

Page 1 SAMANTHA E.NOBLE NOBLE & ASSOCIATES IN THE UNITED STATES DISTRICT COURT NORTHERN DISTRICT OF ALABAMA EASTERN DIVISION WALTER OWENS , et al.,)) Plaintiffs,)) VS.)CASE NO. CV-96-P-0440-E) MONSANTO COMPANY,)) ____Defendant._____) _____ CONTINUED_DEPOSITION_OF_JERRY_BROWN, _____ Taken pursuant to stipulation and agreement before SAMANTHA E. NOBLE, a Court Reporter and Commissioner for Alabama at Large, at Fite & Miller, 1000 Quintard Avenue, Suite 400, Anniston, Alabama, on the 1st day of March, 2001, commencing at approximately 10:40 a.m. A P P E A R A N C E S _____ HONORABLE LARRY WRIGHT, Attorney at Law, 111 Congress Avenue, Suite 1010, Austin, TX, 78701, appearing for and on behalf of The Plaintiffs.	Page 3 1 REPORTER'S INDEX ----- 2 3 CAPTION SHEET 1-2 4 REPORTER'S INDEX 3-4 5 STIPULATION PAGE 5-6 6 CONTINUED TESTIMONY OF JERRY BROWN 7 Examination by Mr. Wright. . .8-119 8 CERTIFICATE120-121 9 EXHIBITS_ _____ 10 Plaintiff's Exhibit Number 11 7 11 Plaintiff's Exhibit Number 12 7 12 Plaintiff's Exhibit Number 13 7 13 Plaintiff's Exhibit Number 14 42 14 Plaintiff's Exhibit Number 15 49 15 Plaintiff's Exhibit Number 16 49 16 Plaintiff's Exhibit Number 17 53 17 Plaintiff's Exhibit Number 18 55 18 Plaintiff's Exhibit Number 19 19 19 Plaintiff's Exhibit Number 20 95 20 Plaintiff's Exhibit Number 21 96 21 Plaintiff's Exhibit Number 22 102 22 Plaintiff's Exhibit Number 23 105 23 Plaintiff's Exhibit Number 24 107
Page 2 SAMANTHA E.NOBLE NOBLE & ASSOCIATES HONORABLE WILLIAM S. COX, III, of The Law Firm of LIGHTFOOT, FRANKLIN & WHITE, Attorneys at Law, The Clark Building, 400 20th Street North, Birmingham, Alabama, 35203-3200, appearing for and on behalf of The Defendant.	Page 4 1 Plaintiff's Exhibit Number 25 110 2 Plaintiff's Exhibit Number 26 112 3 Plaintiff's Exhibit Number 27 115 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Page 5 1 S T I P U L A T I O N ----- 2 3 IT IS STIPULATED between the 4 parties hereto that this deposition is being taken 5 for the purpose of discovery or for use as evidence 6 in the action or for both purposes. 7 IT IS FURTHER STIPULATED between 8 the parties this deposition may be taken before 9 SAMANTHA E. NOBLE, a Court Reporter of Anniston, 10 Alabama, at this time and place without the formal 11 requirement of notice. 12 IT IS FURTHER STIPULATED that 13 neither party need make any objections to any of 14 the questions asked during the taking of the 15 deposition, nor make any motion to exclude any 16 answers, except as to form and leading questions; 17 but both parties may later object to any questions 18 or make a motion to exclude any answers during the 19 trial of the action, and said failure to so object 20 or move to exclude during the taking of this 21 deposition shall not result in a waiver of the 22 right to make objections or move to exclude. 23 IT IS FURTHER STIPULATED between	Page 7 1 the notice in front of me -- Jerry will testify or 2 can testify about the reasons that he is aware of 3 for the cessation of the production of PCBs in 4 Anniston. 5 MR. WRIGHT: Right. I think we've 6 already talked about that. 7 MR. COX: He's the person who is 8 designated for purposes of discussing the 9 investigation of Snow Creek, by the 10 Attorney General in 1985. It was incorrectly 11 designated in the notice as 1990. 12 And I think the remainder had to do 13 with Jerry's role as sort of the chief 14 environmental person from approximately 1974 or so 15 through the end of the 1980s timeframe, and 16 whatever other categories that would involve, that 17 information, he would be the person knowledgeable 18 about that. 19 MR. WRIGHT: Okay. Thank you. 20 Let's start. 21 (WHEREUPON, discussion was held off the record.) 22 (WHEREUPON, Plaintiff's Exhibits 11, 12 & 13 were 23 marked for identification.)
Page 6 1 the parties that all requirements as to 2 examination, reading, signing, or notice of filing 3 the deposition are waived. 4 ----- 5 MR. COX: This is a continuation of 6 Jerry Brown's deposition. At the first session of 7 his deposition, we also made a designation of Jerry 8 pursuant to the Plaintiff's 30(b)(6) notice. And 9 we would just say that that designation still 10 holds. 11 MR. WRIGHT: Yeah, remind me what 12 categories you designated him in. 13 MR. COX: I was afraid you were 14 going to do that to me. 15 MR. WRIGHT: I was just going to 16 make sure. 17 MR. COX: I don't have a copy of 18 the notice. Basically -- 19 MR. WRIGHT: Just to the best of 20 your recollection. 21 MR. COX: Basically, Jerry can 22 testify regarding -- subject to being corrected, 23 subject to what I said last time around, when I had	Page 8 1 JERRY BROWN, 2 having been first duly sworn by the court 3 reporter, was examined and testified under oath as 4 follows: 5 EXAMINATION 6 BY MR. WRIGHT: 7 Q Okay, Mr. Brown, thank you for coming 8 back. Let me hand you what we've marked as Exhibit 9 Number 13. And you may recall you mentioned the 10 last time we were together that you thought that 11 DSN001 had been tested for PCBs and dioxins in, I 12 think you said, 1981 and 1984. 13 A Somewhere in that time frame. 14 Q And Mr. Cox was kind enough to dig up 15 what we've marked as Exhibit Number 13. What is 16 Exhibit Number 13? 17 A This is a priority pollutant scan. 18 THE COURT REPORTER: I'm sorry, a 19 priority -- 20 THE WITNESS: Priority pollutant 21 scan. 22 BY MR. WRIGHT: 23 Q What is a priority pollutant scan?

Page 9 1 A I think we talked about that last time. 2 Where priority pollutants were in the Clean Water 3 Act, a listing of specific potential contaminants 4 were listed in the Clean Water Act as priority 5 pollutants and were incorporated into standard EPA 6 test methods for testing of waters for the presence 7 or absence thereof and incorporating prior to 8 pollutant scan and PCBs and the -- 9 MR. COX: Let's go off the record. 10 (WHEREUPON, discussion was held off the record.) 11 MR. WRIGHT: Let's go back on the 12 record, because there may be something we can talk 13 about. 14 BY MR. WRIGHT: 15 Q It turns out that this Exhibit Number 13 16 does not have data for 001, correct? I didn't see 17 it. Maybe you can correct me. 18 A Yes, it appears that this one was well 19 water sampling. 20 Q Okay. Let's look at the screening 21 levels, though. What is the screening level for 22 the aroclor? 23 MR. COX: It's further in.	Page 11 1 Q Well, which one do you -- 2 A And so, unless I see something that 3 indicates differently, that's -- I would -- my 4 conclusion would be that for quantification, GC/EC 5 is what typically was used. 6 Q Well, why does it say either? 7 A I cannot answer that. 8 Q Now, what's bigger, a microgram or a 9 nanogram? 10 A What is bigger? 11 Q Yes. 12 A A microgram. 13 Q Are you sure that it's parts per billion 14 and not parts per million? Because a nanogram per 15 liter, I think is parts per billion, isn't it? 16 A No. A microgram per milliliter is a 17 part per million. A microgram per liter is a part 18 per billion. 19 Q Okay. Well, we'll come back to this 20 when we get the one for the right discharge point. 21 A This shows in this summary the screening 22 level of one microgram per liter, on page three. 23 Q What page are you looking at?
Page 10 1 THE WITNESS: Two screening levels 2 are listed here, one for the GC/MS screen, which is 3 ten micrograms per liter, and one for the 4 GC electron capture screen, which is one microgram 5 per liter. 6 BY MR. WRIGHT: 7 Q And first, can you translate that to 8 parts per million or parts per billion? 9 A Let me borrow a piece of paper. 10 Microgram per liter is parts per billion. 11 Q Parts per billion? 12 A Uh-huh. 13 Q Okay. Do you know whether -- does it 14 say in here whether they use the ten parts per 15 billion or the one part per billion? Let me give 16 you a hint; on page three, in the summary, it says, 17 they were investigated through either GC/MS or 18 GC/EC screening analysis. It sounds to me like 19 they're not going to tell us whether they used the 20 GC/MS or GC/EC on the aroclor. 21 A Normally, GC/MS was used for 22 identification. GC/EC was used for quantification, 23 because it had a lower level of detection.	Page 12 1 A Page three. 2 Q Okay. And they're saying they did a 3 GC/MS analysis, you're right. 4 A GC/EC. 5 Q Well, they say GC/MS. 6 A Where are you referring to? 7 Q Up here in the title it says, priority 8 pollutant screening levels, GC/MS -- 9 A Okay. 10 Q -- analysis of organics in industrial 11 effluence. 12 A Okay. It also lists in the screening 13 level of one microgram per liter for pesticides and 14 aroclor. 15 Q Yeah, and I'm a little bit puzzled, 16 because they say, see table three. And then table 17 three is what we just looked at. It has both 18 levels, it has the ten and the one. 19 A And it -- and I refer back to the 20 statement I made earlier, that generally, on 21 pesticides and aroclor, for quantification, GC/EC 22 was most commonly used because of its lower 23 detection level.

Page 13 1 Q Let's go over the photographs. I'm 2 going to hand you Exhibit Number 11. And we're 3 just going to walk through these and get you to 4 explain what each photograph shows. Let's start 5 with page one. And I've numbered on each page 6 where there is multiple photographs, I lettered the 7 photographs. So, what does 1-A show? 8 A This is apparently one of the sewer 9 boxes. 10 Q You said sewer boxes? 11 A Well, yes, uh-huh. 12 Q Basically, an opening so that you can 13 observe the sewer? 14 A Yes, it's basically a connection of 15 sewers with an opening so that you can observe. 16 Q And what can you observe in 1-A? 17 A Well, I would have to look, go ahead and 18 look at 1-B and C to try to tie all of those 19 together, I don't -- 20 Q Looking at all of those, what does it 21 show you? 22 A This is relating to a, if I remember 23 correctly, a spill of HB40 that released some few	Page 15 1 Q Uh -- 2 A Equipment of this type is normally 3 dedicated. 4 Q I'm sorry? 5 A Equipment of this type was dedicated. 6 Q Page three. This is where -- what is 7 page three showing us? 8 A A clean-out of one of the limestone 9 beds. 10 Q Is this the limestone bed that fronts on 11 Clydesdale? 12 A Yes. 13 Q What was the purpose for cleaning it out 14 in June of '77? 15 A Because it had basically become plugged 16 with storm sediments, sediments from storm water. 17 Q What happened to the material that you 18 dug out of it? 19 A It was transported to the landfill and 20 placed in the landfill cell. 21 Q Do you know which cell it was placed in? 22 A I don't remember, at this time. 23 Q Page four?
Page 14 1 gallons of HB40 or Therminol 66, whichever name you 2 want to call it, into the storm sewer. And this is 3 basically showing the capture of that. 4 Q Showing the capture? Where was it 5 captured? 6 A It was captured in the sewer box and 7 basically, it was -- anyplace that it was captured 8 there, it was then sucked up with a vacuum truck 9 out of that point. 10 Q Is HB40 heavier than water? 11 A Very slightly. 12 Q On page two, what does page two show? 13 And A looks like another sewer photo; is that 14 right? 15 A And that's basically a continuation of 16 that same event that I referred to. And then these 17 others appear to be photographs that were taken at 18 the dock where the -- where the spill occurred. 19 Q Was this equipment once used to transfer 20 PCBs? 21 A No. 22 Q This was never used to transfer PCBs? 23 A No, not to my knowledge.	Page 16 1 A A is another photograph of the -- the 2 previous series that we looked at. 3 Q By the way, were the sediments tested 4 for PCBs? 5 A At this particular event, I don't know. 6 Photograph B is, I am guessing, a picture prior to 7 the clean-out. 8 Q Of the limestone bed? 9 A Yes, sir. 10 Q Page five, I assume this is, again, the 11 limestone pit? 12 A Yes, sir. 13 Q It says, mid-baffle. What is a 14 mid-baffle? 15 A That's one bed, maybe both, I'm not 16 sure, don't remember, but was constructed in 17 baffles at different points, basically, to divide, 18 help afford -- provide structural support for 19 limestone. 20 Q If we look at A, there's some buildings 21 in the background. You can see two buildings, one 22 three-story building, it looks like, and then one 23 kind of long, metal building. What's the long,

Page 17 1 metal building? 2 A It's a warehouse. 3 Q Is that the warehouse where PCBs used to 4 be stored and drummed? 5 A For a short period of time. That 6 building was built just before the -- 7 Q Was that part of the expansion when the 8 PCBs were shut down? 9 MR. COX: Object to the form. 10 BY MR. WRIGHT: 11 Q You can answer. 12 A I don't remember this being a part of an 13 expansion, but it was part of a new warehouse 14 facility that was built right about the time that 15 the aroclor facility was shut down. 16 Q It was built adjacent to the aroclor, 17 the old aroclor facility, correct? 18 A No. The old aroclor facility would have 19 been south and west of this structure. 20 (WHEREUPON, there was a brief recess.) 21 MR. WRIGHT: Let's go back on the 22 record. 23 BY MR. WRIGHT:	Page 19 1 up some of the writing. The writing said north pit 2 or N pit. I assume that means north pit; is that 3 right? 4 A Yes. 5 Q North pit showing mid-baffle and looking 6 upstream to inlet end. The inlet that they're 7 referring to is where the sewer discharges into the 8 limestone pit, correct? 9 A Yes, sir. 10 Q And again, that's the same sewer that 11 used to run -- well, I say it's the same sewer -- 12 the sewer that ran from the aroclor building, this 13 is the inlet or the outlet, whatever you call it, 14 for that sewer, correct? 15 A There was several sewers that joined -- 16 Q Right. 17 A -- and the inlet at the pit at this 18 point. 19 Q One of them being the aroclor sewers? 20 A Yes. 21 Q Then photo B, it says north pit from 22 inlet towards discharge. So, this is looking 23 towards Clydesdale, correct?
Page 18 1 Q While we were off I asked you to draw a 2 little bird's eye sketch of the two buildings that 3 we see in the background of photo 5-A. And you did 4 that; is that correct? 5 A Yes. 6 Q And I'm going to number these buildings. 7 Well, actually, I'll label them what y'all used to 8 call them. What did you used to call that 9 building. 10 A Building twenty-eight. 11 Q Building twenty-eight. The one to the 12 right of the aroclor building? 13 A That's correct. 14 Q And then the long building south of 15 building twenty-eight or that -- 16 MR. COX: That's south. That's 17 north. 18 THE WITNESS: No, it's north. 19 BY MR. WRIGHT: 20 Q The building north of building 21 twenty-eight? 22 A Is called the MIC Warehouse. 23 Q Now, in the sketch, we kind of covered	Page 20 1 A Yes, sir. 2 Q Note black parenthesis dark brown close 3 parenthesis organic liquid on surface of mud in 4 grit chamber. What does that mean? 5 A That's another photograph of the 6 material I referred to earlier, that had been 7 spilled and was being cleaned up. 8 Q Is that what it would look like when the 9 aroclor would spill? 10 MR. COX: Object to the form. 11 BY MR. WRIGHT: 12 Q You can answer. 13 A I have no idea. I've never seen aroclor 14 spill. 15 Q You don't remember the fifteen hundred 16 gallon spill in I believe it was '69? 17 A No, I do not. 18 Q Then C, photo C says, north pit looks 19 southeast at grit baffle, note black organic 20 material, liquid on mud behind baffle before 21 cleaning, correct? 22 A Yes. 23 Q Was that material ever tested for PCBs?

Page 21 1 MR. COX: Object to the form. 2 THE WITNESS: This material was 3 HB40 and -- 4 BY MR. WRIGHT: 5 Q Right. 6 A And, no, this material is not tested for 7 PCBs. 8 Q Had this limestone pit been replaced 9 since the end of the aroclor production? 10 A Yes. 11 Q When was it replaced? 12 A As I remember, in the '72, '73 time 13 frame. 14 Q How was it replaced? 15 A In a manner very similar to that 16 illustrated in the photographs. 17 Q The material was dug out, put in trucks 18 I assume? 19 A Yes. 20 Q Taken to the landfill? 21 A Yes. 22 Q And then, what was placed in the pit, 23 just a bunch of limestone?	Page 23 1 Q Was that clay tested for PCBs? 2 A That clay was totally virgin clay. But 3 it was being dug and transported. And, no, it was 4 not tested for PCBs. 5 Q Where is the borrow pit? 6 A The borrow pit was at a location east of 7 Mars Hill Church. 8 Q How far east? 9 A Well, it's was where the -- the 10 catchment basins are now located. 11 Q So, it's just down the stream? I mean, 12 downhill from the landfill? 13 A Well, it, itself, was a hill. The flow 14 was not that direction. This was basically a large 15 mound at the time. It was basically pure clay. 16 Q Well -- 17 A That's the clay that was used for 18 operation, both lining and cover in the landfill 19 operation. 20 Q And it was never tested for PCBs? 21 A No. 22 Q 6-D, what does that show? 23 A I don't know. I do not recognize that.
Page 22 1 A Well, it was lined with clay. 2 Q Okay. 3 A Compacted, then filled with limestone. 4 Q Was there just one clean-out between the 5 end of the aroclor and this clean-out in '77? 6 A As I recollect. 7 Q Now, when were these pits finally taken 8 out altogether? 9 A One was removed probably in the late -- 10 in the mid to late -- well, late '70s, and the 11 other in the early '80s. It's -- I don't remember 12 specifically, but that's my best recollection. I 13 do remember they were done one at a time. 14 Q How were they taken out? I mean, what 15 happened? 16 A The material was physically removed as 17 described previously, taken to the landfill and 18 landfilled. 19 Q What was the -- 20 A Then -- 21 Q Go ahead, I'm sorry. 22 A -- backfilled with clay from the clay 23 borrow pit.	Page 24 1 Q Is that sewer pipe? 2 A It's some pipe of some type, and it 3 looks like it's some that has been underground that 4 has been -- been removed. 5 Q Both of these pipes have large crack in 6 them, correct? 7 A That's what it appears. 8 Q On page seven, again, we have a little 9 bit better view of the two buildings in the 10 limestone pit. That's in photo A. In photo B, we 11 see the end of the warehouse and a bunch of drums. 12 What are those drums? 13 MR. COX: You talking about over 14 here? 15 MR. WRIGHT: Yeah. 16 THE WITNESS: They're empty drums 17 that were stored as part of the warehousing 18 operation. 19 BY MR. WRIGHT: 20 Q When the PCBs, when the aroclor were 21 being sold, some of them left the plant in tank 22 cars, correct? 23 A That's correct.

Page 25 1 Q I assume some of them left in drums like 2 this? 3 A They left in drums. I mean, I can't 4 identify this drum well enough to know if it was 5 like that or not. 6 Q How did the -- I think I remember 7 somebody saying that the solids were flaked and 8 sacked; is that right? 9 A Flaked and put into fiber drums, as I 10 remember. 11 Q How else did the aroclor leave the 12 plant? Is that it? 13 A Tank trucks. 14 Q Any other ways? 15 A No. 16 Q If we go back to our little drawing, in 17 relation to these three buildings, where would the 18 railroad tank cars have been loaded? 19 A Uh -- 20 MR. COX: You mean loaded with 21 liquid aroclor? 22 MR. WRIGHT: Yes, sir. 23 THE WITNESS: As I remember, in	Page 27 1 an aroclor structure. And then when the warehouse 2 was built, a new flaker was installed there, was 3 operated for a short period of time, but not long 4 before it was closed down. 5 Q And remind me, what went on in building 6 twenty-eight? 7 A Building twenty-eight, over the course 8 of the years, was used for quite a number of 9 things. When I interviewed at the plant, my first 10 trip was actually caught before the administration 11 building that's known today was built and all the 12 administration offices were in building 13 twenty-eight, including the plant manager's office. 14 There was also a conference room in that building. 15 The laboratory facility was located in that 16 building. The storage facility was located in that 17 building. The plant -- 18 Q Did the laboratory -- 19 A The plant dispensary was also located in 20 that building. 21 Q Did all the functions, except the 22 administrative functions, remain until the building 23 was torn down?
Page 26 1 this area. (Witness Pointing.) 2 BY MR. WRIGHT: 3 Q You're pointing to the -- 4 A There was a rail, a rail line that came 5 down, and then a spur that came around, like so. 6 That's -- I was not directly involved with that, 7 but that's -- that's how I remember. I think 8 that's -- that area is shown a little bit better in 9 some of these other pictures. 10 Q Okay. We'll look at that in a minute 11 then. But you think the actual loading was done -- 12 is this north or south? 13 MR. COX: That's south. 14 BY MR. WRIGHT: 15 Q -- just to the south of the aroclor 16 building? 17 A South and west. 18 Q Okay. And then the tank trucks, where 19 would they have been loaded? 20 A In the same locations. 21 Q And then the flaked solid aroclor, where 22 would they have been drummed? 23 A As I recollect, that flaker was actually	Page 28 1 A The laboratory moved to another building 2 in -- well, that was -- that was the primary QAQC 3 laboratory. There was another building, smaller 4 building, that had the small R&D labs for R & D 5 purposes, in addition to some drafting offices. 6 And when aroclor closed, the laboratory 7 was consolidated into this -- a smaller building 8 that had previously been R&D and drafting area. 9 The building twenty-eight was continued to be used 10 as maintenance offices, storeroom, dispensary, 11 conference room. 12 Q Okay. Page eight is more pictures of 13 the pit clean-out, correct? 14 A Yes. 15 Q So is page nine? 16 A Yes. 17 Q And then page ten? 18 A Page ten, is the -- shows the lining 19 with clay. 20 Q Is this your handwriting? 21 A No, sir. 22 Q Do you know whose it is? 23 A I think it's Bill Taffee.

Page 29 1 Q Have you seen him lately? 2 A Bill -- Bill was basically in charge of 3 this operation. 4 Q Have you seen him lately, Mr. Taffee? 5 A Been approximately a year to fifteen 6 months since I've seen Bill. 7 Q Where did you see him when you saw him? 8 A I think the last time I saw Bill was at 9 the barber shop. 10 Q Does he drive himself? 11 A Oh, no, no. 12 Q Huh? 13 A No. 14 Q Who drove him to the barber shop? 15 A His wife. 16 Q What's his condition? 17 A At that time, Bill could move with an 18 aid of a walker, with assistance from somebody, 19 but -- well, no, he -- he was -- he was in and out 20 of a wheelchair. He was brought in, in a 21 wheelchair. 22 Q What -- 23 A He's --	Page 31 1 weather got like this, they'd pop right back out. 2 Q Okay, page fifteen. What is this 3 showing us now? And is this your handwriting? 4 A No, this is not my handwriting. This is 5 Burns Severson's handwriting. 6 Q Is this showing us the sewer boxes 7 again? 8 A Yes. And that's a vacuum truck, 9 removing what apparently was some small release 10 that was captured in this box. 11 Q On photo B and photo C, can you read 12 what's written? 13 A 3-B says facing railroad's entrance. 14 THE COURT REPORTER: What road? 15 MR. WRIGHT: Railroad. 16 THE WITNESS: Entrance. 17 BY MR. WRIGHT: 18 Q And then C, what does that say? 19 A I can read black float and pit, but I 20 can't make out the -- 21 MR. COX: It looks like after 22 blocking backflow. 23 THE WITNESS: After blocking
Page 30 1 Q -- does he have? 2 A His verbal -- he's had a stroke. He can 3 say one, maybe two words. If I asked him a 4 question, he could answer with one word. 5 Q Now, on page twelve it shows the south 6 pit. Is that one of the two limestone pits there 7 that were close to each other? 8 A Yes. 9 Q And then you have some photos from '79, 10 showing the water hyacinth growing in the pit? 11 A Yes. 12 Q Did y'all plant those intentionally? 13 A The departmental supervisor for the 14 poly-phenyls area, whose operators monitored this 15 area routinely, read about the use of water 16 hyacinths in water cleaning and filtration, and he 17 had property in Florida, where he visited 18 routinely, and he brought back some from his 19 property in Florida and put in the pit. 20 Q Just out of curiosity, did they 21 regenerate after the winter? 22 A Yes. They basically -- the tops died 23 down, but the bottoms did not. And as soon as the	Page 32 1 backflow, I can't -- 2 BY MR. WRIGHT: 3 Q Maybe pit emptied of DO, does that make 4 sense? 5 A No, that's what I can't make sense of. 6 Q It's pit emptied of something 7 accumulation. It look likes DO or DU or OU maybe, 8 I don't know. 9 A Yeah, I have absolutely no idea what 10 that OU or DU is. 11 Q Page sixteen, again shows another sewer 12 box. Why were they stopping the backflow? 13 A That was to -- see, they had had a -- 14 they'd had a small release, and they would 15 basically stop the flow until it could be cleaned 16 out. 17 Q Is this Mr. Severson showed on page 18 eighteen? 19 A No. 20 Q Do you know who that is? 21 A I can't see it well enough to recognize. 22 Burns was a much taller, larger person than that. 23 This is an operator who was working.

Page 33 1 Q On page nineteen, photo number C, is 2 that the same limestone pit we've been looking at? 3 A Yes. It's simply a different 4 orientation. 5 Q Is that landfill in the background? Up 6 there at the -- you see the -- you see the hill 7 there and then you see the bare area or -- I say 8 bare -- the area without trees? 9 A This, are you referring to this? 10 Q Yes, sir. 11 A No, the landfill would have been over 12 here behind these trees. 13 Q Behind which trees? 14 A Well, if this is the entrance into the 15 plant -- 16 Q Yes. 17 A -- and you -- the landfill is right in 18 here. 19 Q I got you. There appears to be kind of 20 an open area up there -- 21 A Yeah. 22 Q -- at the foot of the hill? 23 A Yeah, you got trees on the front, but	Page 35 1 MR. COX: You're going to take 2 Gerald Miller's deposition on the 12th, and he was 3 the aroclor supervisor when it shut down. 4 MR. WRIGHT: Good. 5 MR. COX: Jerry, you understand, 6 these are from -- believe they're from the aroclor 7 unit, don't you? 8 THE WITNESS: That's what I think. 9 MR. WRIGHT: Well good, I'll take 10 that up with Gerald Miller then. 11 BY MR. WRIGHT: 12 Q Let's do whatever you can do today and 13 then I'll go get what he knows when I depose him. 14 Page twenty-two. 15 A Basically, the same. I think they're 16 from the aroclor facility, but -- 17 Q You can't tell whether that's a 18 chlorinator? 19 A Basically, I conclude this because I 20 know all the other facilities better and I do it by 21 deduction, you know, I don't do it because I 22 identify this specifically, you know, I did not 23 know the equipment that well.
Page 34 1 then an open area and then the trees resume. 2 Q Page twenty, that's Exhibit Number 12, 3 picks up with page twenty. There is only one photo 4 on page twenty. What does that show us? 5 A The north end of the aroclor structure. 6 And that photograph is extremely smudgy there, so, 7 it's what appears to be obvious smudge on the 8 photograph. 9 Q What are these tanks that are in the 10 forefront of the photograph? 11 A Well, they're some of the process tanks, 12 I'm -- beyond that, I can't identify them. 13 Q Page twenty-one, what does A show? 14 A I'm right -- not really sure, some 15 vessel. I don't know what it is. 16 Q Is that a chlorinator? 17 A No, it's -- I would not think so. But I 18 did not know these vessels well enough to really 19 identify them. I'm not really -- didn't really go 20 in this department very much during the course of 21 my work. 22 MR. WRIGHT: Buddy, we may end up 23 having to bring one of those other guys back.	Page 36 1 Q So, you can't tell whether we're looking 2 at chlorinators -- 3 A No. 4 Q -- in A and B? 5 A No. 6 Q Twenty-three that shows -- is that the 7 one you're talking about that shows the tank car 8 loading? 9 A That's -- yes, that -- that is one of 10 the loading docks, as I remember. 11 Q And those pipes, the overhead pipes, 12 would they have carried the PCBs or the aroclor? 13 A Well, I'm not totally sure about the 14 routing. I know -- I do know that the acid piping 15 went across there and maybe some aroclor piping, 16 too, but I'm -- I'm not really sure there was -- 17 there was also some loading back on the west side 18 that's not shown here. It had been back -- back in 19 this direction. 20 Q Okay. 21 A You know, before you get this far around 22 on the -- 23 Q Okay, around on the -- what, it would be

Page 37 1 hidden by the building there now? 2 A Well, it would actually be on -- west of 3 the building back in here. 4 Q This brick ditch here, was that to drain 5 spills and so forth, and storm water? 6 A Well, I'm not really sure, I don't -- 7 you know I don't remember anything about the ditch 8 more than what I can see on the picture here. 9 Q Would that have been routed to the 10 sewers, you think? 11 A I would think so. 12 Q 23-B, do you know what that shows? 13 A No. It's obviously a piece of equipment 14 that was, you know, open for maintenance, but I 15 don't know what it is. 16 Q 23-A appears to show some kind of debris 17 or something. Then -- 18 A 24-A. 19 Q 24-A, I'm sorry. 20 A 24-A, that appears to be a piece of 21 piping associated with the poly-phenyls 22 manufacturing. It was when piping would be taken 23 out of service, it would be cut open and inspected	Page 39 1 Q Okay. 2 A And photograph A shows the very top part 3 of it that had been taken off of a truck apparently 4 and B shows the primary body of it, which I would 5 assume came in on a rail car. 6 Q Is the building in 25-A, as we're 7 looking at it to the left, is that the aroclor 8 building? 9 A Yes. 10 Q And then the building to the right, is 11 that building twenty-eight? 12 A Yes. 13 Q And so the poly-phenyl set in between -- 14 A Actually, it was south of them. The -- 15 that was the nearest roadway there and it was then 16 transported by crane to the -- 17 Q I got you. Then page twenty-six, we see 18 there's two photos, A -- and they appear to be 19 dated 1961. Photo A, what does that show? 20 A I think it's a side view of the aroclor 21 department. 22 Q The building was open to the air; is 23 that right?
Page 38 1 and that's -- that's what that appears to be. 2 Q The inside is pitted? 3 A Yes, sir. 4 Q Isn't it? 5 A Yes. 6 Q Was that corrosive? 7 A No, it was -- when that process was 8 started up, there was some pit corrosion that 9 occurred in the piping and it -- it occurred very 10 shortly after the processor was started up, then it 11 was immediately shut down and investigated and it 12 had to do with trace levels of sulfur in the -- in 13 the stream, interacting with the metallic alloy 14 composition, so the metal alloy had to be changed 15 and the sulfur level lowered. 16 Q Were the PCBs corrosive, the aroclor? 17 A Oh, no. 18 Q Okay. Page twenty-five, what does that 19 appear to show? 20 A Well, that shows the arrival of the 21 poly-phenyls furnace that was -- poly-phenyls 22 reactor that was installed in '61, that actually I 23 was referring to when I was talking about piping.	Page 40 1 A I don't -- I don't understand open to 2 the air. I mean -- 3 Q Well, I mean, it's got -- 4 A Are you asking if it is a totally 5 enclosed building? 6 Q I guess that's what I'm asking. 7 A No, it wasn't totally enclosed. 8 Q We can see these openings in the 9 building on all three levels, it looks like. Did 10 those generally remain open? 11 A Yes. Structures of this type were never 12 intended to be closed. They were -- basically, 13 enough building was provided for weatherproofing 14 and that's all. 15 Q All right. Photo B, do you know what 16 that shows? 17 A That appears to be an air dryer and an 18 instruments air line. 19 Q I'm sorry? 20 A An air dryer and an instrument -- 21 instrument airline. 22 Q Explain that, if you would. What do you 23 need an air dryer for?

Page 41 1 A Well, a lot of instruments are operated 2 with air pressure. If you -- when you compress 3 air, as you're well aware, air contains a certain 4 amount of moisture. When you compress it, a lot of 5 this moisture is going to condense. Moisture in 6 air lines can create problems that for instrument, 7 air that's used for operating automated equipment. 8 Q Okay. 9 A And so instrument air typically has an 10 air dryer to dry the air so that the -- 11 Q Okay. 12 A And that appears to be an air dryer to 13 me. 14 Q Okay. Page twenty-seven, what does that 15 show us? 16 A Photograph A is another, what I would 17 think is side view of the aroclor unit. 18 Q Do you know what those tanks -- 19 A No, I do not. 20 Q -- were for? Okay. And what about B? 21 A This appears to be kind of a top shot of 22 a compressor. I can see the -- the guards. If I 23 had to guess, I'm guessing it's an air compressor.	Page 43 1 Q But does that tell you where the sample 2 came from? 3 A That was the M -- that is the permitted 4 discharge. That was the only point under MPDES, 5 AL1201. 6 Q So, there is only one MPDES discharge 7 point? 8 A Yes, sir. 9 Q I thought there was a DSN002 and a 10 DSN003 and a 4 and a 5 and a 6. 11 A If you go back to the MPDES permits, 12 during that period of time, the 001 became the 13 MPDES permitted discharge point. 002 was the 14 indirect, which was under indirect discharge 15 permits, not a direct discharge permit. The others 16 you referred to, three, four, five -- 17 Q Right. 18 A Those were previously identified 19 discharge points that were eliminated as discharge 20 points, prior to the time MPDES permit was issued. 21 Q Well, Number 13 that we looked at just 22 before -- is it Number 13? 23 THE COURT REPORTER: It should
Page 42 1 MR. COX: Can we go off the record 2 for a moment? 3 MR. WRIGHT: Yeah. 4 (WHEREUPON, there was a brief recess.) 5 (WHEREUPON, Plaintiff's Exhibit 14 was marked for 6 identification.) 7 BY MR. WRIGHT: 8 Q Let's go back on the record. All right, 9 Mr. Brown once again, we're going to start the 10 session with a document that may or may not be -- 11 MR. COX: Is that Exhibit 14? 12 MR. WRIGHT: Yes, Exhibit 14. 13 BY MR. WRIGHT: 14 Q Over the lunch break, Mr. Cox went back 15 to the computer and pulled another document that is 16 one of the screening-type documents. And it states 17 it's screening a water sample. But I couldn't find 18 any description in there on where the water sample 19 came from. 20 A (Witness points.) Sample IDAL0001201. 21 Q All right. 22 A Which was the MPDES permit discharge 23 number. That -- that is the MPDES permit.	Page 44 1 still be there. 2 BY MR. WRIGHT: 3 Q Yeah, Number 13 shows DSN5 and 6, 4 discharge 005 and discharge 006, in April of 1981. 5 And this 14 is from January of '81. So, how could 6 the 5 and 6 have been eliminated before this MPDES 7 that you say is shown us in Exhibit Number 14? 8 A Okay. The best way I know how to answer 9 that is to kind of back up and describe a little 10 bit about the history. 11 Q Okay. 12 A When the permitting process was started 13 in the mid '70s, thereabouts, prior to that time, 14 it was common for discharge water, whether it -- 15 and I'm talking non-contact kind of process water, 16 to be discharged in the most convenient direction 17 from a plant, if I will. 18 Okay, as part of the MPDES permitting 19 process, those discharges were all combined or 20 eliminated as a discharge point from operating 21 facilities. Okay. 5 and 6 were basically some 22 underground pipes that dated back many, many years. 23 And as part of this investigation, source of water

Page 45 1 that might be discharged from those was 2 investigated and found to be spring water, ground 3 water. As part of the screening of those to ensure 4 that nothing was leaving from those points, that -- 5 you know, there was a -- I guess a series of 6 testing screen work done on those and everything 7 else, and this being a part of it. 8 Q Number 13 you're talking about? 9 MR. COX: Yes, Exhibit 13. 10 THE WITNESS: Uh-huh. But all 11 non-contact water and boiler blow down water -- 12 THE COURT REPORTER: Boiler -- 13 THE WITNESS: Boiler. 14 MR. COX: Boiler. 15 THE COURT REPORTER: I'm sorry. 16 THE WITNESS: Was discharged at 17 point 001, which when the permit was issued, was 18 the 12 -- what was it 1201 on the EL0001201. 19 Process water, through waste treatment, was 20 discharged through 002, through an indirect 21 discharge permit. That was separate from the MPDES 22 direct discharge permit. 23 BY MR. WRIGHT:	Page 47 1 A Okay, this is a sampler that basically 2 samples continuously, around the clock and puts 3 that sample into a large jug so that a twenty-four 4 hour composite sample is sampled for a full 5 twenty-four hours -- put in there so that when you 6 take a sample out of that jug, that is a composite 7 of that twenty-four hour sampling that was done. 8 Q So, it's taking a little bit of water 9 every so often? 10 A Continuously, continuously, over the 11 twenty-four hour period. 12 Q Just drips in there or something? 13 A It's pumped in there, through the 14 sampler, the sampler is -- is taking the sample on 15 a continuous basis. 16 Q Okay, well here is where I'm -- I'm lost 17 conceptually. You got a jug -- 18 A Uh-huh. 19 Q -- and you've got water flowing into the 20 jug continuously? 21 A Uh-huh. 22 Q Is water flowing out of the jug 23 continuously?
Page 46 1 Q Going back to Exhibit Number 14, do you 2 know what the flow rate was when this sample was 3 taken? 4 A Not unless it's documented back -- I 5 don't know -- if it's doc- -- 6 Q Did you take that sample? 7 A I probably did not, because it was not a 8 part of my job. They had a sampling technician who 9 was responsible for the twenty-four hour composite 10 samplers that were operated. Flow rate and -- was 11 recorded on a daily basis. Samples were taken as a 12 twenty-four hour composite sampler and there was a 13 technician who was responsible for doing that -- 14 that daily sampling. And I'm assuming that he took 15 that sample at that point in time. 16 Q When you say there was a twenty-four 17 hour composite sampler, would you explain that? 18 A Do you know what I mean when I say 19 composite sampler or do I need to explain that? 20 Q You need to explain that. 21 A There is a -- 22 Q I mean, I've got an assumption, but I 23 don't want to --	Page 48 1 A No, no, no, no, no. It's flowing in at 2 a rate so that it will not be filled up over a 3 twenty-four hour period. We're talking about a 4 large jug and a slow sampling rate continuously. 5 Q Do they empty the jug -- 6 A Yes. 7 Q -- after they take the sample? 8 A As the sample is taken, the jug is 9 emptied. Then that starts the next twenty-four 10 hour composite sample. 11 Q Okay. 12 A And this was done on a daily basis, 13 every day. 14 Q But PCBs were not checked routinely, 15 correct? 16 MR. COX: Object to the form. 17 BY MR. WRIGHT: 18 Q You can answer. 19 A They were not checked on a daily basis, 20 that's correct. 21 Q In fact, I thought we decided in our 22 last session that between '74 and '88, there were 23 only approximately two PCB analysis done on the

