PECK: I don't think Snow Creek is anywhere near there.
WITNESS: I'm not sure which church that is.
Q. *(BY MS. ARENBERG) I don't know exactly how to describe it, except I believe it's between 10th and the railroad tracks to the northeast side of the plant. Have you ever been in Snow Creek where it runs right there?*
A. Yes.
Q. *What was the purpose of your being at Snow Creek -- that's near where the sediment removal took place?*
A. Alongside the railroad track there?
Q. *Yes. But you didn't follow the*

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creek farther to see if it went by any houses?
A. I have not actually walked it all the way down to Glenaddie, but through that area, I've been along there many times.
Q. *That area being the Glenaddie area?*
A. The church area you're talking about.
Q. *And the neighborhood that would kind of be in front of that church?*
A. Yes.
Q. *Is there a name for that neighborhood that you know of?*
A. No.
Q. *And you've seen houses in that neighborhood that abut Snow Creek, haven't you?*
MR. PECK: Object to the form of the question. It's not Snow Creek.
WITNESS: That tributary at that point runs through that industrial area. Then runs alongside Snow Creek -- I mean the

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railroad track. And there is no houses adjoining it.
Q. *There are no houses along Snow Creek before the Glenaddie Church?*
MR. PECK: Object to the form of the question.
Q. *(BY MS. ARENBERG) Is that your understanding?*
A. You're asking me about the First Missionary Baptist Church.
Q. *And downstream from it.*
A. The tributary of Snow Creek runs from 10th Street to 11th Street through a commercial area, then goes under the railroad track, and alongside the railroad tracks alongside 11th Street. And there are no houses along there.
Q. *And at some point it passes under Highway 202, doesn't it?*
A. Yes.
Q. *Are there houses along it after that point?*
A. Yes.

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Q. *Have you spoken with any of the property owners in the neighborhood affected by the property buyout program?*
A. No, I have not.
Q. *Do you know anybody that lives in that neighborhood?*
A. Personally? No.
Q. *Have you seen or met -- I guess you've seen people who live in that neighborhood --*
A. And over the years I've met them and talked to them.
Q. *In the context of like a public hearing?*
A. No. Just many different types of occurrences.
Q. *Do you know anyone by name?*
A. I've known the names in the past. But if one walked through the door and you asked me the name, I could not identify one. But in the past, I've known -- back years ago, when I was more in the neighborhood, I knew more people than I do

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now.
Q. *I'm sorry, when you were what in the neighborhood?*
A. When I had reason to be more in the neighborhood.
Q. *Okay. Would that be in terms of like out there making a visual inspection of a pipe or something would bring you out?*
A. Yes.
Q. *And you don't do that sort of thing anymore so you're not out in the neighborhood?*
A. Right.
Q. *Have you ever seen a playground that is located adjacent to the west end landfill, across the road from the west end landfill?*
A. Yes.
Q. *And you've seen that just in the course of being on the plant property and looking through the fence? How did you come to see the day-care center?*
A. Well, I remember when it was

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built.
Q. When was that roughly?
A. In the early '80s.
Q. Was it built by the church that's located right along there?
A. That's my understanding.
Q. Have you ever seen children playing on that playground?
A. Yes.
Q. Are you aware of any samples of soil that would have been taken from the vicinity of that playground?
A. No.
Q. Do you know if there have ever been any taken?
A. No.
Q. That property is located down gradient from the west end landfill, isn't it?
A. No. That property is -- there is actually a low area between the west end landfill and that.
Q. Would that be ditches that are

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alongside the road?
A. Yes, drainage areas, uh-huh.
Q. Have those drainage ditches been tested, to the best of your knowlege, for the presence of PCB's?
A. I don't know.
Q. At the time when you were actively involved in looking at testing results, you never saw any, is that correct?
A. That's correct.
Q. And since that time, you've never heard of any being taken?
A. That's correct.
Q. You said that day-care center was probably built in the late '80s?
A. Early '80s, I think.
Q. Early '80s. Did you or anyone from Monsanto ever warn those people that there might be PCB's on that property?
A. I had no reason to warn them. I had no knowledge of PCB's on that property.
Q. If PCB's were found on that property today, would that surprise you?

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A. Yes.
Q. Why?
A. I cannot explain any mechanism for them getting over there.
Q. You don't think those ditches have ever flooded?
A. No. Not to that level.
Q. Flooding could be a mechanism by which PCB's could be carried onto that property, would that be correct?
MR. PECK: Object to the form of the question. Calls for speculation.
WITNESS: To the extent that flooding is possible.
Q. [BY MS. ARENBERG] Monsanto has experienced instances in which ditches have flooded and PCB's have been found in areas adjacent to ditches, is that correct?
You're aware of situations where that has happened?
A. Yes.
Q. Cobb Town being one of those situations?

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A. I think I stated earlier I don't know Cobb Town.
Q. What situation are you aware of where ditches have flooded and PCB's have been found adjacent to those ditches?
A. The ditch that was published in the article -- or that was mentioned in the article that was published.
Q. And that would be the neighborhood between Highway 202, 10th Avenue, and Clydesdale?
A. Yes.
MS. ARENBERG: If you will give me a minute to consult with Gary, we may be ready to wrap up.

(Whereupon a brief recess was had in the deposition.)

MS. ARENBERG: Mr. Brown, I don't have any new questions. But I was going to given you an opportunity, if you've thought about any of those names that we talked

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about earlier, if any of those have come to you like they come to me somtimes much belatedly.
A. Not at this point.
MS. ARENBERG: I don't have any further questions. The Plaintiffs would hold this deposition open pending the production of documents that were reviewed in preparation by Mr. Brown.
MR. PECK: We obviously don't agree to that. We obviously don't agree to keep the deposition open. I don't agree that you're entitled to those documents, they were not requested, and I think they are work product.
MS. ARENBERG: We are finished.
FURTHER DEPONENT SAITH NOT

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CERTIFICATE

STATE OF ALABAMA)
JEFFERSON COUNTY)

I hereby certify that the above and foregoing deposition was taken down by me in stenotype, and the questions and answers thereto were transcribed by means of computer-aided transcription, and that the foregoing represents a true and correct transcript of the testimony given by said witness upon said hearing.
I further certify that I am neither of counsel, nor of kin to the parties to the action, nor am I in any wise interested in the result of said cause.

MAURICE LAPIDUS

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ADAD21-004244
HARTOLDMON0043836

Monsanto

FROM (NAME & LOCATION): E. S. Tucker - R&D Laboratories - South Second Street

DATE: January 19, 1970

SUBJECT:

REFERENCE:

cc: P. B. Hodges - GO
M. W. Farrar - Res. 1
R. E. Keller - Res. 1
W. R. Richard - GO
E. P. Wheeler - GO

TO: E. G. Wright
Anniston Plant

COPY

The PCB analysis results of the last (11-23-69) round of plant monitoring samples are reported in the following table.

O.R. Log No.	Location	Matrix	Aroclor(s) Found 1242	1248	1254
-128	Choccolasso Creek @ Hwy 9	Mud	456 ppb	-	1.08 p
-129	Choccolasso Creek @ Boiling Springs	Mud	26 ppb	-	-
-130	Choccolasso Creek @ Jackson Shoals	Mud	-	470 ppb	-
-131	Snow Creek @ Glen Eddy	Mud	1430 ppm	-	411 pp
-132	Snow Creek 1 Blk Below Plant	Mud	1656 ppm	-	537 pp
-133	Choccolasso Creek Below Treatment Plant	Water	-	51 ppb	7 pp
-134	Snow Creek 1 Blk Below Plant	Water	16.5 ppm	-	3.84 p
-135	Snow Creek @ Glen Eddy	Water	-	1.13 ppm	305 pp
-136	Choccolasso Creek @ Hwy 9	Water	11 ppb	-	Trace
-137	Choccolasso Creek at Jackson Shoals	Water	10 ppb	-	Trace
-138	Choccolasso Creek @ Boiling Springs	Water	10 ppb	-	Trace

E. S. Tucker

db

DSM 014007

PLAINTIFF'S EXHIBIT

/

ADAD21-017548
HARTOLDMON0043837

OTHER LOCATIONS	GENERAL OFFICES	ANNISTON
	P. B. Hodges W. B. Papageorge J. R. Savage	J. T. Bell/J. L. Brown J. L. Corder/G. W Miller G. L. Jessee J. C. Landwehr/V. R. Haupt/ A. G. McCarty

PROGRESS REPORT
TECHNICAL SERVICES DEPARTMENT
ANNISTON, ALABAMA PLANT

JOB NO. 002-1026 REPORT NO. 2 DATE July 21, 1970

F.L

TITLE: AROCLOR LOSSES AT THE ANNISTON PLANT

OBJECTIVE: To report all data which is available to date on Aroclor losses in the Anniston Plant. Also, to report all data on Aroclor residues in the Snow Creek - Choccolocco Creek Watershed. To summarize progress to date on Aroclor clean-up efforts at Anniston.

PERSONNEL: E. G. Wright, (J. T. Bell)

REPORTED BY: E. G. Wright

SUMMARY: Aroclor losses from the Anniston Plant for the period April 15 through June 30, 1970, averaged ≈ 16 lbs./day. This is a considerable improvement over losses of > 250 lbs./day for a comparable period during 1969. (Note: > 250 lbs./day is used for the 1969 figure because improved analytical methods and actual measurement of material from the catch tank and coalesce have shown that the losses were approximately 10 times as high as was reported in 1969.) This reduction has been primarily achieved by an educational program and resulting changed operating habits plus HCl organics removal projects. Other projects are being installed and evaluated which will further reduce these losses toward the Business Group goal of 10 ppb.

FUTURE WORK:

1. Continue sampling and analyzing for Aroclor losses on a routine basis.
2. Continue to sample and analyze grab samples from Snow and Choccolocco Creeks for Aroclor content.
3. Sample and analyze ambient air for Aroclor content.
4. Sample and analyze tank vents in the Aroclor department to pinpoint atmospheric loss points.
5. Collect additional aquatic samples from Choccolocco Creek Watershed.
6. Issue periodical reports on Anniston Plant losses and progress toward 10 ppb goal.

DSW 013791

E. G. Wright
E. G. Wright

bs

ANNISTON

PLAINTIFF'S EXHIBIT

2

ADAD21-017549
HARTOLDMON0043838

DISCUSSION

I. Aroclor Department Sewers

A. HCl Sewer

Since the installation of a catch tank in the HCl gas line and a coalescer in the acid stream, the Aroclor content in the waste acid stream has been greatly reduced. (i.e., Approximately 200 pounds of organic material is being removed by these two projects.) During the sampling period, this sewer averaged 13.0 ppb of Aroclor. (See Data Sheet I.) Based on this data, the decision was made not to route this stream to the sump presently being installed. This resulted in a substantial savings on installing the sump. However, at times, the spent carbon from the HCl carbon towers was dumped into this sewer. Alternate methods are being evaluated to collect the spent carbon for disposal.

B. Chlorinator and Still Room Sewers

At times these sewers had a two phase flow. The quantity of the Aroclor phase could not be determined. However, these two sewers are being routed through the Aroclor sump. When the sump is completed and put into operation the Aroclor phase can then be quantified. The sump will also provide a means for recovering this second phase, which under present conditions eventually makes its way out of the plant.

When the sump is installed in these sewers, a daily sample will be taken and analyzed to monitor the efficiency of the sump. A second phase of projects is scheduled for further reduction of Aroclor in these process streams (Ref.: Anniston Progress Report No. 1, Job No. 003-1051).

C. Warehouse Sewer

The major losses from this sewer are due to spills while drumming or flaking. These spills are then swept to the sewer during floor clean-up. Presently, clean-up is accomplished by use of Du-Bois steam cleaning which considerably raises the solubility of Aroclor in water. Alternate methods of clean-up and disposal are presently being evaluated.

D. Total Plant Effluent

During the period April 15 through June 30, 1970, the total plant losses averaged 16 lbs./day. This is excluding the period April 21 through May 20, 1970, when the acid neutralization pit was being cleaned. During this period, the losses ran very high (See Data Sheet V.) due to the fact that the Aroclor which was trapped in the pit was being stirred and entrained into the plant effluent.

The discrepancy between the 1.7 lbs./day losses from the sewers and the 16 lbs./day losses reported from the plant effluent may possibly be due to two things: 1) Samples from the sewers did not include any of the Aroclor phase and 2) Due to the mixing and the velocity at the plant effluent sampler, some of the Aroclor was being entrained and, therefore,

ADAD21-017550
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giving higher results. A closer correlation is expected when an accurate measure of the Aroclor phase can be accomplished. Close observation of the sump should provide this information.

E. Miscellaneous Samples (Data Sheet VII & VIII)

These samples were collected from Snow and Choccolocco Creeks at various times. They show that Aroclors are present in the Choccolocco Creek, even above where the Monsanto effluent enters the creek. They also indicate significant amounts of Aroclor in the mud and water of Choccolocco and Snow Creeks a condiserable distance (15-20 miles) downstream from the Anniston Plant. In fact, Aroclor concentrations can probably be found in the Coosa River system.

Data Sheet VIII lists the results of samples taken while the Aroclor department was not operating. These results indicate that significant Aroclor is being lost even when the plant is down or that these are deposits of Aroclor in the various sewers.

The sample from Coldwater Spring (City of Anniston's water supply) was taken for the purpose of establishing a background for this area. It might be interesting to note that this is the only sample collected to date which does not contain Aroclors.

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DATA SHEET I

Sample Location: HCl Department Sewer
Average Flow: 200 GPM

Date	Aroclor Concentration (PPB)	Aroclor Losses (#/day)
4/15/70	12	0.030
4/16/70	7.8	0.019
4/17/70	8.3	0.020
4/20/70	18.5	0.044
4/21/70	6.2	0.015
4/22/70	16.4	0.039
4/23/70	10.6	0.025
4/24/70	20.4	0.050
4/27/70	15.0	0.036
4/28/70	13.1	0.031
4/29/70	18.7	0.045
5/3/70	10.5	0.025
5/4/70	11.3	0.027
Average:	13.0	0.031

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HARTOLDMON0043841

DATA SHEET II

Sample Location: Warehouse Sewer
Average Flow: 65 GPM (Estimated)

Date	Aroclor Concentration (PPB)	Aroclor Losses (#/day)
4/22/70	2,800	2.18
4/23/70	2,860	2.23
4/24/70	1,250	0.98
4/27/70	1,520	1.18
4/28/70	1,300	1.02
4/29/70	2,130	1.66
5/3/70	1,320	1.03
5/4/70	1,480	1.15
Average:	1,833	1.43

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DATA SHEET III

Sample Location: Aroclor Still Room Sewer
Average Flow: 150 GPM (Estimated)

Date	Aroclor Concentration (PPB)	Aroclor Losses (#/day)
4/22/70	12,500*	
4/23/70	13.8	0.025
4/24/70	30.0	0.054
4/27/70	17.0	0.036
4/28/70	12.2	0.022
4/29/70	4.8	0.009
5/4/70	20.0	0.036
5/6/70	11.0	0.020
5/8/70	23.4	0.042
Average:	16.5	0.031

*Contaminated sample - not included in average.

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DATA SHEET IV

Sample Location: Aroclor Chlorinator Sewer
Average Flow: 275 GPM (Estimated)

Date	Aroclor Concentration (PPB)	Aroclor Losses (#/day)
4/22/70	80.0	0.264
4/23/70	46.5	0.153
4/24/70	35.0	0.115
4/27/70	51.0	0.168
4/28/70	56.5	0.186
4/29/70	70.0	0.23[illegible]
5/3/70	81.6	0.262
5/4/70	73.0	0.241
5/6/70	85.3	0.281
Average:	64.3	0.212

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HARTOLDMON0043844

DATA SHEET V

Sample Location: Total Plant Effluent
Average Flow: 900 GPM

Date	Aroclor Concentration (PPB)	Aroclor Losses (#/day)
4/15/70	98	1.08
4/16/70	150	1.65
4/17/70	3,300	36.30
4/21/70	10,800	119.00
4/22/70	16,000	176.00
4/23/70	875	9.62
4/27/70	13,750	151.00
5/4/70	18,000	198.00
5/5/70	3,300 *	36.30 *
5/6/70	9,750	107.00
5/7/70	9,900	109.00
5/10/70	3,300	36.30
5/12/70	1,327	14.60
5/20/70	2,650	29.20
5/25/70	68	0.75
6/2/70	216	2.38
6/3/70	880	9.70
6/5/70	148	1.63
6/6/70	360	3.96
6/7/70	950	10.45
6/8/70	315	3.46
6/9/70	3,100	34.10
6/10/70	400	4.40
6/11/70	760	8.35
6/12/70	1,540	16.90
6/13/70	1,875	20.60
6/14/70	85	0.94
6/15/70	820	9.00
6/16/70	520	5.72
6/17/70	1,820	20.00
6/18/70	490	5.40
6/19/70	3,500	38.50
6/20/70	3,825	42.00
6/21/70	800	8.80
6/22/70	720	7.92
6/23/70	1,920	21.10
6/24/70	1,620	17.80
6/25/70	1,460	16.10
6/26/70	2,940	32.40
6/27/70	680	7.47
6/28/70	3,966	43.60
6/29/70	3,200	35.20
6/30/70	4,200	46.20
Average:	1,460	15.74

*Limestone Pit being cleaned out - Data not included in average.

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ADAD21-017556
HARTOLDMON0043845

DATA SHEET VI

Sample Location: Snow Creek Sampling Station

Date	Aroclor Concentration (PPB)	
4/15/70	1,800.0	
4/16/70	233.0	
4/17/70	124.0	
4/18/70	499.0	
4/19/70	5,435.0	
4/20/70	1,950.0	
4/21/70	1,220.0	*
4/22/70	2,550.0	*
4/23/70	3,200.0	*
4/24/70	3,750.0	*
4/25/70	3,800.0	*
4/26/70	2,166.0	*
4/27/70	1,860.0	*
4/28/70	860.0	*
4/29/70	2,800.0	*
5/1/70	2,800.0	*
5/2/70	1,450.0	*
5/7/70	1,320.0	*
5/8/70	1,760.0	*
5/9/70	1,840.0	*
5/10/70	9,600.0	*
5/11/70	1,740.0	*
5/12/70	3.8	*
5/13/70	1,566.0	*
5/14/70	1,325.0	*
5/18/70	1,920.0	*
5/19/70	2,400.0	*
5/20/70	1,320.0	*
5/21/70	3,000.0	
5/22/70	1,500.0	
5/23/70	800.0	
5/24/70	1,540.0	
5/29/70	12.5	
5/30/70	5.0	
5/31/70	14.8	
6/1/70	25.0	
6/2/70	16.4	
6/3/70	36.0	
6/4/70	14.0	
6/5/70	1,320.0	
6/6/70	140.0	
6/7/70	240.0	
6/8/70	104.0	
6/9/70	430.0	

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HARTOLDMON0043846

DATA SHEET VI - continued

Date	Aroclor Concentration (PPB)
6/12/70	630.0
6/13/70	760.0
6/14/70	254.0
6/15/70	1,470.0
6/16/70	41.5
6/17/70	110.0
6/19/70	216.0
6/20/70	272.0
6/21/70	480.0
Average:	768.0

*Limestone pit being cleaned out - Data not included in average.

ADAD21-017558
HARTOLDMON0043847

DATA SHEET VII

Sample No.	Date	Sample Location	Aroclor Concentration (PPB) Mud	Water
1	10-8-69	Snow Creek at Glenaddie	2.36×10^7	23.3
2	10-8-69	Choccolocco Creek at Boiling Springs (upstream from Monsanto's effluent)	78	8.1
3	10-8-69	Choccolocco Creek at City Treatment Plant (1 block below confluence of Snow and Choccolocco Creeks)	738,000	< 2.0
4	10-8-69	Choccolocco Creek at Jackson Shoals (≈20 miles downstream)	7,300	5.8
5	10-8-69	Choccolocco Creek at Eureka Bridge (≈25 miles downstream, mouth of Choccolocco into Coosa River)	3,240	< 2.0
6	11-23-69	Snow Creek - 1 block below plant	2.19×10^6	20,300
7	11-23-69	Snow Creek at Glenaddie	1.84×10^6	1,435
8	11-23-69	Choccolocco Creek at Highway 9 (≈15 miles upstream from the confluence of Snow and Choccolocco Creeks)	1,536	11
9	11-23-69	Choccolocco Creek at Boiling Springs (upstream from Monsanto's effluent)	26	10
10	11-23-69	Choccolocco Creek at City Treatment Plant (1 block below confluence of Snow and Choccolocco Creeks)	--	58
11	11-23-69	Choccolocco Creek at Jackson Shoals (≈20 miles downstream)	470	10

ADAD21-017559
HARTOLDMON0043848

DATA SHEET VIII

Date		Sample Location	Aroclor Concentration (PPB)
10-3-69		Limestone Pit Influent	4,180
10-3-69		Limestone Pit Effluent	103
10-3-69		Plant Effluent	74
10-3-69	*	Warehouse Sewer	216
10-3-69	*	Aroclor Chlorinator Sewer	317
10-3-69	*	HCl Department Sewer	264
10-3-69	*	Plant Storm Sewer	2
4-20-70		Coldwater Spring (City Water Supply)	NDA

*Note: These samples were collected after the Aroclor department had been shutdown one week due to a fire in the motor control center.

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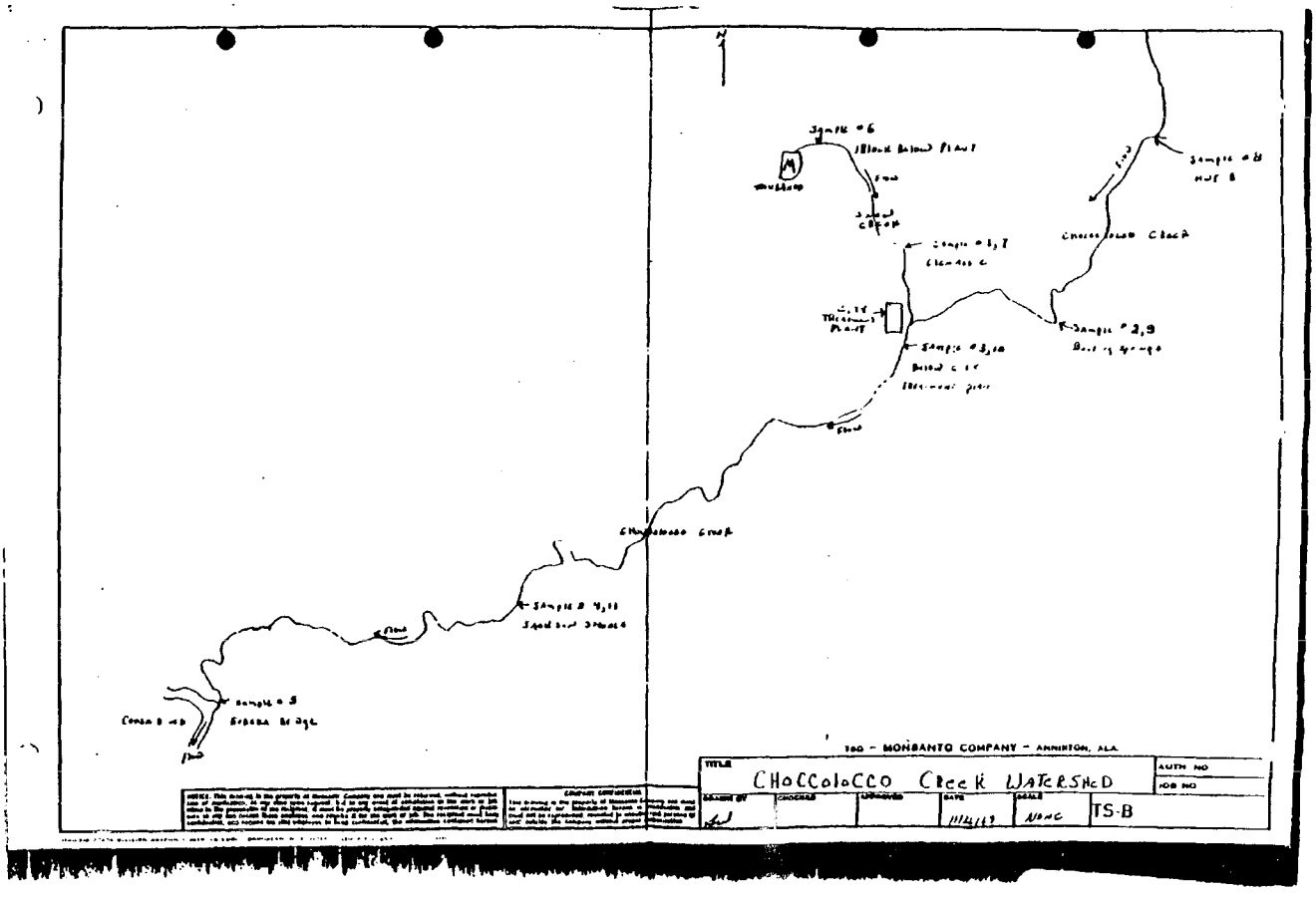
ADAD21-017560
HARTOLDMON0043849



DSW 013803

ADAD21-017561

HARTOLDMON0043850

Medical Department

August 17, 1970

P. B. Hodges, PHODG
~~J. S. Tucker,~~ Queeny Plant

J. C. Landwehr
Anniston Plant

I have enclosed a copy of the data given me by the State of Alabama water pollution authorities on the PCB analyses in Choccolocco Creek and the Martin-Logan Reservoir. These data are collected by the U. S. FDA and are the basis of FDA contact with the Alabama authorities. You will notice that this is the general trend that our own samples show in connection with PCB.

While I was in Alabama, J. L. Crockett, Jr., Chief Engineer of the Alabama Water Improvement Commission, recommended that when we sample fish for PCB analysis that we get samples above and below the Martin-Logan Reservoir. He further suggested that our control program should be written up and submitted to the state as a report covering our past efforts, present status and our future plans in connection with limiting PCB in the Snow Creek effluent. He also said that the state did require that we do daily analysis for PCB's in our effluent and submit weekly summaries to the Water Improvement Commission in Montgomery.

Crockett told me that if this PCB issue hits the Alabama press, the Alabama Water Improvement Commission would be forced to close Choccolocco Creek and the Martin-Logan Reservoir to commercial and sport fishing unless we can prove that the contamination level does not reach the reservoir. The State of Alabama has no choice but to follow the guide lines of the FDA which calls for no more than 5 ppm PCB in fish.

Jack T. Garrett

JTG:ju

Enclosure

OSW 013568

PLAINTIFF'S EXHIBIT 3

Monsanto

E. G. Wright - Anniston, Alabama

November 20, 1969

AROCLOR SPILL ON NOVEMBER 6, 1969

Memo from E.G.W. on November 14, 1969

TO : W. B. Papageorge

cc J. C. Landwehr
W. F. Taffee
H. L. Williams
R. A. Haydel/T. E. Lackey

This memo will serve to bring you up-to-date on what progress has been made in recovering the remainder of the 1,500 gallons of Aroclor which was spilled.

The Aroclor department has recovered approximately 250 gallons more of this material since November 14. This brings the total recovered to approximately 600 gallons, leaving 900 gallons still in the sewer and the limestone pit.

Efforts will continue in trying to recover more of this material as it moves to the sewer outlet.

E. G. Wright

E. G. Wright

:kd

DSW 013748

PLAINTIFF'S EXHIBIT 4

ADAD21-017563
HARTOLDMON0043852

Monsanto

E. G. Wright - Anniston, Alabama

November 14, 1969

AROCLOR SPILL ON MARCH 6, 1969

cc J. C. Landwehr
W. F. Taffee
H. L. Williams
R. A. Haydel/T. E. Lackey

TO : W. B. Papageorge

On Thursday (November 6, 1969) the line on the bottom of the #3 Aroclor still receiver failed which resulted in the loss of approximately 1,500 gallons of Aroclor 1242 to the acid sewer. To date, we have only been able to recover approximately 350 gallons of this material. The remainder of the material is probably lying in the sewer and has been mixed with the dirt and sand at the head of the acid neutralization pit. Small quantities of this material can be seen leaking through the limestone at the effluent end of the limestone pit. It appears highly unlikely that we will be able to recover any more of this material. However, we will attempt to pump some more of this material to drums.

I have checked Snow Creek on two occasions since the spill and can find no two phase flow in the stream itself. I collected two samples from Snow Creek at points which were sampled when our last set of samples were collected and these samples will be sent to Organic Research in St. Louis to be analyzed for P.C.B.