Page 49 1 discharge. Is that still your testimony? 2 MR. COX: Same objection. 3 THE WITNESS: These are the ones 4 that I remember. 5 (WHEREUPON, Plaintiff's Exhibits 15 & 16 were marked 6 for identification.) 7 BY MR. WRIGHT: 8 Q Okay. And there's two, I guess. 9 Assuming that 14 is DSN001, that's one in January 10 of '81 and then is this -- what's the next one? 11 A This is July of '83. 12 Q Now, this one does designate it at 0001, 13 the July of '83, which is Exhibit Number 15 and 14 then what's Number 16? 15 A This was waste water from the waste 16 treatment and biological sludge for dioxins. 17 Q Okay. So, aside from 15 and 16, are you 18 aware of any other testing for PCBs in the 19 discharge from the plant between 1974 and 1988? 20 A No. 21 Q And do you know that the sample that is 22 reflected in Exhibit Number 14, do you know 23 specifically how that sample was collected?	Page 51 1 there could have been. COD and PH being the most 2 important. 3 BY MR. WRIGHT: 4 Q For either one of these samples, either 5 the one shown in 14 or the one shown in 15, do you 6 know whether there had been any rain before these 7 samples were taken? 8 A No, I do not remember. 9 Q Was the storm water run-off ever 10 sampled? 11 A As a part of that sample, but not 12 separately from it. Storm water was included in 13 this discharge point, too. 14 Q Well, if there was storm water -- I 15 mean, if it hadn't rained for several days before 16 this sample was taken, there wouldn't be any storm 17 water in the sample, correct? 18 A That's correct. 19 Q And what I'm asking you is: 20 Specifically, was storm water that was known to be 21 storm water run-off from the plant ever checked? 22 A Not separately from the twenty-four hour 23 composite sampler that was run every -- daily every
Page 50 1 A That sample was collected at the -- the 2 official sampling point, which is a part of the 3 permit process, it's a twenty-four hour composite 4 sampler, as I previously described. And that 5 sample -- that sampler is run on a daily basis, 6 other parameters as specified by permit were run 7 daily or as specified by the permit. 8 Q Right, that's the dissolved solids and 9 stuff like that? 10 A Well, that was not a part of that -- 11 dissolved solids weren't a part of that permit. 12 Q What were the parameters that were run 13 daily, just generally? 14 A In 1981, you're talking COD -- 15 Q What is COD? 16 A Chemical oxygen demand. COD would have 17 been run on probably a weekly basis. PH on a daily 18 basis. Phosphates had been stopped by '81. 19 THE COURT REPORTER: Phosphates, 20 I'm sorry. 21 THE WITNESS: I started to say 22 phosphates had been stopped by '81. I don't 23 specifically remember other parameters, although	Page 52 1 day. 2 Q I'm talking about for PCBs, sir. 3 A Not -- no, not separately from those two 4 points. 5 Q Let me just look at this real quickly. 6 Exhibit Number 15, one, two -- the ninth page of 7 that document is where the PCBs are set out and it 8 shows that the screening level is ten UG, that's 9 micrograms, I assume? 10 A That's correct. 11 Q Per square liter? 12 A Per liter. 13 Q Per liter. 14 MR. COX: That's an asterisk. 15 MR. WRIGHT: Okay, I'm reading it 16 upside down. 17 BY MR. WRIGHT: 18 Q And do you know why they didn't spike 19 the blanks? 20 MR. COX: Object to the form. 21 MR. WRIGHT: What's the matter with 22 that, Buddy? 23 MR. COX: Spike the blanks with

Page 53 1 what? 2 MR. WRIGHT: PCBs. 3 MR. COX: Okay. 4 THE WITNESS: No, I do not know. 5 BY MR. WRIGHT: 6 Q Isn't that a common quality control 7 procedure, so that you know that you're -- you put 8 a known quantity into a blank and try to recover 9 that known quantity so you know that your procedure 10 is working correctly? 11 A I'm really not that familiar with what 12 was required or published as part of this EPA 13 method, so I'm not in a position to answer that 14 question. 15 Q All right. Let's look at these 16 photographs -- I'm debating on whether to attach 17 them or not. I guess we had better. 18 THE COURT REPORTER: 17. 19 (WHEREUPON, Plaintiffs Exhibit 17 was marked for 20 identification.) 21 BY MR. WRIGHT: 22 Q As Exhibit Number 17 -- 23 MR. COX: I don't have any of	Page 55 1 don't know any specific reason other than just 2 somebody taking pictures of the vegetative growth 3 that was present. 4 (WHEREUPON, there was a brief recess.) 5 (WHEREUPON, Plaintiff Exhibit 18 was marked for 6 identification.) 7 BY MR. WRIGHT: Let's mark this as 8 Number -- 9 THE COURT REPORTER: Okay. 10 MR. COX: Is this 18? 11 THE COURT REPORTER: It is. 12 MR. COX: Can he look at it? 13 MR. WRIGHT: Sure. 14 BY MR. WRIGHT: 15 Q What is Exhibit Number 17 or no 18? 16 A This is the storm water permit 17 application, filled out in 1985. 18 Q And Robert Cheever filled that out. He 19 was your subordinate, at the time? 20 A That's correct. 21 Q And you're copied on that document, 22 correct? 23 A That's correct.
Page 54 1 these. 2 BY MR. WRIGHT: 3 Q As Exhibit Number 17 we've marked a set 4 of photographs that were extracted from the bunch 5 of photographs you brought to the first deposition. 6 First of all, what is shown on the first page of 7 Exhibit Number 17? There's two photographs. What 8 are they showing? 9 MR. COX: And I think they depict 10 the same thing; they're duplicates. 11 THE WITNESS: This is a view taken 12 from the top of the landfill, looking northwest 13 toward the plant. 14 BY MR. WRIGHT: 15 Q Do you know which cells are shown here 16 in this photograph? 17 A This is westside. I'd have to look at a 18 diag -- drawing to refresh myself on numbers, but 19 this is up toward the top on the westside. 20 Q Did you take these pictures? 21 A No, I did not. 22 Q Do you know why they were taken? 23 A Let me look through them to -- no, I, I	Page 56 1 Q Let me see it for just a second. On the 2 fourth page of the document, there is a section 3 that says, discharge permits and it says, MPDES and 4 then it has the number that we talked about 5 earlier, AL0001201, that's correct? 6 A Correct. 7 Q And then it shows four separate 8 discharge points 001, 005, 006, correct? 9 A That's correct. 10 Q And then on the next page it has a map 11 of the plant and it shows where each of those 12 discharge points is, correct? 13 A That's correct. 14 Q And they are four separate points, 15 geographically, correct? 16 A That's correct. 17 Q So, going back to the earlier question, 18 you can't say for sure that the sample that's 19 reflected in Exhibit Number 14 was from the end of 20 the pipe at Clydesdale, correct? 21 A What I can tell you for sure is that the 22 point at Clydesdale, known as 001, was the point 23 that was permitted for discharge purposes from the

Page 57 1 manufacturing of the plant. 2 The other points, as identified there, 3 were as I described earlier, points that existed 4 from historical reasons, were identified, sampled, 5 on a number of occasions investigated, but never 6 approved as a discharge point from manufacturing 7 locations of non-contact water and boiler blow down 8 water. 9 Q Well, I mean, all I can go by is what's 10 written here in your application, when you're 11 talking about the existing discharge permits. And 12 it shows four separate discharge locations under 13 the MPDES permit in 1985. 14 A Would you like to get that permit and 15 explore it further then? That's the only way I 16 know how to resolve this question, sir. 17 (WHEREUPON, Plaintiff's Exhibit 19 was marked for 18 identification.) 19 BY MR. WRIGHT: 20 Q Okay. Let me hand you the next 21 document, which will be Number 19. That seems to 22 reflect nine soil samples that were analyzed in 23 what year?	Page 59 1 at the protocol, recently? 2 A You briefly showed it to me last week, 3 if I remember correctly. 4 Q And this shows one sample came back at 5 seven hundred and fourteen micrograms per gram, so, 6 what is that? Is that parts per million? 7 A Yes. 8 Q Seven hundred and fourteen parts per 9 million, one thousand, two hundred and eleven parts 10 per million, a hundred and twenty-three parts per 11 million, and then twelve, seventeen, fourteen, and 12 three parts per billion, with three non-detects, I 13 guess; is that correct? I guess I want you to 14 verify that. Did I call those out correctly? 15 A Based on what I remember, yes, I would 16 say that sounds right. 17 Q What's the CMA? 18 A Chemical Manufacturers Association. 19 Q Have you been to CMA meetings? 20 A Yes, I have. 21 Q Monsanto is a member of the CMA? 22 A Well, at that time, yes. 23 Q Are you aware that the CMA has published
Page 58 1 MR. COX: 1985. 2 BY MR. WRIGHT: 3 Q 1985. Can you tell where those soil 4 samples came from? It says they came from the 5 Anniston plant, but I'm wondering where, 6 specifically? 7 A This is the sediment samples that were 8 analyzed as part of the Attorney General 9 investigation. 10 Q Can I see that? 11 A Uh-huh. 12 Q How do you know that that's what those 13 are? Does it say somewhere here where they came 14 from? 15 A By looking at the sample numbers, 16 that -- if you correlate these sample numbers to 17 that sampling protocol, that sampling science, one, 18 two, three, four, five, six, this is sampling 19 points, one, two, three, four, five, and that's 20 duplicates. If you take the sampling protocol and 21 the numbers listed here, they correlate with the 22 sampling sites on that protocol. 23 Q Okay. When was the last time you looked	Page 60 1 a set of guidelines for responsible manufacturers? 2 Are you generally aware of that? 3 A Yes. 4 Q And I believe one of those guidelines is 5 or says that a responsible manufacturer has a duty 6 to -- I'm trying to paraphrase correctly -- and I'm 7 not going to be able to, so I'll just paraphrase it 8 and then you correct me if I misstate it -- that a 9 manufacturer has a duty to clean up its chemicals 10 after they leave its plant, if it knows that they 11 might be hazardous? 12 MR. COX: Object to the form. 13 THE WITNESS: I don't remember any 14 guideline that stated along that line. 15 BY MR. WRIGHT: 16 Q What do you remember the guidelines 17 saying regarding materials that have left the plant 18 and may be hazardous? What responsibilities does a 19 responsible manufacturer have? 20 A The primary emphasis was control of 21 spills, releases that -- during transportation, CMA 22 was responsible for forming the group called 23 CHEMTREC, which is an emergency-response group that

Page 61 1 basically coordinated a nationwide effort for 2 response in the event of accidental releases of 3 products in transport or wherever else that they 4 may need to be addressed. 5 Q So, that deals with spills and -- 6 A Accidental releases. 7 Q -- accidental releases? What about 8 non-accidental releases that you later find out 9 could pose a hazard to the environment or people? 10 MR. COX: Object to the form. 11 BY MR. WRIGHT: 12 Q Does a manufacturer have any 13 responsibility under the guidelines in that 14 respect? 15 MR. COX: Same objection. 16 THE WITNESS: I don't specifically 17 remember CMA guidelines that address that. 18 BY MR. WRIGHT: 19 Q As a former environmental manager for 20 Monsanto, what do you believe a responsible 21 manufacturer's responsibility is in that situation? 22 MR. COX: Object to the form. 23 BY MR. WRIGHT:	Page 63 1 the -- my career, when I was involved with these -- 2 these kinds of assessments, the state-of-the-art 3 technology is routinely applied to every product 4 that we've made or thought about making. This 5 involves both toxicity testing and environmental 6 fate testing. 7 Now, the most -- as I said, the 8 best you could do is state-of-the-technology at the 9 time. Obviously, you're asking me what to do in 10 retrospect. The best, most responsible thing that 11 can be done is to stop any discharge that you may 12 fall -- that may fall into this category. 13 BY MR. WRIGHT: 14 Q Then what? If you stop, but the stuff 15 that you put out before you stopped is still out 16 there, what's the manufacturer's responsibility? 17 MR. COX: Same objection. 18 THE WITNESS: That's got to be 19 defined as technology allows, that you can only do 20 what you know. 21 BY MR. WRIGHT: 22 Q Can you explain that, because I don't 23 understand what you mean.
Page 62 1 Q And by "that situation," let me define 2 it. When chemicals have left the plant, the 3 manufacturer knows they've left the plant, the 4 manufacturer knows they're present outside of the 5 plant, as a result of the discharges from the 6 plant, and that the chemical may be hazardous to 7 the environment or to people? 8 MR. COX: Same objection. 9 THE WITNESS: You asked a very 10 broad range of things in your series of questions, 11 so, I'll attempt to hit on it the best I can. 12 BY MR. WRIGHT: 13 Q Now, it's just one question. You 14 understand that, right? What's a manufacturer's 15 duty or responsibility under the situation that I 16 described? 17 A Okay, a manufacturer's -- 18 MR. COX: Same objection. 19 THE WITNESS: -- duty is to use the 20 state-of-the-art testing that's available at the 21 time to know or to determine, as well as technology 22 can determine, the hazards that may exist or be 23 posed by one of its products. And throughout	Page 64 1 A One can basically do only what is the -- 2 that you can figure out how to do. 3 Q Monsanto knew how to dig up dirt, didn't 4 it in -- well, in 1935, Monsanto knew how to dig up 5 dirt, right? 6 MR. COX: Object to the form. 7 THE WITNESS: I wasn't born in 8 1935. 9 BY MR. WRIGHT: 10 Q Wouldn't you assume -- 11 A I might be known as old as dirt, but I'm 12 not that old. 13 Q Wouldn't you assume that Monsanto knew 14 how to dig up dirt in 1935? 15 MR. COX: Object to the form. 16 THE WITNESS: Digging up dirt is a 17 very broad term. Now, anybody has known how to dig 18 up dirt since the first child went out and scooped 19 up dirt. 20 BY MR. WRIGHT: 21 Q Right. What we're talking about is 22 remedying the discharges of the past once a 23 terrible hazard has been identified. And one

Page 65 1 method for remedying those discharges is to dig up 2 the contaminated dirt, like you did for a part of 3 Snow Creek in 1989, and remove the contaminated 4 dirt from its proximity to children, elderly, other 5 people, correct? 6 MR. COX: Object to the form. 7 THE WITNESS: Yes. 8 BY MR. WRIGHT: 9 Q Monsanto could have used 10 state-of-the-art technology to minimize or 11 eliminate its discharges before 1972, correct? 12 MR. COX: Object to the form. 13 THE WITNESS: The plant was shut 14 down in '71, so, yes, it was done before '72. 15 BY MR. WRIGHT: 16 Q Well, I thought part of it was shut down 17 in '71 and part of it was shut down in '72? 18 A Well, solid aroclor, but the liquid 19 aroclor is '71. 20 Q Okay. Well, I'm not going to rehash 21 what we did last time with the carbon absorption 22 and things like that. 23 Do you really believe that Monsanto used	Page 67 1 manufacture. 2 Then it moved very quickly to realizing 3 that manufacturing -- stopping manufacturing would 4 be the best decision. The movement from 1970 to 5 1971 was extremely fast, as much as the human 6 beings and technology at the time would allow. And 7 that's -- I don't know how it could have been done 8 anymore aggressively. 9 Q What if Monsanto had waited a year and a 10 half after it knew that PCBs were accumulating in 11 the environment and persistent, would that have 12 been state-of-the-art and satisfied Monsanto's 13 duty? 14 A I have no basis to answer that kind of 15 question; I don't know. 16 Q So, you don't know whether waiting a 17 year and a half would have been the proper thing to 18 do or not? 19 MR. COX: Object to the form. 20 BY MR. WRIGHT: 21 Q Waiting a year and a half to begin 22 taking action? 23 MR. COX: Same objection.
Page 66 1 all state-of-the-art technology to minimize aroclor 2 discharges throughout its production history in 3 Anniston -- 4 MR. COX: Object to -- 5 BY MR. WRIGHT: 6 Q -- and -- 7 MR. COX: Sorry. 8 BY MR. WRIGHT: 9 Q -- used state-of-the-art to fully 10 investigate the extent of its contamination after 11 it became aware of the persistence of PCBs in the 12 environment around the Anniston plant? 13 MR. COX: Object to the form. 14 BY MR. WRIGHT: 15 Q You can answer. 16 A I can't answer throughout production 17 history. I do know that Monsanto moved extremely 18 quickly from the development of detection 19 technology that allowed the presence in the 20 environment to be determined in roughly the late 21 '69, '70 era, up through a very, very, very 22 aggressive program to -- targeted initially to 23 eliminate discharges, while continuing to	Page 68 1 THE WITNESS: As I stated, I have 2 no basis to answer that; I don't know. 3 BY MR. WRIGHT: 4 Q Okay. I guess you'd agree that in 5 general their duty was to act as quickly as 6 possible to identify the hazard and then eliminate 7 the hazard. Is that fair? 8 MR. COX: Object to the form. 9 THE WITNESS: That's -- yes. 10 BY MR. WRIGHT: 11 Q Now, I still don't feel that my original 12 question has been answered. And that original 13 question was: Once a responsible manufacturer 14 knows that its chemical has escaped from the plant 15 and is a potential hazard in the environment, 16 outside of the plant, and is still there, what 17 responsibility does a responsible manufacturer 18 have? 19 MR. COX: Object to the form. 20 THE WITNESS: I don't know that I 21 could answer that question any better than I've 22 already answered it. 23 BY MR. WRIGHT:

Page 69 1 Q Well, with all due respect -- 2 A Well, I mean, you're trying to make me 3 say something you want me to say, and I can't say 4 anything more than I know or honestly believe. 5 Q And I just want to know what the answer 6 is to my question, Mr. Brown. The only answer that 7 I recall -- and now maybe I missed something -- but 8 the only answer that I recall is, when I first 9 asked the question, you said, well, the 10 manufacturer has to use state-of-the-art technology 11 to find out what's going on, basically. And I 12 understand that. 13 But once the manufacturer has used 14 state-of-the-art technology and knows what's going 15 on, what duty does a responsible manufacturer have 16 with regard to its chemicals that have left its 17 plant and are persisting in the environment and may 18 be a hazard to people or animals? 19 MR. COX: Object to the form. 20 THE WITNESS: You're asking a 21 question that's beyond my knowledge and experience 22 and capabilities. 23 BY MR. WRIGHT:	Page 71 1 the environment. And if any product that was 2 shown, any potential to accumulate in the 3 environment was simply not manufactured, was never 4 approved for manufacture. 5 Obviously, a lot of those 6 guidelines were based on what had been learned from 7 PCBs over the years, because PCBs were found to be 8 stable in the environment. 9 MR. WRIGHT: With all due respect, 10 I'm going to have to object, non-responsive again. 11 BY MR. WRIGHT: 12 Q The question is not whether you figure 13 out that it's persisting in the environment; that 14 was an earlier question. 15 The question that's on the table now is: 16 Were you ever given any guidelines by Monsanto on 17 what to do once it's been determined that your 18 chemical has escaped from the plant and is 19 persisting in the environment near the plant and is 20 a potential hazard to the health of humans and/or 21 animals? 22 MR. COX: Same objection. 23 THE WITNESS: Guidelines are
Page 70 1 Q All right. You were never given the 2 tools to answer that question by Monsanto during 3 your years as environmental chief at Anniston? 4 MR. COX: Object to the form. 5 THE WITNESS: Monsanto has made 6 available the tools that the best minds could use 7 at any point in time throughout the period of time 8 I was involved. And that included the regulatory 9 minds and that included the technical minds. 10 MR. WRIGHT: Let me object, 11 non-responsive. 12 BY MR. WRIGHT: 13 Q Did Monsanto ever give you any 14 instruction or literature or guidance on what a 15 responsible manufacturer should do when its 16 chemicals are identified as persisting in the 17 environment and posing a potential hazard to human 18 and animal life? 19 MR. COX: Object to the form. 20 THE WITNESS: I've been involved 21 over my career in many assessments of chemicals, 22 and every one of these assessments have included 23 tests that would look for potential stability in	Page 72 1 developed for ongoing manufacturing operations and 2 what's assessed for the future. So, that's what 3 I've been intensively involved in. So, this is 4 what's confusing my answer to your question. 5 Now, retroactively, the guidelines 6 basically say, you don't manufacture this. And so, 7 for PCBs, manufacturing was stopped. 8 I think what you want me to answer 9 is: Were there any guidelines for what you do in 10 that case? And the guidelines on PCBs have been an 11 ongoing, developing -- how do I say it? For 12 example, in 1971, the regulatory community and 13 Monsanto felt that stopping manufacture of PCBs was 14 the absolutely most responsible thing that anybody 15 could know to do. 16 In 1977 or thereabout, when TSCA 17 came along and established a limit of what was to 18 be considered PCB contaminated, fifty parts per 19 million, became the target then, guideline for the 20 regulatory community and Monsanto and all other 21 industries. So, anything that was greater than 22 fifty parts per million was regulated as PCB 23 contaminated. Anything below that was felt to be

Page 73 1 fine. I mean, that was the state-of-the-knowledge, 2 that was the state-of-the-art, 3 state-of-the-regulations. 4 As time changes, that's continued 5 to change. Now, fifty parts per million is viewed 6 to be a high level. So, it has changed over time 7 as more things have been developed. 8 BY MR. WRIGHT: 9 Q Your understanding is that fifty parts 10 per million in a homeowner's yard was viewed as no 11 problem by the regulators? Is that what you 12 believe? 13 A In 1977, '78, yes, that was the 14 established guideline. 15 Q You're not aware of any lower guidelines 16 for residential property than fifty parts per 17 million? 18 A Well, it has evolved over later years, 19 but I'm trying to answer you for that timeframe. 20 Q And that's what I'm asking you: In that 21 time frame, 1977, 1979, you honestly believe that 22 there were no guidelines for PCB contamination at 23 less than fifty parts per million in things that	Page 75 1 has no responsibility to protect its neighbors from 2 hazardous chemicals if a regulator doesn't tell it 3 to do so? 4 MR. COX: Object to the form. 5 THE WITNESS: I have to answer that 6 question based on my knowledge today. And I 7 answered it based on from a manufacturer's 8 standpoint and that addresses what you're 9 manufacturing or what you may think about 10 manufacturing. And, yes, there is a responsibility 11 and that responsibility is to use state-of-the-art 12 testing. If something is manufactured, 13 communication through MSDS is widely available. 14 BY MR. WRIGHT: 15 Q Communication to who? 16 A The world, whomever. 17 Q Anybody that can -- 18 A Anybody. 19 Q -- be exposed to it? 20 A Any -- doesn't matter if you're exposed 21 to it or what. Anybody, period, anybody that wants 22 it. 23 Q So, the burden's on the person --
Page 74 1 would come in close contact with ordinary people, 2 like their yard or the food they eat or anything 3 else like that? 4 A What I'm telling you is that fifty parts 5 per million was the guideline that had been 6 established by federal regulations as a part of 7 TSCA, Toxic Substances Control Act. That was 8 accepted by everybody, you know, the regulators, 9 EPA, state, as being the guideline that defined PCB 10 contamination. 11 Q What makes you think that in '71 the 12 regulators thought that stopping PCB production was 13 the very best thing that could be done? Have you 14 seen any documents that said that? 15 A No. 16 Q Were you present in any conversations 17 where the regulators told you that? 18 A No, not in 1971. 19 Q So, you have no basis for that 20 statement, other than you think that's probably 21 what they were thinking? 22 A Yes. 23 Q Is it your testimony that a manufacturer	Page 76 1 A That's a communication tool. 2 Q All right. 3 MR. COX: Go ahead and let him 4 finish his question. 5 BY MR. WRIGHT: 6 Q Does the manufacturer have a 7 responsibility to communicate with the people that 8 it exposes to a potentially hazardous chemical? 9 MR. COX: Object to the form. 10 THE WITNESS: Yes. 11 BY MR. WRIGHT: 12 Q Does a manufacturer have a 13 responsibility to identify the people that are 14 being exposed to its potentially hazardous chemical 15 that has escaped its plant? 16 MR. COX: Object to the form. 17 THE WITNESS: When you know of no 18 hazard, the sheer presence is not necessarily 19 identified as a hazard. In every event during my 20 career, that I'm aware of, when some release from 21 our facility occurred, that could potentially 22 affect people, they were told. I was involved 23 personally in going to the community in one event

Page 77 1 and notifying the community. 2 BY MR. WRIGHT: 3 Q That's every release except for PCBs, 4 correct? 5 MR. COX: Object to the form. 6 THE WITNESS: Every release where 7 there was a known potential hazard. 8 BY MR. WRIGHT: 9 Q And that did not include PCBs, because 10 nobody ever went into the community and warned the 11 residents about the release of PCBs from Monsanto 12 facility? 13 A There was no -- 14 MR. COX: Object to the form. 15 THE WITNESS: There was no known 16 hazard. 17 BY MR. WRIGHT: 18 Q If a chemical is a probable carcinogen, 19 is it still your testimony that people that are 20 exposed to that probable carcinogen unwittingly 21 don't deserve to be told by the manufacturer so 22 that they can do something about it? 23 MR. COX: Object to the form.	Page 79 1 BY MR. WRIGHT: 2 Q You didn't see that study? 3 A Which study was it? 4 Q Either Westinghouse or GE, I believe. 5 A No. 6 MR. COX: Object to the form. 7 BY MR. WRIGHT: 8 Q Did you ever read the ATSDR profile for 9 PCBs, either the first version or the new version? 10 A I don't really remember. 11 Q Do you disagree with the federal 12 government that PCBs are a probable human 13 carcinogen? 14 MR. COX: Object to the form. 15 THE WITNESS: Based on my personal 16 knowledge, I see nothing that would support it. 17 BY MR. WRIGHT: 18 Q So, the answer is, yes, you disagree 19 with the federal government? 20 A I can't say I disagree with the federal 21 government, because I have not -- I don't know what 22 report you may necessarily be talking about. I 23 mean, I -- but I'm just answering you based on my
Page 78 1 THE WITNESS: The presence of a few 2 parts per billion to million of PCBs, to my 3 knowledge, has -- I've never seen any documentation 4 that exhibited any hazard from that. I've -- in 5 all epidemiological studies that I've ever seen of 6 workers that have worked around much, much higher 7 levels of PCBs for forty and fifty years, these 8 epidemiological studies have shown no difference in 9 cancer rates, that I have read. 10 BY MR. WRIGHT: 11 Q Well, did you read Monsanto's own study 12 that showed an excess of lung cancer in aroclor 13 workers? 14 A No. 15 Q You didn't read the study that showed an 16 excess of Melanoma in aroclor workers? 17 MR. COX: Object to the form. 18 THE WITNESS: I've not seen that. 19 BY MR. WRIGHT: 20 Q You didn't see the study that showed 21 higher levels of digestive tract cancer in aroclor 22 workers? 23 MR. COX: Object to the form.	Page 80 1 personal knowledge. 2 Q Did you never hear, during your years as 3 environmental chief at Monsanto or thereafter, that 4 PCBs were a probable human carcinogen? 5 A I've heard that. I've also heard to the 6 contrary, too. 7 Q Who told you the contrary, Monsanto? 8 A Well, I remember one particular 9 presentation from a Dr. Renate Kimbrough. 10 Q Who was paid by Monsanto? 11 MR. COX: Object to the form. 12 THE WITNESS: I don't know if she 13 was or not. 14 BY MR. WRIGHT: 15 Q You don't know that she's been paid by 16 Monsanto for many, many years now? 17 MR. COX: Object to the form. 18 THE WITNESS: I mean, I don't get 19 involved in that part of it. I don't know that. 20 BY MR. WRIGHT: 21 Q Well, I guess my question is, Mr. Brown, 22 as the environmental chief or former environmental 23 chief at the Monsanto Anniston plant, did you never

Page 81 1 feel an obligation to find out everything you could 2 find out about these PCBs that you knew and your 3 company knew was in the environment, was staying in 4 the environment, was constantly exposing women and 5 children and old folks and sick people downstream 6 and just across the fence from the Monsanto plant? 7 MR. COX: Object to the form. 8 THE WITNESS: I lost the question. 9 BY MR. WRIGHT: 10 Q The question is: Didn't you feel an 11 obligation to find out everything you could find 12 out from the most valid sources possible -- 13 A And we had a number -- 14 MR. COX: Same objection. 15 THE WITNESS: -- of presentations 16 in our plant, both to me and our workers, from our 17 representatives who follow this full-time. I had a 18 career besides PCBs. And these presentations 19 involved people who were paid by Monsanto. I mean, 20 Dr. Bob Kaley and -- 21 BY MR. WRIGHT: 22 Q I'm sorry, you said who weren't paid by 23 Monsanto?	Page 83 1 Q And when did Mr. Kaley come in? 2 A Well, prior to him, John Craddock and -- 3 but I mean, this is basically an ongoing thing over 4 the years. He's made many, many, many trips to the 5 plant. 6 Q Who has, Bob Kaley? 7 A John Craddock and then followed by 8 Dr. Kaley. 9 Q Specifically, I'm talking about with 10 regard to PCBs, though. 11 A And they were specific to PCBs. I mean, 12 that was their -- any time they came to the plant, 13 it was regarding PCBs. 14 Q Well, let's talk about that. Who is 15 John Craddock? That's a name I'm not familiar 16 with. 17 A He was -- he was basically the 18 coordinator of any PCB technology or dealings or 19 regulations or -- prior to Bob Kaley. 20 Q He was out of St. Louis, I assume? 21 A Yes. 22 MR. WRIGHT: Buddy, is he still 23 around?
Page 82 1 A Who were. 2 MR. COX: Who were. 3 THE WITNESS: I mean, yeah, he came 4 to our facility and gave presentations on the 5 state-of-the-knowledge on PCBs, as did 6 Dr. Renate Kimbrough. 7 BY MR. WRIGHT: 8 Q Dr. Kimbrough came -- I'm sorry, go 9 ahead and finish your answer and I'll ask you a 10 follow-up question. 11 A And, you know, I didn't ask her if she 12 was paid by Monsanto, but I'm sure her trip to the 13 plant was paid by Monsanto. 14 Q So, Dr. Kimbrough actually came to the 15 Anniston plant and gave a speech to Monsanto 16 workers? 17 A I don't remember who all was involved in 18 that presentation, but -- 19 Q When was that? 20 A -- quite a few. Several years ago. I 21 can't remember exactly when. 22 Q Some time after 1994 or '95? 23 A Probably around '95, I guess.	Page 84 1 MR. COX: He's not employed. 2 THE WITNESS: He retired before Bob 3 came -- 4 MR. COX: He retired. I'm not sure 5 if he's still alive or not, Larry, I just can't 6 remember. 7 MR. WRIGHT: Okay. 8 BY MR. WRIGHT: 9 Q What did he tell you about PCBs? 10 A Nothing more than what I've already told 11 you. I mean, basically -- 12 Q That they weren't hazardous? 13 A Basically, this was an ongoing tracking 14 of regulations and -- you know, PCBs, during that 15 period of time, some were still used in 16 transformers and we -- we, across Monsanto and -- 17 went through a gradual phase-out of any PCB 18 containing electrical device. And all of these 19 were monitored and tracked and annual inventory 20 reported. And then when one was taken out of 21 service, its disposition tracked and documented and 22 this was part of the ongoing program pertaining to 23 PCBs.

Page 85 1 Q What you're describing is the drive to 2 become a PCB-free plant, correct, in the '80s, 3 Monsanto decided that it was going to be PCB free? 4 A Well, I think it started in the '70s 5 when we started phasing out any PCB article, you 6 know, transformer, capacitor. 7 Q And the reason Monsanto wanted to become 8 PCB free is because PCBs were a potential hazard to 9 humans or animals, correct? 10 MR. COX: Object to the form. 11 THE WITNESS: The reason to become 12 PCB free was the stability, the negative parts of 13 aroclors had been determined, its stability in the 14 environment. And as one could phase out these 15 devices and basically get rid of them, you moved to 16 the next state-of-technology. 17 BY MR. WRIGHT: 18 Q But the reason you were phasing them out 19 and the reason Monsanto quit making PCBs and the 20 reason the government banned them is because of a 21 concern about hazards to human and animal health? 22 MR. COX: Object to the form. 23 THE WITNESS: The first was a	Page 87 1 there and continue to expose humans and animals 2 outside of the Anniston plant unless something was 3 done about them, correct? 4 MR. COX: Object to the form. 5 THE WITNESS: Monsanto knew they 6 were stable in the environment and the position was 7 that nothing would be continued to be manufactured 8 that was stable in the environment. 9 BY MR. WRIGHT: 10 Q And Monsanto felt no responsibility to 11 identify the people that were being exposed to its 12 PCBs, to identify the specific locations of its 13 PCBs that it had discharged and that were still 14 present in the environment or to communicate the 15 potential hazard to those people who were being 16 exposed or to somehow eliminate the exposure? 17 Monsanto felt no responsibility to do any of those 18 things? 19 MR. COX: Object to the form. 20 THE WITNESS: Yes, it did. 21 Monsanto communicated to every customer, to every 22 worker, that purchased or used PCBs, they were 23 told, they were stable in the environment and
Page 86 1 stability in the environment. Had -- 2 BY MR. WRIGHT: 3 Q Yeah, but -- 4 A Had PCBs not been stable in the 5 environment, there is no known hazard that would 6 have caused the phase-out of them. That hazard 7 could have been very well managed. 8 Q Well, part of the hazard is their 9 stability in the environment? 10 A That was the hazard that caused them to 11 be phased out. 12 Q And the problem with them being stable 13 in the environment is they present a long-term 14 threat to the health of humans and animals because 15 they are present and going to stay present in the 16 environment unless you get rid of them, correct? 17 MR. COX: Object to the form. 18 THE WITNESS: Yes. 19 BY MR. WRIGHT: 20 Q And so Monsanto knew that they were a 21 potential human and/or animal health hazard and 22 that they were present in the environment outside 23 the Anniston plant and they were going to stay	Page 88 1 informed that the product would be discontinued. 2 BY MR. WRIGHT: 3 Q But Monsanto refused to warn or 4 communicate to its neighbors across the fence, who 5 Monsanto knew were being exposed to this stable 6 chemical that was present and was going to stay 7 present in their neighborhood? 8 MR. COX: Object to the form. 9 THE WITNESS: Monsanto communicated 10 to every person that used aroclor. Monsanto did 11 not know the need to communicate to everybody that 12 may have lived along a stream that contained a few 13 parts per million PCBs. 14 BY MR. WRIGHT: 15 Q Well, the numbers that we just looked at 16 were not a few parts per million, they were eleven 17 hundred and twelve hundred parts per million in 18 that stream, correct? 19 A At certain points. At one point. 20 Q Well, and at another point, it was seven 21 hundred and something? 22 A Very shortly -- short distance from 23 that. And that's -- that was removed from the

Page 89 1 stream. 2 Q But Monsanto could have discovered 3 twenty years ago or twenty-five years ago the -- 4 MR. WRIGHT: Is it two hundred 5 thousand parts per million, Buddy, behind Mars Hill 6 or twenty thousand? 7 MR. COX: Two hundred. 8 BY MR. WRIGHT: 9 Q -- the two hundred parts per million, 10 behind the Mars Hill Baptist Church, twenty or 11 twenty-five years ago, had they looked, correct? 12 MR. COX: Object to the form. 13 THE WITNESS: Nobody had absolutely 14 any knowledge or any reason to go looking at that 15 point in time that I'm aware of. 16 BY MR. WRIGHT: 17 Q Well, what did Monsanto learn in 1995 18 that was new knowledge that caused it to go looking 19 and find the PCBs everywhere that it found them, 20 after 1995? What new knowledge did Monsanto have 21 that it didn't have in 1972? 22 MR. COX: Object to the form. 23 THE WITNESS: Well, basically there	Page 91 1 sampling there, I'm not that close to it. But I 2 can assure you that in 1985, when we did that 3 sampling that we talked about earlier, that was the 4 locations were agreed on by us, Attorney General, 5 AWI -- or ADEM, at that time, and EPA. We didn't 6 have the faintest idea that if we had sampled in 7 that direction, we could have found PCBs. 8 BY MR. WRIGHT: 9 Q Sir, Monsanto knew that PCBs were being 10 washed out of the landfill and had been washed out 11 of the landfill for thirty-five years before 1972 12 and Monsanto knew that those PCBs had migrated and 13 were still there in 1972? 14 MR. COX: Object to the form. You 15 were through, weren't you? 16 MR. WRIGHT: Yeah. 17 THE WITNESS: You know, you use the 18 word "Monsanto" like it's a person. You're talking 19 about a lot of people. 20 And to my knowledge -- you say 21 thirty-five years -- to my knowledge, that area was 22 not used anywhere near thirty-five years. But I 23 can assure you, as honestly as I know how, in spite
Page 90 1 was a lot of new knowledge but, to answer that 2 question, you've got to get somebody involved in 3 1995. I was not involved. 4 BY MR. WRIGHT: 5 Q Well, you were there. I mean, you were 6 still employed at the Anniston plant, correct, and 7 living in Anniston? 8 A I'm -- 9 Q Or living in Heflin? 10 A I had an office there, but I was 11 basically working wherever. 12 Q Well, what's the best knowledge that you 13 have about what was new to Monsanto in 1995 that it 14 did not have in 1972? 15 MR. COX: Object to the form. 16 THE WITNESS: One thing was the -- 17 let me just address that hot spot per se. Nobody 18 had the faintest idea that that was there. Nobody 19 had the -- any basis for going to that spot in the 20 woods and taking a sample. Till this day, nobody 21 can explain how it was there, that I'm aware of. I 22 mean, maybe somebody can. I can't. 23 But what led to the eventual	Page 92 1 of what you say looking backwards, that in 1985, 2 when we sat down there and as honestly and 3 sincerely as we could possibly know how, decided 4 where to sample, that never entered anybody's mind 5 as a point that we needed to sample. 6 Now, did somebody some years 7 previous to that have some knowledge that we were 8 not aware of, that's a possibility, but I don't 9 know who they were and they weren't available to 10 us, at the time. All I can tell you is that in 11 1985, there was no attempt to not sample any place 12 where we felt we should sample. 13 BY MR. WRIGHT: 14 Q Well, let me ask you this: In all 15 honesty and in all fairness, if Monsanto -- and by 16 Monsanto, I mean the decision makers at Monsanto -- 17 if Monsanto had known or had a reason to know that 18 PCBs were migrating off of that landfill in 1970 or 19 '71 and had been for a long time prior to that, 20 then should Monsanto have tried to figure out where 21 the PCBs ended up that migrated off of the 22 landfill? 23 MR. COX: Object to the form.

Page 93 1 THE WITNESS: Had that knowledge 2 been available around the table when we were 3 struggling in 1985 on what to do, yes, we -- the 4 sampling would have been extended on up that 5 tributary. 6 BY MR. WRIGHT: 7 Q Should have been extended up that 8 tributary? 9 A It would have been. 10 Q But it should have been? 11 MR. COX: Object to the form. 12 THE WITNESS: What I was saying 13 was, had that been available to us in 1985 when we 14 were trying to put this plan together, it would 15 have. 16 BY MR. WRIGHT: 17 Q Would have and should have, is that 18 fair? 19 MR. COX: Object to the form. 20 THE WITNESS: I'm answering you 21 from the standpoint of what the intent was in 1985, 22 when that sampling protocol was put together. Had 23 that information been known and available around	Page 95 1 MR. COX: Object to the form. 2 THE WITNESS: Yes. 3 BY MR. WRIGHT: 4 Q And those PCBs, common sense would have 5 told you, wherever they might have gone, are still 6 going to be present, even to this day, at least a 7 good portion of them, correct? 8 MR. COX: Object to the form. 9 BY MR. WRIGHT: 10 Q Because of the stability in the 11 environment, the PCBs that common sense would have 12 told you migrated off of that landfill, before the 13 sump was put in, are still going to be around 14 wherever they ended up? 15 A Yes. 16 MR. COX: Object to the form. 17 (WHEREUPON, there was a brief recess.) 18 (WHEREUPON, Plaintiff's Exhibit 20 was marked for 19 identification.) 20 BY MR. WRIGHT: 21 Q We're just going to kind of skip around 22 now. Let me show you a memo that was sent to you 23 by Robert Ivory in January of '81. Do you remember
Page 94 1 that table or even thought about, it would have 2 been included in that sampling plan. 3 BY MR. WRIGHT: 4 Q Was Mr. Taffee still employed in 1985? 5 A No. 6 Q Was he still in the area? Had he had 7 his stroke by then, '85? 8 A I don't think so. 9 Q So, he was still able to communicate and 10 answer questions and give opinions and history and 11 so forth? 12 MR. COX: Object to the form. 13 THE WITNESS: Probably. 14 BY MR. WRIGHT: 15 Q Did he never tell you about the sump at 16 the landfill that was collecting PCBs and had to be 17 pumped out? 18 A No. 19 Q Had he told you that the sump in the 20 drainage from the landfill was collecting PCBs, you 21 could have employed common sense and figured that 22 there were probably PCBs coming out of that 23 landfill before the sump was installed, correct?	Page 96 1 receiving that memo? By the way, this is Exhibit 2 20 we're talking about. 3 A Well, I mean I -- I vaguely remember it. 4 Q It sampled some material from the HB40 5 sump? 6 A Uh-huh. 7 Q And found a hundred and eight parts per 8 million PCBs in that material, correct? 9 A Yes. 10 (WHEREUPON, Plaintiff's Exhibit 21 was marked for 11 identification.) 12 BY MR. WRIGHT: 13 Q And then the second page of that -- it 14 actually may not -- actually, why don't we make 15 that 21, because I'm not sure that they go 16 together, because one is dated in January and the 17 other one is dated in April, right? Number 20, the 18 typewritten memo, is dated in January and Exhibit 19 Number 21, the handwritten document, is dated in 20 April of '81. Is that your handwriting, by the 21 way? 22 A No. 23 Q Do you know whose it is on Exhibit 21?

Page 97 1 A I believe this was before Cheever. 2 Whoever had that environmental position before 3 Cheever. I believe it was Don Huckabee (phonetic), 4 at that point in time. 5 Q Can you read that out loud? If you 6 wouldn't mind. 7 A Jim Campbell of Chemical Waste 8 Management informs that the HB sump material was 9 greater than a hundred parts per million, PCB 10 sample has been okayed by their -- let's see -- 11 lab, and that they are ready to accept it. 12 Roland -- let's see -- to Roland, ask 13 him to get with regional purchasing and get 14 purchase order or -- something tomorrow. 15 Q Now, this is some nine years after 16 manufacture of PCBs was halted in Anniston when 17 this hundred plus parts per million was found in 18 HB40, sump material, correct? 19 A And that was the previous aroclor sump 20 that the HB40 was routed to and used as a separator 21 vessel. And as it was cleaned out, it was analyzed 22 for any PCBs and then disposed of accordingly. 23 Q I'm sorry?	Page 99 1 there was any spill or release, that's what it 2 was -- that's what was its intent, around that HB40 3 area. 4 Q And the PCBs would have come from, I 5 guess, just fugitives from the sewer? 6 A Fugitives from the -- the separator 7 device, itself, the big tank in the ground, if you 8 will. 9 Q Right. But the tank was cleaned out in 10 '71 or '72? 11 A It was emptied. 12 Q Emptied. And then it accumulated 13 material for the next eight or nine years? 14 A From the HB40 unit, yes. 15 Q Would that have included water from the 16 sewers? 17 A No. 18 Q Where did this material that ended up in 19 the sump kit, where did it come from? 20 MR. COX: PCB material? 21 MR. WRIGHT: Well, the material 22 that contained PCBS, yeah. 23 THE WITNESS: When you say the
Page 98 1 A And disposed of accordingly. 2 Q Okay. Is this the only time that sump 3 was ever cleaned out? 4 A It was phased out not long thereafter. 5 Q Between the end of production of 6 aroclors in '81, had it been cleaned out any other 7 times? 8 A I don't remember, but it's not likely, 9 because any accumulation in it was extremely slow. 10 Q Was the sump cleaned out when the 11 aroclor plant was shut down? 12 A Yes. 13 Q So, this is new material that's 14 accumulated PCBs, even though production has been 15 stopped? 16 A Yes. When I say "cleaned out," it was 17 not flushed to a -- it was -- it was empty. And 18 any inlet sewers from the aroclor plant were 19 basically taken out at that point in time. And so, 20 it was -- this particular separator device that was 21 then used to take any water from the HB40 area so 22 it could be used as an oil water separator to 23 separate that. Was a capture device in the event	Page 100 1 sewers -- 2 BY MR. WRIGHT: 3 Q Right. 4 A -- I was assuming you were referring to 5 sewers associated with aroclor manufacturing; is 6 that correct? Maybe you need to define what you 7 mean better. 8 Q Yeah, well, I probably can't, because I 9 don't know what I mean. Let me just ask it, 10 generally. Where did the material that ended up in 11 the HB40 sump, where did it come from? 12 MR. COX: Object to the form. 13 THE WITNESS: I would assume it 14 came from fugitives that were in that tank, itself. 15 What's referred to as the sump. 16 BY MR. WRIGHT: 17 Q Right. Yeah, we're not communicating. 18 Right now I'm not asking specifically about the 19 PCBs, I'm just asking about, what is the stuff that 20 is the sump pit material? 21 A From the HB40 plant. 22 Q Is it everywhere? I mean, does the 23 whole HB40 plant funnel to the sump area?

Page 101 1 A It was set up so that the area was 2 contained, and if there was any spill or release, 3 it would be funneled to this tank. 4 Q What about water, does water go into 5 that tank or did water go into that tank? 6 A A small amount, not -- the rainfall -- 7 this was an area underneath the structure 8 associated with HB40. And any water that would 9 have been directed in that way would have been a 10 very, very small amount. In other words, any -- 11 there was no processed water and rainfall couldn't 12 fall in there. So if -- but if there was, you 13 know, fugitive water that got into there, it would 14 go into that tank. 15 I say fugitive from the standpoint of 16 water, drip or leak or something, steam -- steam 17 condensate. 18 Q Going back to, we talked, I think, in 19 our earlier deposition, about the reports that went 20 to ADEM on the monthly reports that gave a daily 21 summary of the PCBs. Do you recall that? 22 A I recall seeing it, yes. 23 Q Do you know why only twelve forty-two	Page 103 1 Q Could I see that back? 2 Now, it gives an agenda for a meeting. 3 It describes the objectives of the meeting and 4 delineates the landfills and the surface 5 impoundments and the storage areas and the 6 satellite storage areas. And it delineates in 7 table one, has areas of concern, the product 8 storage tank spillage area, where was that? 9 A I'm assuming that could be any storage 10 tank where any spill could have potentially 11 occurred. 12 Q Snow Creek PCB contamination area and 13 former off-site landfill are the three areas of 14 concern listed, correct? 15 A Yes. 16 Q The off-site landfill, would that be the 17 landfill that we've been referring to across the 18 road and up the hill from the plant? 19 A No. 20 Q Or is that the westend landfill, I 21 guess? 22 A That would have been the westend 23 landfill.
Page 102 1 and twelve fifty-four were reported to the state 2 and not twelve twenty-one or any other aroclor? 3 A No, I do not. 4 Q You never heard? 5 A Was not a part of it and have never 6 heard. 7 (WHEREUPON, Plaintiff's Exhibit 22 was marked for 8 identification.) 9 BY MR. WRIGHT: 10 Q What is Exhibit Number 22? 11 A It's the EPA letter to Robert Jones, 12 concerning doing a RCRA facility assessment. 13 Q And what's the RCRA facility for? 14 A Resource Conservation and Recovery Act, 15 RCRA, is the set of laws that are applied to 16 landfill-type facilities. 17 Q So, that related to the landfill? 18 A Well, this was involving a facility 19 assessment, analyzing any potential what was called 20 SWMU, S-W-M-U, solid waste management units, and 21 any other area of concern, basically to address any 22 potential site that could have had any past or 23 ongoing release of any hazardous constituent.	Page 104 1 MR. COX: Can I interject, because 2 otherwise that's wrong, I think. 3 MR. WRIGHT: Okay. 4 MR. COX: Jerry, didn't they 5 identify or attempt to identify some old phosphate 6 landfill and name that as an area of concern, 7 because at the time the westend landfill was still 8 owned by the power company? 9 THE WITNESS: Yeah. But as I 10 recollect, it was a phosphate -- I mean, it was 11 owned by the power company, but -- 12 MR. COX: I thought that was the 13 landfill they thought that was between Clydesdale 14 and that corner of the property, at the corner of 15 Clydesdale and 202, on-site. 16 That's okay. I think the actual 17 RFA and then the -- 18 THE WITNESS: I would have to go to 19 the document and see. 20 MR. COX: -- comments and the RCRA 21 permit, I think clarify that. Sorry. 22 MR. WRIGHT: That's okay. 23 BY MR. WRIGHT:

Page 105 1 Q Was a submittal ever prepared for this, 2 in response to this Exhibit Number 22? 3 A The way I remember this series of events 4 is that this was done under contract by EPA with a 5 company called A. T. Kearney. 6 Q Who? 7 A A. T. Kearney. 8 MR. COX: K-E-R-N-E-N-Y, I think. 9 THE WITNESS: K-E-A-R-N-E-Y. They 10 came on-sight and did their investigation and 11 prepared a document that had to be later corrected. 12 And I think that document was typically referred to 13 as the RFA. 14 MR. WRIGHT: Mark that as our next 15 exhibit. 16 (WHEREUPON, Plaintiff's Exhibit 23 was marked for 17 identification.) 18 BY MR. WRIGHT: 19 Q Here is a memo from Mr. Taffee to 20 J. R. Savage in St. Louis. And you're the first 21 copy recipient of this November 6th, 1975 memo. 22 And it's entitled PCB disposal data, JRS requests 23 10-31-75. Apparently, Mr. Savage requested some	Page 107 1 another series of documents coming to him. 2 Q Relating to what? 3 MR. COX: Object to the form. 4 THE WITNESS: Whatever his request 5 was. 6 BY MR. WRIGHT: 7 Q Well, disposal to landfill follows. But 8 what's disposal to landfill? 9 MR. COX: Object to the form. 10 THE WITNESS: I have to assume that 11 his request was pertaining to anything about PCBs 12 that had gone to the landfill. 13 BY MR. WRIGHT: 14 Q Okay. Do you know why Mr. Savage was 15 asking those questions in '75? 16 A No, I do not. 17 Q You don't have any recollection of that? 18 A I don't remember. 19 MR. WRIGHT: Mark that as our next 20 exhibit. 21 (WHEREUPON, Plaintiff's Exhibit 24 was marked for 22 identification.) 23 BY MR. WRIGHT:
Page 106 1 information and Mr. Taffee is forwarding some 2 information. And he indicates that the effluent to 3 Snow Creek is reported through October '72 and 4 presumably he attached it. Item number two, data 5 on fish samples taken by Gunning and Sutkus are 6 enclosed. 7 You're familiar with those materials, 8 correct? 9 A I'm familiar -- 10 Q Gunning and Sutkus -- 11 A -- with their study, yes. 12 Q And then he said, we can find no 13 indication here of any sediment analyses and no 14 data here on receiving water analyses. What does 15 that mean? 16 A Receiving water is water that you 17 normally bring in and use as -- and indicates the 18 plant is city water, that's -- or I -- well, I'm 19 guessing that's what he means. 20 Q What's this handwritten note down here 21 refer to? 22 A It says, Jim, disposal to landfill is 23 false. So, he's basically saying there would be	Page 108 1 Q Let me hand you Exhibit Number 24. And 2 this is a document dated January 18th, 1979. 3 Again, you were a copy on it. Or 4 actually, it's addressed to you. You're not a copy 5 on it, it's addressed to you. From Mr. Glasgow. 6 And it again, documents PCBs in HB40 oil in 7 Therminol from HB40 system and then two hundred and 8 eighty parts per million into the sump. 9 Is that the same sump that presumably we 10 were talking about in '81, as well? 11 A That's the only sump I'm aware of, so, 12 yes. 13 Q That would indicate that PCBs continued 14 to accumulate in the sump there? 15 A Well -- 16 MR. COX: Object to the form. 17 BY MR. WRIGHT: 18 Q Or continued to accumulate in the sump? 19 A Well, this was prior to that other. 20 Q Right. So, the sump was cleaned out in 21 '78 or '79 -- well, '78, I guess, December of '78, 22 and found to have two hundred and eighty parts per 23 million PCBs, and it was cleaned out again in '81

Page 109 1 and found to have a hundred and eight parts per 2 million PCBs. So, doesn't that tell you that PCBs 3 continued to accumulate? 4 MR. COX: Object to the form. 5 THE WITNESS: It doesn't tell me 6 that it continues to accumulate, it tells me that 7 it's still removing fugitive amounts from the sump. 8 BY MR. WRIGHT: 9 Q Do you not remember any leaching from 10 the landfill during your tenure as the 11 environmental head there at Anniston? 12 A Of the PCBs? 13 Q Well, of anything? 14 A The primary thing I can remember is 15 associated with the ground water study that we 16 initiated in '79, where we did many hundreds of 17 borings to study ground water movement from the 18 landfill and -- 19 Q Was that as a result of a discovery of 20 leaching from the landfill? 21 A And I started to say, on the westside, 22 there was a wet-weather spring that was discovered 23 to contain some leachate. And so we did a study	Page 111 1 credit for discovering the spring with the brown 2 material coming out of the landfill, correct? 3 A The work was started some time before 4 this, the work on contacting Gunning -- I mean, 5 excuse me. Geraghty and Miller, to start the 6 boring work, as I remember, in 1979. And in fact, 7 we start discussing placement of monitoring wells, 8 and that was prior to -- prior to these 9 discussions. 10 But what he refers to here, brown algae, 11 that's nothing more than you see in any wet-weather 12 spring that's basically stagnant. That was not an 13 indication of contamination. 14 Q Well -- 15 A And that was not -- 16 Q Well, let's look at the Geraghty and 17 Miller report, which is dated April of 1980. Or 18 actually, this is just their proposal. I'm not 19 going to mark this, but I'll reference it as 20 DSW073245. Geraghty and Miller gives background 21 for this problem. It talks about in early '79, 22 however, plant personnel noticed a discoloration in 23 water emerging from a small spring at the base of
Page 110 1 that started in '79 and then continued continuously 2 in phases over the next several years to study and 3 address that kind of concern. 4 Q Who identified that leaking from the 5 landfill? 6 A Probably Taffee. 7 Q In fact, wasn't it a state 8 representative? I say "state representative". Not 9 an elected official, but a representative from the 10 Department of Public Health? 11 A But I don't remember specifically how, 12 you know, the events that triggered the study that 13 was started but, you know, it's possible it was 14 noted on an inspection, I just don't remember. 15 Inspections were done on a very routine basis. 16 MR. WRIGHT: Mark that as our next 17 exhibit. 18 (WHEREUPON, Plaintiff's Exhibit 25 was marked for 19 identification.) 20 BY MR. WRIGHT: 21 Q Here is a memo from -- a state document 22 from the Department of Public Health, from Darryl 23 Baker to Alfred Chipley. And Mr. Baker claims	Page 112 1 the landfill. 2 A That's correct, a -- 3 Q Subsequent analysis of the water showed 4 concentrations of organo-phosphate in the range of 5 from three hundred to five hundred PPM. The spring 6 discharge, estimated at from ten to twenty gallons 7 permit minute, flows over land a short distance 8 before entering Snow Creek, which runs parallel to 9 the highway into Anniston. 10 A That's correct. 11 Q Don't you think that the gentleman from 12 The Department of Public Health is talking about 13 the same spring and the same discoloration that the 14 Geraghty and Miller people are talking about? 15 A The brown algae is not. Okay? But 16 this -- there was only one site, so, yes, we're 17 talking about the same site. 18 MR. WRIGHT: Let's mark that. 19 (WHEREUPON, Plaintiff's Exhibit 26 was marked for 20 identification.) 21 BY MR. WRIGHT: 22 Q Let me hand you Exhibit Number 26. And 23 this is a memo to you. And I'll just read it.

Page 113 1 It's short. And then I'm going to ask you what 2 it's about. This is from J. B. Moon at Anniston. 3 Who was J. B. Moon in February of 1980? 4 A He would have been manufacturing 5 superintendent. 6 Q Would he have been your supervisor or 7 was he a peer of yours, I guess? 8 A Changed from supervisor to peer in 1980. 9 Q At this time, was he a supervisor? 10 A Probably my supervisor, at that point, 11 that early in '80. 12 Q It sounds like he's your supervisor in 13 the body of this memo. It says, quote, "Our 14 current solids problems in waste treatment are a 15 major concern to me at the moment. I feel that a 16 somewhat fresh approach must be taken to analyzing 17 this problem. 18 I know that you have considerable 19 background in this area and also have developed 20 natural biases. Please, try to put aside those 21 biases and look at our existing data to see if 22 there are clues to predict when we are headed for 23 upsets.	Page 115 1 discharge only so much suspended solids to the city 2 under the permit. Are you familiar with the 3 clarifier? 4 Q Yes. 5 A I'll just draw something for 6 illustration. But a clarifier typically operates 7 in some sort of equilibrium where the biological 8 solids settle and water overflows the top. 9 The upset condition that he's talking 10 about is a condition that causes this sludge 11 blanket to rise, therefore discharging more solids 12 to the city POW than could be accepted under the 13 permit. 14 When this blanket rose and did that, you 15 basically had to shut down. So, what he is talking 16 about here is some way of predicting and 17 identifying factors that would cause this blanket 18 to rise and overflow. 19 (WHEREUPON, Plaintiff's Exhibit 27 was marked for 20 identification.) 21 MR. WRIGHT: Let's mark this. 22 BY MR. WRIGHT: 23 Q Let me show you these. There's two
Page 114 1 Our approach must change from one 2 of telling people that they have a problem to that 3 of telling them, one, they are headed for a 4 problem, and what is this causing this direction, 5 and two, how, once the problem materializes, it can 6 be readily corrected. 7 Please, document to me your plans 8 in developing a new approach to solids problems. 9 J. B. Moon." 10 What was he talking about? 11 A Okay, in biological waste treatment 12 plant, the -- obviously, the basis for a biological 13 treatment plant is organisms, organisms that 14 biodegrade or consume or eat the waste, as you 15 will. 16 The biological organisms appear in the 17 waste treatment plant as suspended solids. As they 18 eat and consume the waste water or the waste 19 constituents in the water, the biological organisms 20 grow and form more. So, they have to be removed 21 over on some period of -- some basis. 22 Okay, the discharge limit to 002 carried 23 a suspended solids limit, so that one could	Page 116 1 analyses from 1988 by EIRA, Environmental 2 Industrial Research Associates in May of '88, do 3 you know where those samples came from or what they 4 are? They found fifty-eight thousand, five hundred 5 micrograms per kilogram of PCB twelve sixty or 6 aroclor twelve sixty in something in 1988 and I'm 7 wondering what it was. 8 A That would be fifty-eight parts per 9 million or fifty-eight thousand parts per billion. 10 I don't know. Oh, me. 11 MR. COX: The micrograms per 12 kilogram would indicate it's a solid or liquid, 13 Jerry. 14 THE WITNESS: Kilogram typically 15 shown (phonetic) -- I see absolutely nothing that 16 gives me a clue. 17 Are you sure this was associated 18 with our facility? 19 MR. WRIGHT: Yeah. It would have 20 been -- 21 MR. COX: Is it part of a bigger 22 report? 23 MR. WRIGHT: I don't think so.

Page 117 1 BY MR. WRIGHT: 2 Q But anyway, yeah, I'm pretty sure it's 3 your facility, but I don't know anything more about 4 it. 5 A I can never remember having worked with 6 that laboratory there. 7 Q Okay. 8 A It looks like two separate samples. 9 Q I think -- 10 A This is some solid sample from 11 someplace, and I absolutely don't know where it 12 would be from. 13 Q All right. 14 A Yeah, I mean, I was just looking at 15 their location there. 16 Q Where are they? 17 A St. Rose, Louisiana. 18 Q What date is that? Maybe I can pin it 19 down. 20 A It's '88, 4-26-88. 21 Q Oh, let me ask you. This is a question 22 I've been meaning to ask. Do you know anything 23 about the Bass lawsuit against Monsanto in the	Page 119 1 THE WITNESS: Really look forward 2 to it. 3 (WHEREUPON, the deposition was concluded.) 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Page 118 1 '60s? 2 A Only that that I was told, you know. 3 That happened before I was out of college. And I 4 heard some few comments about it. But so far as 5 any, you know, real specific things, no. 6 Q What did you hear about it, because I 7 haven't heard much about it, at all, so any insight 8 could be helpful? 9 A I don't know that I could tell you 10 anything. I just know that there was such. I 11 mean, that's basically all I know. 12 Q Where was it filed, do you know? 13 A I don't know. 14 Q Do you know where it was pending? 15 A I have no idea. 16 Q What happened to it? 17 A I have no idea. 18 MR. WRIGHT: Why don't we go off 19 the record. 20 (WHEREUPON, there was discussion off the record.) 21 MR. WRIGHT: I guess, Mr. Brown, 22 I'll reserve the rest of my questions until we get 23 together again in Birmingham.	Page 120 1 CERTIFICATE ----- 2 STATE OF ALABAMA) 3 CALHOUN COUNTY) 4 5 I, SAMANTHA E. NOBLE, a Court Reporter 6 and Notary Public in and for The State of Alabama 7 at Large, duly commissioned and qualified, HEREBY 8 CERTIFY that the within named witness, JERRY BROWN, 9 who was made known to me, was first duly sworn to 10 testify the truth, the whole truth, and nothing but 11 the truth in the cause aforesaid; that the 12 testimony then given by him was by me reduced to 13 shorthand in the presence of said witness, 14 afterwards transcribed upon a computer, and that 15 the foregoing is a true and correct transcript of 16 the testimony given by him as aforesaid. 17 I FURTHER CERTIFY this deposition 18 was taken at the time and place in the foregoing 19 caption specified, and was concluded without 20 adjournment. 21 I FURTHER CERTIFY that I am not a 22 relative, counsel, or attorney for either party, or 23 otherwise interested in the outcome of this action.

1 -----
2 IN WITNESS WHEREOF, I have hereunto
3 set my hand and affixed my seal at Anniston,
4 Alabama, on this the 2nd day of March, 2001.

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9

10 _____
11 SAMANTHA E. NOBLE
12 Notary Public in and for
13 Alabama at Large

14

15 MY COMMISSION EXPIRES: 11-14-2001.

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Brown, Jerry (Anniston Monsanto Plant employee) in OWENS (2)

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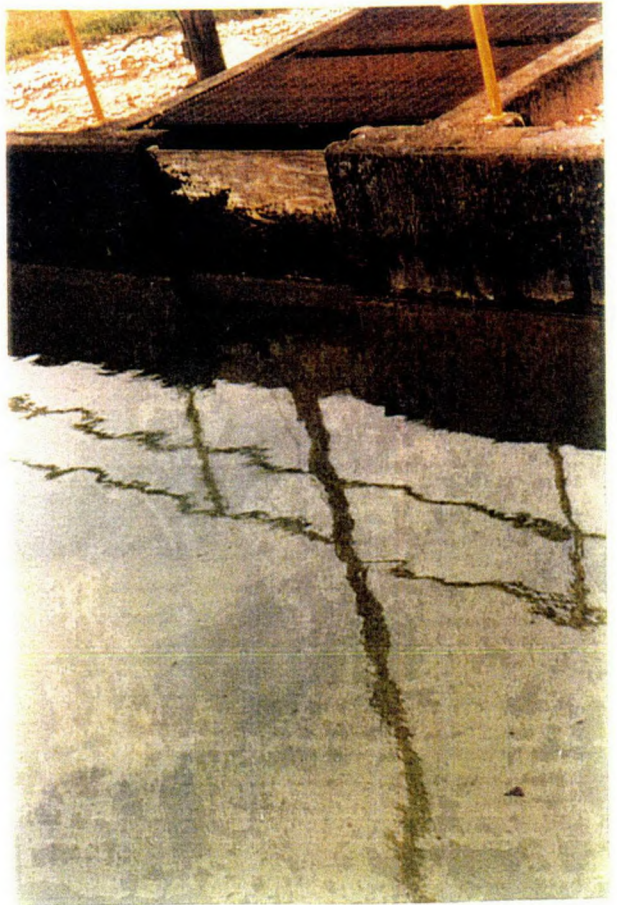


A

June '77



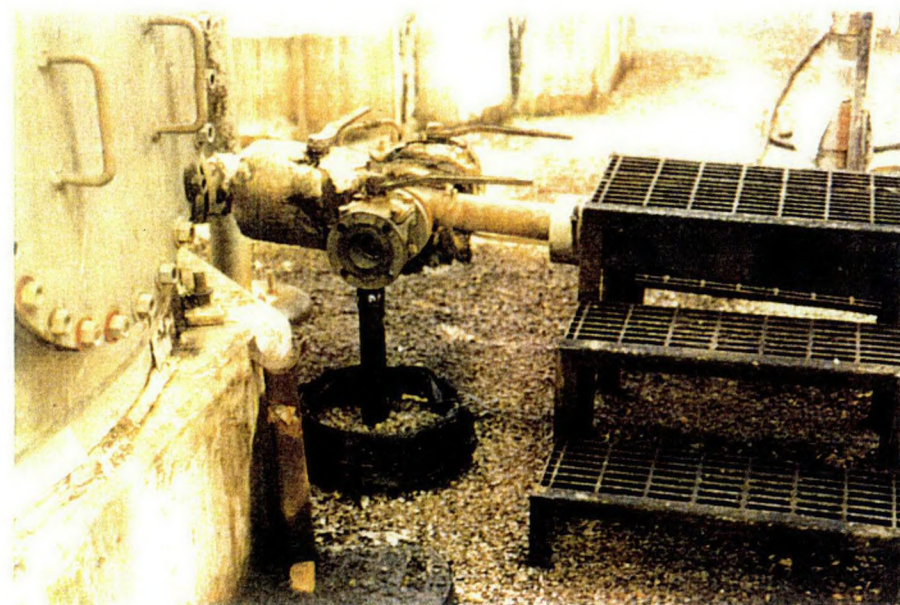
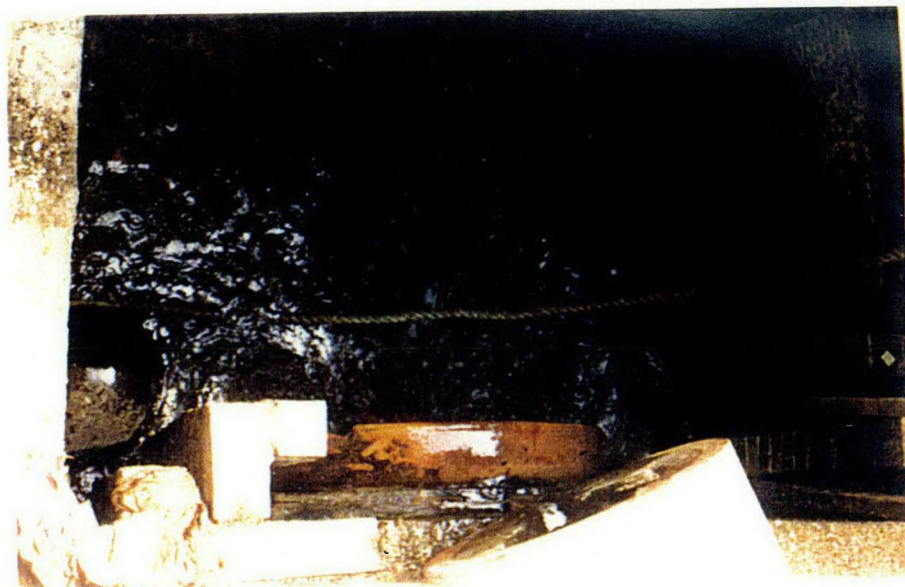
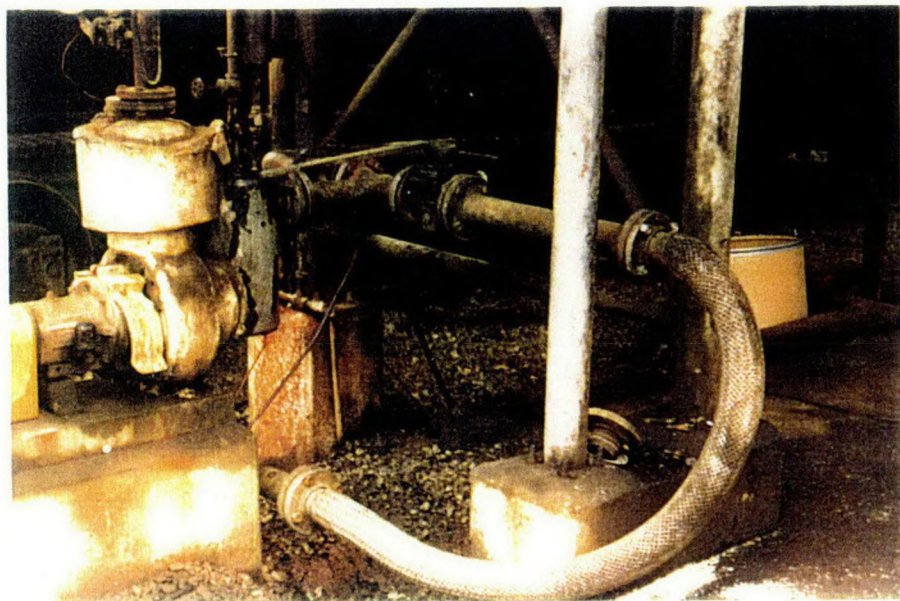
B



PLAINTIFF'S
EXHIBIT

PENGAD-Beyonce, H. J.

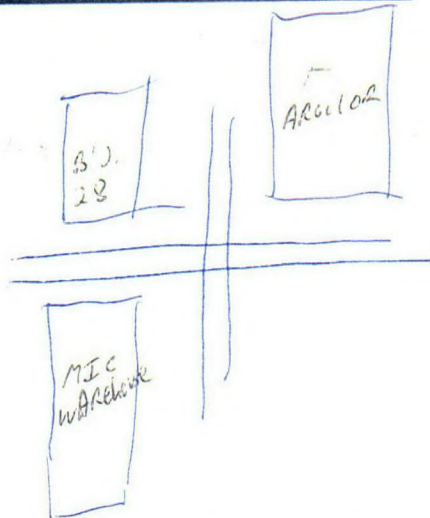
①





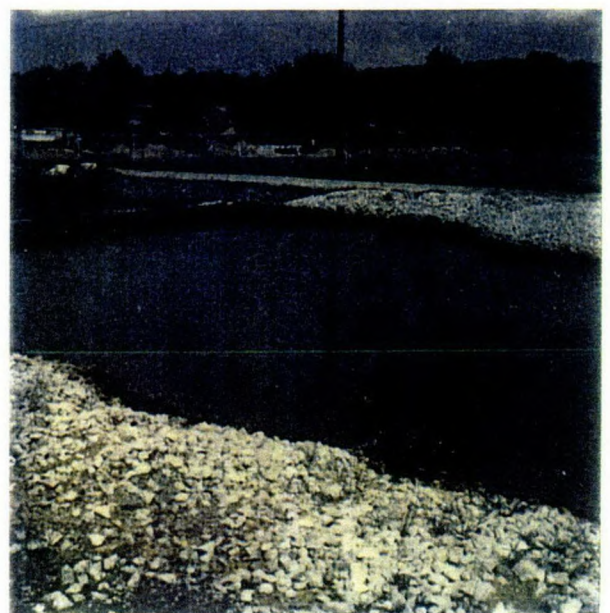


A

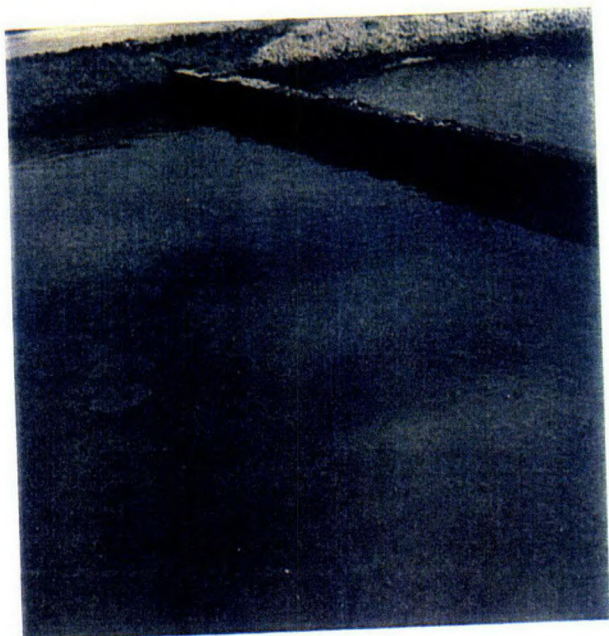


C-LINE #52584
35MM PRINTS

C



A



NOT A - 2012 24

B



NOT A - 2012 24

C



NOT A - Head End First 6-12
2012 N.W.

6/21/12

D



483564 4111 C
STUMP MARK

6



A

N Pit showing mid baffle
Looking up stream to inlet
6/21/77



E

N Pit mid baffle
Looking west

6/21/77

C-LINE #52584
35MM PRINTS



C

N Pit EFG End Looking North
showing mid and the rd structure
6/21/77



D

N Pit East End EFG
Looking NW

6/21/77

7



A

U P + up stream of pit
bottle removed grit baffles
6/21/77



B

U P + Head End First DAFSIC
Looking West
6/21/77



C

U P + looks S E at grit
bottle removed
6/21/77



D

U P + up stream of pit
bottle removed
6/21/77

(S)

A



N. Pit from inlet toward dike.
6/21/77



N. Pit mid cascade during
cleaning
6/21/77

C



ITS workings



N. Pit showing third cascade
looking East
6/21/77

A



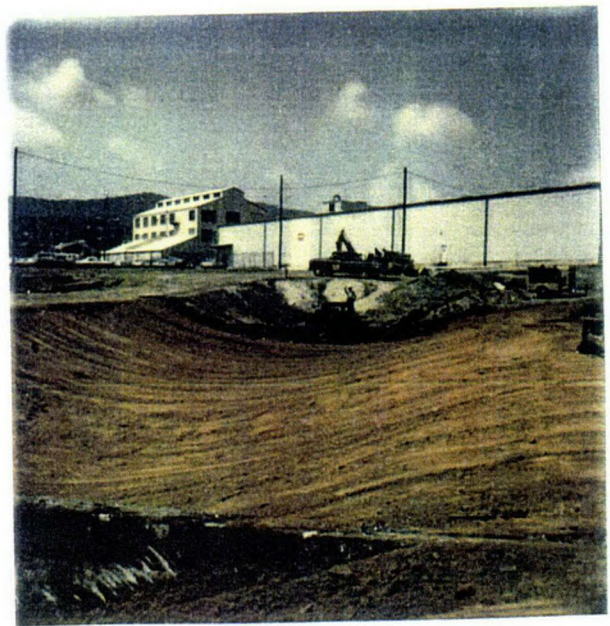
B



C



D



10

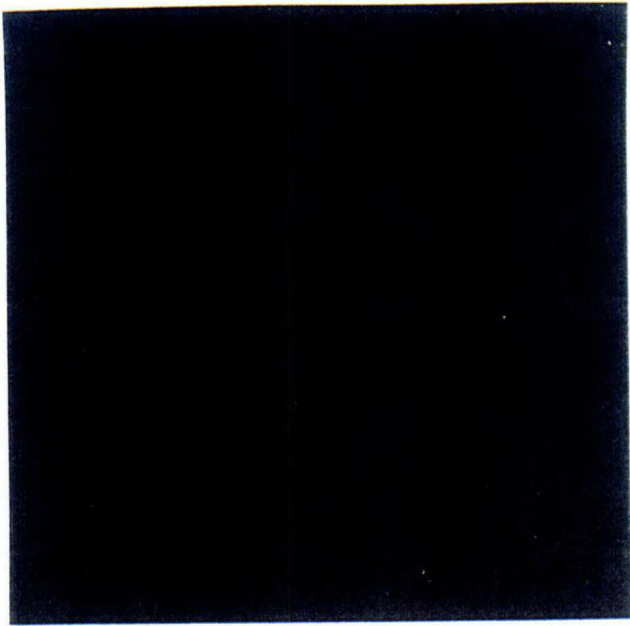
A



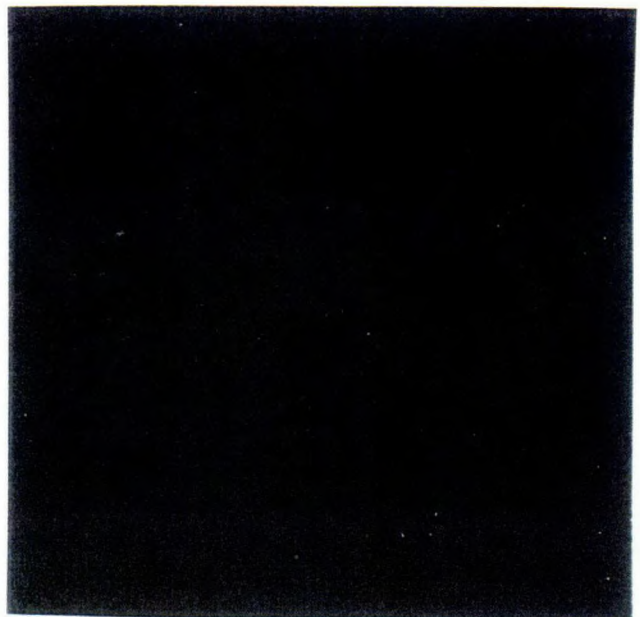
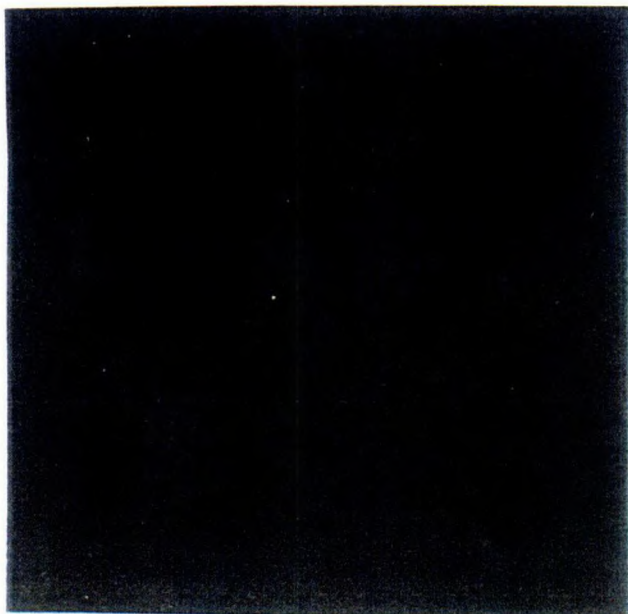
C



11



A



(12)

A



13 May 79

C



WATER HYACINTH
13 May 79.