I would recommend that the plant begin to look into installing a catch basin or some other device (located between the Aroclor department and the acid neutralization pit) which would prevent a recurrence of this type incident.

I would also like to express appreciation to the Organic Production Group and the Maintenance Department for the prompt action which they took in trying to minimize losses of this material to Snow Creek.

Bennett

E. G. Wright

EGW:kd

DSW 013749

ADAD21-017564
HARTOLDMON0043853

September 13, 1974

Gerald E. Gunning, Ph.D.
3608 45th Street
Metairie, Louisiana 70001

Dear Dr. Gunning:

Attached are laboratory results of PCB's in the collection of fishes obtained on June 11-12, 1974.

We analyzed all the lots you marked with an asterisk as indicated on your previous correspondence (copy attached). I am sending the results for your analysis and interpretation. PCB's are expressed as 1254.

I am somewhat concerned in that in most cases the recent data would indicate higher level than previous data. As we discussed on the telephone, our laboratory method and equipment may be more sophisticated than previous methods and equipment. However, I will reserve all judgement pending your interpretation of the results.

Also, attached are data related to water and sediment taken on 3/28/74.

Call me or write if you have any questions or comments related to the data. When you complete your analysis of the data, send your report to my attention.

Edward E. Stewart

P.S. Incidently, we still have your cooler in use.

/tm
att.

DSM 014008

PLAINTIFF'S EXHIBIT 5

ADAD21-017565
HARTOLDMON0043854

Monsanto Company

Special Survey---Collection of Fishes for Residue Analysis

June 11-12, 1971 (Field collections)

Royal D. Suttkus, Ph.D.
Gerald E. Gunning, Ph.D.

Biological Consultants
New Orleans, Louisiana

OSW 014009

ADAD21-017566
HARTOLDMON0043855

Shoal Creek, Tributary to Choccolocco Creek, 2.3 miles east of White Plains, Alabama, June 11, 1974

2	Hypentelium etowanum	Alabama hogsucker
6	Notropis xaenocephalus	Coosa shiner
4	Notropis caeruleus	Blue shiner
21	Notropis trichroistius	Tricolor shiner
1	Notropis venustus	Blacktail shiner
10	Notropis callistius	Alabama shiner
2	Semotilus atromaculatus	Creek chub
1	Phenacobius catostomus	Riffle chub
*5	Lepomis megalotis	Longear sunfish
*3	Lepomis macrochirus	Bluegill
*1	Micropterus coosae	Coosa bass
1	Cottus carolinae	Banded sculpin
3	Etheostoma jordani	Greenbreast darter
*4	Percina nigrofasciata	Blackbanded darter
64	Total specimens	

DSM 014010

ADAD21-017567
HARTOLDMON0043856

Choccolocco Creek at Highway 9, 1 mile south of White Plains, Alabama, Fish Station 3, June 11, 1974

4	Hypentelium etowanum	Alabama hogsucker
7	Notropis trichroistius	Tricolor shiner
3	Notropis callitaenius	Alabama shiner
* 17	Notropis venustus	Blacktail shiner
3	Phenacobius catostomus	Riffle minnow
*5	Notropis stilbius	Silverstripe shiner
*17	Campostoma anomalum	Stoneroller
14	Lepomis macrochirus	Bluegill
*3	Lepomis microlophus	Redear sunfish
*1	Lepomis cyanellus	Green sunfish
1	Ictalurus sp.	Warmouth
1	Cottus carolinae	Banded sculpin
5	Gambusia affinis	Mosquitofish
2	Percina sp.	Logperch
83	Total specimens	

DSM 014011

ADAD21-017568
HARTOLDMON0043857

Choccolocco Creek, Fish Station 7, Highway 95, Martha H. Williams Bridge, June 11, 1974

+1	Dorosoma cepedianum	Gizzard shad
*3	Carassius auratus	Goldfish
*3	Notemigonus crysoleucas	Golden shiner
*37	Notropis venustus	Blacktail shiner
11	Gambusia affinis	Mosquitofish
5	Chaenobryttus gulosus	Warmouth
*16	Lepomis gracilis	Green sunfish
*9	Lepomis macrochirus	Bluegill
*1	Lepomis microlophus	Redear sunfish
1	Pomoxis nigromaculatus	Black crappie
*2	Percina nigrofasciata	Blackbanded darter
89	Total specimens	

Choccolocco Creek, Fish Station 8, Highway 93 Bridge, 3 miles south of I-20, June 11, 1974

*2	Campostoma anomalum	Stoneroller
1	Notropis callistius	Alabama shiner
*5	Notropis stilbius	Silverstripe shiner
*35	Notropis venustus	Blacktail shiner
3	Notropis volucellus	Mimic shiner
*4	Lepomis macrochirus	Bluegill
1	Pomoxis nigromaculatus	Black crappie
*2	Percina nigrofasciatus	Blackbanded darter
53	Total specimens	

DSW 014012

ADAD21-017569
HARTOLDMON0043858

Choccolocco Creek, Highway 77 Bridge, Fish Station 10, June 12, 1974

*5	Dorosoma cepedianum	Gizzard shad
*118	Campostoma anomalum	Stoneroller
* 9	Notemigonus crysoleucas	Golden shiner
*5	Lepomis megalotis	Longear sunfish
*2	Lepomis microlophus	Redear sunfish
139	Total specimens	

Cheaha Creek, Tributary to Choccolocco Creek, 3.6 miles south of I-20, Highway 93, June 11, 1974

3	Hypentelium etowanum	Alabama hogsucker
*25	Campostoma anomalum	Stoneroller
2	Notropis callistius	Alabama shiner
2	Notropis trichroistius	Tricolor shiner
*5	Notropis venustus	Blacktail shiner
5	Gambusia affinis	Mosquitofish
1	Chaenobryttus gulosus	Warmouth
*5	Lepomis cyanellus	Green sunfish
*15	Lepomis macrochirus	Bluegill
*3	Lepomis megalotis	Longear sunfish
3	Lepomis microlophus	Redear sunfish
*1	Percina nigrofasciata	Blackbanded darter
2	Cottus carolinae	Banded sculpin
72	Total specimens	

DSW 014013

ADAD21-017570
HARTOLDMON0043859

Cane Creek, Tributary to Coosa River, Alabama, 8.6 miles north of Lincoln, Alabama, June 12, 1974

*3	Dorosoma cepedianum	Gizzard shad
1	Hypentelium etowanum	Alabama hogsucker
2	Campostoma anomalum	Stoneroller
*1	Cyprinus carpio	Carp
6	Notropis venustus	Blacktail shiner
3	Phenacobius catostomus	Riffle minnow
*12	Lepomis macrochirus	Bluegill
*5	Lepomis megalotis	Longear sunfish
1	Micropterus salmoides	Largemouth bass
1	Percina caprodes	Logperch
2	Percina nigrofasciata	Blackbanded darter
37	Total specimens	

Aker Creek, Tributary to Coosa River, 6.6 miles north of Lincoln, Alabama, June 12, 1974

4	Dorosoma cepedianum	Gizzard shad
* 7	Campostoma anomalum	Stonreroller
*13	Notropis venustus	Blacktail shiner
6	Lepomis macrochirus	Bluegill
17	Lepomis megalotis	Longear sunfish
*1	Micropterus coosae	Coosa bass
1	Micropterus salmoides	Largemouth bass
3	Percina caprodes	Logperch
*4	Percina nigrofasciata	Blackbanded darter
56	Total specimens	

DSM 014014

ADAD21-017571
HARTOLDMON0043860

Coosa River at Stanley Bridge (Logan Martin Reservoir), Highway 34, June 12, 1

21	Notemigonus crysoleucas	Golden shiner
*7	Lepomis megalotis	Longear sunfish
*1	Lepomis cyanellus	Green sunfish
*11	Lepomis macrochirus	Bluegill
*5	Micropterus punctulatus	Spotted bass
45	Total specimens	

Clear Creek
Tributary to Coosa River (Logan Martin Reservoir), Highway 42, June 12, 1974

*17	Notemigonus crysoleucas	Golden shiner
*6	Lepomis megalotis	Longear sunfish
*8	Lepomis macrochirus	Bluegill
*2	Lepomis microlophus	Redear sunfish
1	Chaenobryttus gulosus	Warmouth
*27	Micropterus punctulatus	Spotted bass
61	Total specimens	

SUMMARY OF TOTAL FISHES COLLECTED FOR SPECIAL RESIDUE ANALYSIS SURVEY, June 11-12, 1974:

64	
83	
89	
53	
139	
72	
37	
56	
45	
61	
700	Grand Total for Special Survey June 11-12, 1974

Special Note: Please note that those lots marked with an asterisk (*) are the preferred lots for residue analysis.

Consultants

DSM 014015

ADAD21-017572
HARTOLDMON0043861

COMPANY CONFIDENTIAL

H. L. Campbell - WGK

September 11, 1974

Anniston Alabama Fish
Survey - PCB Residue Analysis
Work Proposal 2542

H. J. Horner
K. Schutzenhofer/T. Osth

E. E. Stewart

The results of the special survey of fishes for PCB residues are enclosed. Only the preferred samples have been analyzed, as indicated by the surveyor, Dr. Gunning.

The analyses were performed by our technicians, K. Schutzenhofer and T. Osthoff following a standard, written procedure. In all cases the entire sample was taken and ground; however where the wet sample weights exceeded the recommended amount, a well mixed portion was taken for the analysis. The determinative step was by electron capture gas chromatography, with the HP-3352 data reduction system used to identify the Aroclor and quantify the result. At least two analytical blanks were run during the course of the analyses.

The remaining samples will be kept in cold storage for at least two months before discarding.

H. L. Campbell

dy
encl.

DSW 014016

ADAD21-017573
HARTOLDMON0043862

E. E. Stewart

Anniston Alabama Fish Survey
- PCB Residue Analysis

I. Shoal Creek, tributary to Choccolocco Creek, 2.3 miles east of White Plains, Alabama - June 11, 1974

Species	PCB's (ppm) Lipid	Wet
Lepomis Megalotis (longear Sunfish)	1.79	0.04
Lepomis Macrochirus (bluegill)	32.6	0.35
Micropterus Coosae (coosa base)	5.30	0.09
Percina Nigrofasciata (blackbanded darter)	1.74	0.06

II. Choccolocco Creek at Highway 9, 1 mile south of White Plains, Alabama, Fish Station 3 - June 11, 1974

Notropis Venustus (blacktail shiner)	79.3	2.93
Notropis Stilbus (silverstripe shiner)	26.4	0.94
Campostoma Anomalum (stoneroller)	15.8	0.67
Lepomis Microlophus (redear sunfish)	22.9	0.32
Lepomis Cyanellus (green sunfish)	18.6	0.30

III. Choccolocco Creek, Fish Station 7, Highway 95, Martha H. Williams Bridge - June 11, 1974

Dorosoma Capadianum (gizzard shad)	6600	62.2
Carassius Auratus (goldfish)	4570	889
Notemigonus Crysoleucas (golden shiner)	877	19.6
Notropis Venustus (blacktail shiner)	1320	80.5
Lepomis Cyanellus (green sunfish)	2020	53.7
Lepomis Macrochirus (bluegill)	2430	26.2
Lepomis Microlophus (redear sunfish)	2840	36.0
Percina Nigrofasciata (blackbanded darter)	1580	48.3

ADAD21-017574
HARTOLDMON0043863

IV. Choccolocco Creek, Fish Station 8, Highway 93 Bridge, 3 miles south of I-20 - June 11, 1974

Species	PCB's (ppm) Lipid	Wet
Campostoma Anomalum (stoneroller)	338	11.4
Notropis Stilbus (silverstripe shiner)	855	26.2
Notropis Venustus (blacktail shiner)	731	39.7
Lepomis Macrochirus (bluegill)	897	43.5
Percina Nigrofasciatus (blackbanded darter)	1620	22.7

V. Choccolocco Creek, Highway 77 Bridge, Fish Station 10 - June 12, 1974

Dorosoma Cepedianum (gizzard shad)	860	15.6
Campostoma Anomalum (stoneroller)	524	18.3
Notemigonus Crysoleucas (golden shiner)	825	9.
Lepomis Megalotis (longear sunfish)	1050	43.
Lepomis Microlophus (redear sunfish)	LOST SAMPLE	

VI. Cheaha Creek, Tributary to Choccolocco Creek, 3.6 miles south of I-20, Highway 93, - June 11, 1974

Campostoma Anomalum (stoneroller)	82.0	5.
Notropis Venustus (blacktail shiner)	108	6.
Lepomis Cyanellus (green sunfish)	14.5	0.
Lepomis Macrochirus (bluegill)	15.2	0.
Lepomis Megalotis (longear sunfish)	78.7	2.
Percina Nigrofasciata (blackbanded darter)	5340	56.

DSM 014018

ADAD21-017575
HARTOLDMON0043864

VII. Cane Creek, Tributary to Coosa River, Alabama, 8.6 miles north of Lincoln, Alabama - June 12, 1974

	PCB's (ppm) Lipid	Wet
Dorosoma Cepedianum (gizzard shad)	62.0	2.1
Cyprinus Carpio (carp)	837	7.3
Lepomis Macrochirus (bluegill)	362	6.9
Lepomis Megalotis (longear sunfish)	173	3.2

VIII. Aker Creek, Tributary to Coosa River, 6.6 miles north of Lincoln, Alabama - June 12, 1974

Campostoma Anomalum (stoneroller)	3.87	0.2
Notropis Venustus (blacktail shiner)	32.0	1.0
Micropterus Coosae (Coosa bass)	25.6	0.2
Percina Nigrofasciata (blackbanded darter)	52.9	0.5

IX. Coosa River at Stanley Bridge (Logan Martin Reservoir), Highway 34 - June 12, 1974

Lepomis Megalotis (longear sunfish)	550	17.2
Lepomis Cyanellus (green sunfish)	1250	13.6
Lepomis Macrochirus (bluegill)	1010	21.7
Micropterus Punctulatus (spotted bass)	416	6.7

X. Clear Creek, Tributary to Coosa River (Logan Martin Reservoir), Highway 42 - June 12, 1974

Notemigonus Crysoleucas (golden shiner)	68.0	0.9
Lepomis Megalotis (longear sunfish)	89.8	2.9
Lepomis Macrochirus (bluegill)	180	2.9
Lepomis Microlophus (redear sunfish)	159	3.5
Micropterus Punctulatus (spotted bass)	177	1.4

ADAD21-017576
HARTOLDMON0043865

	Type		Total
C. Grab samples of water and sludge obtained outside the plant on 3/28/74			
a) Bridge upstream of Martha Williams bridge on Choccolocco Creek			
1) Water	1242	Trace	<10 ppb
2) Sediment	1248 1254	288 ppb 404 ppb	691 ppb
b) At Martha Williams Bridge on Choccolocco Creek			
1) Water	1242	Trace	<10 ppb
2) Sediment	1248 1254	448 ppb 556 ppb	1000 ppb
c) Choccolocco Creek at Highway 93			
1) Water	1242	Trace	<10 ppb
2) Sediment	1248 1254	8360 ppb 13350 ppb	21,700 ppb
d) Stemley Bridge on Logan Martin Lake			
1) Water	1242	Trace	<10 ppb
2) Sediment	1242 1254	188 ppb 125 ppb	313 ppb

ADAD21-017577
HARTOLDMON0043866

ATTORNEY'S NOTES

ADAD21-017578
HARTOLDMON0043867

Xc. Bob Chaven
F. PCB Rigs

Monsanto

E-LOCATION-PHONE: D. B. Redington - C2SB - 4-4956

DATE : July 17, 1985

cc J. H. Craddock*/G3WD

SUBJECT : PCB Transformer Rules

*memo only

REFERENCE :

TO : J. L. Brown/1060
J. R. Kleeve/1630
R. E. Lawyer/1560
P. M. Pruett/1418

The attached correspondence describes new Final Rules involving PCB transformers (i.e., greater than 500 ppm PCB's).

This rule does impact you and your plant.

Relating to all PCB transformers, the rule requires:

NA ~~1.~~ Removal of any exposure risk to food or feed by 10/1/85.

9/23 ~~2.~~ Registration with local fire department or fire brigade by 12/1/85.

3. Removal of any "nearby" stored combustibles by 12/1/85.

ongoing ~~4.~~ Specific, documented visual inspection at least every 3 months (12 months in some cases, but weekly if food/feed risk).

5. Cleanup of PCB leaks in 48 hours.

6. Report to NRC of any heat/pressure-related rupture, plus specified requirements for containment.

ongoing ~~7.~~ Maintain specific inspection and maintenance records for 3 years after disposal.

NRO issued 1-23-85 ~~8.~~ Marking of vault doors, fences, hallways, etc. with M_L symbol, by 12/1/85.

Relating to PCB transformers "in or near commercial buildings", the rule requires:

NA

1. No new or replacement installations after 10/1/85.

2. Phase out of certain transformers by 10/1/1990.

3. Electrical fault protection, both high and low current, on certain other transformers by 10/1/1990.

4. Registration of transformers with building owners by 12/1/85.

PLAINTIFF'S EXHIBIT 6

DSW 023328

ADAD21-017579
HARTOLDMON0043868

Monsanto

Bold Chem

FROM
NAME—LOCATION—PHONE: D. B. Redington - C2SB - 4-4956

DATE : January 17, 1985 cc K. Wittler/1630

SUBJECT : PCB Labels per
40 CFR 761.30

REFERENCE :

TO : J. L. Brown/1060
J. R. Klieve/1630
R. E. Lawyer/1560
P. M. Pruett/1418

The attached labels, to meet the requirements of 40 CFR 761.30, are available through Mike Foresman.

D. B. Redington

DBR:jb
Attachment

WARNING!

VITON ELASTOMER GLOVES REQUIRED DURING MAINTENANCE

THIS SYSTEM CONTAINS LESS THAN 50 ppm OF PCBs (POLYCHLORINATED BIPHENYLS). ALL PERSONS WHO MAINTAIN A HEAT TRANSFER OR HYDRAULIC SYSTEM THAT CONTAINS PCBs MUST WEAR VITON ELASTOMER GLOVES WHILE DOING MAINTENANCE WORK ON THAT SYSTEM. U.S. ENVIRONMENTAL PROTECTION AGENCY REGULATION 40 CFR 761.30

ADDITIONAL INFORMATION:

8 1 5 2765.01/53

N 1120

PLAINTIFF'S EXHIBIT 7

DSM 023332

COPY

UNIVERSITY OF ALABAMA IN BIRMINGHAM
COMPREHENSIVE
GC/MS
GAS CHROMATOGRAPHY / MASS SPECTROMETRY
CENTER

Dr. R. L. Settine, Director

University of Alabama in Birmingham
University Station
Birmingham, Alabama 35294

(205)

Nov. 12, 1984

Mr. Geary Allen
Office of the Attorney General
Administrative Building
64 North Union Street
Montgomery, Alabama 36130

Dear Geary:

Enclosed are the results of our GC/MS analyses/quantitation of your samples. The following table summarizes these results:

	NAME	FILE REFERENCE #	PC
1.	Snow Creek at Highway Overpass Under Construction	6003	198
2.	Snow Creek - Upstream of Monsanto Discharge	6004	0
3.	Below Galvanized Discharge Pipe in Ditch	6006	13.
4.	Snow Creek at F Street	6007	5.
5.	Snow Creek at Confluence of Monsanto Discharge	6008	408.

Extraction and GC/MS analyses were conducted as previously described. Two method blanks were used for QA/QC and were completely blank. Fluorobiphenyl, d_5-nitrobenzene and d_8-naphthalene were used as internal standar and surrogate spikes.

Quantitation was obtained via the generation of a standard curve at the levels of 0, 25, 50 and 100 ppm of Aroclor 1254. Total abundances for each degree of chlorination were obtained (Cl_1-Cl_{10}) and compared to the values from the samples. A plot of the standard curve and a table of corrected abundances from the samples are enclosed.

The identification of the peaks as PCBs was confirmed by their mass spectra and from extracted ion current tracings. Other components present

DSW 015245

PLAINTIFF'S EXHIBIT
8

ADAD21-017581
HARTOLDMON0043870

in the samples consisted of several different polyaromatic hydrocarbons.

The Cl_1-Cl_{10} distribution in the samples is not identical to Aroclor 1254, 1248 or 1242. Thus, the samples may contain a combination of Aroclor or represents "aged" Aroclor.

If you have any questions concerning these data please feel free to call on me.

Sincerely,

Steven A. Barker, Ph.D.
Director for Research
GC/MS Center

rpc

OSW 015246

ADAD21-017582
HARTOLDMON0043871

Monsanto

S&EH/ESC
(CO./DIV./DEPT./LOCATION)

Analysis
(TYPE OF REPORT)

REPORT NO.: ESC-9017
MSL-100028

JOB/PROJECT NO.:

DATE: March 15, 1990

TITLE: Analytical Results of Anniston Soil Analyses For Polychlorinated Biphenyls

AUTHORS: D. E. McKenzie, B. M. Hughes, L. R. Alexander

ABSTRACT: Three soil samples received from the Anniston Plant were analyzed for PCBs. These samples were identified as Snow Creek Sediment A, B, and C. All the samples contained PCBs at concentrations greater than 50 µg/g and less than 500 µg/g. These soils should be considered PCB containing.

Authors: D. E. McKen. ., B. M. Hughes, L. R. Alexander
Title: Analytical Results of Anniston Soil Analyses For Polychlorinated Biphenyls

TECHNICAL APPROVAL: S. W. Mappes
G. W. Mappes
Environmental Sciences Center
Manager, Environmental Sampling and Analysis

APPROVAL BY: Janet M. Lee
J. M. Lee
Environmental Sciences Center
QC/QA and GLP Supervisor

DSW 022380

APPROVAL DATE: March 16, 1990

Report No. ESC 9017
MSL 100028

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PLAINTIFF'S EXHIBIT
9

ADAD21-017583
HARTOLDMON0043872

Monsanto

Environmental Sciences Center

"The Key to Environmental Safety"

RESEARCH REPORT

DATE: February 11, 1989

PROJECT NO: 760.28-0200

TO: J. L. Brown (1060)

FROM:

Environmental Sciences Center
Monsanto Company
800 N. Lindbergh Blvd.
St. Louis, Mo. 63167

Phone No: (314) 694-1464
Fax No: (314) 694-1531

Title: Analytical Results of Anniston Soil Analyses for Polychlorinated Biphenyls.

ABSTRACT

Three Soil samples received from the Anniston Plant were analyzed for PCBs. These samples were identified as Snow Creek Sediment A, B, and C. All the samples contained PCBs at concentrations greater than 50 µg/g and less than 500 µg/g. These soils should be considered PCB containing.

Contents

Abstract	01	QC Results	03
Introduction	02	Project Details	04
Experimental	02	List of Appendices	05
Results and Discussion	02		
Conclusions	03		

DSW 022381

ADAD21-017584
HARTOLDMON0043873

INTRODUCTION

Three soil samples received from the Anniston Plant. PCB analyses were conducted on these samples using Standard Extraction Method PCEX02 and Standard Analysis Method ECAN05. Appendix D of this report contains these methods..

EXPERIMENTAL

Briefly, the extraction method involved weighing one gram sample aliquots into a vial. The samples were spiked with surrogate spiking compounds, and ten mL benzene was pipetted into each sample. Sample vials were capped and ultrasonically extracted for thirty minutes.

Two-hundred μL of these extracts were combined in autosampler vials with two-hundred μL internal standard solution. These extracts were then analyzed by capillary gass chromatography with electron capture detection.

A series of Aroclor standards were included in the analyses so the formulation type(s) present could be identified from unique patterns of PCB congeners. Each chromatogram was visually inspected and the Aroclor formulation(s) were identified. Quantitation was performed by comparing sample responses to appropriate Aroclor standards.

RESULTS AND DISCUSSION

Table 1 contains the results of the soil analyses. Two Aroclor formulations, Aroclor 1248 and Aroclor 1260, were detected in all three samples. The concentrations of the individual Aroclor formulations are reported and the total amounts were obtained by adding the two formulation concentrations. Sample A was analyzed in duplicate.

Since these samples required dilution before quantitation, recoveries of surrogate spiking compound are not reported. The method of quantitation involved the calculation of responses from a total of seven peaks in each formulation. This included two groups of three peaks in each formulation. Comparison of standard responses calculated in a similar manner gave three determinations of each Aroclor formulation present per sample. Table 1 contains the average of these determinations. Appendix D contains chromatograms of the samples and standards. Appendix D also contains the raw data calculation sheets for all samples. The limit of detection was estimated from responses of Aroclor standards. No native spiking studies were performed since the samples contained PCBs on the order of 225 ug/g. Analysis of a method blank indicated that no false positives were detected.

Surrogate compound recoveries could not be measured. The samples contained PCBs at levels which required dilution of the extracts for analysis. Experience indicates that soil samples subjected to the present extraction procedure, usually have extraction recoveries on the order of 80%. Analysis of these samples reveals the concentration of PCBs is below 500 μg/g and greater than 50 μg/g. These materials should be considered PCB containing.

ADAD21-017585
HARTOLDMON0043874

CONCLUSIONS

All the samples analyzed contained Aroclor 1248 and Aroclor 1260. The total concentrations determined, ranged from 120-225 ug/g with an estimated accuracy and precision of ± 80%. The samples should be treated as PCB containing material.

QC RESULTS

The present section summarizes QA/QC results for this set of samples. Quality Assurance and Quality Control studies are conducted upon each set of samples which ESC is requested to analyze. The purpose of these studies is to determine the validity of the reported results so the analysis requestor can better understand what limitations should be placed upon these results. The following describe what experiments were conducted to estimate the precision and accuracy of the reported results. A discussion of whether the data exhibit positive or negative bias follows, and what steps have been taken to assure no false positive or negative values are reported.

Quality Assurance Plan. Appendix C shows the quality assurance plan, data quality objectives, QA/QC SOP, and important terminology used in this report.

Precision. The precision of the data reported in Table 1 can be estimated from the results of analysis of duplicate samples. Sediment A was analyzed in duplicate and concentrations found were 207 and 120 $\mu g/g$. This indicates a precision of ± 80%. This estimate also includes variabilities of sample composition (i.e. sample homogeneity). Another estimate of precision can be obtained from the method of quantitation. Since 3 determinations of concentrations were made for both Aroclor formulations in each sample, standard deviations could be calculated. These data shown on the raw data calculation outputs in Appendix D indicate an analytical precision on the order of ± 35%.

NOTE!! It is the responsibility of the analysis requestor to review these data. And to draw his/her own conclusions concerning the precision of these determinations, and, more importantly, if the stated precision of the determination meets his/her needs.

Accuracy. The accuracy of the data reported in the Table 1 can be estimated from the results of the precision determination. The three concentration determinations for both Aroclor formulations indicate that the accuracy of these analyses is on the order of ± 35%.

Bias. Method blank analyses indicate no significant bias. Recoveries of the surrogate spiking compounds in the method blank also indicate no significant bias. The two measured recoveries were 100 and 95%.

False Positives and Negatives. The analysis of a method blank and low level Aroclor formulation standards indicate no significant false positives or negatives were present in these analyses.

ADAD21-017586
HARTOLDMON0043875

Project Details

The following is a summary of project details for this report. This section contains data processing information on the names of files, samples, extraction and analysis methods, etc.)

Standard Sampling Method(s): Sample obtained from J. L. Brown.

Standard Extraction Method: PCEX02 {See PCFS02 for extraction method flow sheet.}

Standard Instrumental Analysis Method(s): EXAN05 {See ECFS05 for method flow sheet.}

Sample Identification: See login and chain-of-custody information.

Final Report File(s): RA0200

Table File(s): TA0200

QAQC SOP used in this study: ESC-SOP-89-QA209 {Also see QAFS05 flow sheet.}

The following summarize Standard Operating Procedures (SOPs) which have been written for specific analytical activities. Contact Janet Lee, GLP/QA/QC Supervisor (U4E) at 4-1273 for further information concerning SOPs.