13



10 May 79

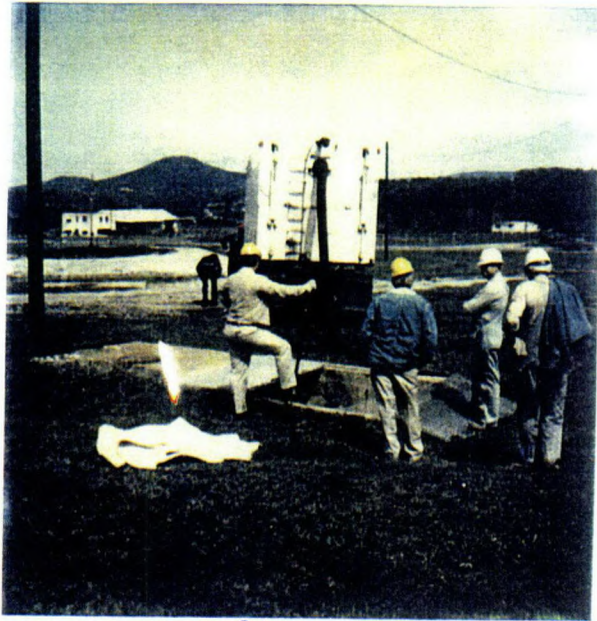
10 May 79
10 May 79
10 May 79
10 May 79
10 May 79
10 May 79
10 May 79
10 May 79
10 May 79
10 May 79



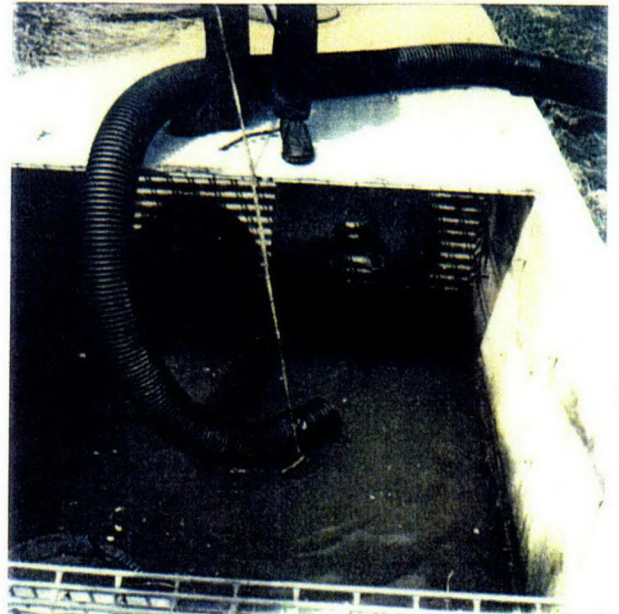
13 May 79



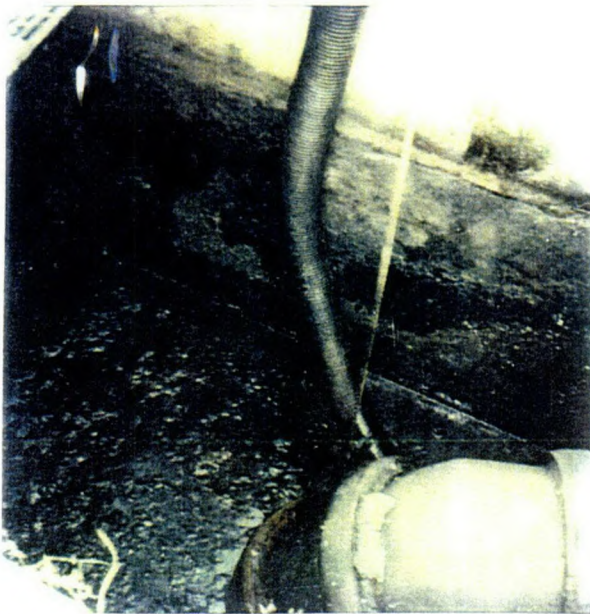
Water lily a cinth
3 May 79



A
3
BP
79
Bryson Slurry Truck



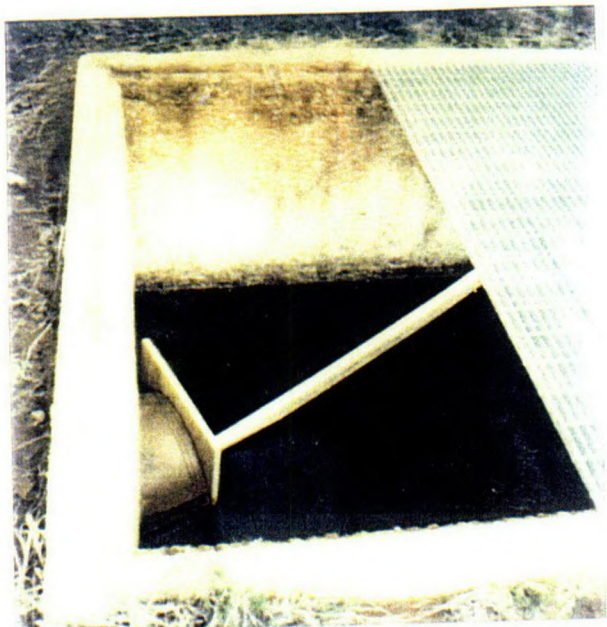
3
BP
79
Facing TR Sewer
Entrance



C
3
BP
79
Pit Empty of all
accumulation. 6 ft
Blocking Jack Pans.



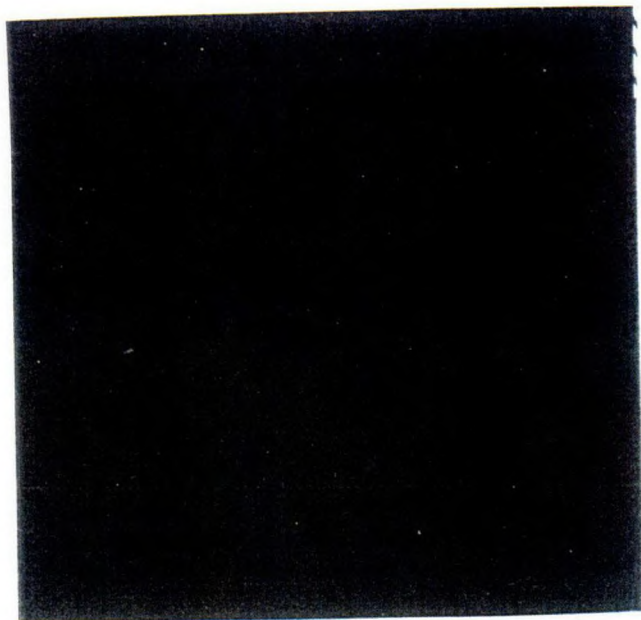
(15)



3 So Pit Dist. Box
 20 Sewer To Primary Box
 79 Block to stop Back Flow



3 So Pit Dist Box
 20 After Pumping
 79



A



Drifted to
the edge of the pond.



B

17

A



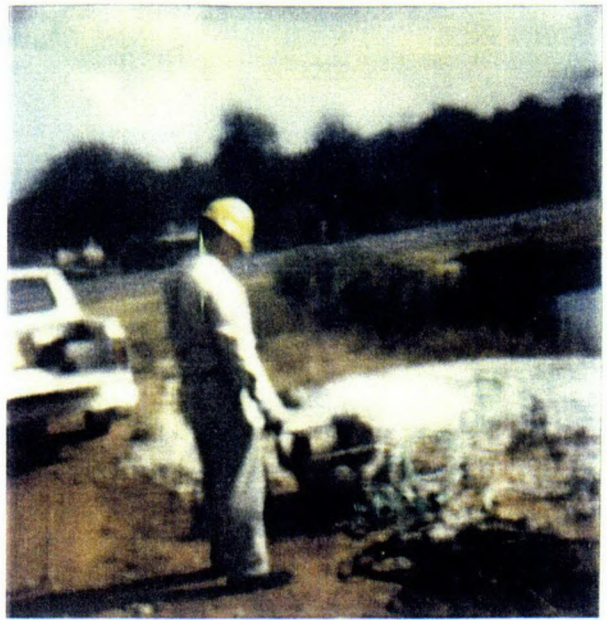
Got a good way to go down
it. I was standing on the
U.S. President's boat.

STAY ON

C



Come on Lets go. Its
getting late.



Yo, Rascal you! Pump!

B

D



Put the Brass in the hole.

(18)



T-3 - P-18-80
Lime Stone Pit #3



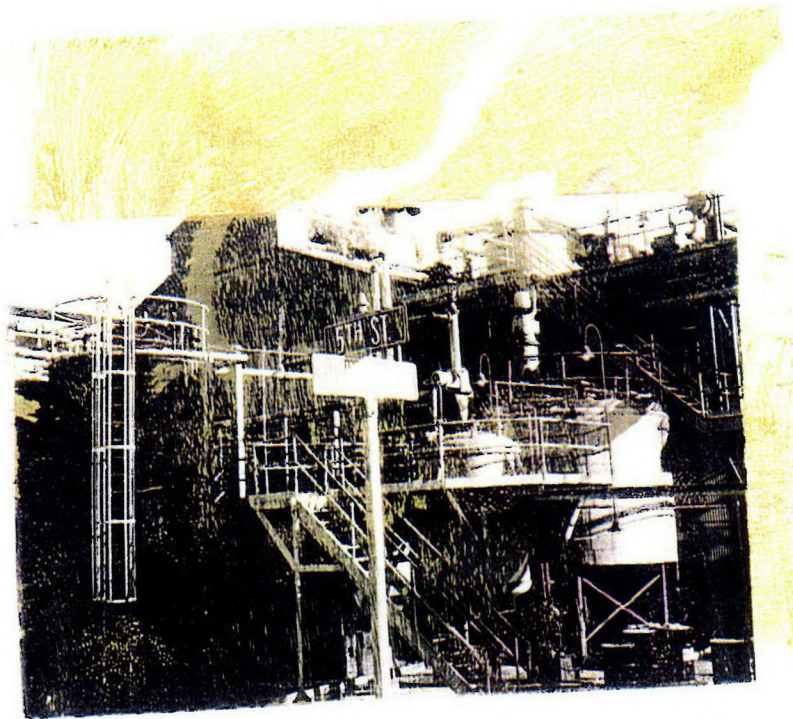
T-3 - P-18-80
Lime Stone Pit #4



T-3 P-18-80
Lime Stone Pit #4

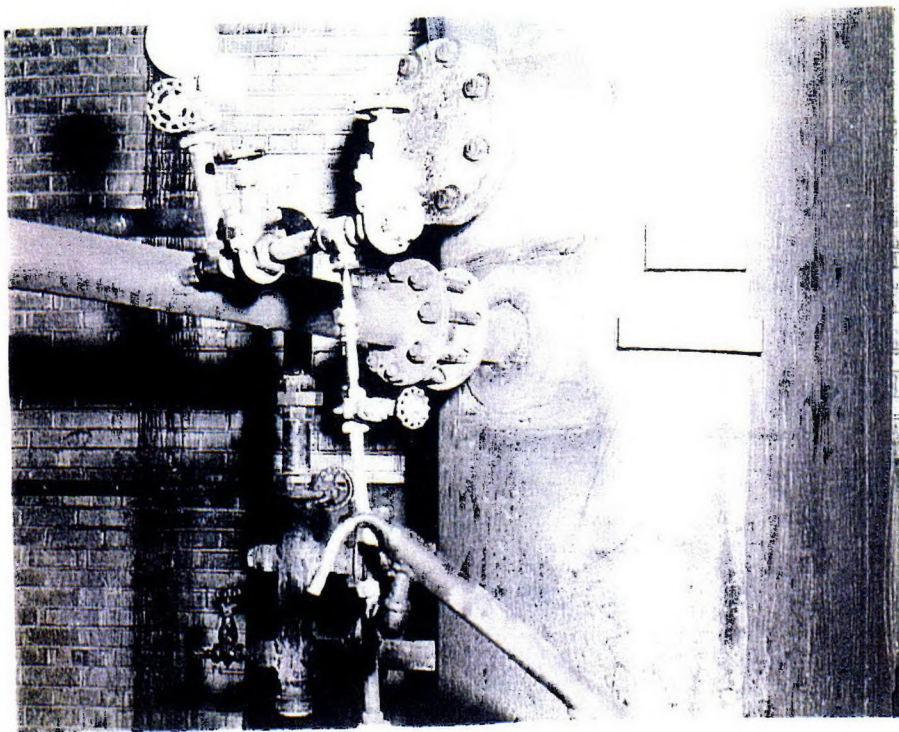


T-3 P-15-80
Lime Stone Pit #5



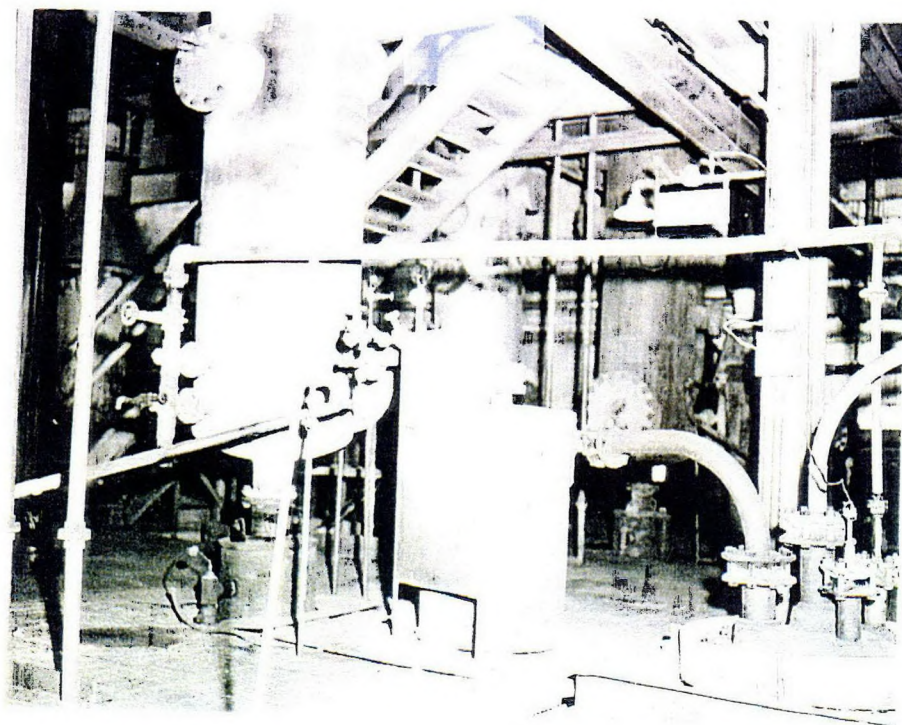
20

A



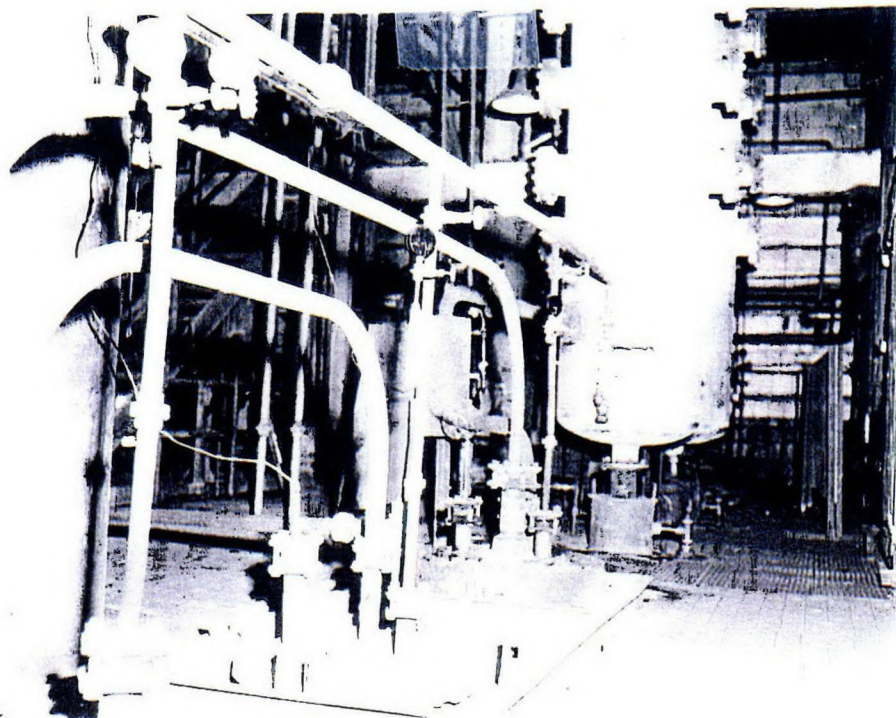
no data

B



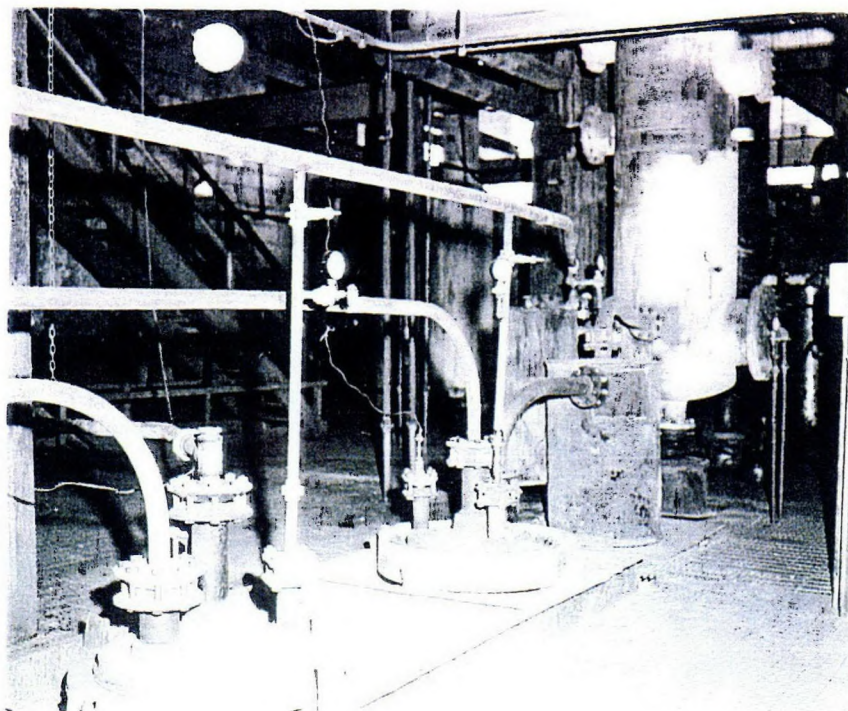
(21)

A



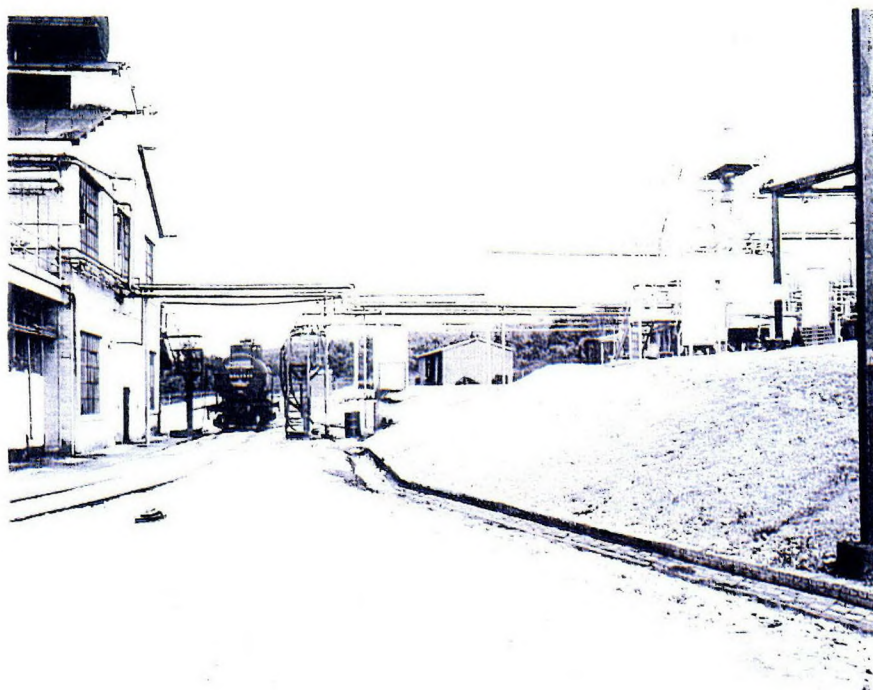
3 tub on

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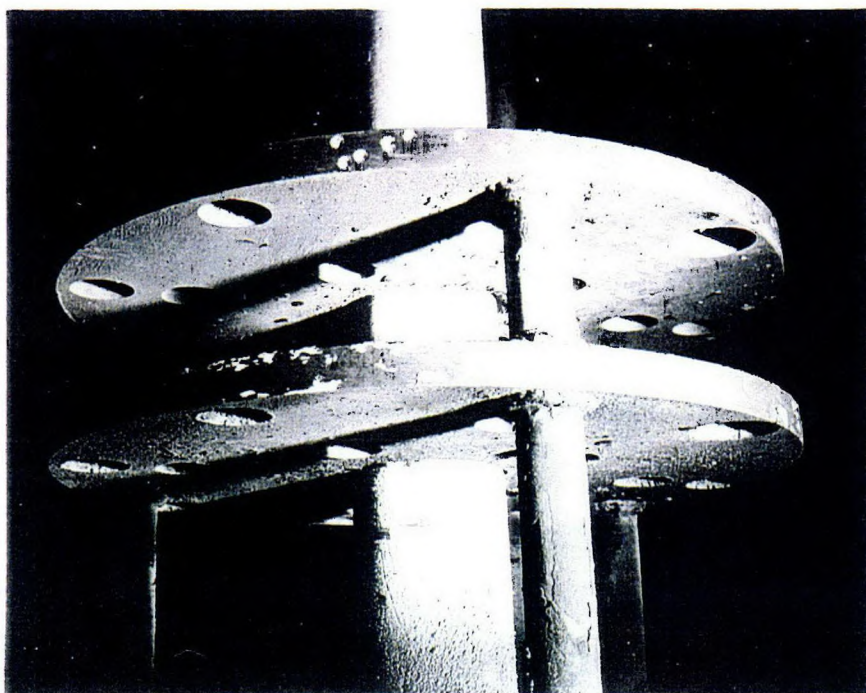
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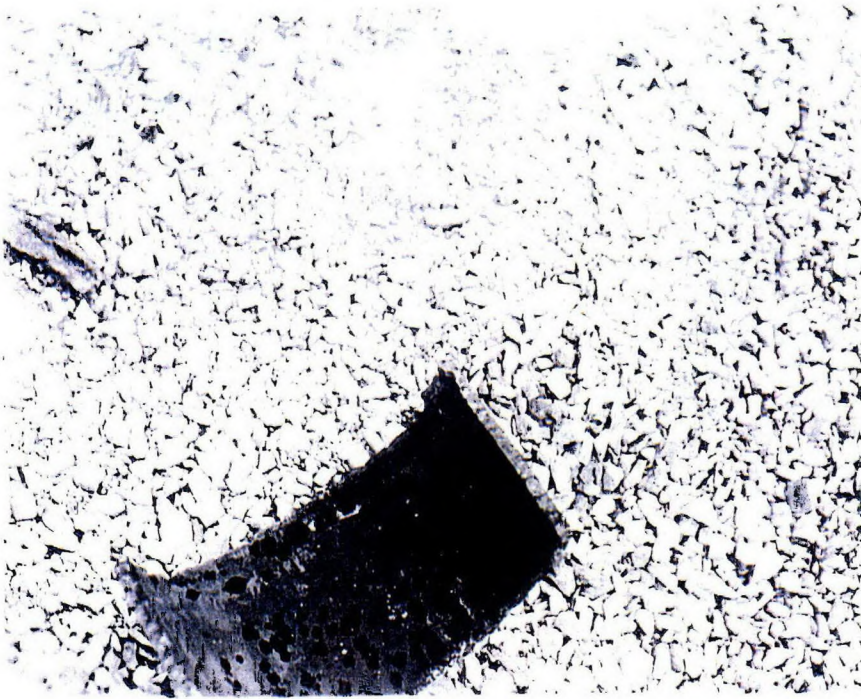
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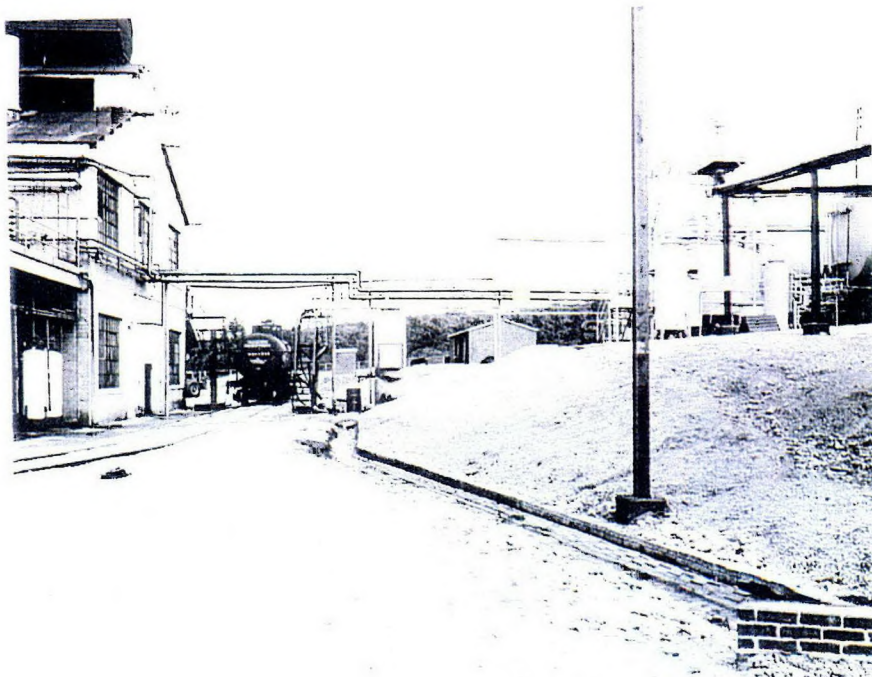
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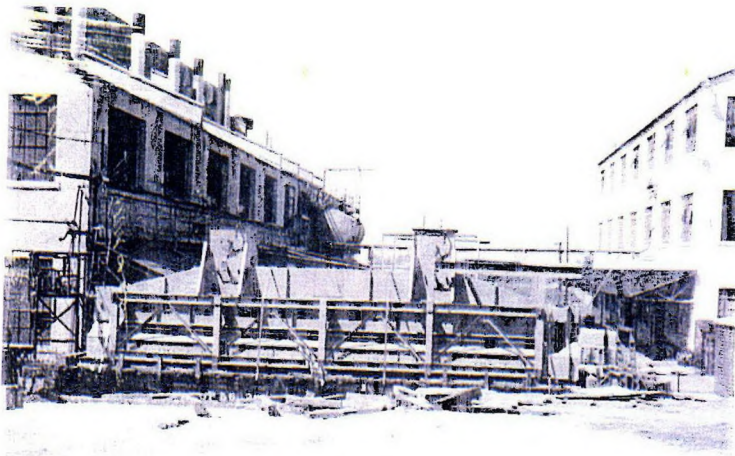
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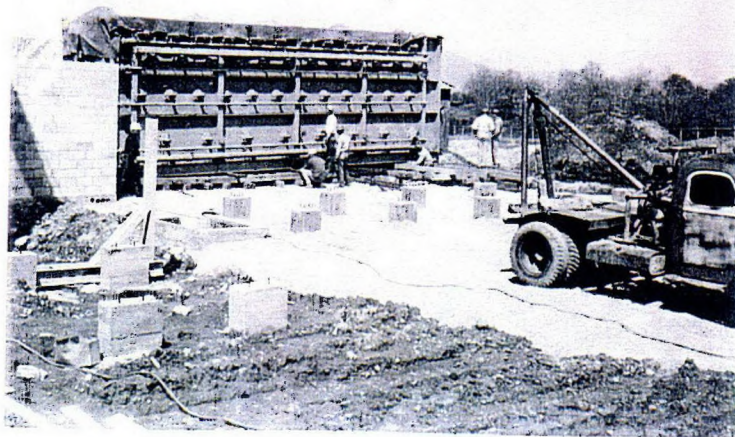
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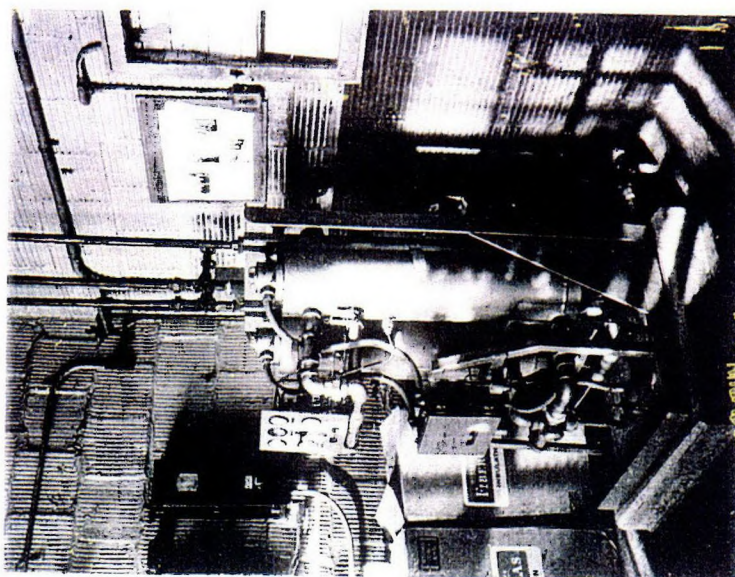


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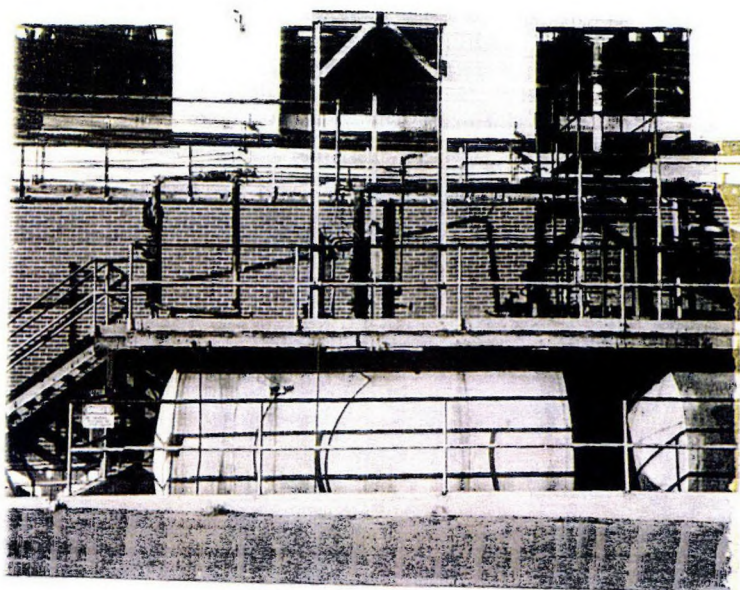
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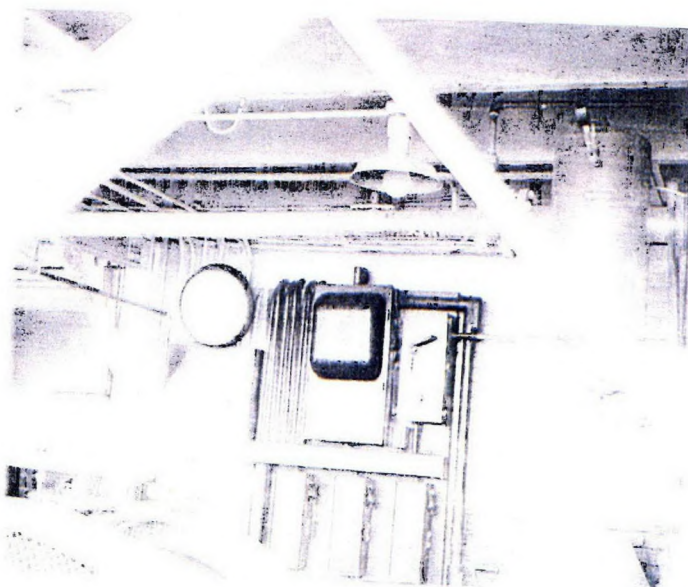
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EASC - Dayton

(DEPT./SECTION)

Analytical

TYPE OF REPORT

REPORT

REPORT NO.: MDA-176

JOB/PROJECT NO.: 408.1000

DATE: April 24, 1981

PERIOD COVERED:

TITLE: ANALYSIS OF ANNISTON PLANT DISCHARGES
FOR PRIORITY POLLUTANTS

AUTHORS: Robert F. Ivory

ABSTRACT: Discharge samples from the MAP Anniston Plant were analyzed for the U.S. Environmental Protection Agency's designated priority pollutants. The results of these analyses are presented in this report.

Approved by:

R. F. Ivory
Robert F. Ivory
Environmental Analytical Sciences
Center Service Project Manager

Approval date:

4/24/81

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AUTHORS: R. F. IVORY
TITLE: ANALYSIS OF ANNISTON PLANT DISCHARGES FOR
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ACKNOWLEDGEMENT

Contributions of the following Dayton Laboratory personnel to this project are gratefully acknowledged:

Analyses: M. R. Arnold
S. A. Barksdale
C. Feldstein
J. A. Giust
J. T. Miller
D. L. Sharp
T. L. Shell
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1. INTRODUCTION

Well water samples collected at the MAP Anniston Plant were submitted to the Dayton Laboratory for priority pollutant screening analyses. The analyses were conducted in accordance with the U.S. Environmental Protection Agency's (EPA) screening phase protocol for priority pollutants [1].

2. SUMMARY

All analyses were conducted according to the procedures developed and recommended by the U.S. EPA [1,2,3]. The organic priority pollutants observed in Anniston plant water samples are shown in Table 1. Although all the organic priority pollutants listed in Table 2 were investigated through either GC/MS or GC/EC screening analyses, only those pollutants observed at or above the screening level concentrations are reported. None of the Aroclors or pesticides listed in Table 3 were detected above their screening levels. The analytical results for the priority and nonpriority pollutant metals, as determined by atomic absorption (AA) and inductively coupled (ICP) spectroscopy, are shown in Table 4. Table 5 shows the quality control data for the metals analyses. Table 6 shows the detection limits for the metals concentrations. Table 7 shows the analytical results for the total phenol and cyanide concentrations in the water samples.

3. SAMPLE COLLECTION

Samples were collected by Anniston Plant personnel and submitted to the Dayton Laboratory for analyses. However, the sample for analysis of phenol in Discharge 005 had to be taken from the metals sample bottle. The container labeled "Arsenic" and preserved with NaOH to pH >12 was used for the cyanide analyses.

TABLE 1. ANALYTICAL RESULTS FOR ORGANIC PRIORITY POLLUTANTS
µg/L (ppb)

Analyte	Sample ID		
	Discharge 005	Discharge 006	Blank
Base/Neutral Fraction			
Bis-(2-chloroethyl)-ether	<10 ^a	ND ^b	ND
Di-n-butyl phthalate	<10	<10	ND
Bis-(2-ethylhexyl) phthalate	<10	<10	ND
Volatile Fraction			
Chloroethane	ND	<10	ND
Methylene chloride	<10	<10	<10
Trichloroethylene	10	<10	ND
Benzene	<10	<10	<10
Toluene	<10	<10	<10

^a"<" = compound observed but was below screening level.

^bND = compound was not detected.

TABLE 2. PRIORITY POLLUTANT SCREENING LEVELS
GC/MS ANALYSIS OF ORGANICS IN INDUSTRIAL
EFFLUENTS

Compound	Screening level, ug/L	Compound	Screening level, ug/L
Acids:		Base/Neutrals:	
2-Chlorophenol	25	1,3-Dichlorobenzene	10
2-Nitrophenol	25	1,4-Dichlorobenzene	10
Phenol	25	Hexachloroethane	10
2,4-Dimethylphenol	25	1,2-Dichlorobenzene	10
2,4-Dichlorophenol	25	Bis(2-chloroisopropyl) ether	10
2,4,6-Trichlorophenol	25	Hexachlorobutadiene	10
4-Chloro-3-methylphenol	25	1,2,4-Trichlorobenzene	10
2,4-Dinitrophenol	250	Naphthalene	10
2-Methyl-4,6-dinitrophenol	250	Bis(2-chloroethyl) ether	10
Pentachlorophenol	25	Hexachlorocyclopentadiene	10
4-Nitrophenol	25	Nitrobenzene	10
Volatiles:		Bis(2-chloroethoxy) methane	10
Chloromethane	10	2-Chloronaphthalene	10
Dichlorodifluoromethane	10	Acenaphthylene	10
Bromomethane	10	Acenaphthene	10
Vinyl chloride	10	Isophorone	10
Chloroethane	10	Fluorene	10
Methylene chloride	10	2,6-Dinitrotoluene	10
Trichlorofluoromethane	10	1,2-Diphenylhydrazine	10
1,1-Dichloroethylene	10	2,4-Dinitrotoluene	10
1,1-Dichloroethane	10	N-nitrosodiphenylamine	10
Trans-1,2-dichloroethylene	10	Hexachlorobenzene	10
Chloroform	10	4-Bromophenyl phenyl ether	10
1,2-Dichloroethane	10	Phenanthrene/anthracene	10
1,1,1-Trichloroethane	10	Dimethyl phthalate	10
Carbon tetrachloride	10	Diethyl phthalate	10
Bromodichloromethane	10	Fluoranthene	10
Bis(chloromethyl) ether	10	Pyrene	10
1,2-Dichloropropane	10	Di-n-butyl phthalate	10
Trans-1,3-dichloropropene	10	Benzidine	10
Trichloroethylene	10	Butyl benzyl phthalate	10
Dibromochloromethane	10	Chrysene	10
Cis-1,3-dichloropropene	10	Bis(2-ethylhexyl) phthalate	10
1,1,2-Trichloroethane	10	Benz(a)anthracene	10
Benzene	10	Benz(b)fluoranthene	10
2-Chloroethyl vinyl ether	10	Benz(k)fluoranthene	10
Bromofluor	10	Benz(a)pyrene	10
Tetrachloroethylene	10	Indeno(1,2,3-cd)pyrene	25
1,1,1,2-Tetrachloroethane	10	Dibenzo(a,h)anthracene	25
Toluene	10	Benzo(g,h,i)perylene	25
Chlorobenzene	10	N-Nitrosodimethylamine	10
Ethylbenzene	10	N-nitrosodi-n-propylamine	10
Direct Injectables:		4-Chlorophenyl phenyl ether	10
Acrolein	200	3,3'-Dichlorobenzidine	10
Acrylonitrile	100	Di-n-octyl phthalate	10
		Pesticides and Aroclors	1.0
		(see Table 3)	

TABLE 3. SCREENING LEVELS FOR PESTICIDES/PCB's
EXTRACTABLE PRIORITY POLLUTANTS

Compound	GC/MS Screen, µg/L	GC/EC, µg/L
β-Endosulfan	10	1
α-BHC	10	1
γ-BHC	10	1
β-BHC	10	1
Aldrin	10	1
Heptachlor	10	1
Heptachlor epoxide	10	1
α-Endosulfan	10	1
Dieldrin	10	1
4,4'-DDE	10	1
4,4'-DDD	10	1
4,4'-DDT	10	1
Endrin	10	1
Endosulfan sulfate	10	1
δ-BHC	10	1
Chlordane	10	1
Toxaphene	10	1
Endrin aldehyde	10	1
Methoxychlor	10	1
Aroclor 1242	10	1
Aroclor 1254	10	1
Aroclor 1221	10	1
Aroclor 1232	10	1
Aroclor 1248	10	1
Aroclor 1260	10	1
Aroclor 1016	10	1

TABLE 4. ANALYTICAL RESULTS FOR PRIORITY METAL POLLUTANTS
 µg/L (ppb)

Analyte	Sample ID	
	Discharge 005	Discharge 006
Arsenic ^a	3	6
Mercury ^a	<1	<1
Selenium ^a	<4	<4
Thallium ^a	<100	<100
Antimony	<250	<250
Beryllium	2	<2
Cadmium	<35	<35
Chromium	215	141
Copper	106	60
Lead	756	<345
Nickel	<120	<120
Silver	<170	<170
Zinc	35	180

^aAnalyses by AA; all others by ICP.

TABLE 5. QUALITY CONTROL DATA FOR METALS ANALYSES
 $\mu\text{g/L}$ (ppb)

Reference Standard	Observed Value	True Value	Percent Recovery
ICP Standard			
Silver	1,010	1,000	101
Beryllium	171	165	104
Cadmium	53	50	106
Chromium	371	320	115
Copper	1,320	1,230	107
Nickel	1,080	1,000	108
Lead	920	1,000	92
Antimony	1,040	1,000	104
Zinc	372	330	113
TM-7			
Arsenic	38	35	107
SRMA			
Arsenic	78	77	102
Selenium	13	11	117
ERA 1916			
Arsenic	67	84	80
Selenium	22	25	89
SPEX B			
Mercury	10	10	100
SPEX A			
Thallium	100	125	125
TM-CI			
Mercury	20	21	104
TM-2			
Thallium	1,000	990	99
<u>Spike</u>			
Discharge 005 spiked with ICP Standard			
= 83% recovery			

TABLE 6. DETECTION LIMITS AND LQD^a CONCENTRATIONS
FOR METALS AS OF APRIL 1981

Atomic absorption metals analysis		
Element	Detection limit, ug/liter	
Arsenic	5	
Mercury	1	
Selenium	5	
Thallium	100	
ICP metals analysis		
Element	Detection limit, ug/liter	LQD conc., ug/liter
Aluminum		180
Antimony	50	250
Barium	2	10
Beryllium	0.4	2
Boron	16	80
Cadmium	7	35
Calcium	25.6	128
Chromium	7	35
Cobalt	20	100
Copper	14	70
Iron	8	40
Lead	69	345
Magnesium	0.6	3
Manganese	0.8	4
Molybdenum	27	135
Nickel	14	120
Silver	34	170
Sodium	1,400	7,000
Strontium	2.2	11
Tin	28	140
Titanium	10	50
Vanadium	12.8	64
Zinc	0.3	15

^aLQD = lowest quantitatively determinable
concentration (95% confidence limits).

TABLE 7. ANALYTICAL RESULTS FOR TOTAL PHENOL AND CYANIDE
 $\mu\text{g/L}$ (ppb)

Analyte	Sample ID	
	Discharge 005	Discharge 006
Cyanide	<4	<4
Phenol	<25	29

QUALITY CONTROL DATA

Reference Standard	Observed Value, $\mu\text{g/L}$	True Value $\mu\text{g/L}$	Percent recovery
ERA 2767 - Cyanide	40	41	98
ERA Light Orange - Phenol	171	204	84
ERA Dark Orange - Phenol	727	900	81

4. PRIORITY POLLUTANT ANALYTICAL PROCEDURES

Analytical procedures developed and recommended by EPA [1,4] were used throughout this project. It is important to realize that the analysis scheme for analyzing for organic priority pollutants is a screening procedure, and is therefore a qualitative, semi-quantitative analysis. Some of the organic priority pollutant analytical methods are still under development and require further verification and validation. Therefore, the data presented for organic species serve to identify which of the organic pollutants were present and to indicate their general concentration ranges. The accuracy of these data may vary by a factor of 2 to 10, depending on the overall composition and concentration of the materials present.

Two of the 129 priority pollutants were not determined in the project: 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and asbestos. The EPA Environmental Monitoring and Support Laboratory (EMSL) recommends that TCDD be omitted because of its extreme toxicity and the potential health hazard involved in preparing standard solutions in the laboratory from the pure compound [1], and therefore, the compound is not included as part of our routine screening procedures. There is presently no EPA-approved method for the determination of asbestos fibers in wastewater.

The analytical procedure used [1] divides the 129 priority pollutants into six basic categories: volatile organics, extractable organics, ~~metals~~, cyanide, total phenol and asbestos. The following sections outline the analytical procedures and the EPA-approved Dayton Laboratory's modifications for analyzing each group of priority pollutants.

4.1 Extractable Organics

The 129 priority pollutants contain 81 solvent-extractable organic compounds that can be separated by gas chromatographic methods. Extractable organics are divided into three groups for analysis: base/neutral organics, acid organics (phenols), pesticides and Aroclors. Compounds classified as extractable organics are listed by these groups in Table 2.

The analytical procedure for extractable organics is described in Reference 1. Figure 1 depicts the sample processing scheme for the base/neutral and acid fractions. A 1-liter aliquot of the extractable organics was made alkaline (pH >11) with sodium hydroxide, and the organic base/neutral compounds extracted with methylene chloride.

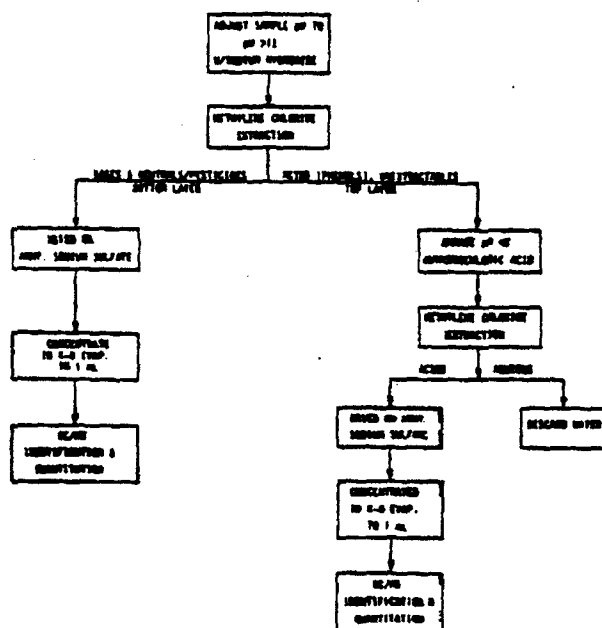


Figure 1. Sample processing scheme for the analysis of the base/neutral and acid fractions of extractable organics.

The residual aqueous phase was acidified (pH <2) with hydrochloric acid, and the organic acids were then extracted with methylene chloride.

The methylene chloride extracts, one containing the base/neutral organics and the other the acidic organics, were dried on columns of anhydrous sodium sulfate. These dried extracts were concentrated to 1.0 mL in Kuderna-Danish (K-D) evaporative concentrators. The concentrates were sealed in septum-capped vials and stored at 4°C until analysis. Gas chromatographic/mass spectrometric (GC/MS) analysis was conducted using SP-2250-DB and SP-1240-DA GC columns for the base/neutral and acid extracts, respectively. Each sample was spiked with deuterated anthracene (an internal standard) immediately prior to analysis at the GC/MS.

The sample processing scheme used for pesticides and Aroclors is shown in Figure 2. A 1-liter aliquot of the original extractable organics sample was adjusted to a pH of 6.5 to 7.5 using either 50% NaOH or concentrated HCl, and the pesticides and Aroclors were extracted into a 15% methylene chloride/hexane solution. The organic phase was separated and the sample cleaned up by acetonitrile partition. Following the cleanup procedure, the samples were screened by gas chromatography on SP-2250/SP-2401 and 3% OV-101 columns, utilizing an electron capture detector.

4.2 Volatile Organics

Table 2 lists those priority pollutants classified as volatile organics. The recommended method for volatile organic analysis was designed by EPA for determining those chemical species which are amenable to the Bellar purge and trap method [1,4]. Hermetically sealed 40 mL glass vials collected from each of the sampling points were composited in the laboratory for one analysis of each sampling point.

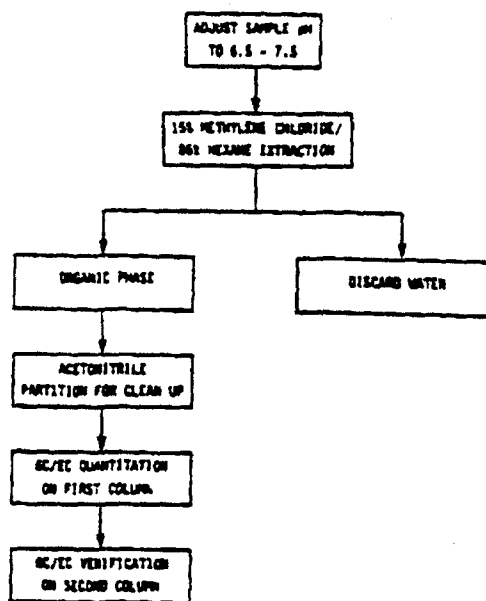


Figure 2. Sample processing scheme for pesticides and Aroclor analysis.

Two laboratory composite solutions were prepared, one for analysis and one as a backup sample. Figure 3 is a simplified diagram of the analytical scheme used for volatile organics analysis. An internal standard, 1,4-dichlorobutane, was added to 5 mL of the composited sample, and this spiked sample was sparged with helium onto a Tenax-GC silica-packed sample tube.

Analyses were completed using a Hewlett-Packard 5981 GC-mass spectrometer with a 5937 data system. Sample tubes were heated to 180°C over a 1-minute period and held at that temperature for 4 minutes to desorb the compounds onto a Carbowax 1500 column held at -4°C. For compounds with boiling points below room temperature, cryogenic trapping at -40°C (liquid nitrogen cooling) generally provides better reproducibility of retention time than does the suggested protocol temperature of 30°C. After desorption, the GC column temperature was raised at 8°C/minute to 170°C.

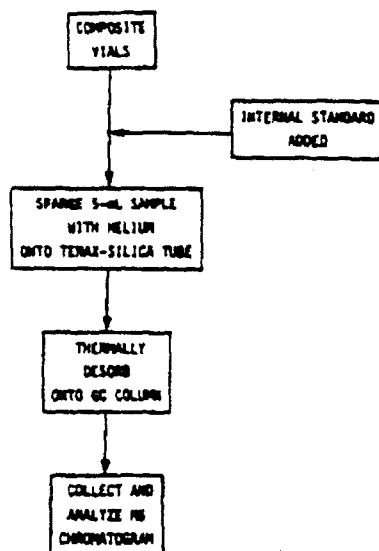


Figure 3. Analytical scheme for volatile organic analysis.

Qualitative identification of a compound was made using the three criteria listed in the protocol [1]: 1) the characteristic ions must be found to maximize in the same spectrum, 2) retention time must coincide with known retention times, and 3) ratios of the three characteristic masses must stand in the proper known proportions. Quantification of volatile organics was made using response ratios to the 1,4-dichlorobutane standard.

4.3 Metals

In addition to extractable and volatile organics, the 129 priority pollutants include 13 metals which are to be analyzed for under the protocol. Four metals (arsenic, mercury, selenium, and thallium) are analyzed by atomic absorption (AA) spectroscopy. All other metals were determined by an inductively coupled plasma (ICP) excitation technique.

4.4 Total Cyanide

Total cyanide was determined according to the conventional wet chemistry technique described in Reference 3. Spiked samples and independent standards were included with the plant samples for quality assurance.

4.5 Total Phenol

In addition to specific phenolic compounds and phenol measured by GC/MS, total phenol was also measured by typical wet chemistry techniques [1-3]. Independent phenol standards were also analyzed for quality assurance.

5. REFERENCES

1. Draft Final Report: Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants. U.S. Environmental Protection Agency, Cincinnati, Ohio, April 1977. 145 pp.
2. Manual of Methods for Chemical Analysis of Water and Wastes. EPA-625/6-76-003a (PB 259 973). U.S. Environmental Protection Agency, Cincinnati, Ohio. 319 pp.
3. Standard Methods for Examination of Water and Wastewater, Fourteenth Edition. American Public Health Association, Washington, D.C., 1976. 1193 pp.
4. EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulation, Federal Register, Monday, December 3, 1979.

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Analysis

TYPE OF REPORT

REPORT

REPORT NO.. MDA-149

JOB/PROJECT NO.: 409.1750

DATE: January 9, 1981

PERIOD COVERED:

TITLE: ANALYSIS OF ANNISTON WASTEWATER
FOR PRIORITY POLLUTANTS

AUTHORS: Robert F. Ivory

ABSTRACT: A water sample from the MAP Anniston Plant was analyzed for the U.S. Environmental Protection Agency designated priority pollutants. The results of the analyses are presented in this report.

APPROVED BY:

Robert F. Ivory
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Center Service Project Manager

APPROVAL DATE:

1/9/81

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AUTHORS: R. F. Ivory
TITLE: ANALYSIS OF ANNISTON WASTEWATER FOR PRIORITY POLLUTANTS

REPT. NO.: MDA-149

COPY NO.: 1



HARTOLDMON0035074

1. INTRODUCTION

A water sample collected at the MAP Anniston Plant was submitted to the Dayton Laboratory for priority pollutant screening analyses. The analyses were conducted in accordance with the U.S. Environmental Protection Agency's (EPA) screening phase protocol for priority pollutants [1].

2. SUMMARY

All analyses were conducted according to procedures developed and recommended by the U.S. EPA [1, 2, 3]. The organic priority pollutants found in the Anniston Plant water sample are shown in Table 1. Although all the organic priority pollutants listed in Table 2 were investigated through GC/MS screening analysis, only those pollutants observed at or above the screening level concentrations are reported. None of the extractable organic pollutants or the Aroclors and pesticides listed in Table 3 were detected above their screening level. The analytical results for the priority and non-priority pollutant metals, as determined by atomic absorption (AA) and inductively coupled argon plasma (ICAP) spectroscopy, are shown in Table 4. Table 5 shows the detection limits for the metal concentrations. Table 6 shows the quality control data for the metals analyses. Table 7 shows the analytical results for the total phenol and cyanide concentrations in the water sample.

3. SAMPLE COLLECTION

Samples were collected by Anniston Plant personnel. Samples were received at the MRC Dayton Laboratory in the designated EPA-approved sampling containers.

TABLE 1. ANALYTICAL RESULTS FOR ORGANIC
PRIORITY POLLUTANTS, ug/L (ppb)

Analyte	Sample ID
	AL-0001201

Volatile organics

Methylene chloride	20
Trichlorofluoromethane	<10 ^a
Trichloroethylene	10
Benzene	<10
Toluene	10

^a"<" means compound was observed but
was below screening level.

TABLE 2. PRIORITY POLLUTANT SCREENING LEVELS GC/MS
ANALYSIS OF ORGANICS IN INDUSTRIAL EFFLUENTS

Compound	Screening level, ug/L	Compound	Screening level, ug/L
Acids		Base/Neutrals:	
2-Chlorophenol	25	1,3-Dichlorobenzene	10
2-Nitrophenol	25	1,4-Dichlorobenzene	10
Phenol	25	Hexachloroethane	10
2,4-Dimethylphenol	25	1,2-Dichlorobenzene	10
2,4-Dichlorophenol	25	Bis(2-chloroisopropyl) ether	10
2,4,6-Trichlorophenol	25	Hexachlorobutadiene	10
4-Chloro-3-methylphenol	25	1,2,4-Trichlorobenzene	10
2,4-Dinitrophenol	250	Naphthalene	10
2-methyl-4,6-dinitrophenol	250	Bis(2-chloroethyl) ether	10
Pentachlorophenol	25	Hexachlorocyclopentadiene	10
4-Nitrophenol	25	Nitrobenzene	10
Volatiles		Bis(2-chloroethoxy) methane	10
Chloromethane	10	2-Chloronaphthalene	10
Dichlorodifluoromethane	10	Acenaphthylene	10
Bromomethane	10	Acenaphthene	10
Vinyl chloride	10	Isophorone	10
Chloroethane	10	Fluorene	10
Methylene chloride	10	2,6-Dinitrotoluene	10
Trichlorofluoromethane	10	1,2-Diphenylhydrazine	10
1,1-Dichloroethylene	10	2,4-Dinitrotoluene	10
1,1-Dichloroethane	10	N-nitrosodiphenylamine	10
Trans-1,2-dichloroethylene	10	Hexachlorobenzene	10
Chloroform	10	4-Bromophenyl phenyl ether	10
1,2-Dichloroethane	10	Phenanthrene/anthracene	10
1,1,1-Trichloroethane	10	Dimethyl phthalate	10
Carbon tetrachloride	10	Diethyl phthalate	10
Bromodichloromethane	10	Fluoranthene	10
Bis(chloromethyl) ether	10	Pyrene	10
1,2-Dichloropropane	10	Di-n-butyl phthalate	10
Trans-1,3-dichloropropene	10	Benzidine	10
Trichloroethylene	10	Butyl benzyl phthalate	10
1,1,1,2-Tetrachloroethane	10	Chrysene	10
Bromochloromethane	10	Bis(2-ethylhexyl) phthalate	10
Cis-1,3-dichloropropene	10	Benz(a)anthracene	10
1,1,2-Trichloroethane	10	Benzo(b)fluoranthene	10
Benzene	10	Benzo(k)fluoranthene	10
2-Chloroethyl vinyl ether	10	Benzo(a)pyrene	10
Bromofur	10	Indeno(1,2,3-cd)pyrene	25
Tetrachloroethylene	10	Dibenzo(a,h)anthracene	25
1,1,2,2-Tetrachloroethane	10	Benzo(g,h,i)perylene	25
Toluene	10	N-Nitrosodimethylamine	10
Chlorobenzene	10	N-nitrosodi-n-propylamine	10
Ethylbenzene	10	4-Chlorophenyl phenyl ether	10
Direct Injectables		3,3'-Dichlorobenzidine	10
Acrolein	200	Di-n-octyl phthalate	10
Acrylonitrile	100	Pesticides and Araclores	
		(see Table 1)	

TABLE 3. PRIORITY POLLUTANT PESTICIDES
AND AROCLORS

Compound	GC/MS Screen, (ug/L)	GC/EC, (ug/L)
β-Endosulfan	10	1
α-BHC	10	1
γ-BHC	10	1
δ-BHC	10	1
Aldrin	10	1
Heptachlor	10	1
Heptachlor epoxide	10	1
α-Endosulfan	10	1
Dieldrin	10	1
4,4'-DDE	10	1
4,4'-DDD	10	1
4,4'-DDT	10	1
Endrin	10	1
Endosulfan sulfate	10	1
δ-BHC	10	1
Chlordane	10	1
Toxaphene	10	1
Endrin aldehyde	10	1
Aroclor 1242	10	1
Aroclor 1254	10	1
Aroclor 1221	10	1
Aroclor 1232	10	1
Aroclor 1248	10	1
Aroclor 1260	10	1
Aroclor 1016	10	1

TABLE 4. ANALYTICAL RESULTS FOR PRIORITY
AND NON-PRIORITY METAL POLLUTANTS,
ug/L (ppb)

Analyte	Sample ID
	AL-0001201

Priority

Arsenic ^a	<5
Mercury ^a	<1
Selenium ^a	<5
Thallium ^a	<100
Antimony	<140
Beryllium	<3
Cadmium	<20
Chromium	<30
Copper	<30
Lead	<205
Nickel	<250
Silver	<150
Zinc	15

Non-priority

Aluminum	<245
Barium	21
Boron	95
Calcium	2.30 x 10 ⁴
Cobalt	<45
Iron	100
Magnesium	1.06 x 10 ⁴
Manganese	35
Molybdenum	<60
Phosphorous	<315
Silicon	6.45 x 10 ³
Sodium	6.59 x 10 ³
Strontium	34
Tin	<90
Titanium	<10
Vanadium	86
Potassium	3.18 x 10 ³

Note: All ICAP data represent duplicate analyses.

^aAnalyses by AA; all others by ICAP.

TABLE 5. DETECTION LIMITS AND LQD^a
CONCENTRATIONS FOR METALS

<u>Atomic absorption metals analysis</u>		
Element	Detection limit, ug/liter	
Arsenic	5	
Mercury	1	
Selenium	5	
Thallium	100	
<u>ICAP metals analysis</u>		
Element	Detection limit, ug/liter	LQD conc., ^a ug/liter
Aluminum	49	245
Antimony	28	140
Barium	0.7	3.5
Beryllium	0.6	3
Boron	5	25
Cadmium	4	20
Calcium	1	5
Chromium	6	30
Cobalt	9	45
Copper	6	30
Iron	4	20
Lead	41	205
Magnesium	0.7	3.5
Manganese	1	5
Molybdenum	12	60
Nickel	50	250
Phosphorus	63	315
Silicon	29	145
Silver	30	150
Sodium	71	355
Strontium	0.7	3.5
Tin	18	90
Titanium	2	10
Vanadium	8	40
Zinc	4	20

^aLQD = lowest quantitatively determinable concentration (95% confidence limits).

TABLE 6. QUALITY CONTROL DATA FOR METALS ANALYSES, ug/L (ppb)

Reference material	Observed value	True value	Percent recovery
ICAP Standard			
Barium	19	20	95
Boron	155	150	103
Cadmium	33	30	110
Cobalt	31	30	103
Chromium	46	40	115
Copper	35	30	117
Manganese	73	70	104
Molybdenum	42	40	105

TABLE 7. TOTAL PHENOL AND CYANIDE CONCENTRATIONS, ug/L (ppb)

Analyte		Sample ID	
		AL-0001201	
Phenol		<50	
Cyanide		<0.005	

Quality control data			
Reference material	Observed value	True value	Percent recovery
ERA 2913 Phenol	369	360	103
Phenol	930	900	103
ERA 7711 Cyanide	0.261	0.275	95

Sample split	First value	Second value	Relative difference
AL-0001201 Phenol	<50	<50	>0
AL-0001201 Cyanide	<0.005	<0.005	>0

4. PRIORITY POLLUTANT ANALYTICAL PROCEDURES

Analytical procedures developed and recommended by EPA [1] were used throughout this project. It is important to realize that the analysis scheme for analyzing for organic priority pollutants is a screening procedure, and is therefore a qualitative, semi-quantitative analysis. Some of the organic priority pollutant analytical methods are still under development and require further verification and validation. Therefore, the data presented for organic species serve to identify which of the organic pollutants were present and to indicate their general concentration ranges. The accuracy of these data may vary by a factor of 2 to 10, depending on the overall composition and concentration of the materials present.

Two of the 129 priority pollutants were not determined in the project: 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and asbestos. The EPA Environmental Monitoring and Support Laboratory (EMSL) recommends that TCDD be omitted because of its extreme toxicity and the potential health hazard involved in preparing standard solutions in the laboratory from the pure compound [1], and therefore, the compound is not included as part of our routine screening procedures. There is presently no EPA-approved method for the determination of asbestos fibers in wastewater.

The analytical procedure used [1] divides the 129 priority pollutants into six basic categories: volatile organics, extractable organics, metals, cyanide, total phenol, and asbestos. The following sections outline the analytical procedures and the EPA-approved Dayton Laboratory's modifications for analyzing each group of priority pollutants and selected non-priority pollutants.

4.1 Extractable Organics

The 129 priority pollutants contain 81 solvent-extractable organic compounds that can be separated by gas chromatographic methods. Extractable organics are divided into three groups for analysis: base/neutral organics, acid organics (phenols), pesticides and Aroclors. Compounds classified as extractable organics are listed by these groups in Table 2.

The analytical procedure for extractable organics is described in Reference 1. Figure 1 depicts the sample processing scheme for the base/neutral and acid fractions. A 1-liter aliquot of the extractable organics was made alkaline (pH >11) with sodium hydroxide, and the organic base/neutral compounds extracted with methylene chloride.

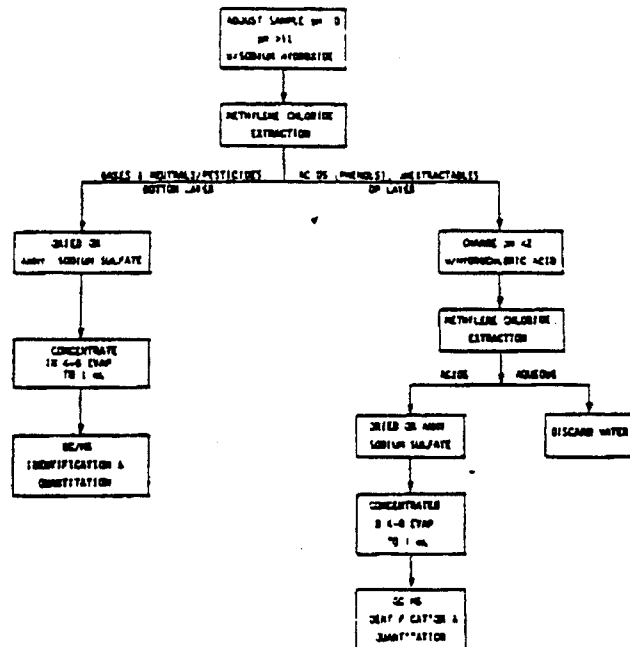


Figure 1. Sample processing scheme for the analysis of the base/neutral and acid fractions of extractable organics.

The residual aqueous phase was acidified (pH <2) with hydrochloric acid, and the organic acids were then extracted with methylene chloride.

The methylene chloride extracts, one containing the base/neutral organics and the other the acidic organics, were dried on columns of anhydrous sodium sulfate. These dried extracts were concentrated to 1.0 mL in Kuderna-Danish (K-D) evaporative concentrators. The concentrates were sealed in septum-capped vials and stored at 4°C until analysis. Gas chromatographic/mass spectrometric (GC/MS) analysis was conducted using SP-2250-DB and SP-1240-DA GC columns for the base/neutral and acid extracts, respectively. Each sample was spiked with deuterated anthracene (an internal standard) immediately prior to analysis at the GC/MS.

The sample processing scheme used for pesticides and Aroclors is shown in Figure 2. A 1-liter aliquot of the original extractable organics sample was adjusted to a pH of 6.5 to 7.5 using either 50% NaOH or concentrated HCl, and the pesticides and Aroclors were extracted into a 15% methylene chloride/hexane solution. The organic phase was separated and the sample cleaned up by acetonitrile partition. Following the cleanup procedure, the samples were screened by gas chromatography on SP-2250/SP-2401 and 3% OV 101 columns, utilizing an electron capture detector.

4.2 Volatile Organics

Table 2 lists those priority pollutants classified as volatile organics. The recommended method for volatile organic analysis was designed by EPA for determining those chemical species which are amenable to the Bellar purge and trap method [1]. Hermetically sealed 40 mL glass vials collected from each of the sampling points were composited in the laboratory for one analysis of each sampling point. Two laboratory composite

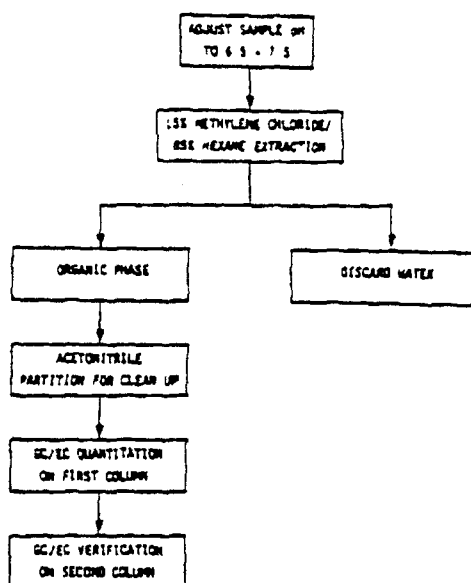


Figure 2. Sample processing scheme for pesticide and Aroclor analysis.

solutions were prepared, one for analysis and one as a backup sample. Figure 3 is a simplified diagram of the analytical scheme used for volatile organics analysis. An internal standard, 1,4-dichlorobutane, was added to 5 mL of the composited sample, and this spiked sample was sparged with helium onto a Tenax-GC silica-packed sample tube.

Analyses were completed using a Hewlett-Packard 5981 GC-mass spectrophotometer with a 5937 data system. Sample tubes were heated to 180°C over a 1-minute period and held at that temperature for 4 minutes to desorb the compounds onto a Carbowax 1500 column held at -40°C. For compounds with boiling points below room temperature, cryogenic trapping at -40°C (liquid nitrogen cooling) generally provides better reproducibility of retention time than does the suggested protocol temperature of 30°C. After desorption, the GC column temperature was raised at 8°C/minute to 170°C.

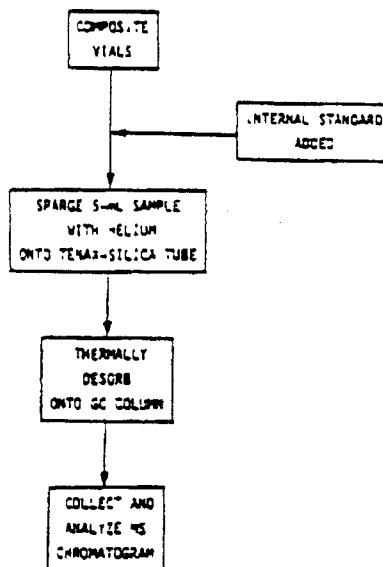


Figure 3. Analytical scheme for volatile organics analysis.

Qualitative identification of a compound was made using the three criteria listed in the protocol [1]: 1) the characteristic ions must be found to maximize in the same spectrum, 2) retention time must coincide with known retention times, and 3) ratios of the three characteristic masses must stand in the proper known proportions. Quantification of volatile organics was made using response ratios to the 1,4-dichlorobutane standard.

4.3 Metals

In addition to extractable and volatile organics, the 129 priority pollutants include 13 metals which are to be analyzed for under the protocol. Four metals (arsenic, mercury, selenium, and thallium) are analyzed by atomic absorption (AA) spectroscopy. All other metals would be determined by an inductively coupled argon plasma (ICAP) excitation technique.

4.4 Total Cyanide

Total cyanide was determined according to the conventional wet chemistry technique described in Reference 3. Spiked samples and independent standards were included with the plant samples for quality assurance.

4.5 Total Phenol

In addition to specific phenolic compounds and phenol measured by GC/MS, total phenol was also measured by typical wet chemistry techniques [1-3]. Independent phenol standards were also analyzed for quality assurance.

5. REFERENCES

1. Draft Final Report: Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants. U.S. Environmental Protection Agency, Cincinnati, Ohio, April 1977. 145 pp.
2. Manual of Methods for Chemical Analysis of Water and Wastes. EPA-625/6-76-003a (PB 259 973). U.S. Environmental Protection Agency, Cincinnati, Ohio. 319 pp.
3. Standard Methods for Examination of Water and Wastewater, Fourteenth Edition. American Public Health Association, Washington, DC, 1976. 1193 pp.

July 11 1983

TECHNICAL REPORT

for

Monsanto Company
P.O. Box 249
Hwy 202 West
Anniston, AL 36202

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986	Monsanto Co	ANNISTON	0001	060883	0800	24
ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

ENVIRONMENTAL TESTING and CERTIFICATION CORPORATION

[Signature]
Denis C. K. Lin Ph.D.
Vice President
Research and Operations

DSW 038848

284 RARITAN CENTER PARKWAY - EDISON, NJ 08837 (201) 225-5600

**PLAINTIFF'S
EXHIBIT**

15

ETC ENVIRONMENTAL TESTING and CERTIFICATION CORPORATION

DENIS C.K. LIN, Ph.D.

Vice President
Research and Operations

July 15, 1983

Mr. Robert Cheevers
Monsanto Company
P.O. Box 249
Hwy 202 West
Anniston, AL 36202

Dear Mr. Cheevers:

We are pleased to submit the accompanying reports in response to your testing requirements. We are confident that the results are of the highest quality.

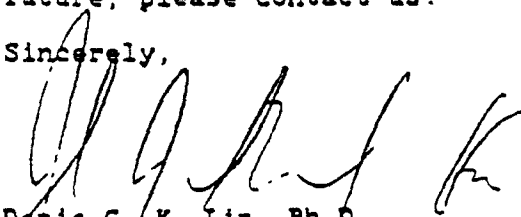
If you have any questions regarding your report, we encourage you to contact any one of the following persons in our Client Service organization:

Deb Holton (201) 225-6742
Pat McIsaac (201) 225-6751
Janet Zimmermann (201) 225-6722

They will coordinate your inquiries with the appropriate technical personnel. Your account executives, along with our Client Service organization are also available to assist you in defining requirements for future testing programs.

If we can be of further service to your organization in the future, please contact us.

Sincerely,



Denis C. K. Lin, Ph.D.

DCKL:rp
Attachments

DSW 038849

284 RARITAN CENTER PARKWAY • EDISON, NJ 08837

(201) 225 5600

HARTOLDMON0035089

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DSW 038850

INTRODUCTION

This report contains the analytical results on your water sample, 0001060883 DACC 24 submitted on June 10, 1983. It is designed to satisfy the needs of your people at various levels in your organization.

The results we obtained on your sample are presented in a tabular format immediately after this introduction. Included with the sample results, the quality assurance data on your specific sample are tabulated to verify the validity of the results obtained. The quality assurance data include those obtained on the surrogates, the blank, the spiked blank, the replicate and the spiked sample (commonly known as matrix spike). Also presented in the quality assurance data report is the verification of the proper functioning of the instruments used. The gas chromatograms and/or mass spectra generated in the analysis of your sample are included in the Appendix of the report. The chain of custody record for your sample is included at the end of this report.

The established methods we used in the analysis of your sample are described in the Methodology section after the Results. In the analysis we followed a rigidly controlled Quality Assurance Protocol. This Protocol is described after the Methodology section.

We hope our report format is useful in assisting you to obtain pertinent information on your sample.

RESULTS

The results obtained on your sample and the accompanying quality assurance data are listed in Table 1. The compounds of interest are listed with their NPDES (National Pollution Discharge Elimination System) number, and Method Detection Limit (MDL) published in the Federal Register, December 3, 1979. When a compound is detected below its MDL it is reported in Table 1 as BMDL (Below Method Detection Limit). When a compound is searched for and cannot be found it is reported as ND (Not Detected). The quality assurance data include results obtained on the Method Blank, Spiked Blank, Replicate and Matrix Spike analyses. However, since the Replicate and Matrix Spike analyses were performed on samples randomly chosen in a sample batch, your specific sample may not be the selected one.

The data on the recovery of the surrogates in your sample and the certification of the GC/MS systems used in the analysis of your sample are listed in Table 2.

The Chain-of-Custody Record on your sample is also included at the end of this Report.