SOP Identification	Title
ESC-SOP-88-QA01	Numbering System for SOPs
ESC-SOP-88-QA04	ESC Sample Log-in Procedure
ESC-SOP-88-QA05	Instrument Calibration Logs
ESC-SOP-88-QA06	Instrument Maintenance Logs
ESC-SOP-88-QA07	Instrument Run Logs
ESC-SOP-88-QA08	Making Correction on Raw Data
ESC-SOP-88-QA09	Laboratory Notebooks
ESC-SOP-88-QA10	Standard Preparation
ESC-SOP-88-QA11	Data Manipulation
ESC-SOP-88-QA12	Computer Files
ESC-SOP-88-QA13	Archiving of Data
ESC-SOP-88-QA16	Preparing a QA Statement
ESC-SOP-88-QA19	Level III GLP, QA Signature on Final Report
ESC-SOP-88-QA20	Level IV GLP, QA Signature on Final Report
ESC-SOP-88-QA21	Maintenance of ESC Master Schedule
ESC-SOP-88-QA22	Final Report

ADAD21-017587
HARTOLDMON0043876

LIST OF APPENDICES

Appendix A. Summary of the Extraction Method PCEX02 and Analysis Method ECAN05 used for this project.

Appendix B. Important analytical request and chain-of-custody information recorded at sample login.

Appendix C. Quality Assurance Project Plan and descriptions of Data Quality Objectives, QA/QC SOP, and important terminology used in Quality Assurance/Quality Control, Analyte Extraction, and Instrumental Analysis.

Appendix D. Additional Documentation. (This section contains raw data in the form of log book entries, chromatograms, Aquarius MS outputs and/or other forms of raw data generated in this study.)

Appendix E. Important Terminology used in QA/QC, Analyte Extraction, and Instrumental Analysis.

ANALYST(S): David E. McKenzie, B. Mason Hughes, and La Shawn M. Alexander

ANALYST APPROVAL: David E. McKenzie
Time Stamp - February 20, 1990; 11:34 AM

ADAD21-017588
HARTOLDMON0043877

Table 1. Analytical Results of Anniston Soil Analyses. All Analyses Conducted With Gas Chromatography with Electron Capture Detection.

Date: 2-5-90

Sample Name	Extract Number	Aroclor 1248 (ug/g)	Aroclor 1260 (ug/g)	TOTAL PCBS(a) (ug/g)	LOD (ug/g) (b)
Sediment A	PCB-2613	110	97	207	5
Sediment A (duplicate)	PCB-2614	66	54	120	5
Sediment B	PCB-2615	90	75	165	5
Sediment C	PCB-2616	136	89	225	5
Blank	PCB-2617	ND(c)	ND	ND	5

Footnotes: (a) Total PCBs = the sum of Aroclor 1248 and Aroclor 1260 detected in the sample. (Aroclor 1248 and Aroclor 1260 were the only formulations detected in the samples.
(b) LOD = limit of detection. This value was estimated on the basis of standard responses.
(c) ND = not detected at or above the limit of dection.

NOTE: Analyses do not include Aroclor 1221.

Filename: TA0200

ADAD21-017589
HARTOLDMON0043878

APPENDICES FOR PROJECT 760.28-0200 ENTITLED "ANALYTICAL RESULTS OF ANNISTON SOILS ANALYSIS FOR POLYCHLORINATED BIPHENYLS"

Appendix A. Summary of Extraction Method PCEX02 and Analysis Methods ECAN05 used for this project.

DSW 022387

ADAD21-017590
HARTOLDMON0043879

ESC Standard Extraction Method (SEM) — ESC Standard Extraction Method No: PCEX02

TITLE: PCBs in Non-EC Active Matrices

MATRI(X),(CES):	TYPICAL SAMPLE SIZE (g)	TYPICAL EXTRACT VOLUME (ml)
Soils and other non-EC active solids and solvents	0.5 - 5.0	10

TYPICAL ANALYTES: Aroclors 1232, 1242, 1248, 1254, 1260, 1262, monochlorobiphenyl isomers through decachlorobiphenyl

ESC Standard Analysis Method Nos: ECAN01, ECAN02, MSAN03, MSAN06, MSAN25

INTERFERENCES: Any electron capturing species in the retention time region of trichlorobiphenyl isomers through octachlorobiphenyl isomers.

TYPICAL SURROGATES	TYPICAL RECOVERIES (%)
pentachlorobenzene	50 - 150
2,4,6-trichlorobiphenyl	50 - 150
Carbon 13 labeled PCB homologues	50 - 150

APPARATUS AND MATERIALS:
Burdick and Jackson benzene or hexane for sample extraction or dilution.
Ultrasonic bath.
Nitrogen for extract volume reduction.
Disposable glassware.
(See flow sheet for this extraction method in PCFS02.)

LIMITATIONS: Method applies only to matrices which do not contain interfering electron capturing species in the trichlorobiphenyl through octachlorobiphenyl isomer retention time region for EC analyses. When interferences are present, a mass spectrometric instrumental analysis method should be used.

SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.

DATES OF METHOD CREATION AND UPDATES: 10/31/83, 2/3/84, 10/5/84

ADAD21-017591
HARTOLDMON0043880

FLOW SHEET PCFS02

FOR ESC EXTRACTION METHOD PCEX02

SAMPLE ID: ---------- MRC EXTRACT # ----------

---------- LOG NO: ----------

EXTRACTION DATE and TIME: ----------

SAMPLE COLOR AND DESCRIPTION ----------

		FINAL WEIGHT ----------
WEIGH OUT SAMPLE INTO A 14 OR 40 mL PIERCE VIAL	[ ]	INITIAL WEIGHT ----------
		SAMPLE WEIGHT ----------
SURROGATE SPIKE OF SAMPLE	[ ]	----------
ADD 10 mL BENZENE, METHYLENE CHLORIDE TO SAMPLE	[ ]	
ULTRASONICATE SAMPLE FOR 1/2 HOUR IN A SOUND BATH.	[ ]	
PLACE 1 mL OF THE EXTRACT INTO A 1 1/2 mL VIAL FOR ANALYSIS.	[ ]	
NITROGEN BLOW DOWN IF REQUIRED	[ ]	FINAL VOLUME ---------- mL

EXTRACT NO: ----------

DATE/TIME COMPLETED ----------

ANALYST: ----------

DSW 022389

ESC JOB NO: ----------

ADAD21-017592
HARTOLDMON0043881

ESC Standard Analysis Method (SAM) — ESC Standard Analysis Method No:
TITLE: Aroclor Formulations in Solvents — ECAN05

ANALYTICAL INSTRUMENT AND MODE OF OPERATION: HP-5880 Capillary GC/EC interfaced to an HP-5857-LAS Laboratory Data System

---

TYPICAL ANALYTE	TYPICAL INSTRUMENT LEVEL OF DETECTION (LOD) (ug/ml)	TYPICAL PRECISION @ 10X LOD (%)	TYPICAL ACCURACY @ 10X LOD (%)
Aroclor formulations 1232, 1242, 1248, 1254, 1260, and 1262	0.1	30	30

INTERFERENCES AND LIMITATIONS: Any electron capturing species in the retention time region of trichlorobiphenyl through octachlorobiphenyl congeners are potential interferences. Exact retention times of most likely PCB congeners can be obtained from the analysis of Aroclors 1248, 1254, and 1260.

CHROMATOGRAPHIC COLUMN: 30 m fused silica J&W DB-5 (0.25 uM) with (0.32mm ID)

COLUMN TEMPERATURE PROGRAM: 130(1)/4/300 — INJECTION TYPE: splitless

---

CALIBRATION AND STANDARDIZATION: Use internal or external standard quantitation technique and calibrate instrument response factors from authentic Aroclor standards. Use a minimum of 10 PCB congeners for the determination of formulation identity and quantity. The external standard quantitation technique is used when chromatographic interferents are present in the retention time region of the internal standard.

CALCULATIONS: Internal Standard Method

$$\text{Formulation concentration} = \frac{(\text{Aroclor Congener Area})}{(\text{RRF})(\text{Internal Standard Area})}$$

$$\text{RRF} = \text{Relative Response Factor} = \frac{(\text{Aroclor Congener Area})}{(\text{Internal Standard Area})(\text{Aroclor Concentration})}$$

External Standard Method

DSW 022390

$$\text{Formulation concentration} = (\text{Aroclor Congener Area})/(\text{RF})$$

$$\text{RF} = \text{Response Factor} = (\text{Aroclor Congener Area in Standard})/(\text{Standard Concentration})$$

The above formulation concentration calculations are performed for 10 - 30 PCB congeners and the values averaged to yield an average Aroclor formulation concentration. Both method concentrations are corrected for dilution by multiplying the average concentrations by (Extract Volume)/(Sample Amount).

SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.

DATE OF METHOD CREATION: 10/25/83, 7/20/87 — Time Stamp - <870807.1606>

ADAD21-017593
HARTOLDMON0043882

FLOW SHEET ECFS05
FOR ESC ANALYSIS METHOD ECAN05

EXTRACT ID: ---------- ESC EXTRACT # ----------

---------- LOG NO: ----------

EC LOGBOOK PAGE NUMBER: ----------

EXTRACT COLOR AND DESCRIPTION ----------

PLACE 150 uL EXTRACT OR AROCLOR STANDARD, AND 150 uL INTERNAL STANDARD SOLUTION CONTAINING 0.04 ug/mL CL6-BENZENE IN A 1.6 mL AUTOSAMPLER VIAL. [ ]

PLACE VIAL IN AUTOSAMPLER TRAY OF HP-5880. [ ]

RECORD ELECTRON CAPTURE AND GAS CHROMATOGRAPHIC OPERATING PARAMETERS AND 3357-LAS FILE INFORMATION IN INSTRUMENT LOGBOOK. [ ]

DETERMINE WHETHER TO USE INTERNAL OR EXTERNAL QUANTITATION METHODOLOGY. INTERNAL QUANTITATION IS PREFERED, [ ] BUT CAN NOT ALWAYS BE USED DUE TO INTERFERENCES.

[ ] CALCULATE CONCENTRATION OF AROCLOR FORMULATION AVERAGING THE VALUES DETERMINED FOR THE 10 - 30 PCB CONGENERS, USING THE APPROPRIATE METHOD OF CALCULATION LISTED BELOW

INTERNAL STANDARD CALCULATION

$$RRF = \text{Relative Response Factor} = \frac{\text{(congener area in Aroclor standard)}}{\text{(CL6-benzene area)(Aroclor concentration)}}$$

$$\text{Aroclor Concentration} = \frac{\text{(congener area)}}{\text{(CL6-benzene area) (RRF)}}$$

THESE EQUATIONS ASSUME THAT THE SAME AMOUNT OF INTERNAL STANDARD IS ADDED TO EXTRACTS AND STANDARDS.

EXTERNAL STANDARD CALCULATION

DSW 022391

Aroclor Concentration = (congener area)/(RF)

RF = Response Factor = (congener area in Aroclor Standard)/(Aroclor Concentration)

Both above calculations are performed for 10 - 30 PCB congeners and the values averaged to yield an average Aroclor formulation concentration. Both methods are also corrected for dilution by multiplying the average concentration by (Extract Volume)/(Sample Amount).

MS FILE NUMBER: ---------- DATE/TIME COMPLETED ----------/-------

ANALYST: ---------- ESC JOB NO: ----------

ADAD21-017594
HARTOLDMON0043883

APPENDICES FOR PROJECT 760.28-0200 ENTITLED "ANALYTICAL RESULTS OF ANNISTON SOILS ANALYSIS FOR POLYCHLORINATED BIPHENYLS"

Appendix B. Important Analytical Request and Chain-of-Custody Information Recorded at Sample Login.

ADAD21-017595
HARTOLDMON0043884

Time Stamp - <900215.0940>

MONSANTO COMPANY/ENVIRONMENTAL SCIENCES CENTER

ANALYSIS REQUEST

DATE: January 15, 1990 LOG NO: U-90-01-15-02

REQUESTER: J. L. BROWN (1060) PROJECT NO: 760.28-0200

LOGIN NOTEBOOK PAGE: 4345930

REPORT RESULTS TO: FILES/QA,BROWN,HUGHES,MCKENZIE

ANALYSIS REQUESTS SENT TO: FILES LEE,MAPPES,HUGHES,MCKENZIE

SAMPLE PICKUP BY: BROWN

SAMPLE LOCATION: U-420

SAMPLE DESCRIPTION FOR 3 SAMPLES

SAMPLE IDENTIFICATION	NUMBER OF BOTTLES	ESC NUMBER(S)
SNOWCREEK SEDIMENT A	1 X 40 mL	PCB-2613-14
SNOWCREEK SEDIMENT B	1 X 40 mL	PCB-2615
SNOWCREEK SEDIMENT C	1 X 40 mL	PCB-2616
METHOD BLANK		PCB-2617

RECORDED BY: ALEXANDER

REQUIRED ANALYSES: PCB

EXTRACTION LOGBOOK NOTEBOOK PAGE: 157627

ESC STANDARD EXTRACTION METHOD(S): PCEX02

ANALYTICAL TECHNIQUES:

TECHNIQUE (EN)	DATE COMPLETED	ESC STANDARD ANALYSIS METHOD	INSTRUMENT LOGBOOK PAGE
X GC/EC ( )	1/20/90	ECAN05	157560

FINAL REPORT NOTEBOOK PAGE: 4074661

OTHER NOTEBOOK PAGES:

QUALITATIVE: X SEMIQUANTITATIVE: QUANTITATIVE: X

REQUIRED QA/QC: SEE GOOD LABORATORY PRACTICES MANUAL

COMPLETION DATE REQUESTED:

COMMENTS: DSW 022393

SAMPLE DISPOSITION: HOLD FOR 90 DAYS

SAFETY PRECAUTIONS: SEE SAFE LABORATORY PRACTICES MANUAL

ADAD21-017596
HARTOLDMON0043885

Monsanto

Total Quality

FROM
(NAME-LOCATION-PHONE) J. L. BROWN - ANNISTON (1060)

DATE: January 11, 1990

SUBJ: SNOWCREEK SEDIMENT

REF:

TO: Mason Hughes - U4E

Three samples of Snowcreek Sediment labeled A, B, & C have been forwarded to you by overnight Airborne shipment for PCB analysis. The charge number for this work will be 02-009-914.07-715.

Please call me at Anniston, (Ext. 206), with the results and mail a copy to me at the address below.

J. L. Brown
Monsanto Company
300 Birmingham Highway
Anniston, Alabama 36201

/cwy

Received 1/12/90
10:35 am
B. Mason Hughes

DSW 022394

ADAD21-017597
HARTOLDMON0043886

APPENDICES FOR PROJECT 760.28-0200 ENTITLED "ANALYTICAL RESULTS OF ANNISTON SOILS ANALYSIS FOR POLYCHLORINATED BIPHENYLS"

Appendix C. Quality Assurance Project Plan.

The following sections describe the quality assurance project plan which was implemented for this study. In addition, important terminology used in QA/QC, Analyte Extraction, and Instrumental Analyses, are also discussed. More details of ESC's Good Laboratory Practices and Standard Operating Procedures can be obtained from Janet Lee (U4E) MNET 544-1273.

ADAD21-017598
HARTOLDMON0043887

Environmental Sciences Center
Quality Assurance Plan
Form

Project Title: Analytical Results of Anniston Soil Analyses for Polychlorinated Biphenyls.
Person Requesting Study: J. L. Brown (1060) Mon Net 621-1206
Sample Types Being Evaluated: Soil

ESC Project Number: 760.28-0200 **Start Date:** January 15, 1990
ESC Project Director: David E. McKenzie
QA/GLP Level (see ESC QA/QC/GLP Manual): Level 3

Data Quality Objectives

Goal of this study: Determine the correct concentrations of polychlorinated biphenyls which may be present in the 5 - 500 μg/g concentration range in soil samples from Monsanto's Anniston Plant.

Measurements to be made: Samples will be analyzed for polychlorinated biphenyls using a modification of EPA Method 608. (This method involves sample extraction followed by capillary GC/EC analyses.)

Intended use of measurements: Disposal of excavated materials from Snow Creek.

Time or resource constraints on data collection: Data must be collected within 10 days of receipt of samples.

Environmental system from which the measurements will be obtained: Excavated soil.

Calculations that will be performed on the data in order to arrive at a result: Polychlorinated biphenyl concentrations are calculated using the internal standard method of quantitation. Surrogate compound recoveries will be used to evaluate accuracy, precision, and analytical bias. It will be assumed that 100% of the polychlorinated biphenyls which are initially present in each soil sample will be detected in this analysis.

QA/QC practices which will be used (such as blinds, spikes, duplicates): Internal and surrogate standards will be used, and selected samples will be analyzed in duplicate and spiked with native compounds.

QA/QC SOPs to be used: ESC-SOP-88-QA209.

EPA or other methods which are similar to those to be used in this study: This method is similar to EPA Method 608. However, there is not sufficient documentation so that this data cannot be used for NPDES permits, etc. It is intended only for in-house use.

ESC's Project Director's Signature: [signature] **Date:** 2/16/90

GLP/QA/QC Supervisor's Signature: **Date:**

Time Stamp - February 15, 1990; 2:21 PM FORM: QAQCFO01.DOC

OSW 022396

ADAD21-017599
HARTOLDMON0043888

FLOW SHEET QAFS09

FOR ESC STANDARD OPERATING PROCEDURE ESC-SOP-89-QA209

Title: Quality Control and Data Quality Objectives (DQOs) for the Analysis of PCB Formulations and Other Extractable Chromatographable Organic Compounds Using GC/EC Instrumental Methods.

Summary: Quality control steps are incorporated into capillary GC/EC analyses so that data quality can be evaluated. Various internal standards are used for quantitation. The analysis of a matrix blank such as clean soil, water, or oil is used to evaluate whether false positive values have been reported and representative samples are spiked with a complex reference standard at 1 and 10 times the estimated level of detection, to evaluate whether false negative values have been reported.

ANALYZE METHOD BLANKS AT A FREQUENCY OF 10% OF SAMPLES SUBMITTED FOR ANALYSIS.	[ ]	Method blanks consist of soil, water, or oil similar to the amount of sample analyzed. Representative glassware and solvents should also be used in this analysis.
ANALYZE DUPLICATES AT A FREQUENCY OF 10% OF SAMPLES SUBMITTED FOR ANALYSIS.	[ ]	If adequate sample is available, two representative aliquots should be removed from sample container and analyzed.
SPIKE CLEAN SOIL/WATER SAMPLES WITH A COMPLEX REFERENCE STANDARD AT 1 AND 10 TIMES THE ESTIMATED LEVEL OF DETECTION. THESE LOW AND HIGH SPIKES WILL BE ANALYZED AT A FREQUENCY OF 10% OF SAMPLES SUBMITTED FOR ANALYSIS.	[ ] (1X) [ ] (10X)	An Aroclor formulation or other complex sample will be prepared in CH_2Cl_2. The chromatographable compounds will be measured in simulated spiking solutions and in the low and high spiking extracts. Percent recovery will be calculated using: $\%\ Rec = \frac{100 \times (\text{amount in extract})}{(\text{amount in simulated spiking solution})}$
ANALYZE AN AROCLOR FORMULATION DAILY.	[ ]	
CALCULATE MEAN, MEDIAN STANDARD DEVIATION, RANGE, MINIMUM, AND MAXIMUM FOR %REC BASED UPON MORE THAN 15 CONGENERS OF AN AROCLOR FORMULATION.	[ ]	

Summary of Data Quality Objectives (DQOs): The analysis requestor will be notified in the event the following goals cannot be met in >90% of the low and high spiking studies.

% Recoveries
Mean and Median = 100 +/- 25%
Standard Deviation = 25%
Minimum % Rec. = 50 %
Maximum % Rec. = 150 %

DSW 022397

Time Stamp - <890622.1001>

ADAD21-017600
HARTOLDMON0043889

Environmental Sciences Center
Standard Operating Procedure
ESC-SOP-89-QA209

Title: Quality Control and Data Quality Objectives for the Analysis of PCB Formulations and Other Extractable Chromatographable Organic Compounds Using Capillary GC/EC Instrumental Methods.

Summary: Quality control steps are incorporated into capillary GC/EC analyses so that data quality can be evaluated. Various internal standards are used for quantitation of chromatographable compounds. The analysis of a matrix blank such as clean soil, water, or oil, is used to evaluate whether false positive values have been reported and representative samples are spiked with a complex reference standard at 1 and 10 times the estimated level of detection, to evaluate whether false negative values have been reported. This complex reference standard may be an Aroclor formulation. When large volumes are extracted and/or limited sample is available, this complex reference standard may be a set of surrogate compounds.

Description: The following QA/QC procedures are implemented for each sample set received for extractable chromatographable capillary GC/EC analyses.

1) Duplicate analyses are performed on at least one sample. For sample sets containing more than 10 samples, duplicate analyses occur for 10% of samples.

2) Internal standards are added to each sample extract and standard.

3) At least one clean sample is spiked with a complex reference standard at concentrations corresponding to 1 and 10 times the estimated level of detection. These spiking studies are referenced as low and high native spikes. For sample sets containing more than 10 samples, spiking occurs with the same frequency as duplicate analyses. A set of surrogate compounds may be used for this purpose, in certain cases.

4) At least one method blank, consisting of clean soil, organic free deionized water, or clean oil, is analyzed. For sample sets containing more than 10 samples, method blank analyses occur with the same frequency as duplicate analyses.

Procedure: ESC Standard Extraction Methods PCEX02, WSEX05, WSEX07, or WSEX16 and Standard Analysis Method ECAN02 and ECAN05 are used for extraction and extract analysis. An internal standard (usually hexachlorobenzene) is added to each extract and standard before analyzing. See detailed descriptions of these extraction and analysis methods for further detailed analysis information.

ADAD21-017601
HARTOLDMON0043890

Instrument response calibration will be monitored by analyzing Aroclor formulations daily. Recoveries of a complex reference standard are calculated for each low and high native spiking study. This standard is normally an Aroclor formulation. In certain cases, surrogate compounds can be used to evaluate recoveries of analytes. Recovery means, medians, standard deviations and ranges, along with minimum and maximum recoveries are reported for these native spiking studies. These data will form the basis for evaluation of analytical precision, accuracy, and bias. The analysis of method blanks and the low and high native spikes form the basis of conclusions concerning the reporting of false positives and negatives.

Objectives: The overall data quality objective of this SOP is to provide requestors of ESC's resources with information which may be used to evaluate the quality of data which has been generated for them. In general, it is ESC's experience for the analysis of PCB formulations and other extractable chromatographable compounds in the low parts-per-million concentration range (ug/mL) in the extract, that precision and accuracy are on the order of 30% and recoveries range from 50 to 150%, with recovery mean and median of 100% and recovery standard deviation on the order of 25%. (For large-sample volume extractions, low parts-per-million extraction concentrations correspond to low parts-per-billion (ug/L) sample concentrations.) If these data quality objectives cannot be met for 90% of the samples, the analysis requestor will be contacted to notify him/her of the increased analytical uncertainty so that he/she can decide how this may impact the final use of this data.

Terminology: This section describes commonly used terminology and phrases which are used in conjunction with Quality Assurance/Quality Control (QA/QC). This information may be helpful in understanding some details of QA/QC procedures which have been incorporated in the present report. The following two sections also give useful information concerning terminology used in analyte extraction and instrumental analysis of samples and sample extracts.

Quality Assurance/Quality Control - Terminology used to describe activities which are designed to produce analytical results of known quality. In an effort to minimize costs of environmental analyses, specific QA/QC elements have been incorporated into ESC/UAG extraction and analysis steps which should not unduly burden analytical studies with large development and method validation costs. This approach has been taken so that sets of samples can be analyzed for various analytes without extensively validating methods over wide concentration ranges and without using methods which are designed for only one matrix.

One price which one pays for this approach is that analytical precision and accuracy are sacrificed, somewhat. However, in many cases, when clearly defined regulatory limits have been set, confirming that the analyte is present at levels well below or well above the limit does not need the type of accuracy that is required when the regulated analyte concentration is in the vicinity of the regulatory limit. In these latter cases, more extensive QA/QC procedures are required than are included in the present study.

Precision - Terminology used to evaluate the reproducibility of a certain determination. Parameters which affect analysis precision range from sample acquisition, to sample storage, to sample extraction, and finally to sample extract analysis. Normally, the major factor which affects the precision of the analysis is the sample extraction step. This step normally results in sample analysis precision on the order of + or - 30%.

ADAD21-017602
HARTOLDMON0043891

The precision of a result can be determined in a number of ways. Replicate analyses of the same sample, followed by the calculation of a percent relative standard deviation for that determination is the most popular method of assessing precision. However, this calculation should not be made when there are less than three replicate points from which to calculate the percent relative standard deviation. In addition, replicate extractions and replicate instrumental analyses must also be performed. Therefore obtaining percent relative standard deviation data can be very expensive and is not normally obtained unless large studies are being conducted. A second method of assessing precision is with the use of duplicate analyses. The present report includes results of at least one sample which was analyzed in duplicate. NOTE!! It is the responsibility of the analysis requestor to review these data and draw his own conclusions concerning the precision of the determination, and, more importantly, if the precision of the determination meets his needs.

Accuracy - Terminology used to determine the "correctness" of the data. The accuracy of most steps in the analysis of samples is typically on the order of 10%. However, when analyte concentrations in the sample extracts approach the level of detection of a determination, accuracy as well as precision can approach 100% or greater. The accuracy of a determination of an analyte which is present at concentrations which are much greater than the instrumental level of detection is most strongly affected by the homogeneity of the sample matrix and the precision of the extraction step, which results in typical accuracies in environmental analyses on the order of 30%. Normally, the concentrations of standard solutions which are used to calibrate analytical instrumentation are within 10% of the correct concentrations, and therefore standard solution concentrations are not an important factor in producing inaccurate data. From time to time, analyte responses of standard solutions from different sources will be compared to standard solutions used for instrument calibration. This information is normally included in the section entitled "QA/QC Results".

The accuracy of a result can be estimated in a number of ways. The current study uses surrogate standard recovery and native analyte recovery information to aid in assessing the accuracy of a result. This recovery information, normally reported as percent recovery, gives you information concerning the percent of surrogate standards and native analytes which were recovered after adding to your sample matrix and performing the various extractions, clean-ups, and instrumental analyses associated with the determination. The use of surrogates also assumes that the spiked surrogates are bound in the matrix in the same way as the analytes of interest. Surrogate standards are added to every sample while native analytes are added to only 10% of each set of samples. Therefore surrogate standard recovery data could be used to correct the reported results of an analyte concentration, if the user of the data feel such corrections are warranted. NOTE!! No data reported in this study include any correction for surrogate standard recovery. It is the responsibility of the person requesting the analyses to apply appropriate recovery corrections, if he/she feels that such corrections are warranted.

Bias - Terminology used to describe how the accuracy of a determination may be affected. A negative bias means that values below the correct value are normally measured. A positive bias means that values above the correct value are normally measured. The instrumental analysis step of extract analysis normally does not contribute significantly to analysis bias. Most bias in environmental analysis is introduced in the sample extraction step. A negative bias is introduced when the sample is not completely extracted and the extract does not contain 100% of the analyte. A positive bias is introduced when the final volume of the extract is less than the correct volume. Surrogate Standards (SS), which are discussed in the next section, can be used to determine the amount of bias which is incorporated in the reported result. NOTE!! No data reported in this report includes any correction for this bias. It is the responsibility of the person requesting the analyses to apply appropriate bias corrections, if he/she feels that such corrections are warranted.

ADAD21-017603
HARTOLDMON0043892

Level of Detection (LOD) - Terminology used to indicate what analyte concentration will produce a signal-to-noise ratio of 10. For the present report, this value is not experimentally determined. Normally, a Limit of Quantitation is used to determine the threshold concentration above which an analyte can be detected.

Limit of Quantitation (LOQ) - Terminology used to indicate the lowest analyte concentration which can reliably be quantified. The precision of the determination of the analyte concentration at the LOQ is normally on the order of 100%. The LOQ is normally determined experimentally by adding a known amount of analyte to the sample matrix and measuring the percent recovery at the LOQ. In some cases, when there is insufficient sample quantity, or for convenience, an LOQ will be determined using other methods. These methods should be clearly described in this report.

Method Detection Limit (MDL) - The lowest concentration which gives a measured concentration which is between 50 and 150% of its true value. This concentration is normally determined by adding a known amount of the native analytes to a representative sample matrix and performing the appropriate extraction and/or instrumental analysis steps.

Below the Method Detection Limit (BMDL) - If analytes are measured at concentrations below their MDLs, their concentrations will be identified as "BMDL (value)" with the measured concentration being given in parentheses. This is done so that concentration information is retained which may be important in determining if these compounds may be present in various method/sampling/instrument blanks and therefore should not be considered to be a part of the sample under analysis. Values which are reported BMDL may be in error by as much as 200% or more and therefore critical decisions should not be based upon the actual concentrations reported.

False Positives - Terminology used to indicate the incorrect reporting of the presence of compounds. In many cases, the source of these false positive values can be traced to the analysis of very high level standards or samples immediately prior to the sample in which positive values are reported. In order to assure against reporting false positives, attempts are made to inject cleaner samples before dirtier samples. When high level components are detected in samples immediately prior to low level samples, these lower level samples are rerun so that it can be documented that the positive values are real. In addition, organic free water and other similar materials which are known to be organic free are used to document that there are no other unknown sources of contamination which would cause the reporting of false positives.

False Negatives - Terminology used to indicate the incorrect reporting of the absence of targeted compounds. The source of false negatives in many instances is due to masking of the compounds of interest by the sample matrix or from instrument malfunction. In order to determine, experimentally, that all components in all samples have been reported if they were present above a certain level of quantitation, a representative sample of each matrix type is spiked with the analytes at the estimated level of quantitation and at ten times the estimated level of quantitation. The recoveries of these compounds are then measured for these two native spiking studies. If recoveries between 50 and 150 % are measured in these two studies, then the lower level native spike is reported to the level of quantitation for the determination. If recoveries in this range can only be reported for the higher level of spiking, then this higher level will be quoted as the level of quantitation. In certain instances, when the analyte being spiked is also present in the sample at concentrations greater than the level of quantitation, corrections will be applied in order to estimate the recovery of this compound. Instrument malfunction as a source of False Negatives is minimized with the use of internal standards. Internal standards insure no False Negatives are reported due to instrumental malfunction and surrogate standards insure no False Negatives are reported due to extraction malfunction.

ADAD21-017604
HARTOLDMON0043893

References:

The general area of Quality Assurance/Quality Control, along with much of the terminology described above, is very complex. The following references may provide further information which may be useful in understanding the validity of the results reported in this study.

ASTM Standard Practice D4210-83 entitled "Intralaboratory Quality Control Procedures and a Discussion on Reporting Low-Level Data".

ASTM Standard Practice D2777-77 entitled "Determination of Precision and Bias of Methods of Committee D-19 on Water".

An article in Analytical Chemistry, authored by 29 well-known environmental scientists. This article was funded by a grant from the Environmental Protection Agency and acknowledges 24 additional scientists in industry and government who were involved in the review of the article. It's citation is:
"Principles of Environmental Analysis", L. H. Keith, et. al., *Anal. Chem. 1983*, 55, 2210 - 2218.

40 CFR Part 136 entitled "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Final Rule and Interim Final Rule and Proposed Rule". This document includes details of EPA's 600-series analysis methods. A current copy of these methods can be found in the October 26, 1984 Federal Register.

Chapter 26. Statistics in Quantitative Analysis in Chemical Analysis by Herbert A. Laitinen, published by McGraw-Hill Book Company, Inc.

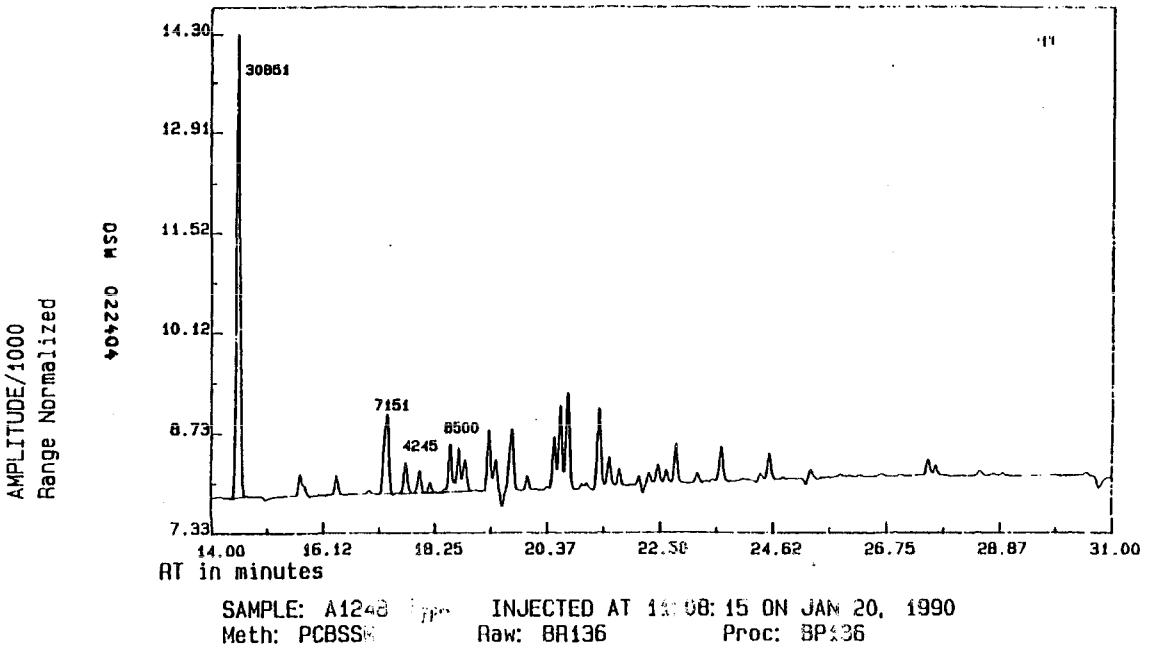
ADAD21-017605
HARTOLDMON0043894

APPENDICES FOR PROJECT 760.28-0200 ENTITLED "ANALYTICAL RESULTS OF ANNISTON SOILS ANALYSIS FOR POLYCHLORINATED BIPHENYLS"

Appendix D. Additional Documentation.

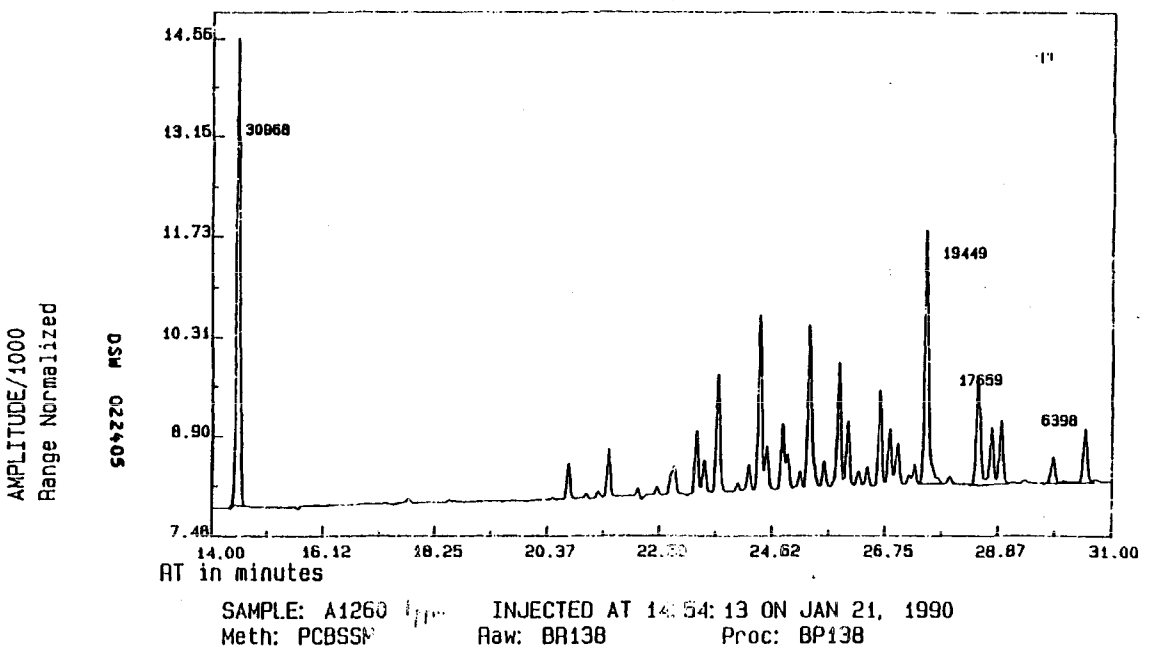
This section contains raw data in the form of log book entries, chromatograms, Aquarius MS outputs and/or other forms of raw data generated in this study.

ADAD21-017606
HARTOLDMON0043895



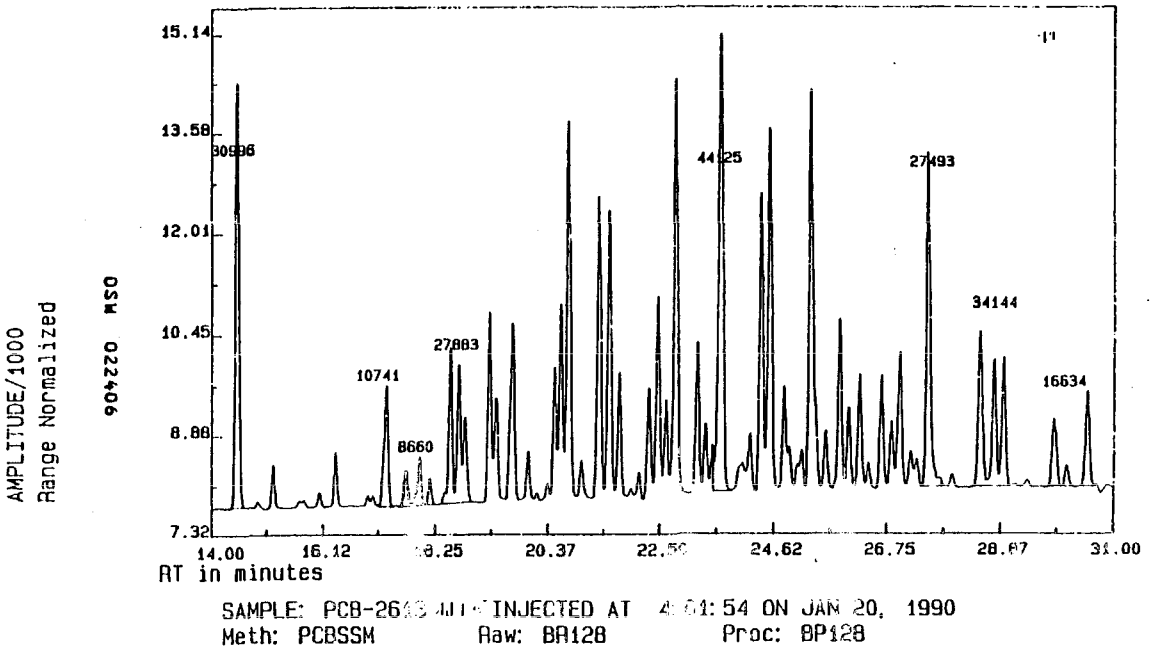
ADAD21-017607

HARTOLDMON0043896



ADAD21-017608

HARTOLDMON0043897



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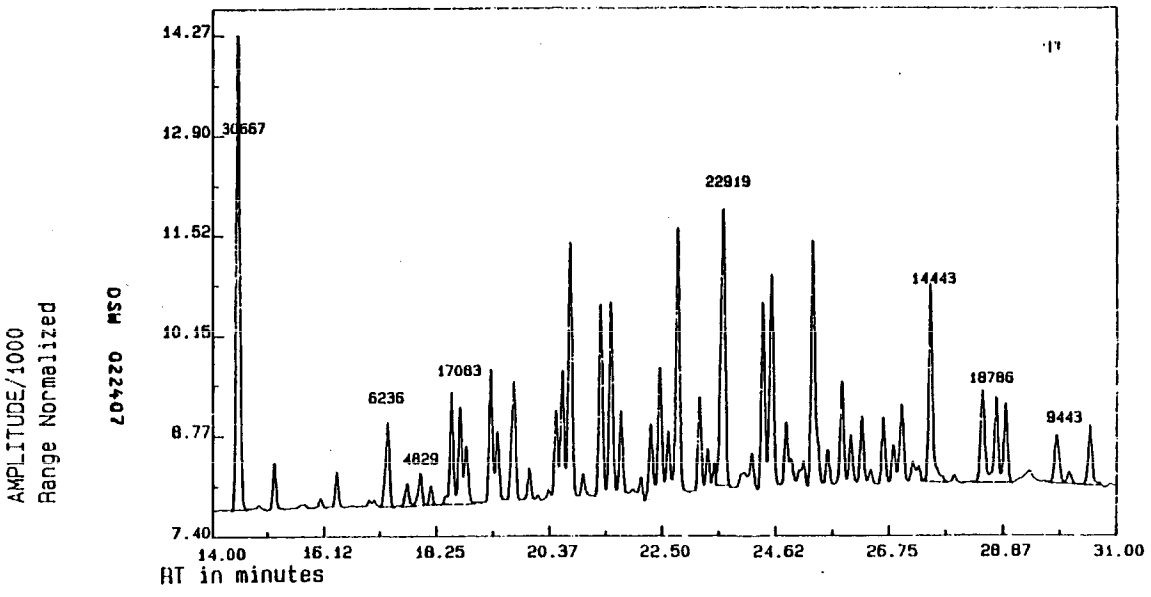
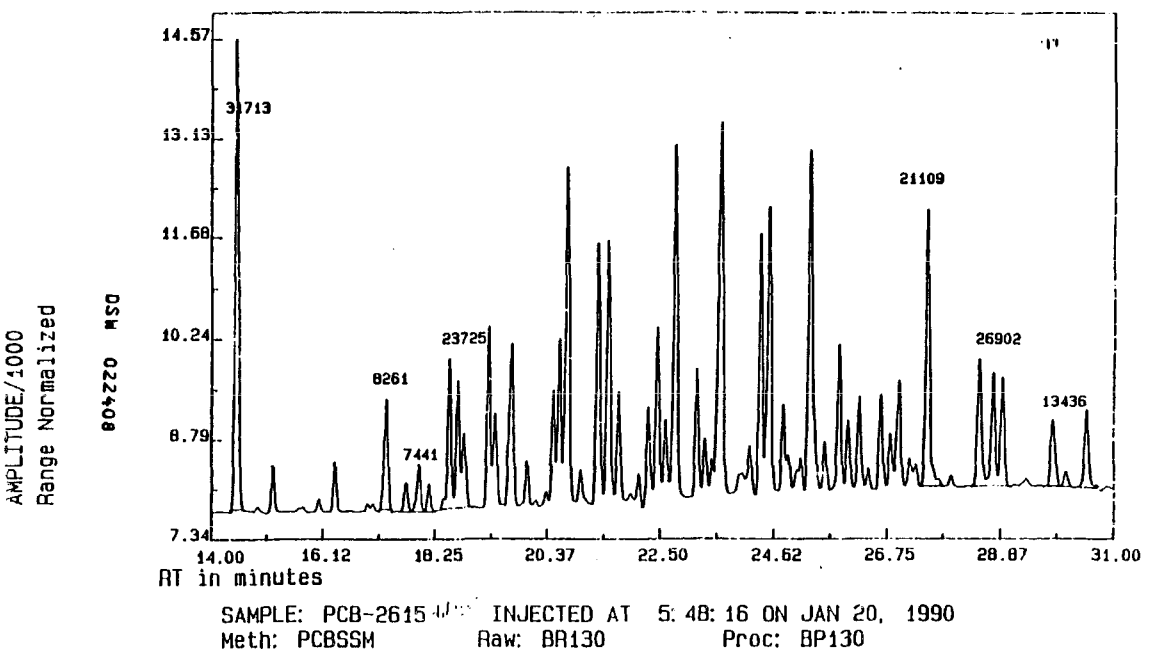


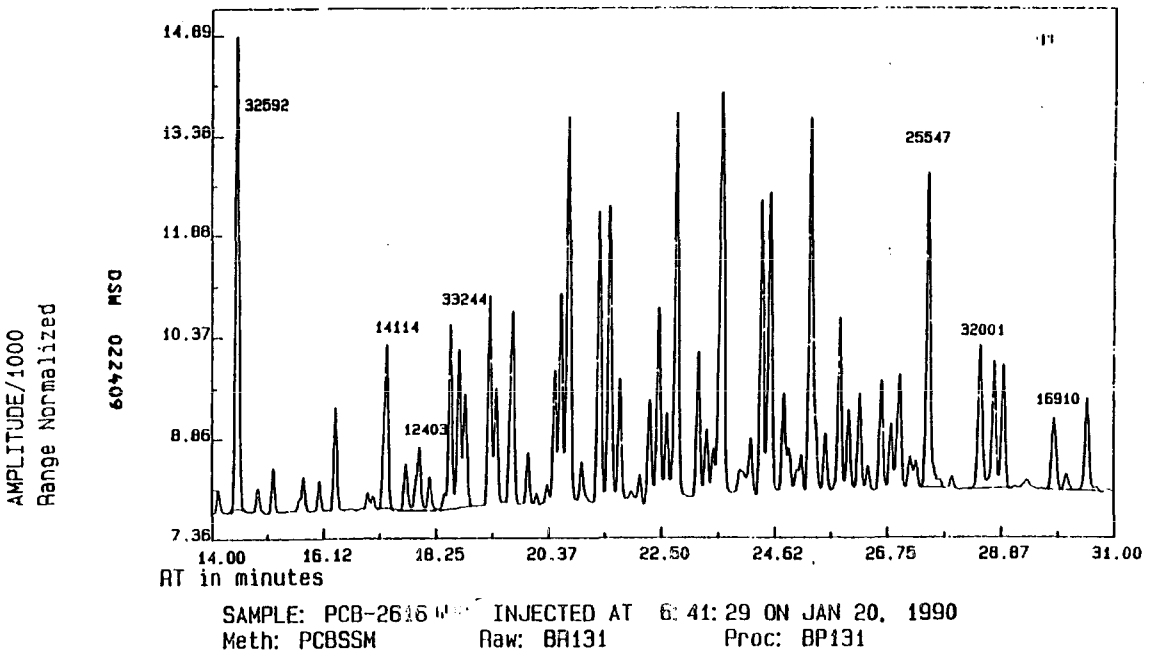
ADAD21-017610

HARTOLDMON0043899

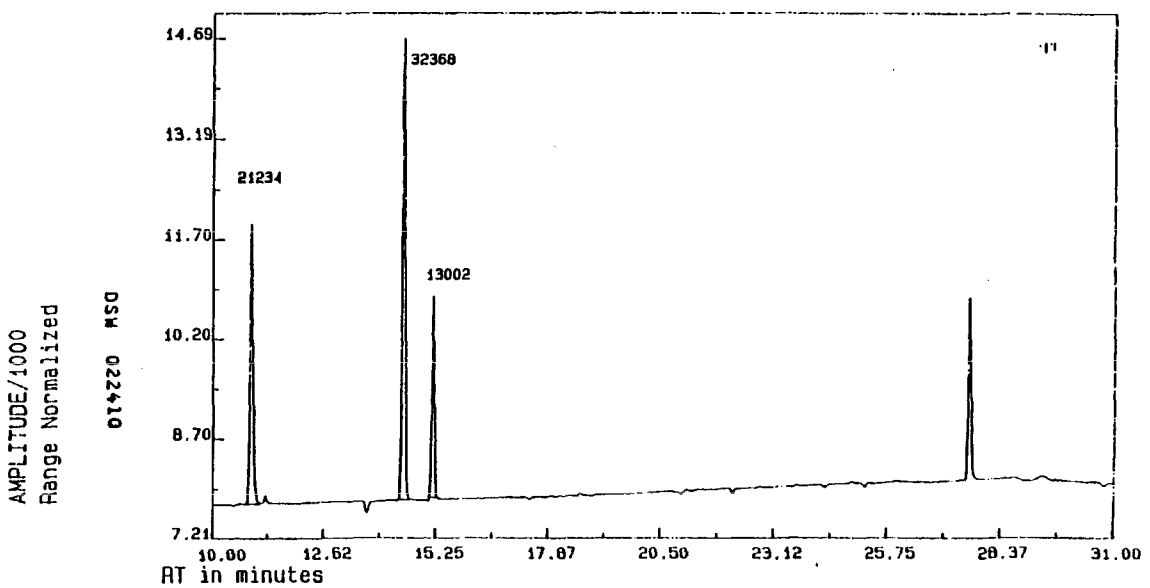


ADAD21-017611

HARTOLDMON0043900



ADAD21-017612



ADAD21-017613

PROJECT NAME/NUMBER: Brown 1 0200 DATE: Jan 15 1990

EXT. LOGBOOK PAGE NUMBER: 157627 EXTRACTION METHOD: PAE102

LOG NUMBER FOR GROUP: U-90-01-15-02 ANALYST: Alexander

EXTRACT NUMBER	SAMPLE IDENTIFICATION	WEIGHT/ VOLUME	COMMENTS:
PCB-2613	Snow Creed Sed A	1.024	Brown soil
PCB-2614	" " " (Dup)	1.004	" "
PCB-2615	" " Sed B	1.023	" "
PCB-2616	" " Sed C	1.029	" "
PCB-2617	Blank Soil	1.009	" "
			DSW 022411

Calibration notes: class S weight 1 g - Balance Reading 1000 g

SOLVENT USED: Benzene NUMBER OF TIMES EXTRACTED X AMOUNT: 1 X 10

SPIKING INFORMATION FINAL VOLUME EXTRACT: 10

SPK- 100 uL DEM 050835-01 (1:10) [10.2 + 20.9

(ALL SAMPLES RECEIVE SPK AND ONLY THOSE INDICATED RECEIVE LS OR HS IN ADDITION TO SPK) (FILE BLSAWU:mh)

LS-

HS-

FLOW SHEET PCFS02

FOR ESC EXTRACTION METHOD PCEX02

SAMPLE ID: [illegible] MRC EXTRACT # PCB-2613-17

LOG NO: 11-90-01-15-02

EXTRACTION DATE and TIME: Jan 15 1990

SAMPLE COLOR AND DESCRIPTION Brown soil

WEIGH OUT SAMPLE INTO A 14 OR 40 mL PIERCE VIAL	[✓]	FINAL WEIGHT ---------- INITIAL WEIGHT ---------- SAMPLE WEIGHT ~1.000g
SURROGATE SPIKE OF SAMPLE	[✓]	SPK-100uL DEN050225-01 [illegible]
ADD 10 mL BENZENE, METHYLENE CHLORIDE TO SAMPLE	[✓]	
ULTRASONICATE SAMPLE FOR 1/2 HOUR IN A SOUND BATH.	[ ]	
PLACE 1 mL OF THE EXTRACT INTO A 1 1/2 mL VIAL FOR ANALYSIS.	[ ]	
NITROGEN BLOW DOWN IF REQUIRED	[ ]	FINAL VOLUME 10 mL

DSW 022412

EXTRACT NO: PCB-2613-17

DATE/TIME COMPLETED Jan 15, 1990

ANALYST: [illegible]

ESC JOB NO: [illegible]

Raw Data and Calculation output for Project: 0200

Aroclor 1260 resp. factors for 1ppm std

	area	Responses
ISTD-CL6	30968	1
peak 1	19449	0.62803539
peak group two	17659	0.57023378
peak group three	6398	0.20660036

PCB-2613 dil 1:5

area	Responses	ug detected	
30996	1	1	
27493	0.886985	70.61587	
34144	1.101561	96.58858	Conc.
16634	0.536649	129.8763	ug/g
Average		99.02692	96.7059837
std		29.70537	29.0091518

Aroclor 1248 resp. factors for 1ppm std

	area	Responses
ISTD-CL6	30851	1
peak 1	7151	0.23179151
peak group two	4245	0.13759683
peak group three	8500	0.27551781

area	Responses	ug detected	
30996	1	1	
10741	0.346528	74.75005	
8660	0.279390	101.5251	Conc.
27883	0.899567	163.2503	ug/g
Average		113.1752	110.522660
std		45.38577	44.3220443

DSM 022413

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Raw Data and Calculation output for Project: 0200

Aroclor 1260 resp. factors for 1ppm std		
	area	Responses
ISTD-CL6	30968	1
peak 1	19449	0.62803539
peak group two	17659	0.57023378
peak group three	6398	0.20660036

PCB-2614 dil 1:5			
area	Responses	ug detected	
30667	1	1	
14443	0.470962	37.49488	
18786	0.612580	53.71308	Conc.
9443	0.307920	74.52081	ug/g
Average		55.24292	53.9481724
std		18.56031	18.1253082

Aroclor 1248 resp. factors for 1ppm std		
	area	Responses
ISTD-CL6	30851	1
peak 1	7151	0.23179151
peak group two	4245	0.13759683
peak group three	8500	0.27551781

area	Responses	ug detected	
30667	1	1	
6236	0.203345	43.86390	
4829	0.157465	57.21994	Conc.
17083	0.557048	101.0911	ug/g
Average		67.39167	65.8121782
std		29.93889	29.2372045

DSM 022414

ADAD21-017617

HARTOLDMON0043906

Raw Data and Calculation output for Project: 0200

Aroclor 1260 resp. factors for 1ppm std

	area	Responses
ISTD-CL6	30968	1
peak 1	19449	0.62803539
peak group two	17659	0.57023378
peak group three	6398	0.20660036

Aroclor 1248 resp. factors for 1ppm std

	area	Responses
ISTD-CL6	30851	1
peak 1	7151	0.23179151
peak group two	4245	0.13759683
peak group three	8500	0.27551781

PCB-2615 dil 1:5

area	Responses	ug detected	
31713	1	1	
21109	0.665626	52.99272	
26902	0.848295	74.38139	Conc.
13436	0.423674	102.5348	ug/g
Average		76.63632	74.8401641
std		24.84793	24.2655589

area	Responses	ug detected	
31713	1	1	
8261	0.260492	56.19113	
7441	0.234635	85.26200	Conc.
23725	0.748115	135.7654	ug/g
Average		92.40618	90.2404196
std		40.26533	39.3216147

DSM 022415

ADAD21-017618

HARTOLDMON0043907

Raw Data and Calculation output for Project: 0200

Aroclor 1260 resp. factors for 1ppm std				PCB-2616 dil 1:5			
	area	Responses		area	Responses	ug detected	
ISTD-CL6	30968	1		32592	1	1	
peak 1	19449	0.62803539		25547	0.783842	62.40433	
peak group two	17659	0.57023378		32001	0.981866	86.09334	Conc.
peak group three	6398	0.20660036		16910	0.518838	125.5658	ug/g
				Average		91.35451	89.2133888
				std		31.90773	31.1599020
Aroclor 1248 resp. factors for 1ppm std							
	area	Responses		area	Responses	ug detected	
ISTD-CL6	30851	1		32592	1	1	
peak 1	7151	0.23179151		14114	0.433051	93.41391	
peak group two	4245	0.13759683		12403	0.380553	138.2857	Conc.
peak group three	8500	0.27551781		33244	1.020004	185.1068	ug/g
				Average		138.9355	135.679202
				std		45.84994	44.7753335

DSM 022416

ADAD21-017619

HARTOLDMON0043908

Raw Data and Calculation output for Project: 0200

Surrogate standard response			PCB-2617		
			area	Responses	% RECOVERY
ISTD-CL6	29963	1	32368	1	100
CL5 benzene	19711	0.65784467	21234	0.656018	99.72236
2,4,6CL3 biphenyl	12673	0.42295497	13002	0.401693	94.97299

DSW 022417

ADAD21-017620

APPENDICES FOR PROJECT 760.28-0200 ENTITLED "ANALYTICAL RESULTS OF ANNISTON SOILS ANALYSIS FOR POLYCHLORINATED BIPHENYLS"

Appendix E. Important Terminology

This section contains important terminology used in QA/QC, analyte Extraction and Instrumental Analyses. More Details of ESC's Good Laboratory Practices and Standard Operating Procedures can be obtained from Janet Lee (U4E) MNET 544-1273.

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Quality Assurance/Quality Control Terminology

This section describes commonly used terminology and phrases used in Quality Assurance/Quality Control (QA/QC). This information may be helpful in understanding some details of QA/QC procedures which have been incorporated in the present report. The following two sections also give useful information concerning terminology used in analyte extraction and instrumental analysis of samples and sample extracts.

Quality Assurance/Quality Control - Terminology used to describe activities which are designed to produce analytical results of known quality. In an effort to minimize costs of environmental analyses, specific QA/QC elements have been incorporated into ESC/UAG extraction and analysis steps. These should not unduly burden analytical studies with large development and method validation costs. This approach has been taken so that sets of samples can be analyzed for various analytes without extensively validating methods over wide concentration ranges and without using methods which are designed for only one matrix.