DSW 038051

June 22, 1983

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Volatile Compounds - GC/MS Analysis Data (QR01)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986	Monsanto Co	ANNISTON	0001	060883	0800	24
ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concn. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concn. Added ug/l	% Recov	Unspiked Sample ug/l	Concn Added ug/l	% Recov
1V	Acrolein	ND	100	ND	ND	ND	1600	109	ND	1600	32
2V	Acrylonitrile	ND	100	ND	ND	ND	160	58	ND	160	112
3V	Benzene	ND	10	ND	ND	ND	36	90	ND	36	86
4V	bis(Chloromethyl)ether	ND	10	ND	ND	ND	0	-	ND	0	-
5V	Bromoform	ND	10	ND	ND	ND	36	81	ND	36	81
6V	Carbon tetrachloride	ND	10	ND	ND	ND	36	99	ND	36	94
7V	Chlorobenzene	ND	10	ND	2	ND	36	89	ND	36	84
8V	Chlorodibromomethane	ND	10	ND	ND	ND	36	92	ND	36	90
9V	Chloroethane	ND	10	ND	ND	ND	36	119	ND	36	119
10V	2-Chloroethylvinyl ether	ND	10	ND	ND	ND	36	92	ND	36	103
11V	Chloroform	ND	10	ND	ND	ND	36	99	ND	36	100
12V	Dichlorobromomethane	ND	10	ND	ND	ND	36	101	ND	36	96
13V	Dichlorodifluoromethane	ND	10	ND	ND	ND	0	-	ND	0	-
14V	1,1-Dichloroethane	ND	10	ND	ND	ND	36	100	ND	36	103
15V	1,2-Dichloroethane	ND	10	ND	ND	ND	36	101	ND	36	106
16V	1,1-Dichloroethylene	ND	10	ND	ND	ND	36	94	ND	36	94
17V	1,2-Dichloropropane	ND	10	ND	5	ND	36	126	ND	36	80
18V	1,3-Dichloropropylene	ND	10	ND	ND	ND	36	105	ND	36	85
19V	Ethylbenzene	ND	10	ND	ND	ND	36	94	ND	36	87
20V	Methyl bromide	ND	10	ND	ND	ND	36	103	ND	36	57
21V	Methyl chloride	ND	10	ND	ND	ND	36	86	ND	36	73
22V	Methylene chloride	ND	10	2	2	ND	36	52	ND	36	63
23V	1,1,2,2-Tetrachloroethane	ND	10	2	2	ND	36	98	ND	36	104
24V	Tetrachloroethylene	ND	10	2	2	ND	36	78	ND	36	76
25V	Toluene	ND	10	ND	ND	ND	36	81	ND	36	83
26V	1,2-Trans-dichloroethylene	ND	10	2	2	ND	36	106	ND	36	91
27V	1,1,1-Trichloroethane	ND	10	3	3	ND	36	102	ND	36	98
28V	1,1,2-Trichloroethane	ND	10	2	2	ND	36	94	ND	36	95
29V	Trichloroethylene	ND	10	ND	ND	ND	36	76	ND	36	103
30V	Trichlorofluoromethane	ND	10	5	5	ND	36	57	ND	36	101
31V	Vinyl chloride	ND	10	ND	ND	ND	36	107	ND	36	101

* 1.5 PA. published Method Detection Limit

USW 038852

July 13, 1983

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA
Acid Compounds - GC/MS Analysis Data (QR02)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986 Monsanto Co ANNISTON 0001 060803 0800 24

ETC Sample No. Company Facility Sample Point Date Time Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concn ug/l	MDL ug/l*	First ug/l	Second ug/l	Blank Data ug/ml	Concn Added ug/ml	% X Recov	Unspiked Extract ug/ml	Concn Added ug/ml	% Recov
	1A 2-Chlorophenol	ND	25	ND	ND	ND	150	48	ND	150	63
	2A 2,4-Dichlorophenol	ND	25	ND	ND	ND	150	53	ND	150	70
	3A 2,4-Dimethylphenol	ND	25	ND	ND	ND	150	51	ND	150	63
	4A 4,6-Dinitro-o-cresol	ND	250	ND	ND	ND	150	59	ND	150	104
	5A 2,4-Dinitrophenol	ND	250	ND	ND	ND	150	57	ND	150	107
	6A 2-Nitrophenol	ND	25	ND	ND	ND	150	50	ND	150	68
	7A 4-Nitrophenol	ND	25	ND	ND	ND	150	38	ND	150	67
	8A p-Chloro-m-cresol	ND	25	ND	ND	ND	150	59	ND	150	79
	9A Pentachlorophenol	ND	25	ND	ND	ND	150	79	ND	150	107
	10A Phenol	ND	25	ND	ND	ND	150	28	<1	150	36
	11A 2,4,6-Trichlorophenol	ND	25	ND	ND	ND	150	55	ND	150	78

* EPA published Method Detection Limit

** Recoveries normally low and variable using EPA Protocol Method 823

CSW 038653

July 1, 1983

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA
Base/Neutral Compounds - GC/MS Analysis Data (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986 Monsanto Co ANNISTON 0001 060883 0800 24
ETC Sample No. Company Facility Sample Point Date Time Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l*	First ug/l	Second ug/l	Blank Data ug/l	Concen Added ug/l	% Recov	Unspiked Extract ug/ml	Concen Added ug/ml	% Recov
1B	Acenaphthene	ND	10	ND	ND	ND	100	80	ND	100	99
2B	Acenaphthylene	ND	10	ND	ND	ND	100	81	ND	100	96
3B	Anthracene	ND	10	ND	ND	ND	100	77	ND	100	101
4B	Benidine	ND	10	ND	ND	ND	100	87	ND	100	68
5B	Benzo(a)anthracene	ND	10	ND	ND	ND	100	75	ND	100	105
6B	Benzo(a)pyrene	ND	10	ND	ND	ND	100	74	ND	100	110
7B	Benzo(b)fluoranthene	ND	10	ND	ND	ND	100	39	ND	100	112
8B	Benzo(ghi)perylene	ND	10	ND	ND	ND	0	-	ND	0	-
9B	Benzo(k)fluoranthene	ND	10	ND	ND	ND	100	67	ND	100	103
10B	bis(2-Chloroethoxy)methane	ND	10	ND	ND	ND	100	91	ND	100	102
11B	bis(2-Chloroethyl) ether	ND	10	ND	ND	ND	100	76	ND	100	89
12B	bis(2-Chloroisopropyl) ether	ND	10	ND	ND	ND	100	74	ND	100	81
13B	bis(2-Ethylhexyl)phthalate	ND	10	3	3	1	100	76	3	100	93
14B	4-Bromophenyl phenyl ether	ND	10	ND	ND	ND	100	80	ND	100	96
15B	Butyl benzyl phthalate	ND	10	ND	ND	ND	100	63	ND	100	84
16B	2-Chloronaphthalene	ND	10	ND	ND	ND	100	80	ND	100	94
17B	4-Chlorophenyl phenyl ether	ND	10	ND	ND	ND	100	82	ND	100	109
18B	Chrysene	ND	10	ND	ND	ND	100	84	ND	100	113
19B	Dibenzo(a,h)anthracene	ND	10	ND	ND	ND	0	-	ND	0	-
20B	1,2-Dichlorobenzene	ND	10	ND	ND	ND	100	68	ND	100	79
21B	1,3-Dichlorobenzene	ND	10	ND	ND	ND	100	66	ND	100	78
22B	1,4-Dichlorobenzene	ND	10	ND	ND	ND	100	68	ND	100	83
23B	3,3'-Dichlorobenzidine	ND	10	ND	ND	ND	100	102	ND	100	133
24B	Diethyl phthalate	ND	10	1	2	ND	100	16	ND	100	74
25B	Dimethyl phthalate	ND	10	ND	ND	ND	100	1	ND	100	63
26B	Di-n-butyl phthalate	ND	10	20	15	ND	100	60	12	100	75
27B	2,4-Dinitrotoluene	ND	10	ND	ND	ND	100	84	ND	100	102
28B	2,6-Dinitrotoluene	ND	10	ND	ND	ND	100	77	ND	100	98
29B	Di-n-octyl phthalate	ND	10	ND	ND	ND	100	83	ND	100	109
30B	1,2-Diphenylhydrazine	ND	10	ND	ND	ND	100	98	ND	100	119
31B	Fluoranthene	ND	10	ND	ND	ND	100	74	ND	100	100

* EPA Publication Method Detection Limit

USM 03854

July 1 1983

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Base/Neutral Compounds - GC/MS Analysis Data (QR03)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986 Monsanto Co ANNISTON 0001 060883 0800 24
ETC Sample No. Company Facility Sample Point Date Time Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l*	First ug/l	Second ug/l	Blank Data ug/l	Concen Added ug/l	% Recov	Unspiked Extract ug/ml	Concen Added ug/ml	% Recov
328	Fluorene	ND	10	ND	ND	ND	100	76	ND	100	100
338	Hexachlorobenzene	ND	10	ND	ND	ND	100	79	ND	100	95
348	Hexachlorobutadiene	ND	10	ND	ND	ND	100	68	ND	100	85
358	Hexachlorocyclopentadiene	ND	10	ND	ND	ND	0	-	ND	0	-
368	Hexachloroethane	ND	10	ND	ND	ND	100	69	ND	100	80
378	Indeno(1,2,3-c,d)pyrene	ND	10	ND	ND	ND	0	-	ND	0	-
388	Isophorone	ND	10	ND	ND	ND	100	97	ND	100	106
398	Naphthalene	ND	10	ND	ND	ND	100	75	ND	100	92
408	Nitrobenzene	ND	10	ND	ND	ND	100	85	ND	100	93
418	N-Nitrosodimethylamine	ND	10	ND	ND	ND	0	-	ND	0	-
428	N-Nitrosodi-n-propylamine	ND	10	ND	ND	ND	100	80	ND	100	90
438	N-Nitrosodiphenylamine	ND	10	ND	ND	ND	100	86	ND	100	103
448	Phenanthrene	ND	10	ND	ND	ND	100	77	ND	100	98
458	Pyrene	ND	10	ND	ND	ND	100	77	ND	100	101
468	1,2,4-Trichlorobenzene	ND	10	ND	ND	ND	100	119	ND	100	138
	2,3,7,8-TCDD	ND	10	ND	ND	ND	0	-	ND	0	-

* EPA Published Method Detection Limit

MSD
030655

ETC ENVIRONMENTAL TESTING AND CERTIFICATION

July 1, 1983

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA
Pesticide Compounds - GC/MS Analysis Data (QR04)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986 Monsanto Co. ANNISTON 0001 060883 0800 24
 ETC Sample No. Company Facility Sample Point Date Time (Elapsed Hours)

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concn. ug/l	MDL ug/l*	First ug/l	Second ug/l	Blank Data ug/l	Concn Added ug/l	% Recov	Unspiked Extract ug/ml	Concn Added ug/ml	% Recov
1P	Aldrin (GC/MS)	ND	10	ND	ND	ND	100	90	ND	100	108
2P	Alpha-BHC (GC/MS)	ND	10	ND	ND	ND	100	34	ND	100	57
3P	Beta-BHC (GC/MS)	ND	10	ND	ND	ND	100	82	ND	100	105
4P	Gamma-BHC (GC/MS)	ND	10	ND	ND	ND	100	38	ND	100	64
5P	Delta-BHC (GC/MS)	ND	10	ND	ND	ND	100	30	ND	100	53
6P	Chlordane (GC/MS)	ND	10	ND	ND	ND	200	125	ND	200	120
7P	4,4'-DDT (GC/MS)	ND	10	ND	ND	ND	100	99	ND	100	126
8P	4,4'-DDE (GC/MS)	ND	10	ND	ND	ND	100	117	ND	100	131
9P	4,4'-DDD (GC/MS)	ND	10	ND	ND	ND	100	97	ND	100	132
10P	Dieldrin (GC/MS)	ND	10	ND	ND	ND	100	111	ND	100	139
11P	Endosulfan I (GC/MS)	ND	10	ND	ND	ND	130	48	ND	130	68
12P	Endosulfan II (GC/MS)	ND	10	ND	ND	ND	70	37	ND	70	79
13P	Endosulfan sulfate (GC/MS)	ND	10	ND	ND	ND	100	51	ND	100	102
14P	Endrin (GC/MS)	ND	10	ND	ND	ND	100	116	ND	100	130
15P	Endrin aldehyde (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
16P	Heptachlor (GC/MS)	ND	10	ND	ND	ND	100	89	ND	100	107
17P	Heptachlor epoxide (GC/MS)	ND	10	ND	ND	ND	100	120	ND	100	153
18P	PCB-1242 (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
19P	PCB-1254 (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
20P	PCB-1221 (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
21P	PCB-1232 (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
22P	PCB-1248 (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
23P	PCB-1260 (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
24P	PCB-1016 (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-
25P	Toxaphene (GC/MS)	ND	10	ND	ND	ND	0	-	ND	0	-

* EPA Published Method Detection Limit

DSW 03d850

June 21, 1983

TABLE 1: QUANTITATIVE RESULTS
Metals, Cyanide and Phenols - Analysis Data (QR05)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986 Monsanto Co ANNISTON 0001 868883 0800 24
ETC Sample No. Company Facility Sample Point Date Time Hours

NPDES Number	Compound	Results											
		Sample Concen ug/l	MDL ug/l										
1M	Antimony	ND	140										
2M	Arsenic	4	4										
3M	Beryllium	ND	6										
4M	Cadmium	ND	7										
5M	Chromium	ND	30										
6M	Copper	ND	10										
7M	Lead	ND	130										
8M	Mercury	ND	0.2										
9M	Nickel	BMDL	40										
10M	Selenium	ND	4										
11M	Silver	BMDL	20										
12M	Thallium	ND	6										
13M	Zinc	ND	20										
14M	Cyanide, Total	15	5										
15M	Phenolics, Total	203	50										

CSM 038857

July 12, 1983

TABLE 2: METHOD PERFORMANCE DATA
Surrogate Recovery - GC/MS Data (QR20)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
----------------	---------	----------	--------------	------	------	------------------

Compound	Amount Added ug	% Recovery	Control Limits *	
			Lower	Upper
VOLATILE FRACTION				
Bromochloromethane	200	99	79	127
Benzene, d ₆	150	111	63	122
Fluorobenzene	150	108	74	122
1,4-Dichlorobutane	200	104	75	117
Pentafluorobenzene	150	108	58	124
Ethylbenzene, d ₁₀	150	112	78	114
ACID FRACTION				
2-Fluorophenol	80	63	20	86
Pentafluorophenol	80	79	37	127
BASE/NEUTRAL FRACTION				
2-Fluorobiphenyl	80	82	62	122
1-Fluoronaphthalene	80	72	64	104
Nitrobenzene, d ₅	80	86	58	105

* Three Standard Deviations About the Mean

* Three Standard Deviations About the Mean

MSD 03856

June 20, 1983

TABLE 2: METHOD PERFORMANCE DATA

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis (QR21)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
----------------	---------	----------	--------------	------	------	---------------

m/z	Ion Abundance Criteria	Abundance (% Base Peak)
50	15-40% of the base peak	28
75	30-60% of the base peak	55
98	Base Peak, 100% relative abundance	100
96	5-9% of the base peak	8
173	Less than 1% of the base peak	<1
174	Greater than 50% of the base peak	67
175	5-9% of mass 174	5
176	Greater than 50% of the base peak	63
177	5-9% of mass 176	3

Date: 061383
Run No: 24919
Spectrum No: 21
Analyst: P Krajczar

DSW 038859

July 12, 1983

TABLE 2: METHOD PERFORMANCE DATA

GC/MS Tuning Data - Decafluorotriphenylphosphine (DFTPP) for Acids Analysis (QR22)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
----------------	---------	----------	--------------	------	------	---------------

m/z	Ion Abundance Criteria	Abundance (% Base Peak)
51	30-60% of mass 198	48
68	Less than 2% of mass 69	<2
70	Less than 2% of mass 69	<2
127	40-60% of mass 198	43
197	Less than 1% of mass 198	<1
198	Base peak, 100% relative abundance	100
199	5-9% of mass 198	6
275	10-30% of mass 198	20
365	Greater than 1% of mass 198	2
441	Less than mass 443	6
442	Greater than 40% of mass 198	41
443	17-23% of mass 442	8

Date: 063083
Run No: 20779
Spectrum No. 220
Analyst M Mukherjee

000000 MSU

June 27, 1983

TABLE 2: METHOD PERFORMANCE DATA

GC/MS Tuning Data - Decafluorotriphenylphosphine (DFTPP) for Acids Analysis (QR22)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
----------------	---------	----------	--------------	------	------	---------------

m/z	Ion Abundance Criteria	Abundance (% Base Peak)
51	30-60% of mass 198	60
68	Less than 2% of mass 69	<2
70	Less than 2% of mass 69	<2
127	40-60% of mass 198	47
197	Less than 1% of mass 198	<1
198	Base peak, 100% relative abundance	100
199	5-9% of mass 198	6
275	10-30% of mass 198	21
365	Greater than 1% of mass 198	2
441	Less than mass 443	12
442	Greater than 40% of mass 198	80
443	17-23% of mass 442	15

Date	062283
Run No	20653
Spectrum No	219
Analyst	P Krajczar

109900 033001

June 30, 1983

TABLE 2: METHOD PERFORMANCE DATA

GC/MS Tuning Data - Decafluorotriphenylphosphine (DFTPP) for Base/Neutrals Analysis (QR23)

Chain of Custody Data Required for ETC Data Management Summary Reports

C3986

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
----------------	---------	----------	--------------	------	------	------------------

m/z	Ion Abundance Criteria	Abundance (% Base Peak)
51	30-60% of mass 198	58
68	Less than 2% of mass 69	12
70	Less than 2% of mass 69	12
127	40-60% of mass 198	44
197	Less than 1% of mass 198	11
198	Base peak, 100% relative abundance	100
199	5-9% of mass 198	7
275	10-30% of mass 198	24
366	Greater than 1% of mass 198	3
441	Less than mass 443	14
442	Greater than 40% of mass 198	95
443	17-23% of mass 442	19

Date	062283
Run No.	25080
Spectrum No.	140
Analyst	W W Chi

05M 03860

METHODOLOGY

The methods employed in the analysis of your sample are established EPA methods for priority pollutants. Combined gas chromatography and mass spectrometry (GC/MS) was used in the analysis of the organic compounds and atomic absorption spectrophotometry (AA) in the analysis of the metals.

For the analysis of the volatile organic compounds, EPA Method 624 (Federal Register December 3, 1979, page 69532) was used. The method can be summarized as follows. Helium is bubbled through a 5-ml water sample contained in a specially designed purging chamber at ambient temperature. The purgeable volatile organic compounds are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed the sorbent column is heated and back flushed with helium to desorb the purgeables onto a gas chromatographic column. The gas chromatograph is temperature programmed to separate the purgeables which are then detected with a mass spectrometer.

For the analysis of the Acid/Base/Neutral and Pesticide priority pollutants, EPA Method 625 (Federal Register, December 3, 1979; page 69540) was used. The method can be summarized as follows. A measured volume of sample, approximately 1-liter, was serially extracted with methylene chloride at a pH greater than 11 and again at pH less than 2 using a separatory funnel or a continuous extractor. The two methylene chloride extracts were individually dried and concentrated to a volume of 1 ml. The concentrates were injected into GC/MS systems set specifically for the separation and measurement of the priority pollutants.

Quantitative identification of the priority pollutants was performed initially using the relative retention times, the relative abundance of three characteristic ions and their ratios. The entire mass spectrum was reviewed before an identification was recorded. Quantitative analysis was performed using an internal standard with a single characteristic ion.

DSW 038863

ANALYSIS OF METALS

AQUEOUS

The determination of metals in aqueous samples was performed according to the methods published by EPA in "Methods for Chemical Analysis of Water and Wastes" EPA-600/4-79-020, March, 1979, and Appendix IV of the Federal Register, December 3, 1979. Arsenic, selenium and thallium were determined by furnace AA. Silver, aluminum, barium, beryllium, boron, cadmium, calcium, chromium, copper, cobalt, iron, magnesium, manganese, molybdenum, nickel, lead, sodium, antimony, tin, titanium, vanadium, and zinc were determined by ICP emission spectrometry, except where lower levels of detection were required in these cases (e.g. lead in groundwater monitoring samples) furnace AA was used. The determination of mercury was performed by cold vapor AA.

EP TOXICITY

The determination of metals in aqueous EP Toxicity leachates was performed according to the methods published by EPA in "Test Methods for Evaluating Solid Waste" EPA SW-846, July 1982, and Appendix IV of the Fed. Reg. Dec. 3, 1979. Silver, arsenic, barium, cadmium, chromium, lead and selenium were determined by ICP emission spectrometry. Mercury was determined using cold vapor AA. For leachates that are organic in nature the analyses were performed according to the methods described under "OIL/SLUDGE" below.

SOIL/SEDIMENT

The determination of silver, beryllium, cadmium, chromium, copper, nickel, antimony, lead and zinc in sediment samples was performed according to methods published by EPA in "Interim Methods for the Sampling and Analysis of Priority Pollutants in Sediments and Fish Tissue", EPA 600/4-81-055, October 1980. Mercury was determined according to the sediment method published by EPA in "Method for Chemical Analysis of Water and Wastes" EPA 600/4-79-020, March 1979. Arsenic, selenium and thallium were determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion.

OIL/SLUDGE

The determination of silver, aluminum, boron, barium, beryllium, calcium, cadmium, copper, chromium, cobalt, iron, magnesium, manganese, molybdenum, sodium, nickel, lead, antimony, tin, titanium, vanadium, and zinc in sludge/petroleum-based samples was performed by ICP emission spectrometry using a magnesium nitrate dry ashing digestion technique.

Arsenic, selenium and thallium were determined by furnace AA using nitric acid in a closed decomposition vessel for sample digestion. Mercury was determined by cold vapor AA using the same digestion technique.

DSW 038864

QUALITY ASSURANCE PROTOCOL

The quality assurance protocol followed in the analysis of your sample is based on the "Handbook for Analytical Quality Control in Water and Wastewater Laboratories" EPA-600/4-79-019, March, 1979, National Enforcement Investigation Center Policies and Procedures manual, EPA-330/9-79/001-R, October, 1979, and the recommended guidelines for EPA Method 624 and 625.

Our protocol calls for a higher percentage of quality assurance samples than the requirements of Method 624 and 625. The key QA elements for the analysis of priority pollutants are summarized as follows:

Method 624

- In every block of 10 samples, analysis of 7 field samples, one blank, one spiked sample and one replicate are performed. This amounts to a 30% quality control factor.
- A minimum of three surrogate compounds are added to each sample in the block of ten.
- Blind quality control samples are included in field samples at a minimum of one every hundred samples.
- The GC/MS is checked and retuned, if necessary, every eight hours to ensure its performance on bromofluorobenzene (BFB) meets the EPA criteria.
- A calibration curve for quantitation is prepared using a minimum of 3 concentrations of a standard mixture of the priority pollutants of interest and 3 internal standards (at a constant concentration).
- The calibration curve is verified with a standard priority pollutant mixture every eight hours.
- Results meet the acceptance criteria given in Method 624.

Method 625

- In every block of 20 samples extracted, there are 16 field samples, one blank, one spiked blank, one sample spiked with the priority pollutant standard mixture and a duplicate field sample.
- Five surrogate compounds are added to each sample in the block of 20.
- Blind quality control samples are included in field samples at a minimum of one every hundred samples.
- The GC/MS is checked and retuned, if necessary, every eight hours to ensure its performance on decafluorotriphenylphosphine (DFTPP) meets the EPA criteria.
- GC performance criteria as specified in Method 625 are met before analysis starts.
- A calibration curve for quantitation is prepared using a minimum of 3 concentrations of a standard mixture of the priority pollutants of interest and 2,2'-difluorobiphenyl as internal standard.
- The calibration curve is verified with a standard priority pollutant mixture every eight hours.
- Results meet the acceptance criteria given in Method 625.

DSW 038865

Analysis of Metals (Standards)

- New working standards are prepared for each batch of samples
- Normal calibration is performed using a blank and four standards that have been carried through the entire sample preparation procedure. A regression analysis is used to construct the calibration curve.
- For each sample analysis in the standard additions technique, a three point calibration is performed using U. S. EPA Methods for Chemical Analysis of Water and Wastes, 1979. Results are obtained using linear regression analysis. Any results obtained with a coefficient of correlation below 0.990 are considered erroneous, necessitating raw data editing or sample re-analysis.
- Normal calibration curves are constructed using greater than or equal to 5 times the Instrumental Detection Limit (IDL) as the lowest concentration level.
- All calibration standards are analyzed in duplicate, as a minimum.
- Independent reference standards are used to check the accuracy of calibration standards.
- A check standard is analyzed every ten samples to establish the validity of the normal calibration curve.

DSW 038000

Analysis of Metals (Sample, for all metals except Mercury)

For all homogeneous samples (minimum of 42% QC), each sample batch may include up to 30 samples and the following fixed number of QC samples

- 3 Replicates
- 2 Replicate spikes
- 2 Replicate independent reference standards
- 8 Calibration standards (processed using the sample preparation method)
- 2 Blanks (using sample preparation method)
- 4 Calibration standards (without sample preparation)
- 1 Blank (without sample preparation)

For all heterogeneous samples (minimum of 65% QC), every field sample in a sample batch is run in duplicate. A sample batch may include up to 30 samples and the following fixed number of QC samples

- 4 Replicates
- 4 Replicate spikes
- 2 Replicate independent reference standards
- 8 Calibration standards (processed using the sample preparation method)
- 2 Blanks (using sample preparation method)
- 4 Calibration standards (without sample preparation)
- 1 Blank (without sample preparation)

Analysis of Metals (Sample, Mercury)

For every matrix (minimum of 66% QC), all the field samples in each sample batch are run in duplicate. A sample batch may include up to 20 samples and the following fixed number of QC samples

- 3 Replicates
- 2 Replicate spikes
- 2 Replicate independent reference standards
- 10 Calibration standards (processed using the sample preparation method)
- 2 Blanks

DSW 038867

Chain-of-Custody

The chain-of-custody procedure is part of our quality assurance protocol. We believe our chain-of-custody record fully complies with the legal requirements of federal, state and local government agencies and of the courts of law. The record covers

- labeling of sample bottles, packing the Sample Shuttle and transferring the Shuttle under seal to the custody of a shipper,
- outgoing shipping manifests,
- the chain-of-custody form completed by the person(s) breaking the seal, taking the sample, resealing the Shuttle and transferring custody to a shipper,
- incoming shipping manifests,
- breaking the Shuttle's reseal,
- storing each labeled sample bottle in a secured area,
- disposition of each sample to an analyst or technician and,
- the use of the sample in each bottle in a testing procedure appropriate to the intended purpose of the sample

The record shows for each link in this process

- the person with custody,
- the time and date each person accepted or relinquished custody

OSW 030800

REPORT APPENDICES

The following appendices provide the support analytical data associated with your sample analyses. They are arranged as follows:

Appendix A

- 1) Reconstructed total ion chromatogram of GC/MS analyses of your sample
- 2) The individual mass spectra of all priority pollutant compounds which have been identified as being present in your sample
- 3) The individual mass spectra of the corresponding compounds as obtained from the standards

Appendix B

- 1) The mass spectra of the calibration compounds, 4-bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), as obtained on the date of sample analyses.

Appendix C [for plus 10 and 50% internal standard option]

- 1) Spectra of tentatively identified compounds, with their differences

Appendix D

- 1) Subcontractor's report

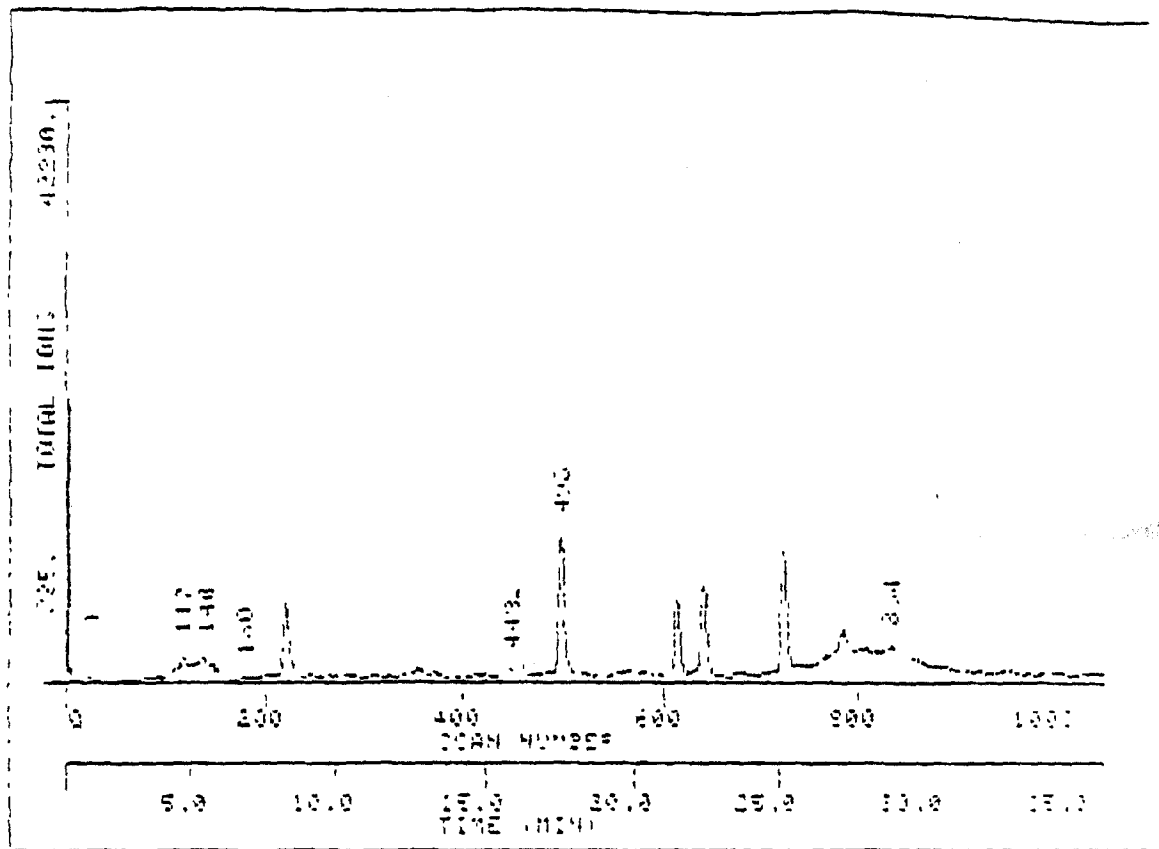
These data are provided to present a complete report on your sample and to provide the data on which analytical decisions have been based. We hope this will aid you in your own analysis of the data.

CSW 038869

APPENDIX A

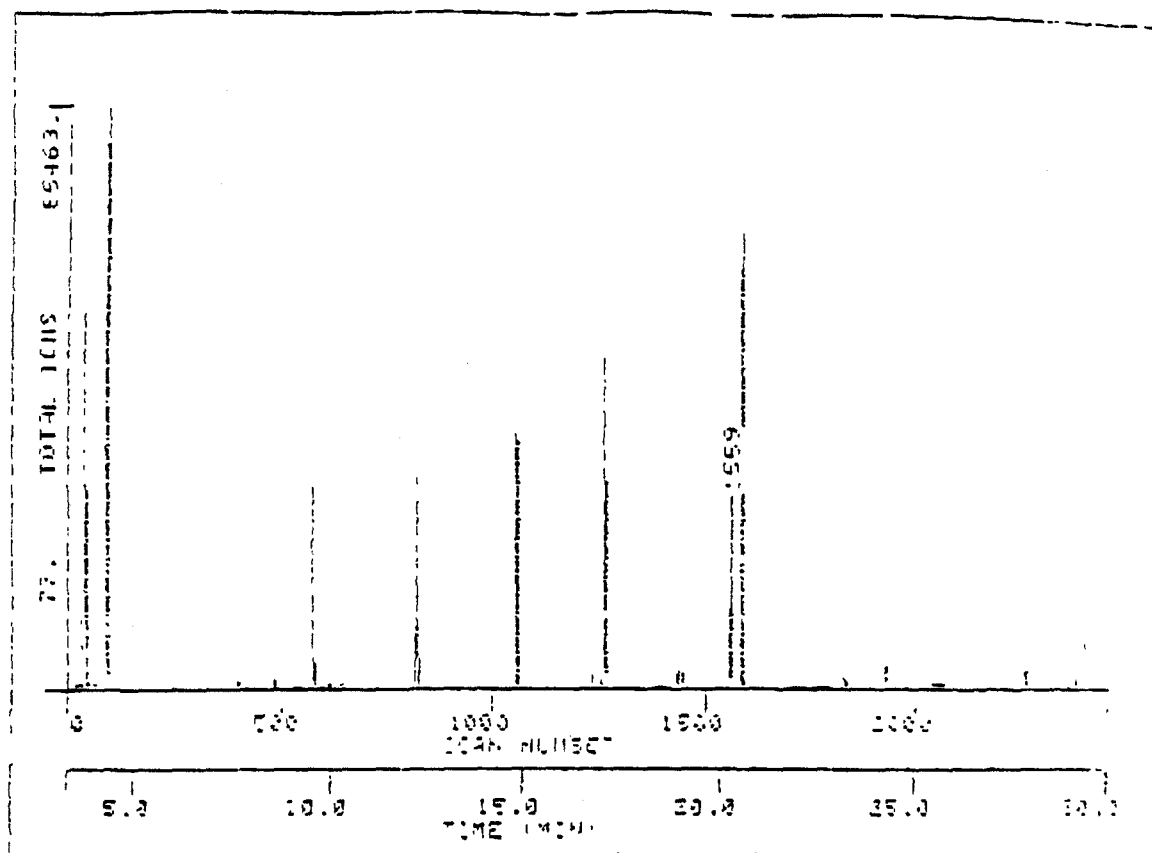
OSW 038a70

TOTAL ION CHROMATOGRAM



MS DATA FILE 801 11.4
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 T. 01-11.42 CIL 11.42
 L. 11.42 11.42 ML 11.42

MSW 038871

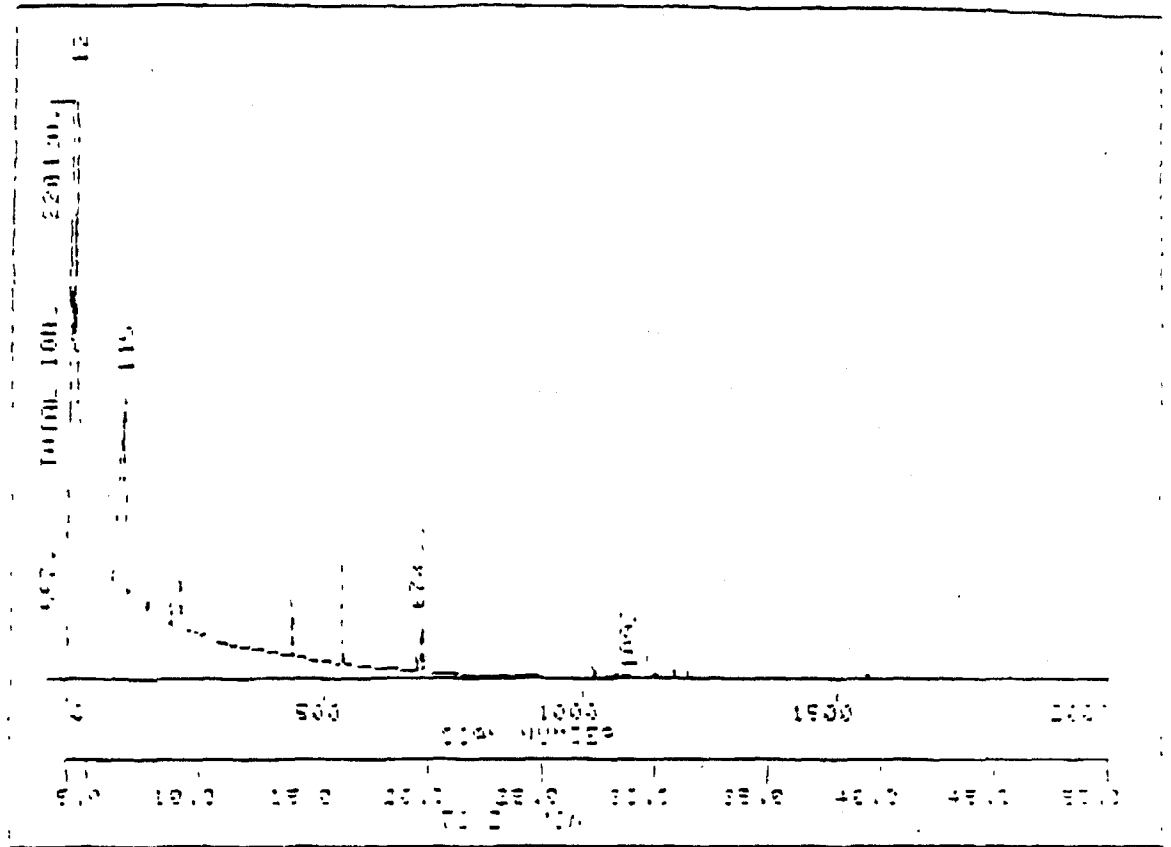


MS DATA FILE FROM 707.7
 NAME: 707.7 (707.7, 1)
 MS DATA: 707.7
 DATE: 11/1/82

0.00746

DSW 038872

LINE 107 CHROMATOGRAM



10.0 11.5 17.4 30.9
 10.0 11.5 17.4 30.9
 10.0 11.5 17.4 30.9

0.000

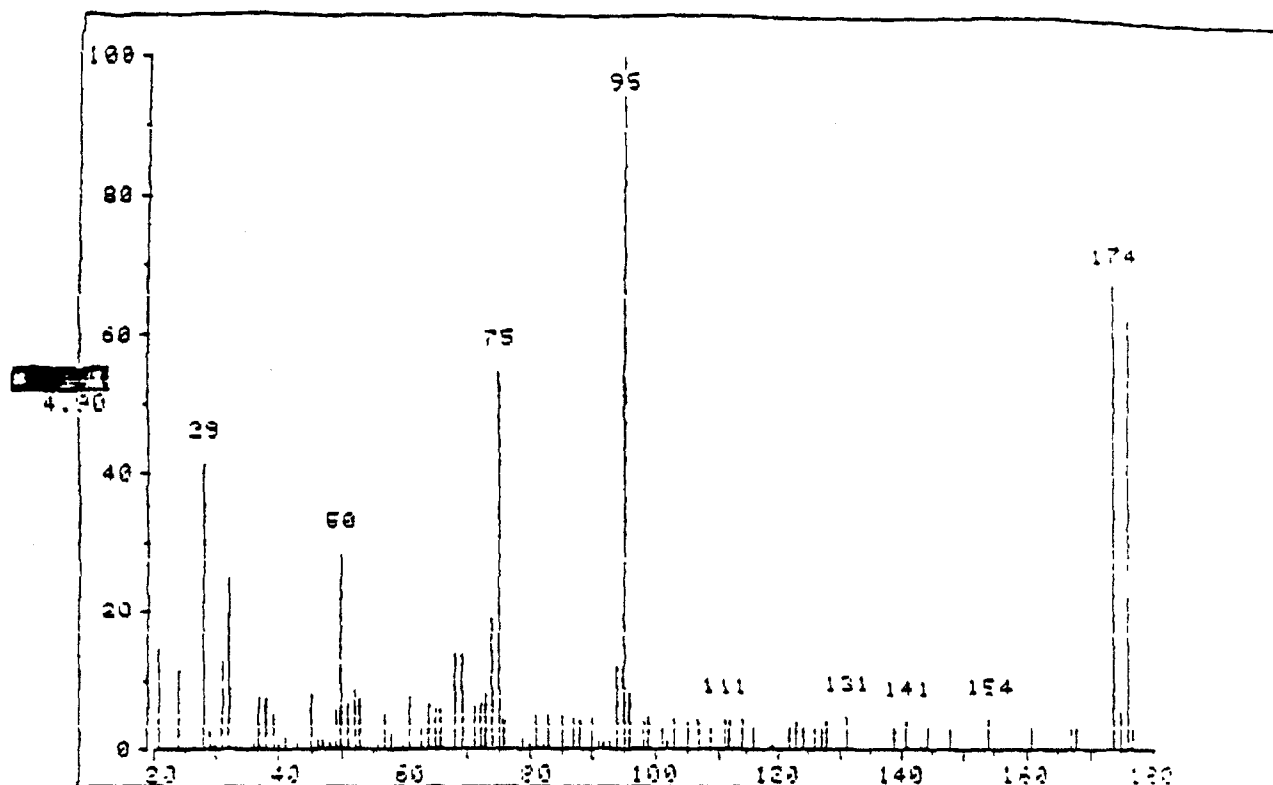
MSD 038873

APPENDIX B

DSW 038874

373 CALIBRATION COMPOUND
800613 GC/MS E BKG SUB #21

FRN: 2491

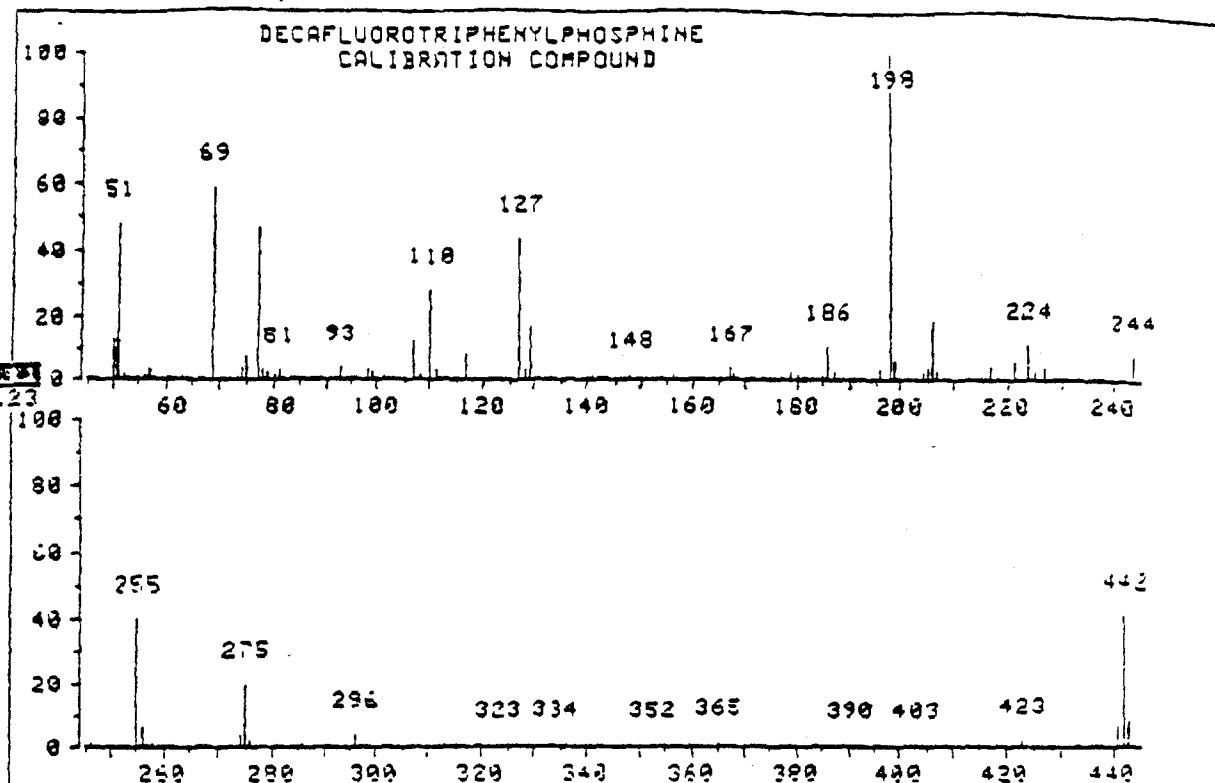


FRN 24919, SPECTRUM # 1 RET TIME 4.90, 98 PEAKS

M/Z	REL ABUND	M/Z	REL ABUND	M/Z	REL ABUND	M/Z	REL ABUND
21	14.6	51	6.5	85	4.4	114	4.1
24	11.7	52	8.6	87	4.3	116	3.6
24	11.6	53	7.1	88	3.8	122	3.2
28	41.4	57	4.8	90	4.3	123	4.0
29	2.4	58	2.1	91	1.1	124	3.2
31	13.0	61	7.6	92	1.1	126	3.5
32	25.0	63	3.2	93	3.3	127	3.5
36	1.3	64	6.5	94	11.9	128	4.0
37	7.8	65	5.9	95	100.0	131	4.6
38	7.1	66	5.5	96	8.1	139	3.2
39	4.9	68	14.1	98	3.8	141	3.8
40	9	69	13.8	99	4.4	144	3.3
41	1.7	71	5.9	101	3.6	148	3.2
43	1.1	72	6.5	102	1.3	154	4.1
45	4.6	73	8.1	103	4.3	161	3.2
45	8.1	74	18.7	105	4.0	167	3.2
46	1.6	75	54.5	107	4.3	168	3.2
47	1.7	76	4.0	107	4.1	174	67.4
48	1.3	79	1.9	109	3.3	175	5.1
49	5.7	81	4.4	111	4.3	176	62.8
50	28.4	83	4.9	112	3.8	177	3.3