One price which one pays for this approach is that analytical precision and accuracy are sacrificed, somewhat. However, in many cases, when clearly defined regulatory limits have been set, confirming that the analyte is present at levels well below or well above the limit does not need the type of accuracy that is required when the regulated analyte concentration is in the vicinity of the regulatory limit. In these latter cases, more extensive QA/QC procedures are required than are included in the present study.

Precision - Terminology used to evaluate the reproducibility of a certain determination. Parameters which affect analysis precision range from sample acquisition, to sample storage, to sample extraction, and finally to sample extract analysis. Normally, the major factor which affects the precision of the analysis is the sample extraction step. This step normally results in sample analysis precision on the order of + or - 30%.

The precision of a result can be determined in a number of ways. Replicate analyses of the same sample, followed by the calculation of a percent relative standard deviation for that determination is the most popular method of assessing precision. However, this calculation should not be made when there are less than three replicate points from which to calculate the percent relative standard deviation. In addition, replicate extractions and replicate instrumental analyses must also be performed. Therefore obtaining percent relative standard deviation data can be very expensive and is not normally obtained unless large studies are being conducted. A second method of assessing precision is with the use of duplicate analyses. The present report includes results of at least one sample which was analyzed in duplicate. NOTE!! It is the responsibility of the analysis requestor to review these data and draw his own conclusions concerning the precision of the determination, and, more importantly, if the precision of the determination meets his needs.

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Accuracy - Terminology used to determine the "correctness" of the data. The accuracy of most steps in the analysis of samples is typically on the order of 10%. However, when analyte concentrations in the sample extracts approach the level of detection of a determination, accuracy as well as precision can approach 100% or greater. The accuracy of a determination of an analyte which is present at concentrations much greater than the instrumental level of detection is most strongly affected by the homogeneity of the sample matrix. The precision of the extraction step typically results in accuracies in environmental analyses on the order of 30%. Normally, the concentrations of standard solutions which are used to calibrate analytical instrumentation are within 10% of the correct concentrations, and therefore standard solution concentrations are not an important factor in producing inaccurate data. From time to time, analyte responses of standard solutions from different sources will be compared to standard solutions used for instrument calibration. This information is normally included in the section entitled "QA/QC Results".

The accuracy of a result can be estimated in a number of ways. The current study uses surrogate standard recovery and native analyte recovery information to aid in assessing the accuracy of a result. This recovery information, normally reported as percent recovery, gives you information concerning the percent of surrogate standards and native analytes which were recovered after adding to your sample matrix and performing the various extractions, clean-ups, and instrumental analyses associated with the determination. The use of surrogates also assumes that the spiked surrogates are bound in the matrix in the same way as the analytes of interest. Surrogate standards are added to every sample while native analytes are added to only 10% of each set of samples. Therefore surrogate standard recovery data could be used to correct the reported results of an analyte concentration, if the user of the data feel such corrections are warranted. NOTE!! No data reported in this study include any correction for surrogate standard recovery. It is the responsibility of the person requesting the analyses to apply appropriate recovery corrections, if he/she feels that such corrections are warranted.

Bias - Terminology used to describe how the accuracy of a determination is affected. A negative bias means that values below the correct value are normally measured. A positive bias means that values above the correct value are normally measured. The instrumental analysis step of extract analysis normally does not contribute significantly to analysis bias. Most bias in environmental analysis is introduced in the sample extraction step. A negative bias is introduced when the sample is not completely extracted and the extract does not contain 100% of the analyte. A positive bias is introduced when the final volume of the extract is less than the correct volume. Surrogate Standards (SS), which are discussed in the next section, can be used to determine the amount of bias which is incorporated in the reported result. NOTE!! No data reported in this report includes any correction for this bias. It is the responsibility of the person requesting the analyses to apply appropriate bias corrections, if he/she feels that such corrections are warranted.

Level of Detection (LOD) - Terminology used to indicate what analyte concentration will produce a signal-to-noise ratio of 10. For the present report, this value is not experimentally determined. Normally, a Limit of Quantitation is used to determine the threshold concentration above which an analyte can be detected.

Limit of Quantitation (LOQ) - Terminology used to indicate the lowest analyte concentration which can reliably be quantified. This quantity is also referenced as the Method Detection Limit (MDL) which is defined in the following paragraph. The precision of the determination of the analyte concentration at the LOQ is normally on the order of 100%. The LOQ is normally determined experimentally by adding a known amount of analyte to the sample matrix and measuring the percent recovery at the LOQ. In some cases, when there is insufficient sample quantity, or for convenience, an LOQ will be determined using other methods. These methods should be clearly described in this report.

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Method Detection Limit (MDL) - The lowest concentration which gives a measured concentration which is between 50 and 150% of its true value. This concentration is normally determined by adding a known amount of the native analytes to a representative sample matrix and performing the appropriate extraction and/or instrumental analysis steps.

Below the Method Detection Limit (BMDL) - If analytes are measured at concentrations below their MDLs, their concentrations will be identified as "BMDL (value)" with the measured concentration being given in parentheses. This is done so that concentration information is retained which may be important in determining if these compounds may be present in various method/sampling/instrument blanks and therefore should not be considered to be a part of the sample under analysis. Values which are reported BMDL may be in error by as much as 200% or more and therefore critical decisions should not be based upon the actual concentrations reported.

False Positives - Terminology used to indicate the incorrect reporting of the presence of compounds. In many cases, the source of these false positive values can be traced to the analysis of very high level standards or samples immediately prior to the sample in which positive values are reported. In order to assure against reporting false positives, attempts are made to inject cleaner samples before dirtier samples. When high level components are detected in samples immediately prior to low level samples, these lower level samples are rerun so that it can be documented that the positive values are real. In addition, organic free water and other similar materials which are known to be organic free are used to document that there are no other unknown sources of contamination which would cause the reporting of false positives.

False Negatives - Terminology used to indicate the incorrect reporting of the absence of targeted compounds. False negatives in many instances are due to masking of the compounds of interest by the sample matrix or from instrument malfunction. In order to determine, experimentally, that all components in all samples have been reported if they were present above a certain level of quantitation. A representative sample of each matrix type is spiked with the analytes at the estimated level of quantitation and at ten times the estimated level of quantitation. The recoveries of these compounds are then measured for these two native spiking studies. If recoveries between 50 and 150 % are measured in these two studies, then the lower level native spike is reported to the level of quantitation for the determination. If recoveries in this range can only be reported for the higher level of spiking, then this higher level will be quoted as the level of quantitation. In certain instances, when the analyte being spiked is also present in the sample at concentrations greater than the level of quantitation, corrections will be applied in order to estimate the recovery of this compound. Instrument malfunction as a source of False Negatives is minimized with the use of internal standards. Internal standards insure no False Negatives are reported due to instrumental malfunction and surrogate standards insure no False Negatives are reported due to extraction malfunction.

Further Information

The general area of Quality Assurance/Quality Control, along with much of the terminology described above, is very complex. The following references may provide further information which may be useful in understanding the validity of the results reported in this study.

ASTM Standard Practice D4210-83 entitled "Intralaboratory Quality Control Procedures and a Discussion on Reporting Low-Level Data".

ASTM Standard Practice D2777-77 entitled "Determination of Precision and Bias of Methods of Committee D-19 on Water".

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An article in Analytical Chemistry, authored by 29 well-known environmental scientists. This article was funded by a grant from the Environmental Protection Agency and acknowledges 24 additional scientists in industry and government who were involved in the review of the article. It's citation is: "Principles of Environmental Analysis", L. H. Keith, et. al., *Anal. Chem. 1983*, 55, 2210 - 2218.

40 CFR Part 136 entitled "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Final Rule and Interim Final Rule and Proposed Rule". This document includes details of EPA's 600-series analysis methods. A current copy of these methods can be found in the October 26, 1984 Federal Register.

Chapter 26, Statistics in Quantitative Analysis in Chemical Analysis by Herbert A. Laitinen, published by McGraw-Hill Book Company, Inc.

ADAD21-017626
HARTOLDMON0043915

Analyte Extraction Terminology

This section describes commonly used terminology and phrases which are used in conjunction with analyte extraction. This information may be helpful in understanding some details of how analytes in your samples were isolated for instrumental analysis. Instrumental Analysis Terminologies are given in the following section of this report.

Sample - Terminology used to reference the material which you submit for analysis. Samples may be solid, liquid, and in some cases, gases. When a sample is received for analysis, it is logged into the ESC sample login book. The proper chain-of-custody documents are maintained in the event this information is required for litigation purposes.

Analyte - Terminology used to reference specific compounds or formulations of compounds. When an analysis is requested for a certain analyte within a certain sample matrix, normally some type of extraction process is required.

Extraction - This terminology refers to the step which isolates the analyte of interest into an appropriate solvent. Extraction is required for several reasons. Often, the concentration of the analyte is below the level of detection of the instrument which will be used for analysis. Therefore, extraction involves removing the analyte of interest from a relatively large volume of sample and placing it into a relatively small volume of solvent. This places the analyte in the solvent at a concentration which can easily be detected by the analytical instrument.

A second reason that extraction is required, is that the sample may not be appropriate for direct instrumental analysis of the analyte of interest. This can be easily understood for analytes in soils. Very few analytical instruments allow soils to be directly inserted into the instrument. Therefore some type of isolation step (i. e. extraction) is required in order to place the analyte in an appropriate matrix for instrumental analysis.

When the analyte of interest is present at sufficient concentration, and the sample matrix can be directly inserted into the analytical instrument. The sample, or the diluted sample, can be directly analyzed. However, this case represents a minority of sample analyses which ESC is asked to perform.

Matrix - Terminology used to reference the major components of a sample. In most cases, major components are not of direct interest except as they affect the types of extraction steps and other isolation procedures which must be used to isolate the analyte from the sample matrix. For the majority of environmental samples which ESC is asked to analyze, the matrix is normally water or soil. However, many environmental matrices contain relatively high levels of organic compounds which may interfere with the instrumental analysis of the analyte of interest. Therefore, depending upon the analyte of interest, the required level of detection, and the amounts and types of other organic materials which may interfere with the instrumental analysis. Extraction methods must be developed which are very specific for a given set of samples. In order to deal with almost a limitless set of matrices and analytes. Extraction methods, instrumental methods, and an organized approach to sample extraction, followed by instrumental analysis, has been developed at ESC.

Extract - Terminology used to identify the analyte-containing solvent which was obtained from the extraction of a certain matrix.

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Extract Clean-up - Terminology used to identify chemical steps which are required to reduce the concentration of organic compounds which may be extracted with the analyte of interest. These co-extracted compounds may be at such high levels relative to the analyte and/or produce responses that interfere with the instrumental analysis of the analyte in the extract.

Extractable Compounds - Terminology which refers to the ability of a compound to be isolated from the sample matrix and placed into the extract solvent. When the sample matrix is primarily soil which contains little organic matter, most organic compounds are extractable compounds. However, when the sample matrix is primarily water, only those compounds which are hydrophobic are extractable compounds.

Standard Extraction Method - Terminology used to reference an organized description of the steps involved in isolating an analyte from a given matrix. These methods are assigned short names which can also be used as computer file names for these methods. The names of specific Standard Extraction Methods which are used in this study are listed in the final report in the section entitled "Details". In addition, copies of these Standard Extraction Methods are shown in a separate section of this report. Standard Extraction Methods also include details of sample clean-up, if required.

Extraction Flow Sheet - Terminology used to reference a graphic description of a Standard Extraction Method. This flow sheet is filled out by the analyst in the laboratory and serves as a detailed record of what occurred in the sample extraction step. Flow sheets of individual sample extractions may be included in a section of this report.

Surrogate Standards (SS) - One important element in the extraction of an analyte from a matrix, is the determination of what percent of the analyte was actually extracted from the matrix. Methods which involve liquid/liquid extraction of water with an organic solvent, or liquid/solid extraction of soils with an organic solvent, can vary in efficiency. It is imperative that data be obtained which gives the analysis requestor information concerning what percentage of the analyte was isolated in the extract during the extraction step. Surrogate Standards serve this important purpose.

The philosophy on the use of Surrogate Standards is as diverse as the analysts who use them. If cost were no object, analyte recovery information could be obtained by the use of standards addition analysis methods. However, since many samples require extensive labor to isolate an analyte into an extract, standards addition analysis methods are too costly for most studies. (A standards addition analysis requires each sample to be extracted and analyzed at least three times.) Surrogate Standards give the same type of information, with only one analysis being required.

A "Surrogate" Standard is a compound which is chosen to behave exactly as the analyte. It is a surrogate for that analyte and thus information obtained for this surrogate can be assumed to also apply to the analyte of interest. For the analysis of regulated analytes, it is important that when data is generated showing that the analyte is not present. The data must also show that if the regulated analyte were present in the sample matrix, it would have been detected. This is especially true when complex extraction and instrumental analysis steps are involved in this determination. Therefore, when an extraction is performed, a known amount of a Surrogate Standard is added to the sample before any extraction steps take place. When the extract is then analyzed for the analyte of interest, the amount of the Surrogate Standard is also determined. From this information one can document, for each sample, what recoveries were measured for this Surrogate Compound. From this, one can describe some level of confidence on the data generated for the analyte of interest.

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A detailed discussion on how Surrogate Standards are chosen is beyond the scope of this section on Analyte Extraction Terminology. ESC normally uses two types of Surrogate Standards. The first is when the surrogate is exactly the same as the analyte of interest, except the naturally occurring carbon, hydrogen, or halogen atoms in the analyte have been replaced with non-naturally occurring isotopes. These surrogates can be expected to act exactly as the native analytes. One good example of this type of surrogate is the 2,3,7,8-TCDD surrogate in which all carbon atoms are carbon-13 or all chlorine atoms are chlorine-37.

The second type of Surrogate Standard is one which does not have the same chemical structure as the analyte of interest. It is known, or assumed to act chemically identical to the analyte of interest during the extraction and clean-up steps. Examples of this type of surrogates are deuterated compounds which may be added to a matrix in which any chromatographable materials are to be identified. This approach can only be applied to GC/MS analyses, since the surrogates can be differentiated from the native compounds from their different mass spectra. Since it is not known before sample extraction and extract analysis what analytes may be present, surrogates must be chosen that could not possibly be present in the sample. In addition, since only liquid/liquid or liquid/solid extraction would be involved, with no clean-up (since clean-up would remove compounds in which the requester is interested) any hydrophobic deuterated compound could serve as a surrogate. Normally, phenol-d5, 2-CL-phenol-d4, CL2-benzene-d4, pyrene-d10 and chrysene-d12 are used as Surrogate Standards for the analysis of a wide variety of hydrophobic materials in environmental samples.

A sub-set of this second type of Surrogate Standards are the surrogates which are used in the capillary GC/EC analysis of Aroclor formulations. Since mass spectrometric detection is not used, surrogates which contain unique isotopes cannot be distinguished from their native counterparts. Therefore, other compounds are used as Surrogate Standards since they have been observed to act exactly as the polychlorinated biphenyls (PCBs) in the Aroclor formulations. Any halogenated compound can be used which acts exactly as PCBs in the extraction and clean-up step. ESC normally uses CL5-benzene and 2,4,6-CL3-biphenyl for this purpose.

Method Detection Limit (MDL) - The lowest concentration which gives a measured concentration which is between 50 and 150% of its true value. This concentration is normally determined by adding a known amount of native analytes to a representative sample matrix and performing the appropriate extraction and/or instrumental analysis steps.

Below the Method Detection Limit (BMDL) - If analytes are measured at concentrations below their MDLs, their concentrations will be identified as "BMDL (value)" with the measured concentration given in parentheses. This is done so that concentration information is retained which may be important in determining if these compounds may be present in various method/sampling/instrument blanks and therefore should not be considered to be a part of the sample under analysis. Values which are reported BMDL may be in error by as much as 200% or more. Therefore, critical decisions should not be based upon the actual concentrations reported.

Native Analytes - Terminology which references the analytes of interest which contain naturally-occurring isotopes of carbon, hydrogen, halogens, etc.

Native Spike - Terminology which references the addition of a known amount of native analytes to the sample matrix. Normally, at least one sample will be spiked with the native analyte at the reported level of detection (low native spike) and at 10 times the level of detection (high native spike). Recoveries of the native analytes provide further documentation on the quality of the analyses performed. The frequency of low and high level native spikes for sample sets which contain more than 10 samples is 10% of the number of samples.

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Method Blank - Terminology which refers to a sample which is known to contain none of the analytes of interest. For water analyses, this is normally Burdick and Jackson Brand Water, deionized, or distilled water. For soil, it may be soil which has been previously analyzed and known to contain none of the analytes of interest. All extraction steps, using randomly selected glassware, solvents, and all surrogate spiking solutions must be used. This provides documentation that the analytes of interest were not inadvertently present in extraction glassware and solvents used in the analysis. A minimum of one method blank must be generated with each set of samples. For sample sets containing more than 10 samples, method blanks are generated at a frequency of 10% of the number of samples.

Duplicate Analyses - Terminology used to indicate the duplicate extraction and duplicate extract analysis of a sample. This provides documentation on the precision of an analysis. Normally the precision of environmental analyses of homogeneous samples is on the order of 30%. A minimum of one duplicate analysis is required for each sample set. For sample sets containing more than 10 samples, duplicate analyses are generated at a frequency of 10% of the number of samples.

Further Information

The general area of Analyte Extraction, along with much of the terminology described above, is very complex. The following references may provide further information which may be useful in understanding extraction fundamentals and terminology.

40 CFR Part 136 entitled "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Final Rule and Interim Final Rule and Proposed Rule". This document includes details of EPA's 600-series analysis methods. A current copy of these methods can be found in the October 26, 1984 Federal Register.

Statement of Work for the Contract Laboratory Program which is used in conjunction with EPA's Superfund Site studies. A current copy may be obtained by contacting:

Joan F. Fisk, Project Officer
Analytical Support Branch
Hazardous Response Support Division
USEPA
Washington, D. C. 20460

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HARTOLDMON0043919

Instrumental Analysis Terminology

This section describes commonly used extract analysis terminology and phrases. This information may be helpful in understanding some details of how instrumental analyses of sample extracts were performed. The previous section of this report describes terminology associated with analyte extraction.

Sample Extract - Terminology used to describe the solvent containing the analyte of interest which is obtained from some type of sample extraction step. Detailed information on how this extract is prepared can be found in the Standard Extraction Methods and flow sheets associated with the methods. Summaries of these methods which were used for this project can be found in a separate section of this report.

Internal Standard (IS) - Terminology used to reference a compound which is added to the sample extract and standard solutions of the analytes of interest immediately before instrumental analysis. The purpose of the internal standard is to provide data which can be used to correct for variations in injected volumes of extract and standard solutions which may occur during instrumental analysis. The internal standard must not be present in the sample extract. Typical internal standards used in mass spectrometric analyses are benzene-d6, naphthalene-d8, anthracene-d10 and chrysene-d12. Purge-and-trap mass spectrometric analyses typically use bromochloromethane, 1-chloro-2-bromopropane, and/or 1,4-dichlorobutane. The deuterated compounds produce unique mass spectra and are not present in naturally-occurring samples. A commonly used internal standard for GC/EC analysis is hexachlorobenzene.

Internal Standard Quantitation Method - Terminology which refers to a method of data analysis. This method requires that a known amount of an internal standard be added to the sample extract prior to instrumental analysis. Responses of all analytes are calculated relative to the internal standard using the following relationship:

$$RR = \text{Relative Response} = (\text{Analyte Area})/(\text{Internal Standard Area})$$

If different volumes of the sample extracts and standard solutions are injected, these differences are reflected by differences in the internal standard areas. In addition, if instrument sensitivity changes, these changes are also reflected in changes in the internal standard areas. The calculation of the relative response corrects for these types of fluctuation.

In order to determine the analyte concentration-Relative Response relationship, analyte Relative Response Factors are calculated using the following relationship for data obtained from the analysis of standard solutions:

$$RRF = \text{Relative Response Factor} = \frac{(\text{Analyte Area})\ (\text{Internal Standard Concentration})}{(\text{Internal Standard Area})\ (\text{Analyte Concentration})}$$

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When identical amounts of the internal standard are added to both extracts and standard solutions, the internal standard concentration term in the above equation can be eliminated. When this is done and Relative Response is substituted for the ratio of analyte area to internal standard area, the RRF equation becomes:

RRF = RR/(Analyte Concentration)

Analyte concentrations in the extracts are calculated from the following equation:

Analyte Extract Concentration = RR/RRF

In order to obtain the concentration of the analyte in the sample, the following equation is used:

$$\text{Analyte Sample Concentration} = \frac{(\text{Analyte Extract Concentration})\ (\text{Extract Volume})}{(\text{Amount of Sample Extracted})}$$

The area terms in the above equations may be total ion areas, FID peak areas, EC peak areas, or extracted ion areas. The details of how the internal standard quantitation method is applied to specific methods are described in the various instrumental Standard Analysis Methods.

The following equation shows what calculations should be made to correct for analytical bias:

$$\text{Analyte Sample Concentration (Corrected for Analytical Bias)} = \frac{(\text{Analyte Sample Concentration})}{(\text{Assumed Analyte Recovery})}$$

The Assumed Analyte Recovery can be obtained from an average of surrogate recoveries or native analyte recoveries, measured for the sample in question. NOTE!! No data reported in this study include any correction for surrogate standard recovery. It is the responsibility of the person requesting the analyses to apply appropriate recovery corrections, if he/she feels that such corrections are warranted.

External Standard Quantitation Method - Terminology which refers to a method of data analysis. This method requires that a known amount of the analyte standard be analyzed under the same conditions as the sample extract. In order to determine the analyte concentration analyte response relationship, Response Factors are obtained from the following relationship:

RF = Response Factor = (Analyte Area)/(Analyte Concentration)

Analyte concentrations in the extracts are calculated from the following equation:

Analyte Extract Concentration = (Analyte Area)/RF

In order to obtain the concentration of the analyte in the sample, the following equation is used:

$$\text{Analyte Sample Concentration} = \frac{(\text{Analyte Extract Concentration})\ (\text{Extract Volume})}{(\text{Amount of Sample Extracted})}$$

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HARTOLDMON0043921

The area terms in the above equations may be total ion areas, FID peak areas, EC peak areas, or extracted ion areas. The details of how the external standard quantitation method is applied to specific methods are described in the various instrumental Standard Analysis Methods.

The following equation shows what calculations should be made to correct for analytical bias:

$$\text{Analyte Sample Concentration (Corrected for Analytical Bias)} = \frac{\text{(Analyte Sample Concentration)}}{\text{(Assumed Analyte Recovery)}}$$

The Assumed Analyte Recovery can be obtained from an average of surrogate recoveries or native analyte recoveries, measured for the sample in question. NOTE!! No data reported in this study include any correction for surrogate standard recovery. It is the responsibility of the person requesting the analyses to apply appropriate recovery corrections, if he/she feels that such corrections are warranted.

Standard Analysis Methods - Terminology used to reference an organized description of the steps involved in the instrumental analysis of a sample or a sample extract. These methods are assigned short names which can also be used as computer file names for these methods. The names of specific instrumental Standard Analysis Methods which are used in this study are listed in the final report in the section entitled "Details". In addition, copies of these Standard Analysis Methods are shown in a separate section of this report. Flow sheets of the Standard Analysis Methods are usually also provided in this section.

Method Detection Limit (MDL) - The lowest concentration which gives a measured concentration which is between 50 and 150% of its true value. This concentration is normally determined by adding a known amount of the native analytes to a representative sample matrix and performing the appropriate extraction and/or instrumental analysis steps.

Below the Method Detection Limit (BMDL) - If analytes are measured at concentrations below their MDLs, their concentrations will be identified as "BMDL (value)" with the measured concentration being given in parentheses. This is done so that concentration information is retained which may be important in determining if these compounds may be present in various method/sampling/instrument blanks and therefore should not be considered to be a part of the sample under analysis. Values which are reported BMDL may be in error by as much as 200% or more and therefore critical decisions should not be based upon the actual concentrations reported.

Analysis Flow Sheet - Terminology used to reference a graphic description of a Standard Analysis Method. This flow sheet gives specific information on how samples, extracts, and standards are analyzed and what types of data reduction methods are used.

TECC = Total Extractable Chromatographable Components. This terminology refers to the total concentration of components measured using the capillary GC/FID Standard Analysis Method FLAN03. The value is calculated by summing all peaks which are present in the chromatogram after the solvent peaks, subtracting all surrogate and internal standard areas, and dividing this total area by the area of the dodecane internal standard and multiplying by the internal standard concentration. This gives a Total Extractable Chromatographable Concentration in the extract (in units of ug/mL). A dilution factor is then applied which results in reporting the TECC in the original sample. These calculations assume: 1) 100% extraction efficiencies for all chromatographable components, and 2) that the FID responses of all extractable chromatographable components equal that of dodecane. Both of these assumptions are not correct, but this approach gives order-of-magnitude estimates which are very useful in comparing samples.

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SURR1, SURR2, SURR3, SURR4, SURR5, SURR6. These abbreviations for the six surrogate compounds are defined in data tables located elsewhere in this report.

SS and IS = Surrogate and Internal Standard. These abbreviations are shown in figures in the appendices. The internal standard for capillary GC/MS analyses using MSAN02 is anthracene-d10. The surrogate standards used in WSEX05 are shown at the bottom of data tables. The surrogate and internal standards used in the purge-and-trap capillary GC/MS analysis are shown in MSAN27.

CH_3-naphthalene or me-naphthalene, etc. Abbreviations for methylnaphthalene isomers. Dimethyl- and trimethylnaphthalene isomers are similarly named. Similar abbreviations may be used to identify various features of chromatograms located in the report and in the appendices.

n-C_{11}, n-C_{12}, n-H/C. Abbreviations for normal hydrocarbon with 11-carbons, 12-carbons, or unknown number of carbons. Mass spectra, upon which these identifications are based, are very similar, no matter how many carbons are present in the specific hydrocarbon.

Isomers. Terminology indicating that the specific details of the bonding in the molecule are unknown. In many instances, mass spectra of compounds with the same molecular formula, but with different positions of various functional groups, will appear almost identical. In order to determine what specific isomer is present in an environmental extract, analytical standards containing all possible isomers must be prepared and analyzed under the same chromatographic and mass spectrometric conditions. This is generally not feasible and therefore, unless standards containing specific isomers have been analyzed, and have been shown to have the exact retention time as the unknown compounds, or unless mass spectra of specific isomers are unique, specific isomer information is not available.

AMU. Abbreviation for Atomic Mass Unit. This corresponds to the molecular formula weight, when ^{12}C, ^{1}H, ^{35}CL, ^{15}N, and ^{16}O are used in calculation. The molecular weight of a non-nitrogen-containing compound can be estimated from it's mass spectrum if there is an intense even-mass fragment, and if odd-mass losses are seen, and if there are isotope peaks following the assumed molecular weight which are present in the 5 - 15% range.

Base Peak. The largest peak in the mass spectrum of a compound.

Further Information

The general area of Extract Analysis, along with much of the terminology described above, is very complex. References provided in the previous section entitled "Analyte Extraction Terminology" may provide further information which may be useful in understanding instrumental analysis fundamentals and terminology.

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HARTOLDMON0043923

GOOD LABORATORY PRACTICES AND QUALITY ASSURANCE STATEMENT

This report represents a Level III study as described in the Environmental Sciences Center (ESC) Good Laboratory Practices/Quality Assurance/Quality Control Manual, 1988. A Level III study is performed for a Monsanto client using a method developed or modified by a scientist in ESC. The final report has been reviewed for completeness and adherence to the GLP and QA policies as described in the Manual.

Quality Assurance practices such as instrument calibrations, standard preparation, use of method blanks, spikes and replicates have been followed and the results are included in the final report. Good Laboratory Practices policies such as documentation of procedures in Standard Operating Procedures and documentation of the data in run logs, notebooks, etc., have been followed.

The raw data will be retained by the ESC according to the Monsanto Records Retention Policy.

Janet M. Lee April 10, 1990

Janet M. Lee
Supervisor, QA/QC/GLP

DSW 022431

ADAD21-017635
HARTOLDMON0043924

Monsanto

MONSANTO COMPANY / DAYTON LABORATORY / DAYTON, OHIO 45407

ESC/DAYTON
(Department/Section)

ANALYTICAL
(Type of Report)

(5)

REPORT NO.: MDA-636

JOB/PROJECT NO.: 217

DATE: 12 July 1985

PERIOD COVERED:

TITLE: ANALYSES FOR PCB's IN SOIL SAMPLES

AUTHORS: B. M. Hughes

RECEIVED
JUL 17 1985
Ans'd.....

ABSTRACT: Soil samples from the Anniston plant were analyzed for possible concentrations of polychlorinated biphenyls. The results of these analyses are shown in this report.

TECHNICAL APPROVAL: P L Sherman /RSL
P. L. Sherman
Sr. Research Group Leader

APPROVED BY: R F Ivory
R. F. Ivory
Environmental Sciences Center
Service Project Manager

APPROVAL DATE: 7-12-85

RESTRICTED DISTRIBUTION: (see over)

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DSW 015269

REPORT NO.: MDA-636 AUTHORS: B. M. Hughes
COPY NO.: 1 TITLE: ANALYSES FOR PCB's IN SOIL SAMPLES

PLAINTIFF'S EXHIBIT
10

ADAD21-017636
HARTOLDMON0043925

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ABSTRACT ONLY

H. A. Wolfermann

NOTE: Distribution of this report is restricted. Requests for additional copies should be made through the principal contact at the Monsanto location involved or the Manager, Environmental Sciences Center, Dayton Laboratory, Dayton, Ohio.

ACKNOWLEDGEMENT

Contributions of the following Dayton Laboratory personnel to this project are gratefully acknowledged:

Analyses: B. M. Hughes
D. McKenzie
B. Williams
C. Trang

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ADAD21-017637
HARTOLDMON0043926

Time Stamp - (850711.1028)

ANALYSIS REPORT

DATE: 7-10-85

LOG NUMBER: 1-85-06-20-01 PROJECT NO: 760.18 - 217

TO: Anniston/Ivory

FROM:

Environmental Sciences Center
Monsanto Company/Dayton Laboratory
1515 Nicholas Road
Dayton, Ohio 45418

Phone No: (513) 268-3411

Title: Polychlorinated Biphenyls in Nine Anniston Soil Samples

Standard Sampling Method No(s): Samples supplied by the Anniston Plant.

Standard Extraction Method No(s): PCEX21

Standard Analysis Method No(s): ECAN02

Final Report File No(s): A21718

Table File No(s): B21718

Nine soil samples were received from the Anniston Plant for PCB analysis. Samples were prepared for analysis using Standard Extraction Method PCEX21. GC/EC analysis, using Standard Analysis Method ECAN02, showed that several of the samples contained PCBs ranging from 5 to 1211 ug/g. Table 1 summarizes the values obtained for Aroclor formulations: 1242, 1248, and 1260. Table 1 also reports the total concentration of PCBs present as the sum of A1242, A1248, and A1254.

Also included in this report are:

1) A copy of Log-in information generated.
2) A copy of the Standard Analysis Method, and the Standard Extraction Method used in analyses.
3) A copy of chain-of-custody information for this project.
4) A copy of the ESC/UAG GLP Manual which explains quality control procedures utilized by ESC.

ANALYST(S): B. Mason Hughes, Chi Trang, David McKenzie, and Barbara Williams

ANALYST APPROVAL: B. Mason Hughes

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ADAD21-017638
HARTOLDMON0043927

TABLE 1. Summary of PCB Concentrations and QA/QC for Anniston Soil Samples.

ESC Project No: 760.18 - 217 Date: July 9, 1985

Sample I.D.	Surrogate Recoveries(%Recovery) CL5-benzene	2,4,6-CL3-biphenyl	PCB Concentration (ug/g) A1242	A1248(d)	A1260	Total
S-6-18-85-01-01	-(c)	-(c)	524.0	<100(b)	190.0	714.0
SFB-6-18-85-01	111	106	ND(a)	ND(a)	ND(a)	ND(a)
S-6-18-85-02-01	-(c)	-(c)	923.0	<100(b)	288.0	1211.0
S-6-18-85-03-01	106	124	<10(b)	88.0	33.0	121.0
S-6-18-85-04-01	99	103	ND(a)	7.0	5.3	12.3
SFB-6-18-85-01(Site4)	101	105	"	ND(a)	ND(a)	ND(a)
S-6-18-85-05-01	105	107	"	12.0	5.2	17.2
S-6-18-85-05-01(DUP)	100	106	"	10.3	4.6	14.9
S-6-18-85-06-01	99	102	"	3.1	2.0	5.1
SFB-6-18-85-01(Site6)	107	109	"	ND(a)	ND(a)	ND(a)
Method Blank	94	95	"	"	"	"

Native Spiking Data	Amount A1254 Spiked (ug/g)	Amount Detected (ug/g)
SFB-6-18-85-01(Site 4) + LS	1.1	1.0
SFB-6-18-85-01(Site 1) + HS	9.9	9.8

Explanation of Table: Limit of detection (LOD) = 1.0 ug/g
Duplicate analysis = DUP.
LS = low level native spike(e)
HS = high level native spike(e)

Footnote(s):
a - ND = not detected at the LOD.
b - An estimated LOD for particular Aroclor formulations in the presence of other Aroclor formulations at higher levels.
c - Recoveries of surrogate compounds could not be calculated because the samples were diluted in order to quantitate PCBs present.
d - Differentiation between Aroclors 1242 and 1248 is based upon early eluting trichlorobiphenyl congeners. However, natural environmental degradation, such as exposure to heat, may alter this pattern from that of 1242 to that of 1248. Therefore Aroclor 1248 reported in the above table may originate from Aroclor 1242 further upstream. The quantitative results reported in the table would not be affected by this transformation.
e - See UAG/GLP manual for quality control criteria.

TABLE FILE NO: B21718:MH

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ADAD21-017639
HARTOLDMON0043928

The following pages describe Analytical Request Information generated for this project.

ADAD21-017640
HARTOLDMON0043929

MONSANTO COMPANY/DAYTON LABORATORY

ENVIRONMENTAL SCIENCES CENTER

ANALYSIS REQUEST

DATE: 6/20/85 LOG NO: 1-85-06-20-01

REQUESTER: ANNISTON PROJECT NO: 760.18 - 217

REPORT RESULTS TO: FILES/MEES, IVORY, SHERMAN, HUGHES, McKENZIE, TRANG

ANALYSIS REQUESTS SENT TO: FILES, IVORY, SHERMAN, HUGHES, McKENZIE

SAMPLE PICKUP BY: McKENZIE

SAMPLE LOCATION: BUILDING 2 LAB 28

SAMPLE DESCRIPTION FOR --- SAMPLES

SAMPLE IDENTIFICATION	NUMBER OF BOTTLES	ESC NUMBER(S)
S-6-18-85-01-01	1 pt.	PCB-1356
SFB-6-18-85-01 (SITE 1)	1 pt.	PCB-1357, PCB-1367-HS
S-6-18-85-02-01	1 pt.	PCB-1358
S-6-18-85-03-01	1 pt.	PCB-1359
S-6-18-85-04-01	1 pt.	PCB-1360
SFB-6-18-85-01 (SITE 4)	1 pt.	PCB-1361, PCB-1366-LS
S-6-18-85-05-01	1 pt.	PCB-1362, PCB-1363-DUP
S-6-18-85-06-01	1 pt.	PCB-1364
SFB-6-18-85-01 (SITE 6)	1 pt.	PCB-1365
METHOD BLANK		PCB-1368
	RECORDED BY:	McKENZIE

REQUIRED ANALYSES: PCBs

ANALYTICAL TECHNIQUES:

TECHNIQUE (EN)	DATE COMPLETED	TECHNIQUE(EN)	DATE COMPLETED
X— GC/EC (18)	7/9/85	--- GC/MS ( )	———

QUANTITATIVE: X

REQUIRED QA/QC: SEE GOOD LABORATORY PRACTICES MANUAL

COMPLETION DATE REQUESTED:

COMMENTS:

SAMPLE DISPOSITION: - HOLD FOR 60 DAYS

SAFETY PRECAUTIONS: SEE SAFE LABORATORY PRACTICES MANUAL

ANALYSIS REQUEST FILE NAME: AA217:LI

DSM 015274

ADAD21-017641
HARTOLDMON0043930

The following pages describe Standard Extraction Methods and Standard Analysis Methods used for this project.

ADAD21-017642
HARTOLDMON0043931

ESC Standard Extraction Method (SEM)
TITLE: PCBs in Non-EC Active Matrices

ESC Standard Extraction Method No:
PCEX21

MATRI(X),(CES):	TYPICAL SAMPLE SIZE (g)	TYPICAL EXTRACT VOLUME (ml)
Soils and other non-EC active solids and solvents	0.5 - 5.0	10

TYPICAL ANALYTES: Aroclors 1232, 1242, 1248, 1254, 1260, 1262, trichloro-biphenyl isomers through octachloro-biphenyl isomers

ESC Standard Analysis Method Nos:
ECAN01, ECAN02

INTERFERENCES: Any electron capturing species in the retention time region of trichlorobiphenyl isomers through octachlorobiphenyl isomers that is non acid hydrolyzable

TYPICAL SURROGATES	TYPICAL RECOVERIES (%)
pentachlorobenzene	50 - 120
2,4,6-trichloro-biphenyl	50 - 120

APPARATUS AND MATERIALS:
Burdick and Jackson benzene or hexane for sample extraction or dilution.
Pierce vials.
Sulfuric acid at varying concentrations.
Ultrasonic bath.
Disposable glassware.
(See flow sheet for this extraction method in PCFS21.)

LIMITATIONS: Method applies only to matrices which do not contain interfering electron capturing species in the trichlorobiphenyl through octachloro-biphenyl isomer retention time region.

SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.

DATES OF METHOD CREATION AND UPDATES: 12/17/84

ADAD21-017643
HARTOLDMON0043932

FLOW SHEET PCFS21

FOR ESC EXTRACTION METHOD PCEX21

SAMPLE ID: ---------- MRC EXTRACT # ----------

---------- LOG NO: ----------

EXTRACTION DATE and TIME: ----------

SAMPLE COLOR AND DESCRIPTION ----------

WEIGH OUT SAMPLE INTO A 14 OR 40 mL PIERCE VIAL	[ ]	SAMPLE WEIGHT----------
SURROGATE SPIKE OF SAMPLE	[ ]	----------
ADD 10.0 mL BENZENE TO SAMPLE.	[ ]	
ULTRASONICATE SAMPLE FOR 1/2 HOUR IN A SOUND BATH.	[ ]	
PLACE 2 mL OF THE EXTRACT INTO A 7 mL VIAL	[ ]	
ADD 2 mL ------ SULFURIC ACID AND SHAKE	[ ]	
ALLOW PHASES TO SEPARATE REMOVE 1 mL FOR ANALYSIS.	[ ]	FINAL VOLUME 10.0 mL

EXTRACT NO: ----------

DATE/TIME COMPLETED ----------

ANALYST: ----------

ESC JOB NO: ----------

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ADAD21-017644
HARTOLDMON0043933

ESC Standard Analysis Method (SAM)
TITLE: Aroclor Formulations in Solvents

ESC Standard Analysis Method No: ECAN02

ANALYTICAL INSTRUMENT AND MODE OF OPERATION: HP-5880 Capillary GC/EC interfaced to an HP-3357-LAS Laboratory Data System

TYPICAL ANALYTE	TYPICAL INSTRUMENT LEVEL OF DETECTION (LOD) (ug/ml)	TYPICAL PRECISION @ 10X LOD (%)	TYPICAL ACCURACY @ 10X LOD (%)
Aroclor formulations 1232, 1242, 1248, 1254, 1260, and 1262	0.1	30	30

INTERFERENCES AND LIMITATIONS: Any electron capturing species in the retention time region of trichlorobiphenyl through octachlorobiphenyl isomers are potential interferences. Exact retention times of most likely PCB isomers can be obtained from the analysis of Aroclor 1248, Aroclor 1254 or Aroclor 1260 formulations.

CHROMATOGRAPHIC COLUMN: 30-meter fused silica J&W DB-5 (0.25 uM) with wide bore (0.32mm).

COLUMN TEMPERATURE PROGRAM: 130(1)/4/300 INJECTION TYPE: Splitless

CALIBRATION AND STANDARDIZATION: Use internal standard quantitation technique and calibrate instrument response factors from authentic Aroclor formulation standards. Use a minimum of 10 PCB isomers for the determination of formulation identity and quantity.

CALCULATIONS: Formulation concentration =
(isomer RRF)(isomer area/internal standard area)

where: RRF is the relative response factor for the appropriate PCB isomer in a given formulation. Formulation concentration is obtained from the average of at least 10 such calculations.

SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.

DATE OF METHOD CREATION: 10/25/83, 2/3/84 Time Stamp - <850201.1123>

ADAD21-017645
HARTOLDMON0043934

The following pages show chain-of-custody information for this project.

ADAD21-017646
HARTOLDMON0043935

QUALITY ASSURANCE FORM #4

SAMPLE TRANSMITTAL LETTER

Client MONSANTO Project Title MIC-NAMP

Date shipped 6-19-85 Shipped by [illegible]

Shipped from Anniston

Shipped to Dayton ESC Attention of Mason Hughes

Additional shipping information or comments Anniston PCB Samples from Snow Creek and drainage ditch

Sample description code	Comments
S-6-18-85-01-01	
SFB-6-18-85-01 (site 1)	
S-6-18-85-02-01	
S-6-18-85-03-01	
S-6-18-85-04-01	
SFB-6-18-85-01 (site 4)	
S-6-18-85-05-01	
S-6-18-85-06-01	— [illegible]
SFB-6-18-85-01 (site 6)	

Samples received by (Monsanto representative [illegible]

Date samples received [illegible]

Return letter received by contract laboratory _____ Date _____

DSW 015280

The following is a copy of the ESC/UAG Good Laboratory Practices Manual.

OSW 015281

ADAD21-017648
HARTOLDMON0043937

Copy Number: _____

GOOD LABORATORY PRACTICES MANUAL

A Guide to Quality Control/Quality Assurance

Ultratrace Analysis Group

March 1984

Joseph J. Brooke
Group Leader, Ultratrace Analysis

H. A. Woltermann
Manager, Environmental Sciences Center

Issued to: _____

Date: _____

Environmental Sciences Center
Dayton Laboratory
Dayton, Ohio 45407

JR3/JOB A

DSW 015282

ADAD21-017649
HARTOLDMON0043938

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HARTOLDMON0043939

I. Objectives

The main objectives of the Ultratrace Analysis Group quality assurance/quality control program are: 1) to assure that our laboratory generates high quality results; and 2) to maintain the necessary records that document laboratory performance.

II. Scope

The scope of this manual includes areas of GLP not specifically addressed in the ESC section manual and expands upon certain areas where QA/QC practices differ from those described in the section manual. It is intended to be used along with the section manual to provide a complete picture of the GLP within the Ultratrace Analysis Group.

III. Analysis

The generation of analytical results within the Ultratrace Analysis Group routinely involves two processes: sample preparation and instrumental analysis. Sample preparation involves one or more of a variety of techniques including extraction, dilution, acid/base washes, column chromatography, concentration and numerous other techniques to render the sample in a suitable condition for instrumental analysis. Instrumental analysis takes the suitably prepared sample and introduces it into an analytical instrument to measure the desired parameter(s). Both of these processes can be described by clearly defined and separable methods called sample preparation methods (SPMs) and instrumental analysis methods (IAMs). SPMs and IAMs may be combined in numerous ways (depending upon the nature of the samples and the needs of the customer) to produce a successful analytical protocol. For example, several different SPMs may be used to produce samples that are suitable for analysis by a single IAM. The measures incorporated into each of these experimental processes to ensure that an assessment of the quality of the results can be made constitute the QA/QC program for a project. The following subsections describe the elements of the analysis process:

A. Methods

Methods are the written documentation that describe the analytical process. They contain sufficient detail such that a competent scientist or technician can readily perform the required analyses. The usual practice is to have methods that describe the sample preparation process (SPMs) and methods that describe the instrumental analysis process (IAMs). Each method developed within the Ultratrace Analysis Groups is assigned a method number as described in the ESC Section Manual.

Methods are obtained from various sources including in-house development, modification/adaptation of literature methods, or specific protocol methods dictated by government agencies. Methods may be formally validated by a series of experiments that describe a classical validation protocol or may be less vigorously proven owing to factors such as frequency or use, customer needs and

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cost/timing restrictions. In any case a QA/QC program is applied to the analysis process to provide a measure of the quality of the results. Unless a QA/QC program is prescribed by a required protocol (e.g., EPA Dioxin in Soil protocol), certain minimum QA/QC measures (depending upon the analysis type) are incorporated into all Ultratrace Analysis projects. The following subsection describes the Ultratrace QA/QC program:

B. QA/QC Program

An effective QA/QC program incorporates experiments that provide information relative to each of the following questions:

(1) Are there any impurities, background or contamination that will influence the results?

(2) How reproducible are the results?

(3) How well can the analyte be recovered from the sample matrix?

(4) What is the limit of detection for the analysis?

(5) What is the dynamic range of the analysis?

(6) What is the accuracy of the analysis?

All of these questions are addressed by properly selecting/applying the use of blanks, replicates, spikes and standards in a QA/QC program. The discussion of the use of these QA/QC techniques as they apply to Ultratrace Analysis Group activities is best done by considering the sample preparation and instrumental analysis processes separately.

1. Sample Preparation QA/QC

a. Method blanks - Representative glassware, solvents and reagents are used with sample matrices which are similar to those for which results are being reported, yet do not contain the analytes of interest. Method blanks are analyzed at a frequency equal to 10% of the analyzed samples for sample sets which are multiples of 10. At least one method blank is analyzed for sample sets containing between 1 and 9 samples.

b. Replicates - If sufficient sample amounts have been submitted for analysis, replicate frequency is the same as the method blank frequency. If at all possible, replicates should be obtained from the same sample bottle in order to minimize sample inhomogeneity problems due to samples being taken at slightly different times.

c. Spikes - If sufficient sample is available for each sample type, the sample is split and spiked at two levels with

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the native (unlabeled) analyte(s). The levels are typically 2x (low) and 20x (high) the anticipated detection limit and serve as a technique for estimating the limit of detection for each matrix. These low and high spikes are conducted at a frequency equal to the Method Blank frequency. Obviously spiking with the native analyte cannot be done for widescan analysis since this presupposes knowledge of the identity of the analyte(s) in the sample.

Other spiking techniques are used to evaluate the extraction/recovery efficiencies for the analyte(s) of interest. Ideally extraction/recovery efficiencies are determined for each sample, since, in principle, each sample may represent a different matrix. This can be done very easily when the detection technique is mass spectrometry if an isotopically labeled version of the analyte(s) is available. Documentation of extraction/recovery efficiencies is not required for each sample if the sample matrix for a set of samples is constant. However, for a sample set for which the similarity of samples is not known, and for which adequate sample is available, each sample must be split and spiked with a known amount of the analyte(s) of interest to determine extraction efficiency. If adequate sample size is not available or the identity of the analyte(s) is not known before the fact (i.e., widescan analysis), surrogate spiking compounds may be used to assess extraction efficiencies in each sample without actually spiking each sample with the analyte(s) of interest. The choice of the surrogate spiking compound is tailored for each analyte. This surrogate must be chosen so that it is either chemically identical to the analyte of interest (for example using isotopically labeled analogues of the analytes), or is closely similar in terms of liquid/liquid partition properties, chemical reaction properties, column elution properties or other matrix isolation properties which are used to isolate the analyte(s) from the sample matrix. Another property of the surrogate spiking compound is that it not be present in the sample being analyzed.

2. Instrumental Analysis QA/QC

The final step in obtaining analytical results involves the use of an appropriate instrumental technique to produce the analytical data. Several QA/QC practices must be incorporated in this process to ensure validity of the data.

a. Instrumentation

Careful documentation of instrument usage, calibration, and maintenance is essential for the generation of high quality results. Each major instrument within the Ultratrace Analysis Group will be the assigned responsibility of a professional employee designated as the Instrument Steward. The Instrument Steward is responsible for making sure that logbooks are available and properly completed by instrument users. It is the

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HARTOLDMON0043942

responsibility of each individual using the equipment to record all the pertinent data required in the logbook. An example of a page from a GC/MS logbook is given in Figure 1 and that of a GC/EC logbook is given in Figure 2.

Instruments will be calibrated according to the instrument manufacturers' specifications or according to the method being used with the instrument. A log of instrument calibration will be maintained with the instrument.

The Instrument Steward will be responsible for ensuring that preventative and corrective maintenance programs are carried out on all instruments under his/her responsibility. If a specific problem is noted by an instrument user, it should be noted in the logbook and the Instrument Steward notified so that appropriate corrective action can be taken.

b. Blanks

A solvent blank will be analyzed at a frequency equal to the method blank. The method blank can serve as the solvent blank provided it is clean in the area of the analyte(s) of interest. This practice eliminates the possibility of background instrumental contamination.

c. Quantitation Internal Standard

A quantitation internal standard will be added to each sample following sample preparation but prior to instrumental analysis. This compound will serve for determining relative response factors and for correcting for variations in sample injection volumes and evaporation of solvents.

d. Standards

Standards are solutions of the analyte(s) of interest used to determine the response of the detector over the range of analyte concentrations found in the samples. For Quantitative analyses, sufficient standards and replication of standards will be run to demonstrate linearity and precision of the detector response over the range of analyte concentrations. Should sample concentrations fall outside the demonstrated linear range, either additional standards are prepared to expand the range, or appropriate dilution/concentration of the sample is done to place it in the proper range.

C. Degrees of Quantitation

The information provided for any particular analysis is tailored to the needs of the customer. In actual practice these needs vary across the broad continuum from the grossly qualitative to the precisely quantitative. It is informative to examine what is involved in providing the varying degrees of quantitation required by our customers.

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HARTOLDMON0043943

HP 5985A

MRC-DA
Nº 156047

SUBJECT _____ DATE _____ 19___ READ AND UNDERSTOOD BY ME

SIGNATURE _____ DATE _____ 19___

Job No. _____

Date	Analyst	Job Number	Run Time	Time of Day	CRM	AR	7920 Disc Pack	FRM	Volume (ml)	Sample Identification	Comments	MS Instrument Number	GC Conditions	Run Time	MS Conditions: Multi	Thres	ADC	Mass	De
25-84	SM	309	10011	1hr.	112	02	AE	18:50	1µl	150ng/ml		1	50(5)/8/300	39	2000	100	1	300	3
								51				2							
								52				3							
								53				4							
								54				5							
26-84	SM	309	10011	1hr	112			18:55		150ng/ml		–		39	2000	EI	E 300	17	
30-84	SM	Installed	new	HP	multiplier														
31-84	SM	983	2528	1hr.	112	02	AE	18:56		150ng/ml		4	50(5)/8/300	39	2000	EI	E 300	18	
								18:57											
1/84	Bent	280	5279	1	112	02	AE	18:58	1	150ng/ml		1	50(5)/8/300	39	2000	100	1	300	3
								59				2							
					113	03	AE	19:00				3							
								01				4							
1/84	Bent				112	02	AE	18:58				1		18	100				
								59				2							

FIGURE 1. Example of GC/MS Logbook page.

382510 RSD 015288

ADAD21-017655

HARTOLDMON0043944

HP 5880 GC/EC

MRC-DA

Nº 1563(

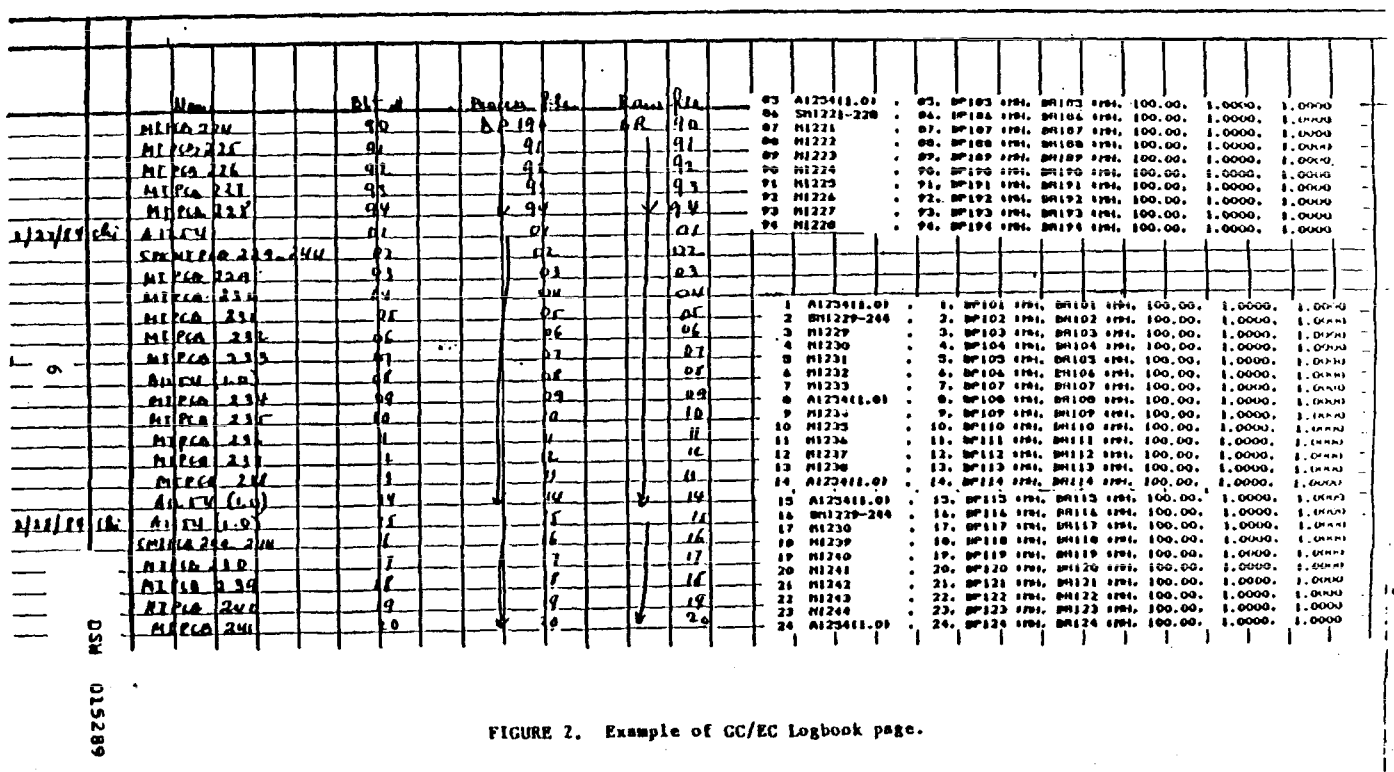

FIGURE 2. Example of GC/EC Logbook page.

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HARTOLDMON0043945

1. Qualitative Analysis

Qualitative analysis implies no quantitation at all but rather seeks only the identity of the compound(s) present. GC/MS is particularly applicable to this type of analysis problem. Two types of identifications can be made:

a. Tentative

A tentative identification is made on the basis of the analyst's judgement of a match between the mass spectrum from the sample and a mass spectrum from a reference library. This is often done for the large number of compounds found in a widescan organic analysis.

b. Confirmed

A confirmed identification requires that the chromatographic retention time and the mass spectrum of the unknown compound match those of a known standard of the tentatively identified compound. This is often done in widescan analyses when standards can be obtained for tentatively identified compounds that are of concern.

The normal QA/QC requirements for qualitative analysis are (1) analysis of a blank, (2) analysis of duplicate samples and (3) use of a calibration compound (usually Decafluorotriphenylphosphine, DFTPP) to assure that the mass spectrometer will produce mass spectra that can be compared with library spectra.

2. Semi-Quantitative Analysis

Semi-Quantitative Analysis extends the information provided by a qualitative analysis to include some estimate of the amount of analyte(s) present. The method of semi-quantitation involves the comparison of detector response of the analyte(s) with that of an internal standard. The estimated concentration is obtained by assuming a unit response factor between the analyte(s) and the internal standard(s). An indication of recovery from the sample matrix is obtained from the recovery of the surrogate internal standard(s).