>PAUSE

DSW 038875



king
PP FPA CRITERION VERIFIER

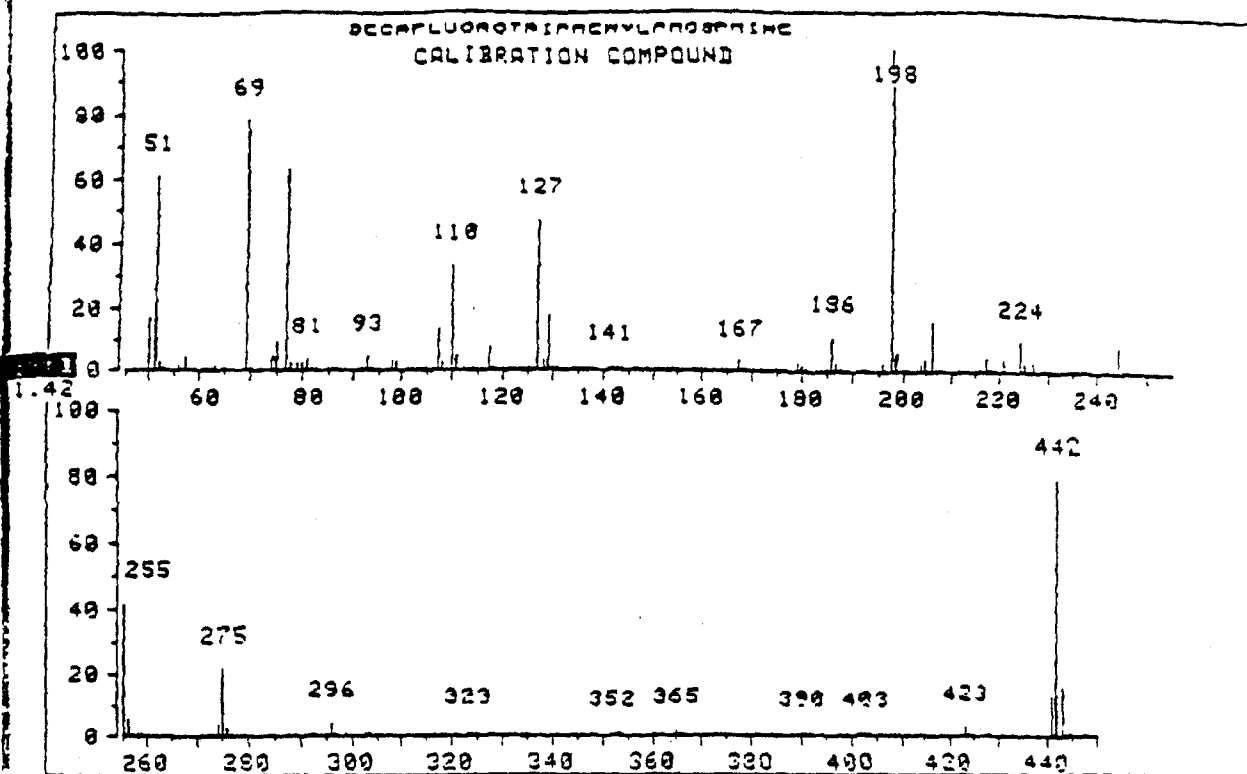
20779
SPECTRUM 1

Mass	Rel Abund	Criterion
51	48 1906	30-60% MASS 198
69	0	< 2% MASS 69
110	58 9656	< 2% MASS 69
127	19.475	< 2% MASS 69
127	43 4067	40-60% MASS 198
197	0	< 1% MASS 198
198	100	BASE PEAK
199	5 9125	5-5% MASS 198
275	20 0287	19 30% MASS 198
365	1 59375	> 1% MASS 198
441	6 49687	< MASS 441
442	41 6969	> 40% MASS 198
443	7 93437	17-23% MASS 442

'xx' indicates out of range

DSW 038870

AS (RETURN) TO RCRUN

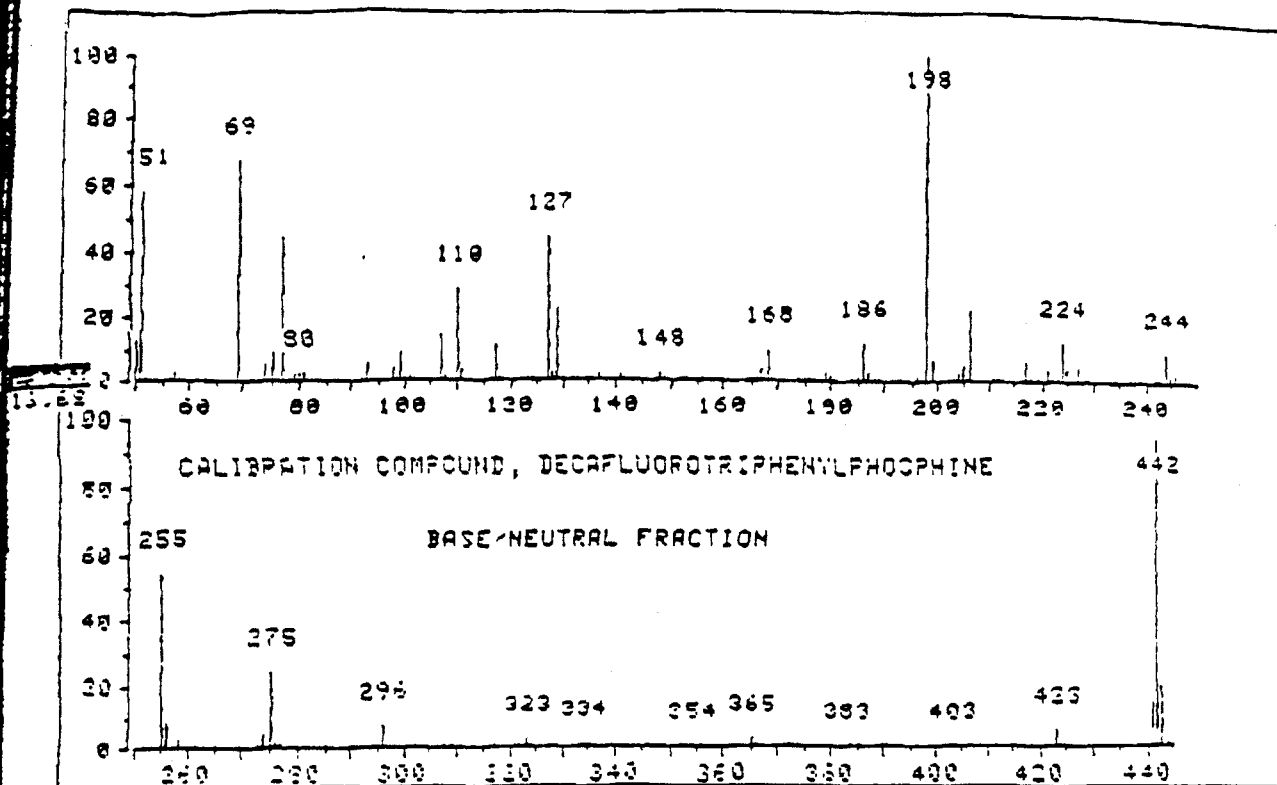


N 20653, SPECTRUM # 1 RET.TIME 11.42, 256 PEAKS

M/Z	REL ABUND	M/Z	REL ABUND	M/Z	REL ABUND	M/Z	REL ABUND
50	16.6	107	13.6	179	2.3	255	41.3
51	60.4	108	2.2	180	1.9	256	5.4
52	2.8	110	32.6	185	1.1	258	1.5
56	2.0	111	4.6	186	10.8	273	9.9
57	3.7	116	6.6	187	2.5	274	3.8
63	1.7	117	7.8	192	7.7	275	21.1
65	6.6	123	8.8	196	2.7	276	2.5
69	78.0	127	47.4	198	100.0	277	1.1
74	4.4	128	3.0	199	6.3	296	4.1
75	9.3	129	17.9	204	2.4	323	1.7
77	63.3	130	1.4	205	3.6	334	1.0
78	2.8	141	1.8	206	16.5	365	1.8
79	2.7	142	7.7	207	1.2	372	6.6
80	2.5	148	1.3	217	4.5	423	3.6
81	3.7	153	6.6	221	4.3	424	7.7
86	6.6	155	7.7	223	1.1	441	12.4
92	7.7	156	1.1	224	9.5	442	79.7
93	4.4	161	8.8	225	2.4	443	15.2
98	3.0	162	6.6	227	3.5	444	1.4
99	2.3	167	2.9	244	8.6		
101	1.0	168	8.8	245	1.1		
105	1.1	175	1.3	246	1.3		

USE

CSW 038877



DETPP EPA CRITERION VERIFIER

PM 25080
SPECTRUM 1

Mass	Rel Abund	Criterion
51	57 9531	30-60% MASS 198
68	0	< 2% MASS 69
69	67 0875	
70	0	< 2% MASS 69
127	44.2531	40-60% MASS 198
197	0	< 1% MASS 198
198	100	BASE PEAK
199	6 77188	5-9% MASS 198
275	24 4074	10-30% MASS 198
365	3 30625	> 1% MASS 198
441	14 4875	< MASS 443
442	95 275	> 40% MASS 198
443	18 7406	17-23% MASS 442

OTE 'xx' indicates out of range

PRESS (RETURN) TO RERUN .

DSW 038876

CHAIN-OF-CUSTODY RECORD

OSW 038879

CHAIN OF CUSTODY FORM (CC1)
ETC SHUTTLES NOT USED

ETC Sample # C3986
Sample Date 6/16/83
Sample By S. R. J. W.

Company MONSANTO
Facility/State Hwy 202 WEST
Address ANNISTON, AL 36202
Attn ROBERT CHEENEY
Phone (205) 236-6381

SAMPLE IDENTIFICATION

Facility/State Code M101NSIAINT101
Source Code:
Well (W) _____ River/Stream (R) _____ Surface Impoundment (I) _____ Lake/Ocean (L) _____
Soil (S) _____ Bottom Sediment (B) _____ Pretreatment Facility (P) _____ Treatment Facility (T) _____
Outfall (O) _____ Generation Point (G) _____ Leachate Collection Sys. (C) _____ Other (X) _____
Source Code (from above) 0 Your Sample Point ID (left justify) 111111110011 Start Date (mo/day/yr) 06/08/83 Start Time (2400 hr. basis) 0800 Collected hours (as-passed) 12.4
Container W 1101/J263P1 05/15/81 09:30 113

SAMPLE COMMENTS

Sample Date	Container	Sample Date	Container
C3986 V3 to V14 T3486 TB -			

CHAIN OF CUSTODY CONT.

1. Shuttle Operated By (print) DON YATES Date 6-9-83 Time 07⁰⁰ AM
Signature Don Yates Seal # 044722 Initials YATES

I have received these materials in good condition from the above person.

2. Name _____ Signature _____
Date _____ Time _____ Remarks _____

I have received these materials in good condition from the above person.

3. Name _____ Signature _____
Date _____ Time _____ Remarks _____

I have received these materials in good condition from the above person.

4. Name _____ Signature _____
Date _____ Time _____ Remarks _____

5. Shuttle Sealed By (print) _____ Date _____ Time _____
Signature _____ Seal # _____

ETC USE ONLY Opened By D. Schuchert Date 6/10/83 Time 10:35am
Seal # 14722 Condition Seal intact

DSW 038800

CHAIN OF CUSTODY FORM (CC1)

Seal Code

5-31-83

Sealed By

Monsanto/Farley

SHIP TO:

Company:

Monsanto

Facility/State:

Hwy 202 West

Attn:

Robert Cheevers

Address:

Anniston, AL 36202

Phone:

205 236-6381

SAMPLE IDENTIFICATION

Facility/State Codes

Source Codes

Well (W)

River/Stream (R)

Surface Impoundment (I)

Lake/Ocean (L)

Soil (S)

Bottom Sediment (B)

Pretreatment Facility (P)

Treatment Facility (T)

Outfall (O)

Generation Point (G)

Leachate Collection Sys. (C)

Other (X)

Source Code
(from above)Your Sample Point ID
(left justify)Start Date
(mo/day/yr)Start Time
(2400 hr. clock)Elapsed time
(calendar)

Sample:

W

110111216131P11

015115811

0191310

131

SAMPLE COMMENTS

Sample Bottle

Condition

Sample Bottle

Condition

C3986

E₁ to E₃

C3986

V₁ to V₂

C3986

CN-

C3986

PN-

C3986

m₁-

C3986

TB-

C3986 all samples sealed with yellow electrical tape

CHAIN OF CUSTODY CHRONOLOG

Shuttle Opened By (print)

DON YATES

Date: 6-9-87

Time: 07⁰⁰ AM

Signature:

Don Yates

Seal #. 0070722

Intact: YES

I have received these materials in good condition from the above person.

Name:

Signature:

Date:

Time:

Remarks:

I have received these materials in good condition from the above person.

Name:

Signature:

Date:

Time:

Remarks:

I have received these materials in good condition from the above person.

Name:

Signature:

Date:

Time:

Remarks:

Shuttle Sealed By (print)

Date:

Time:

Signature:

Seal #:

EPA USE ONLY

Opened By:

D. Schuchert

Date: 6/10/87

Time: 10:35 AM

Seal #:

14722

Condition:

Seal intact

DSN 036881

C3986

ETC Sample No.

SAMPLE POINT INFORMATION FORM (CC2)

FIELD MEASUREMENT DATA

Select up to 3 parameters to be recorded by entering the appropriate code letter in the first space for each of the 3 data entry fields provided. Enter the actual measurement data (in the units specified) for the three parameters you have selected.

PARAMETERS	ACTUAL (unit specified)	EXAMPLE
Flow (CFS) _____ A	_____	C 2.5
Volume (Gal) _____ B	_____	E 5.0
Sample Depth (ft) _____ C	_____	G 1.1 0.3
Depth to Water (ft) _____ D	_____	
Discharge Rate (GPM) _____ E	_____	
Depth to Bottom (ft) _____ F	_____	
Event Time (2400-Hr Clock) _____ G	_____	
Depth to Screen (ft) _____ H	_____	

FIELD TEST DATA

DO (mg/L) _____	Sample Temp. (°C) _____
pH _____	
Single Measurement _____	2nd of Quadruplicate _____
3rd of Quadruplicate _____	4th of Quadruplicate _____
Specific Conductance (µMCS/cm) _____	
Single Measurement _____	2nd of Quadruplicate _____
3rd of Quadruplicate _____	4th of Quadruplicate _____

THE FOLLOWING DATA IS FOR YOUR RECORDS ONLY

SAMPLING METHOD (choose one)

AIR-LIFT PUMP ()	PERISTALTIC PUMP ()	TRIEY ()
AUGER ()	PETROSEN ()	TRIER ()
BAILER ()	PISTON PUMP ()	VENNEMETER ()
BOTTLE ()	SCOP/SHOVEL ()	OTHER _____
COLUMBA ()	SQUEEZE PUMP ()	_____
DIPPER ()	SUBMERSIBLE PUMP ()	_____
EDMUND ()	SUCTION LIFT PUMP ()	_____
HOVER ()	SURBER ()	_____

SAMPLE TYPE (choose one)

DRAW ()	COMPOSITE ()	OTHER ()
	24 HOUR	
	7AM (6-8-83) → 7PM (6-9-83)	
	(describe)	(describe)

WEATHER

SAMPLE DESCRIPTION (e.g., water, soil)

_____	_____
_____	_____
_____	_____
(describe)	(describe)

Form Prepared By:

DOIN YATES

Employer:

MONSANTO CO

(name (print))

ETC Form CC2 6/1/82

LABORATORY CHAIN-OF-CUSTODY

ETC Sample Number(s) C3986

Relinquished By W Schuckert

Received By B. J. [Signature] Date 6/17/83 Time 10:04a

Relinquished By _____

Received By _____ Date _____ Time _____

Relinquished By _____

Received By _____ Date _____ Time _____

Relinquished By _____

Received By _____ Date _____ Time _____

Relinquished By _____

Received By _____ Date _____ Time _____

DSW 038883

LABORATORY CHAIN-OF-CUSTODY CHRONICLE

ETC Sample Number(s)

C3986

Sample Preparation For

Analyst

Date

Base/Neutral/PCB's & Pesticides

See Sample - 1-1-83

Acids

See Sample - 1-1-83

Metals

J. Breen 6/10/83

Others

Others

Others

Others

Sample Analysis For

Analyst

Date

Base/Neutral/PCB's & Pesticides

See Sample - 6/21/83

Acids

See Sample - 6/21/83

VQA Purgeables

See Sample - 6/21/83

Metals

J. Breen 6/14/83Others Cyanide/PhenolW. J. W. 6/12-16/83

Others

Others

Others

Others

Others

Verified By

B.F. Dinkelschlag

DSW 038884

0257

Monsanto

MONSANTO RESEARCH CORPORATION / DAYTON LABORATORY / DAYTON, OHIO 45407

EASC-Dayton

(DEPT./SECTION)

Sampling/Analysis

TYPE OF REPORT

REPORT

REPORT NO.: MDA-410

JOB/PROJECT NO.: 483.1400

DATE: November 3, 1983

PERIOD COVERED:

TITLE: ANALYSIS OF WATER AND SLUDGE FOR 2,3,7,8-TCDD

AUTHORS: Frederick D. Hileman

ABSTRACT: Water and sludge samples from the Anniston Plant were analyzed for their possible 2,3,7,8-tetra-chlorodibenzo-p-dioxin content. The results of these analyses are shown in this report.

Technical Approval:

Joseph J. Brooks
Joseph J. Brooks
Research Group Leader

Approved By:

Robert F. Ivory
Robert F. Ivory
Environmental Analytical Sciences
Center Service Project Manager

Approval Date:

11-3-83

PLAINTIFF'S
EXHIBIT
16

RESTRICTED DISTRIBUTION (see over)
C O M P A N Y C O N F I D E N T I A L

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OSW 081606

AUTHORS: F. D. Hileman
TITLE: ANALYSIS OF WATER AND SLUDGE FOR 2,3,7,8-TCDD

REPT. NO.: MDA-410

COPY NO.: 1

0257/E

HARTOLDMON0035126

DISTRIBUTION

<u>COPY NUMBER</u>	<u>ABSTRACT ONLY</u>
1 R. Cheever, Anniston	R. M. Scott 02B
2 R. F. Ivory	H. A. Woltermann
3 F. D. Hileman	
4 Central Files	
5 Research Technical Library	

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ACKNOWLEDGEMENT

Contributions of the following Dayton Laboratory personnel to this project are gratefully acknowledged:

Analyses: F. D. Hileman
D. E. Kirk

COMPANY CONFIDENTIAL

When no longer needed, or upon request, return this report to Central Files, Dayton.

INTRODUCTION

One water and one biological sludge sample were received from An-niston for the analysis of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). The samples were assigned MRC Log Number 1-83-09-13-05.

SAMPLE PREPARATION

The water samples were prepared by extracting one liter of water with three 60mL portions of methylene chloride (CH_2Cl_2). This included rinsing the bottle with CH_2Cl_2 to ensure complete recovery of any TCDD which may have adhered to the glass. The CH_2Cl_2 extract was concentrated and exchanged to hexane and then chromatographed through a multiple stage column consisting of silica, silica plus concentrated sulfuric acid and silica plus potassium hydroxide. The eluant from this column passed directly onto a Woelm B alumina column which strongly retains the TCDD. This alumina column is then eluted with 2% CH_2Cl_2 /hexane to remove PCBs and this fraction is discarded. The column is then eluted with 50% CH_2Cl_2 /hexane to strip off the TCDD and the solvent is concentrated to 10 μL and submitted for GC/MS analysis.

The sludge samples were prepared in a somewhat similar manner. Ten grams of sludge was extracted with a mixture of 15mL of methanol and 150mL of hexane. The extract was decanted from the sludge and then partitioned against organic free water and then concentrated sulfuric acid to remove impurities. This cleaned-up hexane was then run through a similar column arrangement as the water and submitted for GC/MS analysis.

SAMPLE ANALYSES

The GC/MS analyses were carried out on a Hewlett Packard 5985 B GC/MS system using a 60m SP-2330 capillary column for the separation of the 2,3,7,8-TCDD from other interferences. The mass spectrometer was operated in the selected ion monitoring mode following ions characteristic of 2,3,7,8-TCDD and the isotopically labeled TCDDs which were used as surrogates for quantitation.

RESULTS AND DISCUSSION

The results of the analyses are shown in Tables 1 and 2. No TCDD was found in the water or the sludge at the method detection limits. Quality control information is also provided in these tables. Note that the results for the water sample are listed as part per trillion (ppt) or one part in 10^{12} . The results for the sludge are parts per billion (ppb) or one part in 10^9 .

DSM 081608

0257/1

TABLE 1. ANALYSIS OF DISCHARGE WATER FOR 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN

Sample	ppt 2,3,7,8-TCDD found	ppt 2,3,7,8-TCDD added
Discharge Water	ND*	-
Discharge Water (Rep)	ND	-
Discharge Water (Spike)	0.9	1.0
Discharge Water (Spike)	9.0	10
Blank	ND	-
Method Detection Limit	0.5	-

* ND = none detected at the method detection limit

0257/F

TABLE 2. ANALYSIS OF BIOLOGICAL SLUDGE FOR 2,3,7,8-
TETRACHLORODIBENZO-P-DIOXIN

Sample	ppb 2,3,7,8-TCDD found	ppb 2,3,7,8-TCDD added
Sludge	ND*	-
Sludge (Replicate)	ND	-
Sludge (Spike)	0.9	0.9
Sludge (Spike)	8.5	9.5
Blank	ND	-
Method Detection Limit	0.5	-

* ND = none detected at the Method Detection Limit



June 85





June 82





June 85





June 82





June 85





June 82





June 85





June 82





June 85





June 82





June 85





23 June





June 85





June 82





June 85





28 9mT





June 85





June 82





June 85





23 9mJL





June 25





June 85





28 9mT





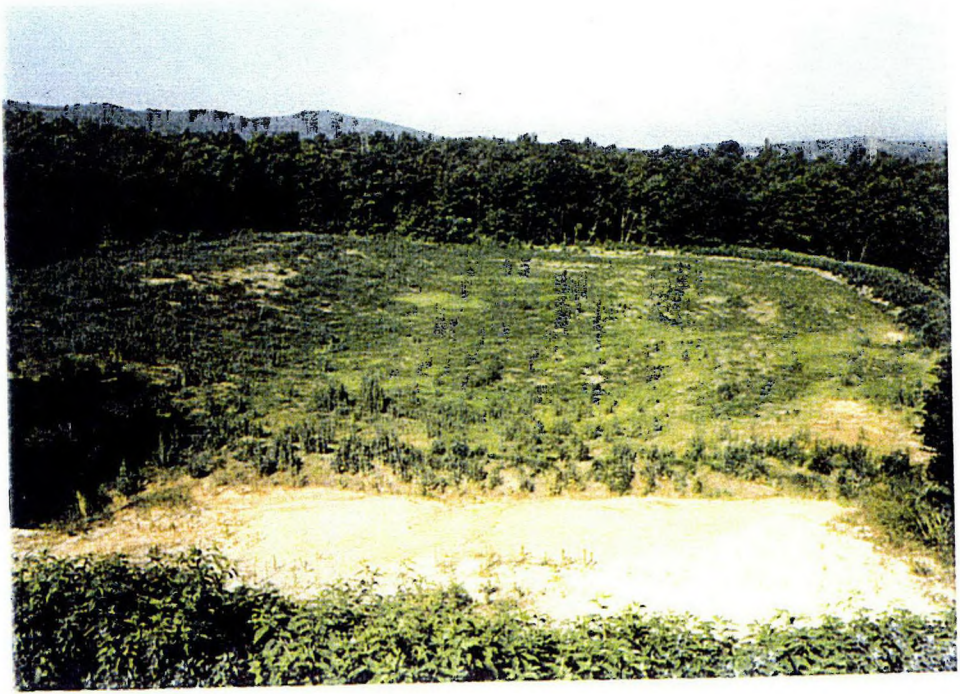
June 85





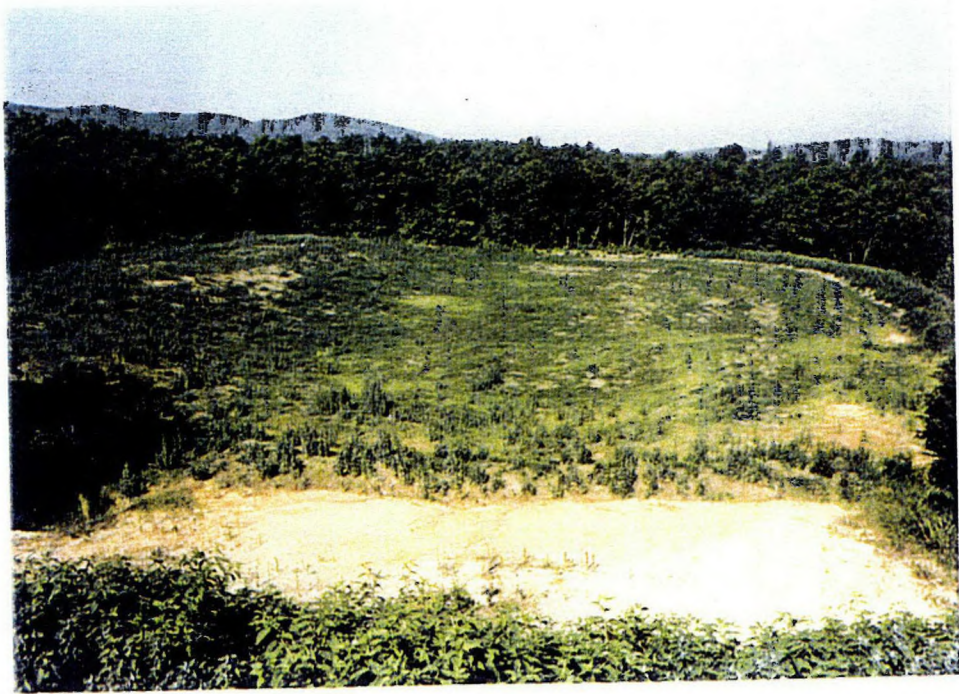
June 28





June 85





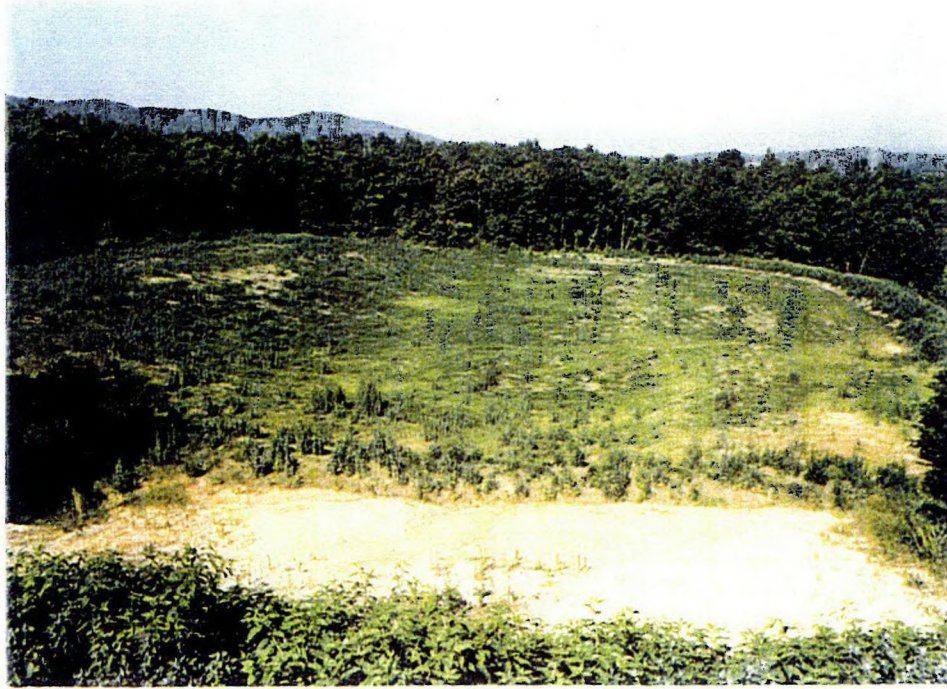
28 9m7





June 85





28 June





June 85





28 9m16





June 85





28 snut





June 85





June 82





June 85





June 82





June '85





June '82



Monsanto

FROM NAME AND ADDRESS

Robert L. Cheever - Anniston - 1060 Ext. 292

DATE

June 11, 1985

TO

J. L. Brown

E. J. Jurevic

SUBJECT

Stormwater Permits

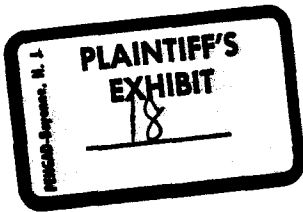
RE: (OPTIONAL)

TO

D. B. Redington - C2SB

Attached please find the Anniston Plant's stormwater discharge permit application for your review and for corporate signature.

If you have any questions or need further information, please give me a call.



Robert L. Cheever

/sag

Attachment

DSW 107197

Accident Prevention Demands Constant Attention

HARTOLDMON0035170

A. FIRST		B. SECOND	
72879 Agricultural Pesticides		72869 Industrial Organic Chemicals	
C. THIRD		D. FOURTH	
2819 Industrial Inorganic and Organic Chemicals		7 (Specify)	

VII. OPERATOR INFORMATION

A. NAME			B. PHONE (Area code & no.)	
MONSANTO COMPANY			☒ YES ☐ NO Is the name listed in Form VII-A and the company?	
C. STATUS OF OPERATOR (Enter the appropriate letter into the space below. If "Other", specify.)			D. PHONE (Area code & no.)	
F-FEDERAL G-STATE H-PRIVATE I-PUBLIC (other than federal or state) J-OTHER (specify)			714 694 1000 NA	
E. STREET OR P.O. BOX				
800 NORTH LINDBERGH BLVD.				
F. CITY OR TOWN			G. STATE H. ZIP CODE	
S.T. LOUIS.			MO 63167	
I. INDIAN LAND				
☐ YES ☒ NO Is the facility located on Indian land?				

X. EMISSIONS ENVIRONMENTAL PERMITS

A. WASTE (Discharge to Surface Water)		B. AIR (Air Emissions from Proposed Sources)	
BIN A L O O O 1 2 0 1		BIP NA	
C. UIC (Underground Injection of Fluids)		D. OTHER (Specify)	
BIN NA		See Attached Sheet	
E. RCRA (Hazardous Waste)		F. OTHER (Specify)	
BIN NA		NA	

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Agricultural Chemicals; Organic Chemicals; Inorganic Chemicals

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (Type or print)	B. SIGNATURE	C. DATE SIGNED

COMMENTS FOR OFFICIAL USE ONLY

MONSANTO COMPANY
ANNISTON, ALABAMA
EPA I.D. NUMBER ALD004019048

FORM 1, ITEM X

EXISTING ENVIRONMENTAL PERMITS

1. AIR EMISSION PERMITS

The following listed air emission permits were issued by the Alabama Air Pollution Control Commission.

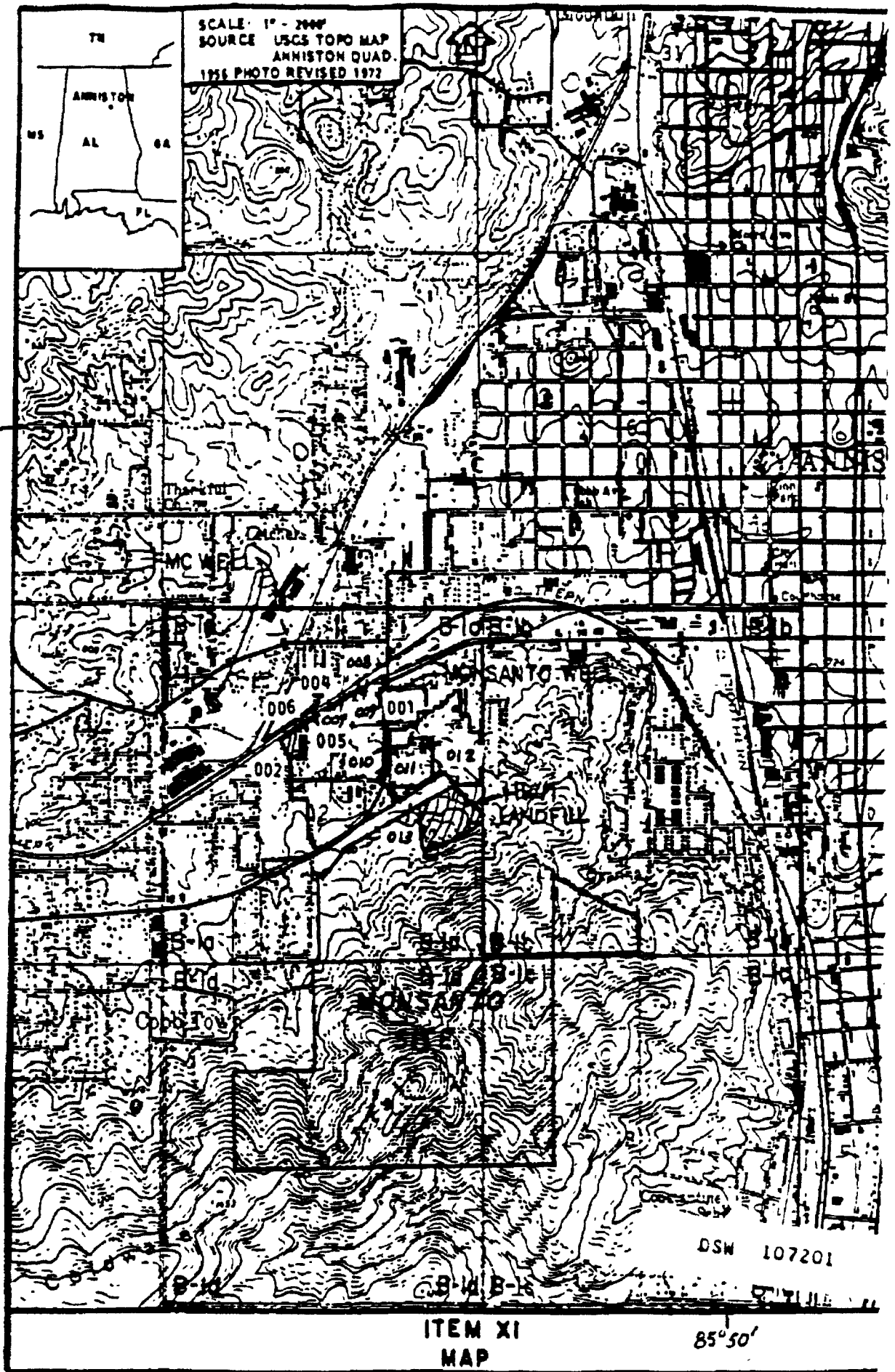
<u>MANUFACTURING/UTILITY UNIT</u>	<u>PERMIT NUMBER</u>	<u>DATE ISSUED</u>
Boiler	3-01-0007-2003	05/08/78
Parathion	3-01-0007-2008	02/06/79
Paranitrophenol	3-01-0007-2006	08/17/78
Paranitrochlorobenzene Unloading Dock	3-01-0007-2005	11/30/77
Acetone Storage Tank	3-01-0007-2004	05/08/78
Phosphorus Pentasulfide	3-01-0007-2007	11/30/77
Polyphenyl Manufacturing Process	3-01-0007-2002	02/23/80
Phosphorus Pentasulfide Casting	3-01-0007-2009	04/24/80
Boiler	3-01-0007-2010	12/24/80

2. DISCHARGE PERMITS:

- a. NPDES - AL0001201 (001) (004) (005) (006) - April 1, 1980 and March 31, 1981. The permit was issued by Water Improvement Commission of the State of Alabama. Permit application for new permits was submitted in a timely manner; however, no action has been taken to date.
- b. State Indirect Discharge Permit (002) - This permit governs the discharge of pretreated wastewater from Monsanto Anniston's Industrial Wastewater Treatment Facility to the City of Anniston POTW: April 1, 1980, March 31, 1981 and August 26, 1983. This indirect discharge permit was issued by the Water Improvement Commission of the State of Alabama. Permit application for new permit was submitted in a timely manner; however, no action has been taken to date.

/sag

DSW 107200



STORMWATER DISCHARGES

Discharge Serial No. 007

Drainage area consists of approximately 16½ acres of light industrial property. The stormwater discharges into Snow Creek. The stormwater receives no treatment.

The following materials are used or manufactured at this facility and may be discharged in the stormwater:

- methyl parathion
- parathion
- benzene
- phosphorus pentasulfide
- sulfuric acid
- methylene chloride
- 4-nitrophenol

Discharge Serial No. 008

Drainage area consists of approximately 5.5 acres of light industrial property. The stormwater discharges into Snow Creek. The stormwater receives no treatment.

The following material are used or manufactured at this facility and may be discharged in the stormwater:

- methyl parathion
- parathion
- benzene
- phosphorus pentasulfide
- sulfuric acid
- methylene chloride
- 4-nitrophenol

Discharge Serial No. 009

Drainage area consists of approximately 9 acres of light industrial property. The stormwater discharges into Snow Creek. The stormwater receives no treatment.

The following materials are used or manufactured at this facility and may be discharged in the stormwater:

- methyl parathion
- parathion
- benzene
- phosphorus pentasulfide
- sulfuric acid
- methylene chloride
- 4-nitrophenol

DSW 107202

Discharge Serial No. 010

Drainage area consists of approximately 4 acres of office building and parking lot property. The stormwater discharges into Snow Creek. The stormwater receives no treatment.