3. Quantitative Analysis

Quantitative Analysis provides for the accurate assessment of the amount of analyte(s) present in a sample. To be able to do quantitative analysis one must know the identity of the analyte so that standards can be prepared for spiking and for the generation of calibration curves. The method of quantitation is based on a three-point calibration curve using standards of the analyte(s) of interest over the range of concentrations in the samples. A one-point calibration method can be used (as with the laboratory data

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HARTOLDMON0043946

system) provided that linearity has been demonstrated over the concentration range of the samples using standards of the analyte(s) at three concentrations in the range. This calibration curve is then used to provide concentrations of the analyte(s) in the samples via an external standards method or more preferably via an internal standards method. For the internal standards method, the quantitation internal standard is added to each of the standards (just as with the samples) prior to instrumental analysis and relative response factors are determined.

For quantitative analysis the mass spectrometer is operated as a gas chromatographic detector. The MS is therefore tuned and operated in a manner specified in the approved method rather than using a calibration compound as required for qualitative analyses.

D. Quality Criteria and Remedial Action

The inclusion of QA/QC measures into an analysis program has little meaning unless the results are interpreted and appropriate action is taken when necessary. The ability to do this assumes some set of criteria that will trigger a response or remedial action. The following subsections describe the criteria that are used in the Ultratrace Analysis Group to evaluate when quality control data indicate a need for corrective measures and what remedial action will be taken.

1. Quality Criteria

The overriding quality criterion above all others is: Do the results meet the needs of the customer. This determination will be made jointly between the customer and the analyst. The analyst must exercise caution in not allowing the customer to overstate, misinterpret or unintentionally misrepresent the data. In addition to this prime quality criterion, the following conditions must be met:

a. Blanks - In the event that a blank produces a positive value, it may not be used as a valid blank if it exceeds 10% of any reported value for a sample.

b. Recoveries - Recoveries for all surrogate and native spikes must lie in the range of 50%<Recovery<150%.

c. Precision - Precision will be calculated based on the recoveries of surrogate internal standards. Average recoveries will be calculated with ± standard deviation for each sample set. Replicate analyses and low and high native spike recoveries may also be used to provide additional information/insight into the precision of the analysis.

OSW 015291

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d. Limit of Detection - The limit of detection (LOD) will normally be stated as ½ the value of the low level native spike if it is recovered and quantifiable. Should the low level native spike not be recovered, the LOD will be stated as ½ the value of the high level native spike if it is recovered and quantifiable. Should neither spike be recovered, a decision must be made regarding the advisability of reprocessing the sample. Should all samples contain such large quantities of the analyte(s) that the levels of the low and high spikes are insignificant (≤10%) by comparison, the value of the LOD becomes less important and is simply stated as the LOD for the instrumental analysis process determined by the analysis of standards and the ability to recover the surrogate spikes.

e. Accuracy - The accuracy of the analyses is best determined by analyzing some sample which contains the analyte at some predetermined level (e.g., an NBS standardized sample). If this type of standard is not available then the low level and high level spikes can be used as a measure of the accuracy of the analyses. Results must fall within a range of 75% to 120% of the excepted value for the analyses to be considered valid.

If the above quality criteria are not met the analyst will immediately assess the need for and extent of remedial action that may be necessary.

2. Remedial Action

The first course of action will be for the analyst and/or group leader to contact the customer and discuss the results pointing out the limitations of the data indicated by the quality control results. At this point the overriding quality criterion of customer needs will be addressed first. It could be that the customer's needs are met without meeting one or more of the other criteria. In such a case no remedial action is necessary. It could also be that the customer has such a demand for tightness in the results that his needs are not met even though the other quality criteria are. This would trigger further analyses with tighter quality control designed around the results obtained (e.g., replications of positives to better establish precision or spikes of non-detected samples to better establish the limit of detection).

In consultation with the customer additional experiments will be designed including the appropriate quality control to ultimately provide the results of sufficient quality to meet the customer's needs.

IV. Data

This section deals with the subject of data and how they are obtained, recorded and reduced so as to be useable in a report and yet readily available for referral and inspection.

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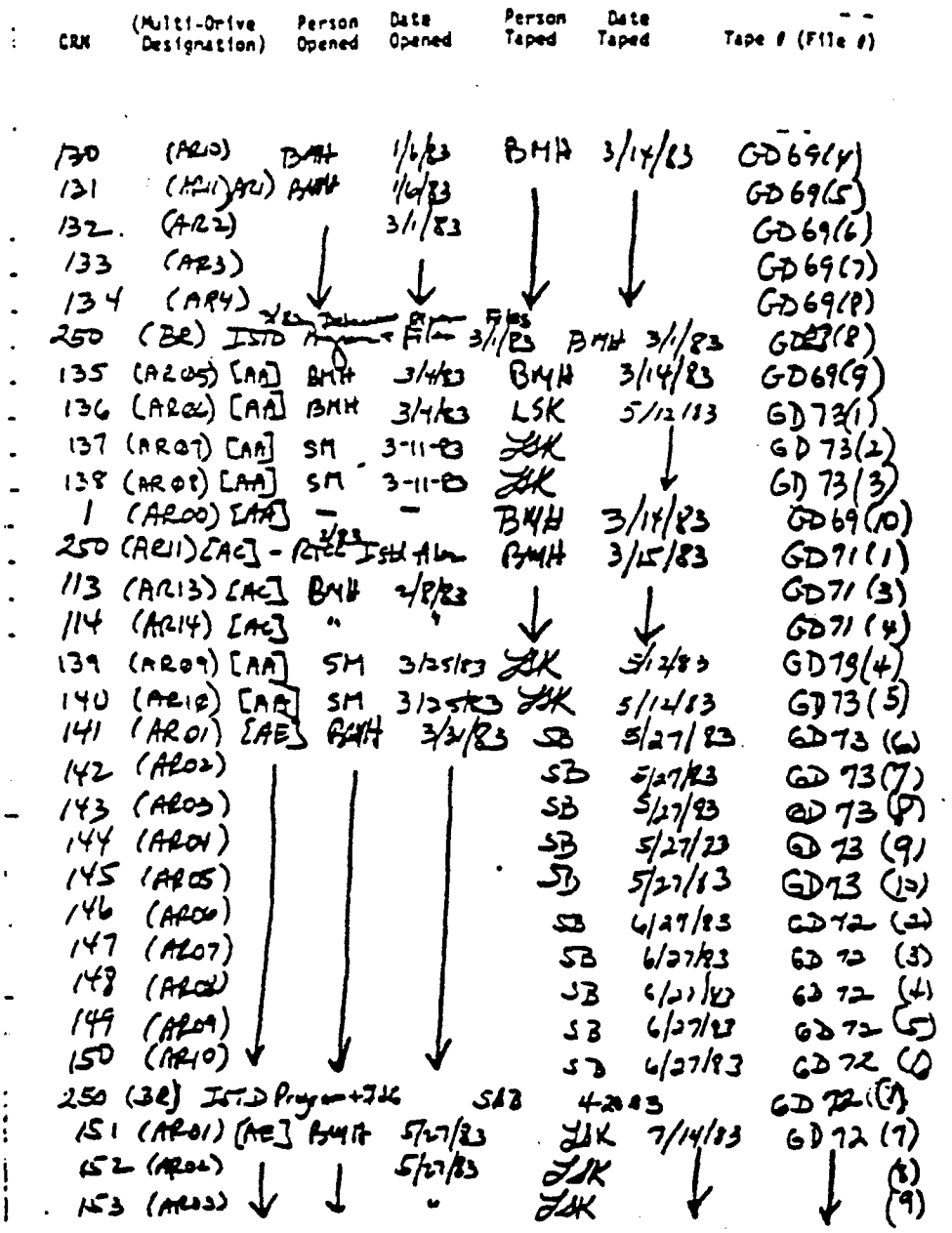

FIGURE 3. Example of DISC/Tape Logbook page.

DSW 015294

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HARTOLDMON0043949

Snow Creek Sediment

Sample I.D.	PCB (µg/g) Monsanto	ADEM
S-6-18-85-01-01	714	186
S-6-18-85-02-01	1211	1069
S-6-18-85-03-01	121	163.2
S-6-18-85-04-01	12.3	23.2
S-6-18-85-05-01	17.2	16.5
S-6-18-85-06-01	5.1	16.3

ADAD21-017661
HARTOLDMON0043950

ATTORNEY'S NOTES

FOSHEE & TURNER COURT REPORTER
1-800-888-3376

Monsanto

ORGANIC CHEMICALS DIV

Monsanto Company
800 N Lindbergh Boulevard
St. Louis, Missouri 63166
Phone: (314) 694-1000

September 1, 1971

Mr. H. J. Haynes, President
Chevron Oil Company
225 Bush Street
San Francisco, California 94120

Dear Mr. Haynes:

We recently contacted your firm relative to our desire for your firm to discontinue the use of the Therminol FR series heat transfer fluid and to replace them with a heat transfer fluid which does not contain polychlorinated biphenyl (PCB). The Therminol FR series includes Therminol FR Lo-Temp, Therminol FR-O and Therminol FR-1. Your firm indicated that because of the fire-resistant characteristics of the Therminol FR series, such a change could not be made at this time.

While we cannot make any assurances that Therminol FR products will continue to be available, we are, for the present and because of your special need for a fire-resistant heat transfer fluid, willing to continue supplying Therminol FR products to your firm on the following understanding:

1. Your firm acknowledges that it is fully aware that in some studies certain PCBs have been found to be persistent, an environmental contaminant and, possibly, injurious to some forms of bird, aquatic and animal life. Accordingly, it is very important that PCBs be kept out of the food chain.

DSM 019627

PLAINTIFF'S EXHIBIT

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HARTOLDMON0043952

2. Your firm shall use Therminol FR products only in existing heat transfer systems which are presently utilizing Therminol FR products. In no event shall your firm use any Therminol FR product in any system associated with, related to, or in connection with food, food-related products, animal feeds, pharmaceutical products, packaging materials involving any of those items and buildings where any of those items are manufactured or stored.

3. In the use of Therminol FR products, your firm shall use its best efforts to prevent entry of PCBs into the environment through spills, leakage, use, disposal, vaporization or otherwise.

4. Your firm shall indemnify and save Monsanto harmless against any and all losses, damages, costs and expenses (including cost of defense and reasonable attorneys' fees) which Monsanto may suffer, incur or pay out by reason of any claims, actions or demands arising out of or resulting from any pollution, contamination, toxicity or environmental matters which involve or are in any way associated with any of the Therminol FR products supplied to your firm. Your firm shall not assert any claims against Monsanto arising out of or resulting from any such pollution, contamination, toxicity or environmental matters.

It must be recognized that this letter in no way obligates Monsanto to continue to sell Therminol FR products to your firm. Monsanto reserves the right at any time to suspend, curtail or terminate the sale of Therminol FR products to your firm.

ADAD21-017664
HARTOLDMON0043953

If the foregoing is acceptable, please have one of the copies of this letter signed by an authorized officer of your firm and returned to the undersigned. We appreciate your cooperation in this matter; if there are any questions or comments, please contact us.

Sincerely,

Howard S. Bergen

Howard S. Bergen, Director
Specialty Products
Organic Chemicals Division

/jf

ACCEPTED AND AGREED TO:

_____

BY _____

TITLE _____

DATE _____

ADAD21-017665
HARTOLDMON0043954

Monsanto

FROM (NAME & LOCATION) Paul B. Hodges - St. Louis

DATE September 18, 1970

SUBJECT

REFERENCE

TO Toby Bell - Anniston

cc J. R. Savage - JSAVA
W. B. Papageorge - WPAPA
D. B. Hosmer - DHOSM
G. L. Jassee - Anniston
G. Miller - Anniston
J. Landwehr - Anniston
J. L. Corder - Anniston

CONFIDENTIAL

In reviewing your proposed letter to Joe Crockett with Legal, et al, we requested latest emissions data on the flow to Snow Creek. We had hoped that it might show an improvement over the 1st week in September and thus demonstrate a favorable trend to Crockett. Instead, the emissions are considerably increased with 9/13/70 at 6.25 ppm (or about 80 lbs. of PCB for the day). From the Legal standpoint, there is extreme reluctance to report even the relatively low emission figures because the information could be subpoenaed and used against us in legal actions. Obviously, having to report these gross losses multiplies, enormously, our problems because the figures would appear to indicate lack of control.

Realizing the extreme efforts the plant has gone to in order to curtail loss of PCB's, is there anything more that can be done to get the losses down? Is there a possibility that sampling practices are responsible for the wide variations shown (you might try duplicate effluent samplers)? Are there any practices in the manufacturing area which might result in the peak losses? Obviously, we cannot solve the problems from St. Louis but we do want to emphasize the concern from here.

Paul

Paul B. Hodges

/mp

PLAINTIFF'S EXHIBIT

12

DSM 014095

ADAD21-017666
HARTOLDMON0043955

February ?, 1972

518-747-3341 Ext 217
518-792-4583 Home

Dr. A. Posefsky
Industrial and Power Capacitor
Products Department
General Electric Company
John Street
Hudson Falls, New York 12839

Mr. E. L. Raab
Distribution Transformer Department
General Electric Company
100 Woodlawn Avenue
Pittsfield, Massachusetts 01201

Gentlemen:

Attached is a Question and Answer list for responding to PCB inquiries which I offered to mail to you at our December 10th ANSI C-107 meeting.

I recognize that the list is not complete but I hope it will serve as a good start with further additions made by your respective committees. Should any help be required from Monsanto in responding to additional questions, please let me know.

Sincerely,

W. B. Papageorge
Manager, Environmental
Protection

/hg

attachment

DSM 018940

cc: Messrs: A. M. Salazar - NEMA
P. G. Benignus- EPSC

111

PLAINTIFF'S EXHIBIT
13

ADAD21-017667
HARTOLDMON0043956

Questions and Answers For ANSI
PCB

1. Question

What is PCB?

Answer

PCB are initials which stand for polychlorinated biphenyl. PCB is a family of chlorinated hydrocarbons which have long been used as a fire-resistant safety fluid in electrical components.

2. Question

Is PCB in Askarel?

Answer

Askarel is a generic name for the PCB-containing fluids used in electrical transformers and capacitors. Individual electrical equipment manufacturers have different trade names which describe their specific fluid.

3. Question

Explain the current environmental flap over PCB.

Answer

In the mid-60's, scientific instruments became sophisticated to the point where parts-per-million or even parts-per-billion of a substance could be detected in the environment.

Swedish scientists, looking for DDT, encountered "interferring substances" in their laboratory analyses. These substances they identified as PCB.

Subsequently other scientists in other parts of the world looked for and found PCB in a variety of samples; thus leading to the conclusion that PCB exists in the worldwide environmen

DSW 018941

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HARTOLDMON0043957

4. Question

How does PCB get into the environment?

Answer

Probably through improper handling, use and disposal. A frequently cited accident occurred in Japan in 1968 when PCB leaked into rice oil which the Japanese use for cooking. Levels in the oil reached 2,000 to 3,000 parts-per-million.

However, it should be emphasized that when properly handled, used and disposed of, PCB can be as safe to use as any other chemical -- many of which are much more dangerous than PCB.

5. Question

Is PCB toxic?

Answer

Toxicity is a relative term. Some studies have shown it is toxic to certain species of birds and fish. More important, PCB is a persistent chemical which builds up in the environment. It, therefore, should not be allowed to escape to the environment.

6. Question

Does PCB cause birth defects?

Answer

Again, some studies have shown it can be detrementsl to the reproductive cycles of certain species of wildlife.

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HARTOLDMON0043958

7. Question

Is the public in any immediate danger?

Answer

The Federal Government at a press conference in September, 1971, stated emphatically that the public was in no danger from present levels of PCB now in the environment. They said proper steps were being taken to reduce further escape of PCB which would ultimately reduce even the low levels currently being found in the environment.

8. Question

How can PCB be disposed of?

Answer

Under high temperature, controlled incineration, PCB breaks down into hydrochloric acid, carbon dioxide and water. There are three commercial incinerators in the United States which can handle disposal of used fluids. Contact your supplier for information about returning used fluids for proper disposal.

DSW 018943

WBP 9/2/72

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HARTOLDMON0043959

Monsanto

MONSANTO AGRICULTURAL PRODUCTS CO.
P. O. Box 249
Anniston, Alabama 36202
Phone: (205) 236-6381

May 15, 1986

Mr. James M. Moore, III, Engineer
Industrial Branch
Water Division
Alabama Department of Environmental Management
1751 Federal Drive
Montgomery, Alabama 36130

Dear Mr. Moore:

Please find a copy of the proposed Snow Creek Sediment Removal Protocol attached for your review. We will discuss at the meeting scheduled for May 27 at 11:00 A.M. in Anniston.

Call if you have questions.

Sincerely,

Jerry L. Brown
Technology & Engineering Superintendent

LETTER/sag

Attachments

cc Mr. Craig Kneisel

bcc R. T. Allen - G3WB
R. L. Cheever
E. J. Jurevic
D. B. Redington - C2SB

PLAINTIFF'S EXHIBIT
14

DSW 015296

A unit of Monsanto Company

ADAD21-017671
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SNOW CREEK TRIBUTARY
SEDIMENT REMOVAL

Three sections of the drainage ditch and Snow Creek are proposed for sediment removal. The sediment removal will consist of dredging and disposal of bottom sediments, which will also effectively deepen and improve the channel of the drainage ditch. This plan also proposes the installation of a culvert in Section 1 (described below).

Section 1: Length of drainage ditch from sampling site 1 to sampling site 2. Effectively, this dredging operation will encompass the length of the ditch from the emergence of the ditch from the culvert under the Bethel Missionary Baptist Church to the culvert under Route 202, 10th Street. This distance is approximately 500 feet.

Section 2: Stretch of ditch between the Southern Railway railroad tracks and 11th Street, from where the ditch passes under the tracks, to the confluence of the ditch and Snow Creek. This distance is approximately 1200 to 1500 feet.

Section 3: Section of Snow Creek from the confluence to a point approximately 100 feet downstream.

Local authorities in Anniston will be contacted to arrange for necessary easements, approvals, and access rights to properties which will be affected by the proposed dredging operation.

The necessary contracts will be executed with an experienced contractor to carry out the proposed operations. All aspects of the operation will be funded by Monsanto Company, except for any analytical work done by regulatory agencies.

The dredging will be done by an experienced contractor. The specific heavy equipment and the dredging procedure will be specified to the contractor. The creek bottoms (sediments) will be dredged to a depth of approximately 12 inches or to bedrock and to a width defined by the width of the water in the ditch and creek. The dredging operation should proceed in a downstream direction to minimize recontamination by resedimentation of particulate material suspended during the dredging.

The dredged material is to be deposited on the creek bank for dewatering. (The dewatering is anticipated to take two days at the most.) Following dewatering the dredged material will be loaded and transported to a secured area at the Monsanto Company landfill. The material will be stored at this location only long enough to sample the dewatered sediment and to perform analyses to determine the average concentration of PCBs. (See below.)

After the dredging operations in the three sections of the drainage ditch and Snow Creek have been completed, the ditch and creek bottoms will be sampled in accordance with the sampling method developed for the 1985 program. Sampling sites will be selected to roughly correspond to sampling points 1, 2, and 3 of the original protocol, with an additional point to be sampled in section 2 of dredged ditch, between 11th Street and the railroad tracks. These samples will

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HARTOLDMON0043961

be shipped to the Environmental Sciences Center, Monsanto Company, St. Louis, MO., for expeditious analysis to verify the results of the dredging operation. This laboratory will be notified of the dredging schedule, to ensure that the analyses will be done as soon as possible. Results will be communicated by Monsanto Company to the Alabama Department of Environmental Management and the Alabama State Attorney General's office. Split samples will be made available to either agency upon prior request. Verification that the residual sediments in the ditch and Snow Creek contain less than 50 ppm PCBs will signal successful completion of the dredging operation.

Following acceptance of the results of the dredging program, no further action will be taken at sections 2 and 3 of the dredged ditch. The dredging will have accomplished an effective channelization of the ditch and Snow Creek, which will improve the water carrying capacity of the waterways. However, in section 1, a concrete culvert will be installed to completely enclose the ditch from its emergence from under the church to 10th Street. The culvert will be covered with backfill and seeded. Completion of this operation is predicated upon receiving proper approval from the landowners along this section of the drainage ditch.

The dredged materials will be transported to a temporary storage site at the Monsanto Company landfill site. The site will be a level section to eliminate risk of downhill migration of the stored material. The stored material will be covered with polyethylene sheeting or some other water-impervious material to prevent runoff, in the event of rain, and dispersal by wind. The covering will be secured with sandbags to prevent lift off caused by wind. The temporary storage site will be inspected daily to ensure the integrity of the protective cover.

The stored, dewatered dredgings will be sampled and analyzed by Monsanto Company to determine final disposition of the material. The sampling will be carried out in accordance with a scheme published in United States Environmental Protection Agency document EPA-560/5-85-026, "Verification of PCB Spill Cleanup by Sampling and Analysis." A 6 group compositing plan for 19 sample points, shown in the attached figure, will be used to statistically sample the dredged materials. The sampling plan is based on a hexagonal grid system, centered on the center of the stored sediments. The nineteen samples will be composited as shown in the figure. The six composited samples will be shipped to the Environmental Sciences Center, Monsanto Company, St. Louis, MO., for analysis for PCBs.

Sampling will be done using 1" x 18" stainless steel core tubes, as described in the protocol for the 1985 sampling program. The labeling, storage, shipping, and quality assurance aspects of that protocol will also be employed during the sampling of the temporarily stored material.

It is felt that this sampling protocol for the stored material will give a valid assessment of the PCB concentration of the bulk of the material. The dredging, loading, and dumping operations preceding this sampling should thoroughly mix the dredged materials. The six composited samples ultimately analyzed will therefore represent the bulk of the material. The analytical results for the six composited samples will be averaged to determine the average PCB concentration of the temporarily stored material.

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The results of the analyses of the temporarily stored material will determine the ultimate disposition of the sediments. If the average PCB concentration of the material is less than 50 ppm, the material will be moved to a cell at the Monsanto Company landfill at the Anniston Plant.

If the material is determined to contain PCBs at an average concentration of greater than 50 ppm, the material will be treated as PCB-contaminated waste. Monsanto Company will arrange to have the material disposed of at an EPA-approved PCB landfill in accordance with all applicable federal regulations. The landfill site is anticipated to be the Emelle, Alabama landfill, operated by Chemical Waste Management. However, Monsanto Company reserves the right to make other arrangements with an alternate permitted disposal site, if necessary. Proper certificates of disposal will be obtained to verify the ultimate disposal of the sediments.

In either case, a few inches of soil from the temporary storage site will be included along with the dredged material, to ensure that no PCB contaminated soil remains at the temporary storage site.

Since the PCB concentrations of the sediments during the dredging and transporting operations will be unknown, prudence dictates that all equipment involved in these operations be decontaminated in accordance with Section 761.79(b) of the federal PCB regulations. This decontamination involves swabbing surfaces that have contacted the sediments with a solvent in which PCBs are soluble to at least 5% by weight. Kerosene is one such solvent. The excess solvent and any mops, rags, etc. must be collected and disposed of as PCB contaminated material.

The dredging and transporting operations should not involve personal contact with the sediments. Normal precautions should be exercised. If the sediments are contacted, the affected body parts should be washed thoroughly with soap and water. Affected clothing should be laundered.

Sampling the temporarily stored sediments will probably involve contact with the material, including climbing on the piled dredgings. Personnel involved in this sampling should wear protective gloves, protective clothing, and boots. Since this will be an open air procedure, respiratory protection will not be necessary. If the protective clothing is of the disposable type, it should be collected and disposed of as PCB-contaminated material in accordance with federal regulations. This disposal is precautionary, since PCB contamination of the clothing is unlikely.

An MSDS for polychlorinated biphenyls is attached for information on occupational control procedures.

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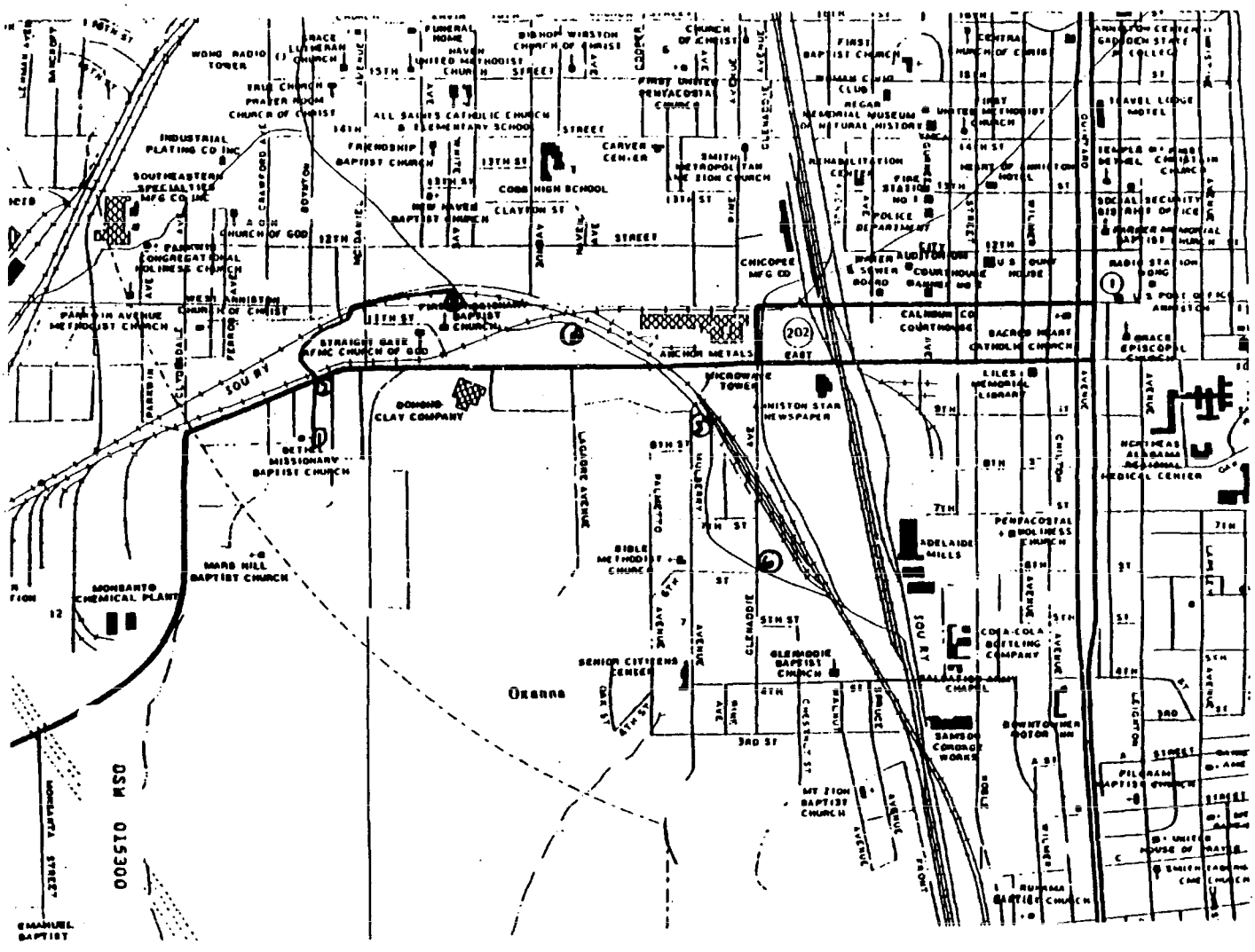
HARTOLDMON0043963



ADAD21-017675

United States
Environmental Protection
Agency

Office of
Toxic Substances
Washington DC 20460

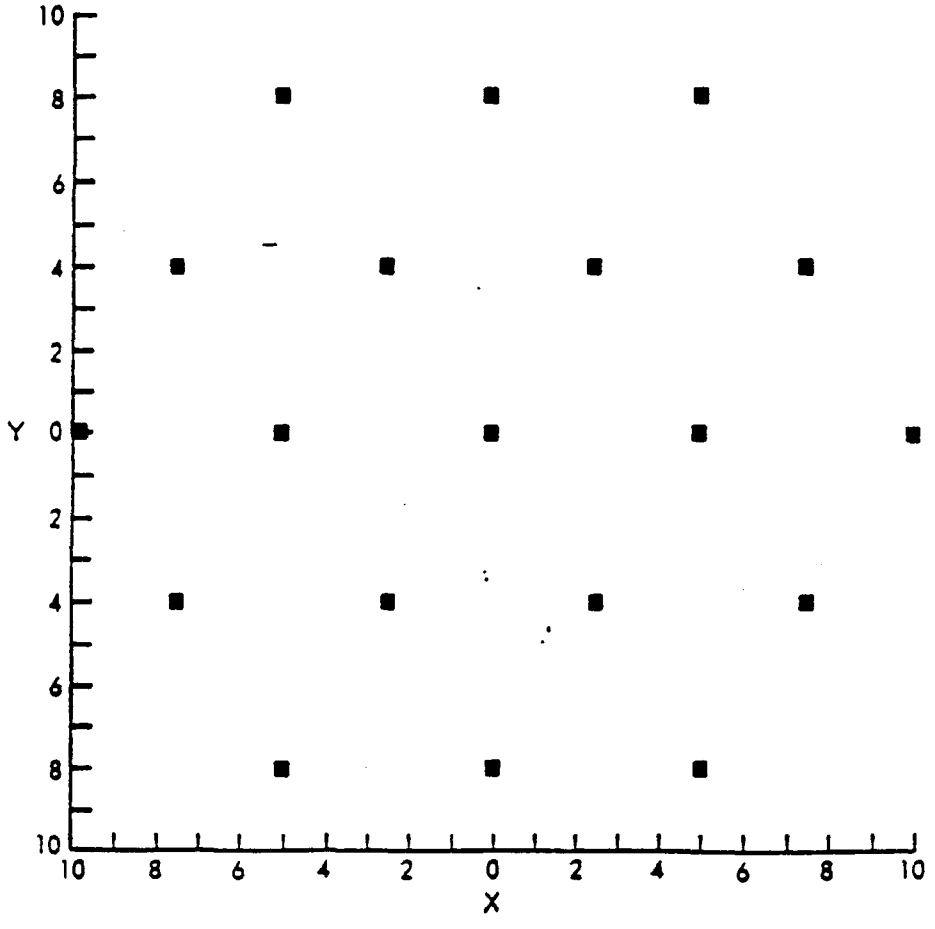
EPA-560/5-85-026
August, 1985

Toxic Substances

EPA

VERIFICATION OF PCB SPILL CLEANUP BY SAMPLING AND ANALYSIS

SEP 16 1985



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ADAD21-017676
HARTOLDMON0043965

A 6 GROUP COMPOSITING PLAN FOR 19 SAMPLE POINTS

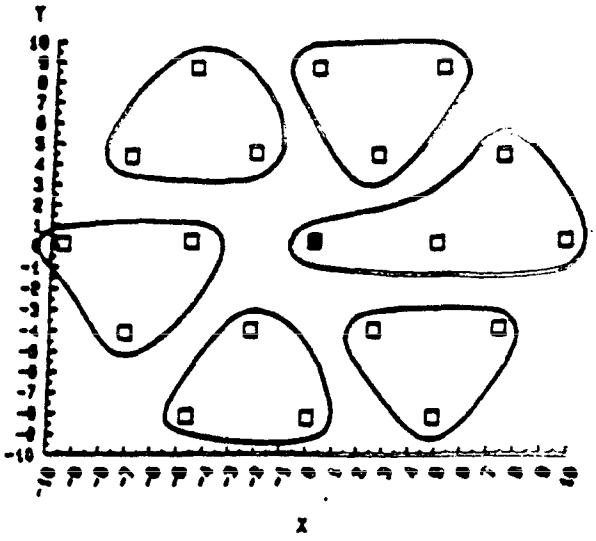


Figure 10. Location of sample points in a 19 sample point plan, with detail of a 2 group compositing design.

DSW 015302

ADAD21-017677
HARTOLDMON0043966

MONSANTO PRODUCT NAME

Polychlorinated Biphenyls (PCBs)

MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MO 63167

Emergency Phone No.
(Call Collect)
314-694-1000

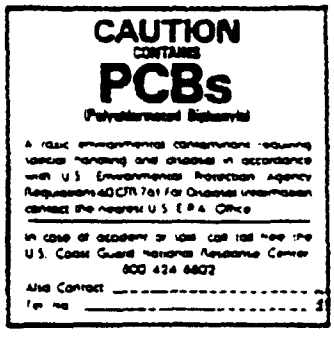
PRODUCT IDENTIFICATION

The following materials contain 99.9% or greater PCBs. For information about other ingredients in formulations containing PCBs, contact the manufacturer of those ingredients.

Synonyms:	PCBs Chlorodiphenyl (__% Cl) Chlorinated biphenyl Polychlorinated biphenyl Chlorinated biphenyls (approx. __% Cl)
Trade Names *(Commonly used Monsanto products)*	Askarel** Aroclor® Series 1016, 1221, 1232, 1242, 1248, 1254, 1260 Therminol® FR Series
CAS No.:	001336363, 053469219, 012672296, 011097691, 011096825 and others

WARNING STATEMENTS

Federal regulations under the Toxic Substances Control Act require PCBs and PCB items to be marked. (Check regulations for details.)





PRECAUTIONARY MEASURES

Care should be taken to prevent entry into the environment through spills, leakage, use, vaporization, or disposal of liquid or containers. Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact, flush with water. In case of spillage onto clothing, the clothing should be removed as soon as practical, skin washed, and clothing laundered. Comply with all federal, state, and local regulations.

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EMERGENCY AND FIRST AID PROCEDURES

Ingestion: Consult a physician. Do not induce vomiting or give any oily laxatives. NOTE TO PHYSICIAN—If large amounts are ingested, gastric lavage is suggested.

Skin: If liquid or solid PCBs are splashed or spilled on skin, contaminated clothing should be removed and the skin washed thoroughly with soap and water. NOTE TO PHYSICIAN—Hot PCBs may cause thermal burns.

Eyes: Eyes should be irrigated immediately with copious quantities of running water for at least 15 minutes if liquid or solid PCBs get into them. A petrolatum-based ophthalmic ointment may be applied to the eye to relieve the irritating effects of PCBs.

Inhalation: Remove to fresh air. If skin rash or respiratory irritation persists, consult a physician. NOTE TO PHYSICIAN—If electrical equipment arcs over, PCBs or other chlorinated hydrocarbon dielectric fluids may decompose to produce HCl, hydrochloric acid, a respiratory irritant.

OCCUPATIONAL CONTROL PROCEDURES

Eye Protection: Wear chemical splash goggles and have eye baths available where there is significant potential for eye contact.

Skin Protection: Wear appropriate protective gloves and protective clothing that provide a barrier to prevent skin contact. Consult glove manufacturer to determine appropriate type glove for given application. Wear chemical safety goggles and a face shield and a protective apron that provides a barrier when splashing is likely. Wash immediately if skin is contaminated. Remove contaminated clothing promptly and launder before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

ATTENTION: Repeated or prolonged contact may cause chloracne in some people.

Respiratory Protection: Avoid breathing vapor or mist. Use NIOSH/MSHA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical splash goggles. Consult respirator manufacturer to determine type equipment for given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. High airborne concentrations may require use of self-contained breathing apparatus or supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR Part 1910.134.

Ventilation: Provide ventilation to control exposure levels below airborne exposure limits. Use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Airborne Exposure Limits: Chlorinated biphenyl (approximately 42% chlorine)

OSHA PEL:	1 mg/m³ 8-hour time-weighted average - Skin*
ACGIH TLV®:	1 mg/m³ 8-hour time-weighted average - Skin*
	2 mg/m³ short-term exposure limit - Skin*

Chlorinated biphenyl (approximately 54% chlorine)

OSHA PEL:	0.5 mg/m³ 8-hour time-weighted average - Skin*
ACGIH TLV®:	0.5 mg/m³ 8-hour time-weighted average - Skin*
	1 mg/m³ short-term exposure limit - Skin*

**Skin notation means that skin absorption of this material may add to the overall exposure. Avoid skin contact.*

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FIRE PROTECTION INFORMATION

Fire and Explosion: PCBs are fire-resistant compounds. They may decompose to form CO, CO_2, HCl, phenolics, aldehydes and other toxic combustion products under severe conditions such as exposure to flame or hot surfaces.

At temperatures in the range of 600-650°C in the presence of excess oxygen PCBs may form polychlorinated dibenzofurans (PCDFs). Laboratory studies under similar conditions have demonstrated that PCBs do *not* produce polychlorinated dibenzo-p-dioxins (PCDDs).

PCBs in electrical equipment have been reported to produce both chlorinated dioxins (PCDDs) and furans (PCDFs) during fire situations. These combustion products may result all, or in part, from non-PCB components of the dielectric fluids or other combusted materials. Consult the equipment manufacturer for information regarding composition of the dielectric fluids in electrical apparatus.

Standard fire fighting wearing apparel and self-contained breathing apparatus should be worn when fighting fires that involve possible exposure to chemical combustion products. Fire fighting equipment should be thoroughly cleaned and decontaminated after use.

If a PCB transformer is involved in a fire-related incident, the owner of the transformer may be required to report the incident. Consult and follow appropriate federal, state, and local regulations.

REACTIVITY DATA

PCBs are very stable, fire-resistant compounds.

HEALTH EFFECTS SUMMARY

Skin Contact: PCBs can be absorbed through intact skin. Local action on skin is similar to that of common organic solvents where contact leads to removal of natural fats and oils with subsequent drying and cracking of the skin. A potential exists for the contracting of chloracne.

Eye Contact: The liquid products and their vapors are moderately irritating to eye tissues.

Ingestion: The acute oral toxicities of the undiluted compounds are: LD_{50} rats—8.65 gm/kg for 42% chlorinated, and 11.9 gm/kg for 54% chlorinated—"slightly toxic."

Inhalation: Animal experiments of varying duration and at different air concentrations show that for similar exposure conditions, the 54% chlorinated material produces more liver injury than the 42% chlorinated material.

Other: There are literature reports that PCBs can impair reproductive functions in monkeys. A study reported in the literature with female rats using Aroclor® 1260 stated that Aroclor 1260 caused liver cancers. Monsanto sponsored animal feeding studies of Aroclor 1242, 1254 and 1260. These compounds, fed to both sexes of rats, did not produce cancers. The National Cancer Institute performed a study in 1977 using Aroclor 1254 with both sexes of rats. NCI stated that the PCB, Aroclor 1254, was not carcinogenic under the conditions of their bioassay.

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(Health Effects Summary Continued On Next Page)

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HEALTH EFFECTS SUMMARY (Continued)

The consistent finding in animal studies with PCBs is that they produce liver injury following prolonged and repeated exposure by any route, if the exposure is of sufficient degree and duration. Liver injury is produced first, and by exposures that are less than those reported to cause cancer in rodents. Therefore, exposure by all routes should be kept sufficiently low to prevent liver injury.

Numerous epidemiological studies of humans, both occupationally exposed and non-worker environmentally exposed populations, have not demonstrated any statistically significant causal relationship between PCB exposures and chronic human illnesses such as cancer or neurological or cardiovascular effects. Nor was there any increase in overall cancer mortality as a result of PCB exposure. PCBs can cause dermatological symptoms; however, these are reversible upon removal of exposure source.

PCBs are identified as hazardous chemicals under criteria of the OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The Standard requires that this document mention that PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1982)-Group 2B and in the National Toxicology Program (NTP) Annual Report on Carcinogens (Third).

PHYSICAL DATA

Properties of Selected Aroclors[1]

Property	1016	1221	1232	1242	1248	1254	1260
Color (APHA)	40	100	100	100	100	100	150
Physical state	mobile oil	mobile oil	mobile oil	mobile oil	mobile oil	viscous liquid	sticky resin
Stability	inert	inert	inert	inert	inert	inert	inert
Density (lb/gal 25°C)	11.40	9.85	10.55	11.50	12.04	12.82	13.50
Specific gravity x 15.5°C	1.36-1.37 x-25°	1.18-1.19 x-25°	1.27-1.28 x-25°	1.30-1.39 x-25°	1.40-1.41 x-65°	1.49-1.50 x-65°	1.55-1.56 x-90°
Distillation range (°C)	323-356	275-320	290-325	325-366	340-375	365-390	385-420
Acidity mg KOH/g, maximum	.010	.014	.014	.015	.010	.010	.014
Fire point (°C)	none to boiling point	176	238	none to boiling point	none to boiling point	none to boiling point	none to boiling point
Flash point (°C)	170	141-150	152-154	176-180	193-196	none	none
Vapor pressure (mm Hg @ 100°F)	NA	NA	0.005	0.001	0.00037	0.00006	NA
Viscosity (Saybolt Univ. Sec. @ 100°F)	71-81	38-41	44-51	82-92	185-240	1800-2500	—

NA - Not Available

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SPILL, LEAK & DISPOSAL INFORMATION

Disposal of liquid PCBs and other PCB items is strictly regulated by the federal government. The regulations are found at 40 CFR Part 761. Consult these regulations as well as applicable state and local regulations prior to any disposal of PCBs, PCB items, or PCB-contaminated items.

If PCBs leak or are spilled, the following steps should be taken immediately:

All non-essential personnel should leave the leak or spill area.

The area should be adequately ventilated to prevent the accumulation of vapors.

The spill/leak should be contained. Loss to sewer systems, navigable waterways and streams should be prevented. Spills/leaks should be removed promptly by means of absorptive material, such as sawdust, vermiculite, dry sand, clay, dirt or other similar materials, or trapped and removed by pumping or other suitable means (traps, drip-pans, trays, etc.).

Personnel entering the spill or leak area should be furnished with appropriate personal protective equipment and clothing as needed. See Occupational Control Procedures section of this MSDS.

Personnel trained in the emergency procedures and protected against the attendant hazards should shut off sources of PCBs, clean up spills, control and repair leaks and fight fires in PCB areas.

All wastes and residues containing PCBs (e.g., wiping cloths, absorbent material, used disposable protective gloves, clothing, etc.) should be collected, placed in proper containers, marked and disposed of in the manner prescribed by EPA regulations (40 CFR Part 761) and applicable state and local regulations.

Various federal, state, and local regulations may require reporting of PCB spills and may also define spill clean-up levels. Consult your attorney or appropriate regulatory officials for information relating to spill reporting and spill clean-up.

ADDITIONAL COMMENTS

Polychlorinated Biphenyls

For regulatory purposes, under the Toxic Substances Control Act the term "PCBs" refers to a chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contain such substance (40 CFR Part 761).

Chemically, commercial PCBs are defined as a series of technical mixtures, consisting of many isomers and compounds that vary from mobile oily liquids to white crystalline solids and hard non-crystalline resins. Technical products vary in composition, in the degree of chlorination and possibly according to batch.

The mixtures generally used contain an average of 3 atoms of chlorine per molecule (42% chlorine) to 5 atoms of chlorine per molecule (54% chlorine). They are used as components of dielectric fluids in transformers and capacitors. Prior to 1972, PCB applications included heat transfer media, hydraulic and other industrial fluids, plasticizers, carbonless paper, paints, inks and adhesives. Federal regulations specify that non-totally enclosed PCB activities are permitted only if specifically exempted or authorized. (40 CFR Part 761).

CAS No. 001336363: For general class of compounds

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(Additional Comments Continued On Next Page)

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ADDITIONAL COMMENTS (Continued)

Trade Names/Common Names

**ASKAREL - Generic name for a broad class of fire-resistant synthetic chlorinated hydrocarbons and mixtures used as dielectric fluids that commonly contained about 30-70% PCBs. Some ASKAREL fluids contained 99% or greater PCBs.

PYRANOL[R1] and INERTEEN[R2] are trademarks for commonly used dielectric fluids that may have contained varying ratios of PCBs as well as other components including chlorinated benzenes.

[R1] Registered trademark of Monsanto Company
[R2] Registered trademark of General Electric Company
[R3] Registered trademark of Westinghouse Electric Corporation

This list of trade names is representative of several commonly used Monsanto products (or formulated with Monsanto products). Other trademarked PCB products were marketed by Monsanto and other manufacturers. PCBs were also manufactured and sold by several European and Japanese companies. Contact the manufacturer of the trademarked product directly, if not in this listing, to determine if the formulation contained PCBs and its composition.

DATE: 10/15/85 **REVISED:** **SUPERSEDES:** All prior to 10/15/85
MSDS NO.: G 4048

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

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ATTORNEY'S NOTES

Monsanto

SPECIALTY CHEMICALS DIVISION

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A Unit of Monsanto Company
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Office: (205) 235-6361

bcc J. L. Brown
R. L. Cheever
M. R. Foresman - G4WT

April 15, 1988

Honorable Donald Siegelman
Attorney General
State of Alabama
11 South Union Street
Montgomery, Alabama 36130

Dear Attorney General Siegelman:

Thank-you very much for taking time from your busy schedule to address the Alabama Chemical Association and have dinner with us on March 23rd. It was also a pleasure to see you again March 29th at dinner with our government relations group from Monsanto. I applaud your efforts to attack the drug problem in the state and wish you continued success. You made a statement at the Alabama Chemical Association with regard to working with the Attorney General's office to resolve environmental issues that struck a responsive note.

In January 1985, the Attorney General brought to Monsanto's attention a matter of polychlorinated biphenyls (PCB's) in the sediments of Snow Creek, downstream of Monsanto's Anniston, Alabama site. In February 1985, representatives of Monsanto met with members of the Attorney General's staff to discuss the findings and plan a course of action.

Additional discussions were held in March and April with both the Alabama Department of Environmental Management (ADEM) and the Attorney General's office to develop a mutually acceptable sampling program to define the situation. In May 1985, a sampling protocol was proposed and on June 18, 1985, the sediments were sampled by representatives of Monsanto, Attorney General's office and ADEM.

On October 2, 1985, a meeting was held with representatives of the Attorney General's staff, ADEM, and EPA Region IV to review the results of the sediment sampling and plan the next course of action. The EPA stated that they would defer any action to ADEM. It was agreed that Monsanto would submit a proposed clean-up plan for approval.

PLAINTIFF'S EXHIBIT
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This proposed Snow Creek Sediment Removal Protocol was discussed with and transmitted to representatives of the Attorney General's office and ADEM on May 27, 1986. The representative of the Attorney General said he would push to get approval of the plan, from EPA and others, and would be back to Monsanto within a week with any necessary changes. As yet, this matter is still open.

Monsanto believes that the proposal represents the best resolution of original concerns and Monsanto would like to complete the program in 1988. We are available, at your convenience, to meet with your representative and representatives from ADEM to discuss this matter further.

Please feel free to contact Mr. Jerry Brown at 205-236-6381, extension 206 or Mr. Robert Cheever at 205-236-6381, extension 292, if there are any questions that need to be addressed. We look forward to meeting with you and ADEM on this matter.

Sincerely,

David Denner

David K. Denner
Plant Manager

LETTR3/sag

cc Leigh Pegues, Director
ADEM

DSW 015310

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RCRA FACILITY ASSESSMENT

OF

MONSANTO CHEMICAL COMPANY
ANNISTON, ALABAMA

EPA I.D. NO. ALD004019048

SUBMITTED BY:

A.T. KEARNEY, INC.
1100 ABERNATHY ROAD
SUITE 900
ATLANTA, GEORGIA 30328

SUBMITTED TO:

MS. ROWENA SHEFFIELD
REGIONAL PROJECT OFFICER
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

IN RESPONSE TO:

EPA CONTRACT NO. 68-W9-0040
WORK ASSIGNMENT NO. R04-11-03

ENI

DOCKET NO. 0000374

AUGUST 1991

ALD004019048

PLAINTIFF'S EXHIBIT
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I. EXECUTIVE SUMMARY

This RCRA Facility Assessment (RFA) is based on a Preliminary Review (PR) of the U.S. EPA Region IV and the Alabama Department of Environmental Management (ADEM) files and a Visual Site Inspection (VSI). The PR was conducted in December 1990 and the VSI was delayed until May 21 and 22, 1991. The purpose of the RFA is to identify Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) located at the facility, and to evaluate their potential for release of hazardous constituents to the environmental media. AOCs may be potential sources of releases of hazardous constituents to the environment which do not necessarily involve wastes. A summary of findings and suggested further actions for each SWMU and AOC is presented in Table I-1 at the end of this section. A total of 46 SWMUs (some of which have multiple subunits) and 3 AOCs were identified at the time of the VSI.

The Monsanto-Anniston facility operates a chemical manufacturing facility in Anniston, Alabama. Currently the facility manufactures paranitrophenol (PNP) and polyphenols. In the past, the facility has also manufactured phosphates, phosphoric acid, Aroclor (PCBs), parathion, methyl parathion, ferro-manganese, ferro-silicon, and ferro-phosphorous. The Monsanto-Anniston facility has been in operation since 1917.

An RFA of the Monsanto-Anniston facility was conducted in 1983/1984. This second RFA is designed to update the original report before the facility's March 1991 Part B Permit Modification Application is reviewed (Reference 160).

The facility has two RCRA-regulated units which have undergone a state approved closure. These units are Cells 4E and 5E (SWMUs 1I and 1J) of the Landfill (SWMU 1) and the New Limestone Bed (SWMU 11). In addition, the Old Limestone Bed (SWMU 8) and the Closed Container Storage Area (SWMU 13) have also undergone closure.

The facility is currently involved in remediating ground-water contamination at the site. Four Corrective Action Systems have been installed to monitor, intercept and recover contaminated ground water. These units are the Western Landfill Corrective Action System (SWMU 3), the Northern Landfill Corrective Action System (SWMU 5), the Limestone Bed Corrective Action System (SWMU 10) and the Plant Corrective Action System (SWMU 30). The source of the ground-water contamination being remediated by the Plant

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Corrective Action System (SWMU 30) has not been identified. Further investigation of the source of the contamination has been recommended. Recovered ground water is discharged to the Wastewater Treatment Facility (WWTF) (SWMU 29) for biological treatment. Monitoring of the site was initiated by the facility in 1980.

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According to facility representatives, neither the state nor EPA responded to the proposed plan (References 2, 25, 68, 168, 169).

In April 1988, Monsanto proceeded to implement the sediment removal plan without approval from state or federal agencies. During the remediation activities, the facility shipped approximately 1000 tons of contaminated soils and sediments to Chem Waste Management in Emelle, Alabama. Sediment sampling after removal still indicated greater than 50 ppm PCBs remaining (References 2, 25, 68, 168, 169). No further information on the remediation activities or the current status of Snow Creek was available.

Ground-water Contamination

In May 1980, Monsanto retained Geraghty & Miller to conduct a hydrogeologic investigation of the Landfill (SWMU 1) to determine if this unit would meet the requirements of RCRA (Reference 6). Since this investigation identified ground-water contamination, the facility was required to properly define the extent of ground-water degradation and the rate and direction of contaminant movement under the Landfill (SWMU 1), the southern plant area, and the area surrounding the Old and New Limestone Beds (SWMUs 8 and 11).

The assessment of the Landfill (SWMU 1) began in December, 1980. Water level and water quality monitoring programs were established in this area to define the contaminant ground-water plume. Interceptor wells were installed and operational in the Western and Northern Landfill Corrective Action Systems (SWMUs 3 and 5) in February 1983.

The facility's Part B permit (approved in 1986) required Monsanto to institute a compliance monitoring program in the event that ground-water monitoring results indicated a statistically significant increase of identified Appendix IX constituents (Reference 75). Consequently, the Plant Corrective Action System (SWMU 30) was installed and became operational in February 1988, while the Limestone Bed Corrective Action System (SWMU 10) was installed and became operational in February 1989. Monsanto-Anniston reports on the effectiveness of these systems every six months as part of their RCRA Part B Permit conditions (References 6, 7, 23, 87). Appendix C contains the most recent ground-water monitoring results for the units. Appendix E presents withdrawal data for all corrective action interceptor wells, and Appendix F provides construction details for all interceptor and observation wells.

The Western Landfill Corrective Action System (SWMU 3) is comprised of four interceptor wells and six observation wells. The interceptor wells were installed in 1982 to intercept and recover shallow ground water and to pump it to the on-site WWTF

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(SWMU 29). Concentrations of PNP ranged from not detected to 3.5 ug/L in the six month period between November 1989 and April 1990. Concentrations of parathion ranged from not detected to 26 ug/L during the same time period (Reference 156).

The Northern Landfill Corrective Action System (SWMU 5) is comprised of nine interceptor wells and six observation wells. The interceptor wells were installed in 1982 to intercept and recover shallow groundwater and to pump it to the on-site WWTF (SWMU 29). Concentrations of PNP ranged from not detected to 24,115 ug/L in the six month period between November 1989 and April 1990. Concentrations of parathion ranged from not detected to 247 ug/L during the same time period (Reference 156).

The Plant Corrective Action System (SWMU 30) is made up of two interceptor wells and five observation wells. The interceptor wells were installed in late 1987 to intercept and recover shallow groundwater and to pump it to the on-site WWTF (SWMU 29). Concentrations of PNP ranged from not detected to 10 ug/L in the six month period between November 1989 and April 1990. Concentrations of parathion ranged from not detected to 4 ug/L during the same time period (Reference 156).

The Limestone Bed Corrective Action System (SWMU 10) is comprised of six interceptor wells and seven observation wells. The interceptor wells were installed in 1988 to intercept and recover shallow groundwater and to pump it to the on-site WWTF (SWMU 29). Concentrations of PNP ranged from not detected to 402,035 ug/L in the six month period between November 1989 and April 1990. Concentrations of parathion ranged from not detected to >1,000 ug/L during the same time period (Reference 156).

Air Releases

Prior to the mid-1970's, Monsanto-Anniston flared hydrogen sulfide (H_2S) and incinerated contaminated sulfur. These activities caused odor complaints and vegetation damage. An ambient sulfur dioxide (SO_2) monitoring network was maintained to track SO_2 emissions from Monsanto. Odor complaints also have occurred due to air emissions from the WWTF (SWMU 29). The WWTF was modified in 1984 to reduce air emissions and odor (References 74, 77).

Accidental air releases have occurred from the Monsanto-Anniston facility. The most recent episode occurred in September 1985 when a ruptured disk on the thio acid reactor blew and the unit released approximately 11 pounds of H_2S. Monsanto has installed a siren to warn the surrounding neighborhood of accidental releases (References 74, 77).

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AOC NUMBER: B **PHOTO NUMBER:** No photo

NAME: Snow Creek Contamination Area

TYPE OF UNIT: Creek

PERIOD OF OPERATION: Unknown to Present

PHYSICAL DESCRIPTION AND CONDITION: This unit consists of the soils and sediments in and around Snow Creek and its tributaries which have been contaminated with PCBs. This creek lies less than one mile from the main plant facility.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The Alabama Attorney General's Office found PCB contamination in Snow Creek sediments in 1985. Contaminant levels in some locations were in excess of 400 ppm. Sediment samples approximately 1 to 1.5 miles from the facility contained PCB levels as high as 198 ppm.

RELEASE PATHWAYS: Air (L) Surface Water (*) Soil (*)
Ground Water (*) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Following the January 1985 disclosure by the Alabama Attorney General of PCB contamination in Snow Creek, Monsanto-Anniston representatives met with members of the Attorney General's staff as well as ADEM personnel to discuss possible courses of action. Snow Creek sediments were sampled in June 1985 (by Monsanto-Anniston, ADEM, and the Attorney General's office), and a meeting between Monsanto-Anniston, the Attorney General's staff, ADEM, and EPA Region IV was held in October 1985 to discuss the results. At this meeting, EPA deferred action to ADEM, and Monsanto-Anniston agreed to submit a proposed clean-up plan.

On May 15, 1986, Monsanto-Anniston submitted to ADEM a "Snow Creek Sediment Removal Protocol" which proposed sediment removal in three sections of the drainage ditch leading to Snow Creek, as well as portions of Snow Creek itself. The plan specified sediment removal to less than 50 ppm PCBs and disposal of all sediments with more than 50 ppm PCBs at an EPA-approved PCB landfill. However, by April 1988, Monsanto-Anniston had not received a response to the proposed plan; therefore Monsanto-

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Anniston proceeded to implement the sediment removal plan without approval from state or federal agencies. During the remediation, the facility shipped approximately 1000 tons of contaminated soils and sediments to Chem Waste Management; sediment testing after removal still indicated > 50 ppm PCBs remaining.

RECOMMENDATIONS: No Further Action ( )
Confirmatory Sampling ( )
RFI Necessary (*)

REFERENCE(S): 2, 25, 68, 160, 168, 169

COMMENTS: * The facility should provide additional documentation to demonstrate that the PCB contamination in Snow Creek has been adequately remediated. If sufficient documentation can not be provided, then additional investigation is warranted. This investigation should include the Former PCB Production Area (SWMU 42) and the ditches of the Stormwater Drainage System (SWMU 37) leading to Snow Creek.

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