Discharge Serial No. 011

Drainage area consists of approximately 16 acres of roadway right-of-way, undeveloped forest land and closed landfill cells. The stormwater discharges into Snow Creek. The stormwater receives no treatment.

Discharge Serial No. 012

Drainage area consists of approximately 11 acres of undeveloped forest land and closed landfill cells. The stormwater discharges into Snow Creek. The stormwater receives no treatment.

Discharge Serial No. 013

Drainage area consists of approximately 8 acres of undeveloped forest land and active landfill cells. The stormwater discharges into Snow Creek. The stormwater receives no treatment.

OSW 107203

Monsanto

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ESC/DAYTON
(Department/Section)

47634

ANALYTICAL

(Type of Report)

REPORT NO.:

MDA-636

JOB/PROJECT NO.:

217

DATE:

12 July 1985

PERIOD COVERED:

TITLE:

ANALYSES FOR PCB'S IN SOIL SAMPLES

AUTHORS:

B. N. Hughes

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
P. L. Sherman
Sr. Research Group Leader

APPROVED BY:

R. F. Ivory
R. F. Ivory
Environmental Sciences Center
Service Project Manager

APPROVAL DATE:

7-13-85

RESTRICTED DISTRIBUTION: (see over)

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MONS 023462



HARTOLDMON0035177

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COPY NUMBER

ABSTRACT ONLY

H. A. Wolterbahn

1. J. Brown (Anniston)
2. B. M. Hughes (1250)
3. A. F. Ivory (1250)
4. Technical Reports Library (R2C)
5. Central Files

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ACKNOWLEDGEMENT

Contributions of the following Dayton Laboratory personnel to this project are gratefully acknowledged:

Analyses: B. M. Hughes
D. McKenzie
B. Williams
C. Trang

COMPANY & CONFIDENTIAL

MONS 023463

File Name = 4357138V02

ANALYSIS REPORT

DATE: 7-10-85

LOG NUMBER: 1-85-06-20-01

PROJECT NO: 760.10 - 217

TO: Anniston/Ivory

FROM:

Environmental Sciences Center
Monsanto Company/Dayton Laboratory
1515 Nicholas Road
Dayton, Ohio 45418

Phone No: (513) 268-1411

Title: Polychlorinated Biphenyls in Nine Anniston Soil Samples

Standard Sampling Method No(s): Samples supplied by the Anniston Plant.

Standard Extraction Method No(s): PCX21

Standard Analysis Method No(s): ECAN02

Final Report File No(s): A21710

Table File No(s): D21710

Nine soil samples were received from the Anniston Plant for PCB analysis. Samples were prepared for analysis using Standard Extraction Method PCX21. 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/VAQ GLP Manual which explains quality control procedures utilized by ESC.

ANALYST(S): B. Mason Hughes, Ché Truong, David McKenzie, and Barbara Williams.

ANALYST APPROVAL:

B. Mason Hughes

MONS 023464

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)		PCB Concentration (ug/g)			
	CL5-benzene	2,4,6-CL3-biphenyl	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(Site 4)	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(Site 6)	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(s)
HS = high level native spike(s)

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 UAC/CLP manual for quality control criteria.

TABLE FILE NO: 821718:MM

MONS 023465

The following pages describe Analytical Request Information generated for this project.

MONS 023466

Time Stamp - (850710:7112)

MONSANTO COMPANY/DAYTON LABORATORY

ENVIRONMENTAL SCIENCES CENTER

ANALYSIS REQUEST

DATE: 6/20/85 LOG NO: 1-85-06-20-01

REQUESTER: AMNISTON PROJECT NO: 760.10 - 217

REPORT RESULTS TO: FILES/NEES, 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-MS
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.LT

MONS 023467

The following pages describe Standard Extraction Methods and Standard Analysis Methods used for this project.

MONS 023468

ESC Standard Extraction Method (SEM)	ESC Standard Extraction Method No:	
TITLE: PCBs in Non-EC Active Matrices	PCF521	
MATRIX(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, trichlorobiphenyl isomers through octachlorobiphenyl 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-trichlorobiphenyl	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 PCF521.)		
LIMITATIONS: Method applies only to matrices which do not contain interfering electron capturing species in the trichlorobiphenyl through octachlorobiphenyl isomer retention time region.		
SAFETY PRECAUTIONS: See PCB handling protocols in laboratory safety manual.		
DATES OF METHOD CREATION AND UPDATES: 12/17/84		

MONS 023469

FLOW SHEET PCF221
FOR ESC EXTRACTION METHOD PCF221

SAMPLE ID: HRC 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:

MONS 023470

ESC Standard Analyze Method (SAM)
TITLE: Aroclor Formulations in Solvents

ESC Standard Analyze Method No:
ECAM02

ANALYTICAL INSTRUMENT AND MODE OF OPERATION: HP-5890 Capillary GC/EC interfaced to an HP-3357-LAS Laboratory Data System

TYPICAL ANALYTE	TYPICAL INSTRUMENT LEVEL OF DETECTION (LOD) (ug/g)	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)

MONS 023471

The following pages show chain-of-custody information for this project.

MONS 023472

QUALITY ASSURANCE FORM 04

SAMPLE TRANSMITTAL LETTER

Client MONSANTO Project Title KIC-RAMP
 Date shipped 6-18-85 Shipped by L. H. Green
 Shipped from Oriskany
 Shipped to Ingles ESE Attention of Mason Hughes
 Additional shipping information or comments Shipment of 80 Samples from
Small Creek - near the road

Sample description code	Comments
<u>S-6-12-85-01-01</u>	
<u>S-6-12-85-01-02</u>	
<u>S-6-18-85-02-01</u>	
<u>S-6-18-85-02-01</u>	
<u>S-6-18-85-01-01</u>	
<u>S-6-18-85-01 (sk 4)</u>	
<u>S-6-18-85-05-01</u>	
<u>S-6-18-85-06-01</u>	<u>IT KIC-RAMP GREEN</u>
<u>S-6-18-85-01 (sk 6)</u>	

Samples received by (Monsanto representative) (L. H. Green)
 Date samples received 6/20/85
 Return letter received by contract laboratory _____ Date _____

MONS 023473

The following is a copy of the ESC/QAG Good Laboratory Practices Manual.

MONS 023474

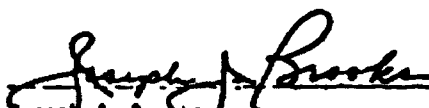
Copy Number: _____

GOOD LABORATORY PRACTICES MANUAL

A Guide to Quality Control/Quality Assurance

Ultratrace Analysis Group

March 1984


Joseph J. Brooks
Group Leader, Ultratrace Analysis


E. A. Veltmann
Manager, Environmental Sciences Center

Issued to: _____

Date: _____

**Environmental Sciences Center
Dayton Laboratory
Dayton, Ohio 45407**

JL3/J03 A

MONS 023475

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MONS 023476

1. 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.

11. Scope

The scope of this manual includes areas of GLP not specifically addressed in the EPC 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.

111. 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 analysis. 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 Group is assigned a method number as described in the EPC 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 of use, customer needs and

What/fining 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 Division 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

the native (unlabeled) analyte(s). The spikes are typically 2x (low) and 10x (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 videscan 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., videscan 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

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 volume 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. Degree 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.

HP 5985A

1. DATE _____
 2. TIME _____
 3. LOCATION _____
 4. NAME _____
 5. ADDRESS _____
 6. CITY _____
 7. STATE _____
 8. ZIP _____
 9. PHONE _____
 10. TELETYPE _____
 11. FAX _____
 12. EMAIL _____
 13. WEB _____
 14. MOBILE _____
 15. HOME _____
 16. WORK _____
 17. CELL _____
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 100. TELEFAX _____

MRC-LA
Nº 15614:

[illegible]

FIGURE 1. Example of OC/NE logbook page.

MONS 023481

HARTOLDMON0035196

HP 5880 GC/GC

DIRECT

427

READ AND REWRITE: IN THE

NY 15634

State of Texas

The

[illegible]

FIGURE 2. Example of CC/EC logbook page.

MONS 023482

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 widearea 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 widearea 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

system) provided that linearity has been demonstrated over the concentration range of the sample 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 sample 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 Ultrastaco Analysis Group to evaluate when quality control data indicates 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 2 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.

- d. **Limit of Detection** - The limit of detection (LOD) will normally be stated as $\frac{1}{2}$ 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 $\frac{1}{2}$ 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 ($\leq 1\%$) 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 spike.
- 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 125% of the accepted value for the analyte 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 usable in a report and yet readily available for referral and inspection.

The samples will be labeled with a log number or sample login according to the procedure described in the EIC Section CLP Manual. When delivered to the responsible technical person, the samples may then receive additional labeling as deemed necessary. This additional labeling will be documented in a laboratory logbook and/or notebook. These logbooks and notebooks will be used by the analysts to record all pertinent work and results obtained from the samples. The laboratory notebooks will be filled out in accordance with Monsanto Uniform Notebook Procedures.

All raw data generated for a given project, which cannot be conveniently placed in the laboratory notebook (e.g., chromatograms, computer output, etc.), will be filed under some prescribed order (i.e., log number) in a central file under the supervision of the Project Leader and/or QA Specialist.

Most of the data generated by the Ultratrace Analysis Group are computer data stored on magnetic discs. In order to archive these data the specific file name and disc number associated with the analysis will be written down in the laboratory notebook and/or instrument logbook. When the disc is completely full of data an entire unedited disc image or copy of the files on the disc will be transferred to magnetic tape. A logbook will be kept for recording the disc number, name and prefix associated with it, along with the associated tape and file number to which the disc was transferred. An example of such a logbook is given in Figure 3. When the data are transferred a verification program is used to check all transferred records for correctness. When tapes are filled (they typically hold seven to ten disc images) they should be stored in a fireproof vault.

All calculations of the results of the data will be specified in the method used. These calculations will be entered in the analysts laboratory notebook unless they are computer generated. In this case, a copy of the computer output will be filed with the raw data. The Project Leader will be responsible for checking the correctness of the data.

V. Sample Disposal

Samples will be disposed of in accordance with the instructions on the Analysis Request form. The only exception to this would result when the analysis reveals a problem which requires sample disposal in a manner other than that originally specified. If the Project Leader notes from the results of the analysis that a potentially toxic product was present in the samples then the samples will be disposed of in a manner deemed safe by the Safety Department. The date of sample disposal and the manner should be noted on the request form stored with the raw data completing the chain of custody of the sample.

Line	Multi-Drive Designation	Person Assigned	Date Assigned	Person Typed	Date Typed	Tape # (File #)
130	(AC0)	BWH	1/1/83	BWH	1/1/83	GD69(1)
131	(AC0) (AC1)	BWH	1/1/83			GD69(5)
132	(AC2)		1/1/83			GD69(6)
133	(AC3)					GD69(7)
134	(AC4)					GD69(8)
250	(B2) JSD	BWH	1/1/83	BWH	1/1/83	GD69(8)
135	(AC05) [AC]	BWH	1/1/83	BWH	1/1/83	GD69(9)
136	(AC06) [AC]	BWH	1/1/83	LSK	1/1/83	GD70(1)
137	(AC07) [AC]	SM	1/1/83	LSK		GD70(2)
138	(AC08) [AC]	SM	1/1/83	LSK		GD70(3)
1	(AC09) [AC]			BWH	1/1/83	GD69(10)
250	(AC10) [AC] - R	BWH	1/1/83	BWH	1/1/83	GD71(1)
113	(AC13) [AC]	BWH	1/1/83			GD71(3)
114	(AC14) [AC]					GD71(4)
139	(AC09) [AC]	SM	1/1/83	LSK	1/1/83	GD70(4)
140	(AC10) [AC]	SM	1/1/83	LSK	1/1/83	GD70(5)
141	(AC01) [AC]	SM	1/1/83	LSK	1/1/83	GD70(6)
142	(AC02)			LSK	1/1/83	GD70(7)
143	(AC03)			LSK	1/1/83	GD70(8)
144	(AC04)			LSK	1/1/83	GD70(9)
145	(AC05)			LSK	1/1/83	GD70(10)
146	(AC06)			LSK	1/1/83	GD72(1)
147	(AC07)			LSK	1/1/83	GD72(2)
148	(AC08)			LSK	1/1/83	GD72(3)
149	(AC09)			LSK	1/1/83	GD72(4)
150	(AC10)			LSK	1/1/83	GD72(5)
250	(B2) JSD	BWH	1/1/83	BWH	1/1/83	GD72(6)
151	(AC01) [AC]	BWH	1/1/83	LSK	1/1/83	GD72(7)
152	(AC02)			LSK		(8)
153	(AC03)			LSK		(9)

FIGURE 3. Example of DISC/Tape Logbook page.

MONS 023487

Monsanto

F - 125

FROM
(NAME-LOCATION-PHONE) R. F. Ivory-EASC-Dayton-1250-ext. 417

DATE : January 20, 1981 CC: D. J. Dahm-1250
C. S. Friedman-1250
SUBJECT : ANALYSIS OF SAMPLES FOR PCB CONTENT
REFERENCE : MRC Job #408.1010
TO : J. Brown
1060
Anniston

Three fluid samples were analyzed for their PCB content by MRC Method MRC-08-GC-RO. The samples were screened for PCB Aroclors 1242, 1254, and 1260. The sample chromatograms were compared to standards of these Aroclors, for identification and quantitation, run under similar conditions. The method has a lower detection limit of 1 $\mu\text{g/mL}$ (ppm). Results of these analyses are listed in the following table.

PCB Content in Samples

<u>Sample ID</u>	<u>PCB Level</u> <u>$\mu\text{g/mL}$ (ppm)</u>
HLD Flush Material	5
HB-40 Vent Material	ND ^a
HB-40 Sump Pit Material	108

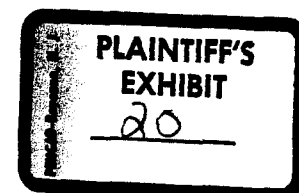
^aND = not detected, if present concentration is <1 ppm.

If you have any questions, please contact me.

R. F. Ivory
Robert F. Ivory
EASC Service Project Manager

bh

OSW 022540



Jim Campbell, 4/15/81
Chem Waste Mgt
informs that
H1340 dump material
with 3100 ppm PCB
sample has been
OK'd by their
lab & is ready
ready to accept it.
Turned this on to Roland
& asked him to get a price
on removal. Purchased 9 &
get material back in town and
Jim Campbell

DSW 023281





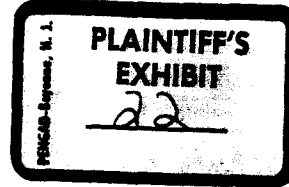
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR 05 1991

Mr. Robert Jones
Monsanto Chemical Company
300 Birmingham Highway
Anniston, Alabama 36201



Copies to:
J. Brown
D. Denner
M. McCamb

Re: EPA Contract No. 68-W9-0040; Work Assignment No. R04-11-03;
Monsanto Chemical Company, Anniston, Alabama; EPA ID No.
ALD004019048; Visual Site Inspection Agenda

Dear Mr. Jones:

The Environmental Protection Agency (EPA) Region IV is conducting a RCRA Facility Assessment (RFA) of the Monsanto Chemical Company in Anniston, Alabama. The 1984 Hazardous and Solid Waste Amendments (HSWA) provide EPA authority under RCRA to require comprehensive corrective actions on releases of hazardous constituents to air, surface water, ground water, and soil at facilities which manage hazardous waste. The RFA includes a review of the RCRA, CERCLA, Air, and Water files at the EPA Region IV and Alabama Department of Environmental Management (ADEM) offices, as well as a Visual Site Inspection (VSI), and, if necessary, a sampling visit (SV).

A VSI of the Monsanto facility is scheduled for April 17-18, 1991. The VSI will be conducted by A.T. Kearney, under EPA Contract No. 68-W9-0040. The objectives of the VSI are to identify all Solid Waste Management Units (SWMUs) and other Areas of Concern (AOCs) at the facility and determine their potential for past or ongoing releases of hazardous constituents.

Enclosure A is the Proposed RCRA VSI Agenda which includes a list of potential SWMUs and AOCs (Table 1) identified from the preliminary file review. Enclosure B is a summary of the general information gaps identified from the file review. These enclosures will be reviewed with facility personnel prior to or at the beginning of the VSI. At that time, the VSI schedule may be adjusted as needed to facilitate a complete, thorough, and expeditious inspection of all past and present waste handling, storage, treatment, and disposal areas. The inspection will include all indoor or outdoor waste generation, accumulation, and transfer points in operation areas. During the inspection, photographs will be taken to document the condition and location of all SWMUs and AOCs, as well as general facility waste management practices.

RECEIVED

APR 08 1991

Ass't.....

CHANGED TO
MAY 21-22, 1991

OSW 061582

HARTOLDMON0035205

Mr. Robert Jones
Page 2

In preparation for the VSI, the contractor is required to identify any potentially hazardous conditions likely to be encountered during the VSI, and, if necessary, prepare a safety plan to deal with anticipated hazards. The contractor will contact you prior to the VSI to obtain specific information regarding materials handled and the level of personal protective equipment required for entry into the facility.

The A.T. Kearney inspection team will consist of representatives of EPA Region IV and the Alabama Department of Environmental Management, as well as individuals from the A.T. Kearney Team. If you have any questions concerning the VSI, please contact the EPA Region IV Work Assignment Manager, Ms. Nancy Bethune, who can be reached at (404) 347-3433.

Sincerely Yours,

Beverly F. Williams
Beverly F. Williams, Chief
AL/MS Unit
Waste Engineering Section
RCRA & Federal Facilities Branch

Enclosures

cc: Jerry Bohannon, ADEM

OSW 061583

ENCLOSURE A

PROPOSED RCRA VISUAL SITE INSPECTION AGENDA

Facility: Monsanto Chemical Company
Anniston, Alabama

EPA ID No.: ALD004019048

Facility Contact: Robert ^T~~X~~ Jones
300 Birmingham Highway
Anniston, Alabama 36201

Facility Address: West 10th Street
Highway 202
Anniston, Alabama 36201

Inspection Date: April 17-18, 1991

Inspection Team: Denise Turner, A.T. Kearney
Jasmine Schliesmann, A.T. Kearney
Nancy Bethune, U.S. EPA Region IV
Jerry Bohannon, ADEM

OBJECTIVE OF VISUAL SITE INSPECTION:

The Hazardous and Solid Waste Amendments (HSWA) of 1984 broaden EPA's authority under RCRA to require corrective action for releases of hazardous and solid wastes containing hazardous constituents at facilities that manage hazardous wastes. The corrective action authority extends to all Solid Waste Management Units (SWMUs) at the facility. The first phase of the corrective action program as established by EPA is performance of a RCRA Facility Assessment (RFA). The steps in the RFA process include a preliminary review of available file information, a visual site inspection (VSI) of the facility, and if necessary, a sampling visit (SV). A preliminary review of file materials has been performed for this facility, and it has been determined that a VSI is necessary. The purpose of the VSI is:

1. To collect all available, relevant information on solid waste management practices that have been used on the site;
2. To gain first-hand information as to the identification, location, construction, configuration, function served, method of operation, and condition of each SWMU;

DSW 061584

3. To confirm, by visual inspection, information collected during the review of file materials;
4. To survey the site for additional SWMUs and other Areas of Concern (AOCs) not identified in the review of the file materials;
5. To identify potential sample points for possible future sampling activities;
6. To review the site information and collect additional information to address the information needs identified during the PR; and
7. To take photographs of all SWMUs and other AOCs.

INSPECTION PLAN AND SCHEDULE:

EPA's contractor will send a two-member field team to perform the Visual Site Inspection. A two-day inspection is anticipated; however, the field team is prepared to extend the VSI through April 19, 1991, if necessary. The team will inspect all past and current solid waste and hazardous waste handling, storage, treatment, and disposal areas on site. Outdoor and indoor waste generation, collection, and accumulation areas will be inspected as necessary to acquire a complete understanding of waste streams, waste flows, and waste handling procedures. The team also will identify, inspect, and document potential pathways for release of hazardous constituents into the environment. Facility staff will possibly be interviewed to develop a better understanding of past and current waste management practices. At this time, the facility may present updated environmental monitoring or sampling data that may not be in the current EPA or State files. Data may include any soil characterization, hydrogeologic data, air quality data, or any other supporting studies.

The overall rationale of this inspection is to enable the team to trace the waste flow through the entire facility from the points of generation to ultimate disposal. The following schedule has been prepared based on the preliminary file review, and is intended as an outline for a thorough and efficient inspection of all SWMUs and AOCs on the site. Some adjustments to the proposed agenda may be necessary to accommodate facility staff, location of units, operational constraints, or unforeseen conditions. This proposed schedule will be reviewed during the introductory meeting and adjusted, if necessary, at that time. The VSI field team will make every reasonable effort to conform to the facility's normal hours of operation.

DSN 061585

A general schedule for the VSI has been developed based on the information gathered during the PR. Due to the field team's lack of information relating to exact locations, it is suggested that a facility map be available during the introductory meeting so that the inspection schedule can be finalized between the inspection team and facility representatives. Also, at the introductory meeting, the SWMU list and information needs will be reviewed with facility representatives to resolve any remaining issues or questions.

DSW 061586

HARTOLDMON0035209

PROPOSED VSI SCHEDULE
MONSANTO CHEMICAL COMPANY
April 18-19, 1991

<u>TIME</u>	<u>ACTIVITY</u>
APRIL 17, 1991	
8:00 - 8:30	Introductory meeting with facility representatives; discuss agenda, safety and health considerations, and transportation arrangements.
8:30 - 12:00	Discuss past and present facility operations, waste streams, waste flows, generation, collection, treatment, and disposal methods. Identify any SWMUs and AOCs not identified in file review.
12:00 - 1:00	Lunch break.
1:00 - 5:00	Begin tour of the facility. Inspect waste generation areas, waste collection devices and systems, and waste accumulation areas.
APRIL 18, 1991	
8:00 - 12:00	Continue tour of the facility. Inspect waste generation areas, waste collection devices and systems, and waste accumulation areas.
12:00 - 1:00	Lunch break.
1:00 - 4:00	Continue tour of facility. Inspect waste generation areas, waste collection devices and systems, and waste accumulation areas.
4:00 - 5:00	Closing meeting with facility representatives. Discuss information needs generated by VSI. Obtain any additional information on SWMUs or AOCs.
APRIL 19, 1991	Reserved, if additional time is needed. To be determined by VSI Team Leader.

OSW 061587

TABLE 1
SOLID WASTE MANAGEMENT UNITS AND
OTHER AREAS OF CONCERN
MONSANTO CHEMICAL COMPANY

SOLID WASTE MANAGEMENT UNITS

LANDFILLS

1. Inactive Cell 1E
2. Inactive Cell 2E
3. Inactive Cell 1W
4. Inactive Cell 2W
5. Inactive Cell 2WA
6. Inactive Cell 3W
7. Closed Cell 4W
8. Cell 3E
9. Closed Cell 4E
10. Closed Cell 5E
11. Mixed Industrial Waste Disposal Area

SURFACE IMPOUNDMENTS

12. Closed Neutralization Basin
13. Old Neutralization Basins (2)
14. Closed Limestone Bed Surface Impoundment
- 15 - 18. Landfill Catchment Basins (4)
19. Landfill Runoff Retention Area (if constructed) **NEVER
CONSTRUCTED**

STORAGE AREAS

20. Closed Limestone Bed Storage Area
21. Closed Neutralization Basin Storage Area
22. Closed Warehouse Building No. 2 Storage Area
23. 90-Day Storage Area
24. Hazardous Materials Storage Area
25. Waste Pile/Container Storage Area No. 1
26. Waste Pile/Container Storage Area No. 2
27. Used Nickel Catalyst Storage Area

SATELLITE STORAGE AREAS

28. Laboratory Dumpster
29. Agricultural Warehouse Dock Dumpster
30. Niran Dumpster
31. Pentasulfide Dumpster
32. Hold Tank Area Dumpster
33. Basin Wall Recycle Dumpster
34. Niran Recycle Dumpster
35. PNP Dumpster

DSM 061588

TABLE 1
SOLID WASTE MANAGEMENT UNITS AND
OTHER AREAS OF CONCERN
MONSANTO CHEMICAL COMPANY
(continued)

THERMAL TREATMENT

- 36. Old Trash Incinerator
- 37. Reuse-as-Fuel Boiler

BIOLOGICAL TREATMENT SYSTEM

- 38. Process Wastewater Sewer
- 39 - 40. Hold Tanks (2)
- 41 - 48. Aeration Basins (8)
- 49 - 52. Clarifiers (4)

TANKS

- 53. Leachate Intermediate Storage Tank
- 54. Hazardous Waste Aboveground Storage Tank
- 55. Hazardous Waste Belowground Storage Tank

SUMPS

- 56 - 57. Boiler Sumps (2)
- 58. Cell 5E Sump
- 59 - 60. French Drain Piping Systems (2)
- 61. Neutralization Basin Sump
- 62. Neutralization Basin Underdrain Sump

CORRECTIVE ACTION SYSTEMS

- 63. Western Landfill Corrective Action System
- 64. Northern Landfill Corrective Action System
- 65. Plant Corrective Action System
- 66. Limestone Bed Impoundment Corrective Action System

MISCELLANEOUS

- 67. Paranitrochlorobenzene Unloading Dock
- 68. Acetone Recovery Column
- 69. Trash Dumpsters
- 70. Snow Creek Drainage Ditch
- 71. Stormwater Drainage System

AREAS OF CONCERN

- A. Product Storage Tank Spillage Area
- B. Snow Creek PCB Contamination Area
- C. Former Off-Site Landfill

DSW 061589

**ATTACHMENT B
RFA INFORMATION NEEDS**

1. Provide description of waste management practices and dates implemented.
2. Provide type and volume of waste generated.
3. Provide most recent biennial report.
4. Provide surrounding land use information (e.g., distance to population centers).
5. Provide description of drum storage areas:
 - Location
 - Type and volume of waste
 - Secondary containment
 - Frequency of pick-up for disposal/treatment
 - Treatment/disposal method
6. For each accumulation area, provide:
 - Description
 - Length of time waste normally stored
 - Secondary containment
 - Type and number of containers
 - Type waste generated
 - Waste management procedures
 - Spill/release history
7. Provide any sampling reports of analysis performed on the sediments or water in Snow Creek.
8. For each SWMU and AOC listed, please give:
 - Date unit began operating
 - Date operations ceased (if applicable)
 - Dimensions of unit
 - Location of unit in facility
 - Description of waste handled
 - Unit function
 - Material of construction
 - Release controls
 - History of release
9. Provide recent sampling results:
 - Groundwater
 - Soil
 - Wastestreams
10. Provide a site map of suitable scale to show boundaries of all contiguous property which can be used to show the locations of the SWMUs and AOCs on the property.
11. Provide sanitary, stormwater, and industrial sewer maps.

DSW 061590

ATTACHMENT B
RFA INFORMATION NEEDS
(continued)

12. Provide a current list of permitted emissions, the results of the most recent inspection by the Air Pollution Authorities, and documentation of any violations.
13. Explain the NPDES permit status of the facility. Provide the results of the most recent compliance monitoring test results and documentation of any violations.
14. Provide a history of pollutant spills/releases for the facility. Information should include:
 - Date of release
 - Quantity of release or extent of release
 - Location
 - Description of product
 - Corrective action taken
 - Soil/water analysis results
15. How are domestic refuse and sanitary wastes handled by the facility?
16. Provide information on all manufacturing processes which have been and are currently being conducted on the property [flow diagrams would be most helpful].
17. Provide a site map of suitable scale identifying the location of all facility monitoring wells.
18. Identify past or present SWMUs and AOCs which have not been identified in the VSI Agenda. Include a brief description of the wastes managed in these units, the period of operation, and a physical description. Units include, but are not limited to, the following:
 - Aboveground and underground waste storage tanks
 - Abandoned storage tanks
 - Waste storage units for solid and hazardous wastes which fall under the 90-day exemption from RCRA
 - All waste handling areas and associated activities including loading zones, transfer areas, and waste accumulation areas
 - Runoff collection sumps
19. Identify sources of drinking water in the area. Where does the facility obtain its drinking and process water?
20. Provide documentation on how all former process units were disposed of.

DSW 061591

ATTACHMENT B
RFA INFORMATION NEEDS
(continued)

21. Provide the start-up date of the facility and submit a history of the facility prior to the start-up date, including former owners, site uses, manufacturing processes used, waste generated, and existing buildings and/or structures.

DSW 061592

Monsanto

FROM: NAME & LOCATION W. F. Taffee - Anniston, Alabama

DATE November 6, 1975

SUBJECT PCB DISPOSAL DATA

REFERENCE JRS Request 10/31/75

TO J. R. Savage - B2SL
St. Louis

J. L. Brown
G. L. Jessee
W. L. Kraus
B. O. Severson ✓
W. E. Voss

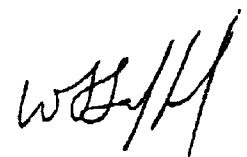


Jim, per our telephone conversation this morning you will find attached copies of all the plant liquid effluent analytical data which we still have in our files for the period 1/1/71 through 6/30/75.

1. Effluent to Snow's Creek is reported through October 1972. See attached letter from Alabama Water Improvement Commission dated 13 November 1972.

All available data for the period 1/1/71 through 10/31/72 is included.

2. Data on fish samples taken by Gunning and Sutkus are enclosed.
3. We can find no indication here of any sediment analyses.
4. No data here on receiving water analyses.


W. F. Taffee

/md
Att.

Jim - disposal to land fill follows.

USW 038690

IN 6 81 1 77

HARTOLDMON0035216

Monsanto

FROM: NAME & LOCATION: D. Gerald Glasgow-EASC-Dayton-1250

Copy DO Johnson
J B Mann
David Wood - SFL

DATE: January 18, 1979
SUBJECT: PCB CONTENT OF OIL SAMPLES
REFERENCE: MRC JOB NO. 408.0671 and 415.0920
TO: J. L. Brown
Anniston

cc: D. J. Dahm
F. N. Hodgson
A. J. Wright



The samples of oil which you submitted recently on three occasions for determination of PCB content were analyzed under the conditions given below. The PCB concentrations below (calculated as Aroclor 1242) were found.

Date Received	Oil Identification	PCB level, ppm
14 Dec. 1978	Sample HB-40 oil	260
18 Dec. 1978	Therminol 66 from Santowax system	1
	Therminol from HB-40 system	210
	Sump	280
9 Jan. 1979	HB-40 vent tank	7
	Therminol 66, HB-40 plant	50

The oil was diluted with hexane and analyzed by electron capture gas chromatography under the following conditions:

GC Model:	Varian Model 3700
Column:	6' x 1/4" glass packed with 4% XE-60
Column Temperature:	200°C
Injection Port Temp.:	220°C
Detector Temperature:	350°C
Carrier Gas:	N ₂ at 45 ml/min
PCB Screened for:	Aroclor 1254 and Aroclor 1242

The PCB present was identified by comparing the sample chromatogram to those of Aroclor 1242 and 1254 to establish which of these two was the most likely PCB present. The PCB level was then calculated using the corresponding calibration curve.

Please contact me at Ext. 328 if you have any questions.

D. Gerald Glasgow
D. Gerald Glasgow
EASC Project Manager

DGG/bap

DSW 022541



State of Alabama
Department of Public Health
State Office Building
Montgomery, Alabama 36130



IRAL MYERS, M. D.
STATE HEALTH OFFICER

January 22, 1980

M E M O R A N D U M

TO: Mr. Alfred S. Chipley, Director
Division of Solid Waste & Vector Control

FROM: Darrell A. Baker, Public Health Engineer
Division of Solid Waste & Vector Control *DAB*

RE: Monitoring Wells for Monsanto, Anniston



I met with Mr. Jerry Brown of Monsanto and Mr. Paul Moser of the Alabama Geologic Survey on January 10, 1980 to discuss implacement of monitoring wells for Monsanto's disposal site. After a visit to the site, Mr. Moser recommended that the wells be implaced as per the attached map (1-upgradient, 5-downgradient).

I sketched the proposed construction of the monitoring wells, which is also attached. I also obtained a copy of a soil study made at the disposal site in 1973 (attached). I believe that the sites chosen for the monitoring wells are well located and should give a good indication of any ground water contamination.

While inspecting the disposal site, I noticed that the dam which surrounds the parathion waste pit has broken at the lower extremity. Mr. Brown said that this will be corrected when drier weather permits. I also discovered an underground spring which surfaces from a hill west of the catch basins and north of the biological solids disposal area (downgradient from the bio solids area). The water was filled with a substantial amount of brown algae. This may be an indication of phosphate contamination from the biological solids area. All drainage from the area empties into Snow Creek.

DAB:se

Attachments

M24775

Monsanto

FROM NAME & LOCATION J. B. Moon - Anniston

DATE February 8, 1980

SUBJECT

REFERENCE

TO J. L. Brown



Our current solids problems in waste treatment are of major concern to me at the moment. I feel that a somewhat fresh approach must be taken to analyzing this problem. I know that you have considerable background in this area and also have developed natural biases. Please try to put aside those biases and look at our existing data to see if there are clues to predict when we are headed for upsets.

Our approach must change from one of telling people that they have a problem to that of telling them, 1) they are headed for a problem and what is causing this direction, and 2) how, once the problem materializes, it can be readily corrected.

Please document to me your plans in developing a new approach to solids problems.

Jim

J. B. Moon

/md

DSW 104415

IN 1 RG / 72

HARTOLDMON0035219

Client: MONSANTO
Sample: 90229
Lab ID: 8804MS12

Date Extracted: 04/26/88
Date Analyzed: 04/28/88
Time Analyzed: 17:38
Analyst: MCR

PCB FRACTION

Compound	Chrom. Ret. Time		Sample Concentration (ug/Kg)	MQL (ug/Kg)
	Col. 1	Col. 2 *		
	(min.)			
Aroclor-1016			BOL	14000
Aroclor-1221			BOL	14000
Aroclor-1232			BOL	14000
Aroclor-1242			BOL	14000
Aroclor-1248			BOL	14000
Aroclor-1254			BOL	28100
Aroclor-1260	11.24		58500	28100

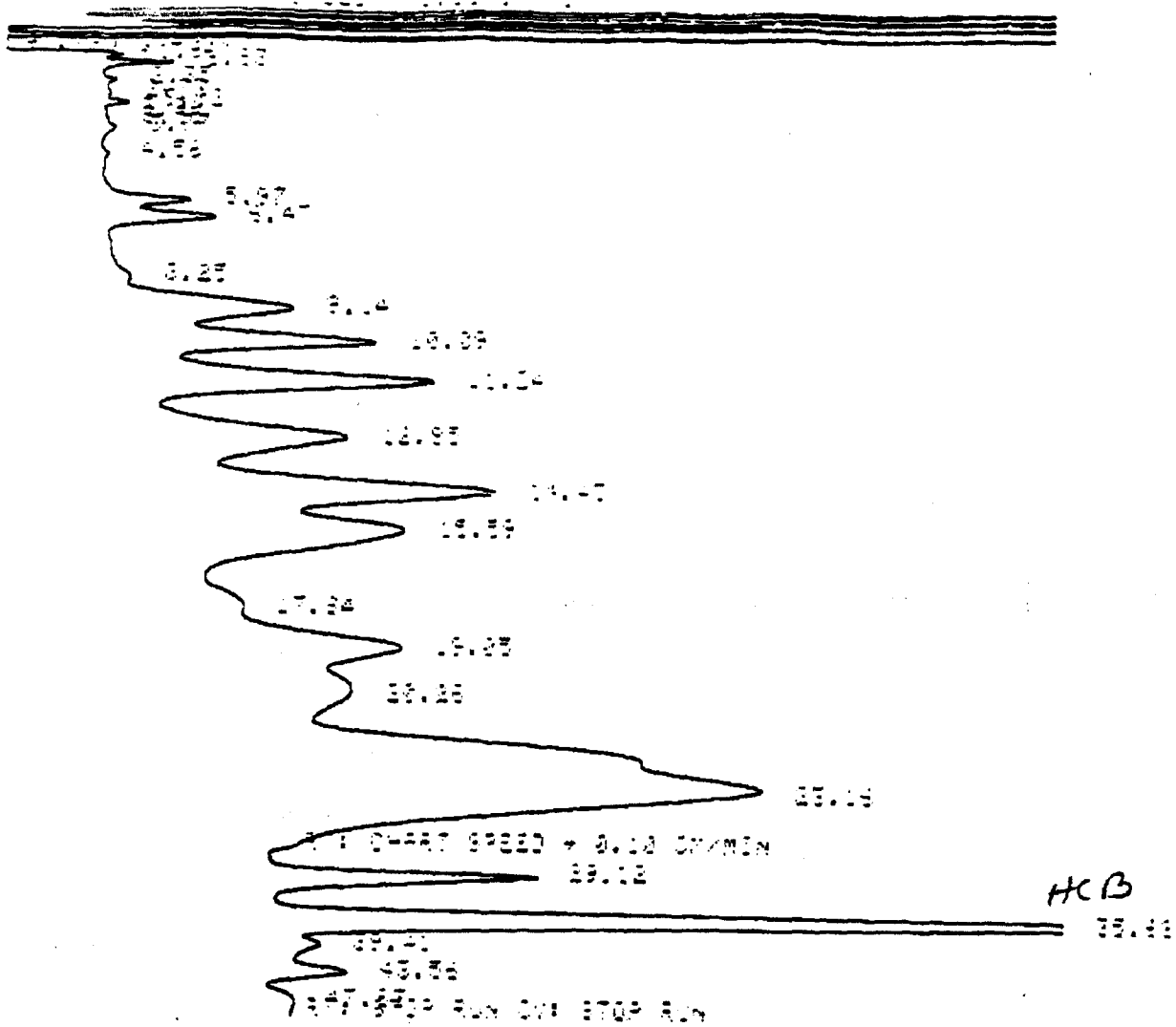
Surrogate 2,2',3,3',6,6'-HCB Recovery: 154%

NOTES: MQL: Method Quantitation Limit
BQL: Below Quantitation Limit
* : Col. 1: 6 ft x 2 mm 3% SP-2250
** : Below Quantitation Limit, but Detected
B : Detected in Blank at Level Indicated
MS : Matrix Spike Compound



DSM 022507

EIRA ENVIRONMENTAL INDUSTRIAL
RESEARCH ASSOCIATES, INC.



1991 58804 SAMPLE INJECTION 6 17:33 APR 28, 1995
 SAMPLE # 1 10 0000
 15 28047612

AREA 1

AK1260 A_x = 916865

511216

RT	AREA	TYPE	AREA %
1.83	3746.87	PP	0.071
3.97	14726.88	PP	0.232
5.27	19678.98	PP	0.373
6.25	3794.82	PP	0.116
8.16	66631.48	PP	1.270
10.09	75391.80	PP	1.441
11.12	11312.89	PP	0.126
12.63	124325.80	PP	2.379
14.65	171114.88	PP	3.262
15.53	180825.88	PP	3.594
17.96	53323.38	PP	1.287
18.03	178145.88	PP	3.336
20.25	154811.88	PP	3.133
21.16	838838.88	PP	15.998
23.12	751775.88	PP	14.381
25.63	1428648.88	PP	26.773
29.41	323763.88	PP	6.218
33.36	338163.88	PP	7.028
47.33	338153.88	PP	6.416

DSW 022508

TOTAL AREA = 7141895.80

Client: MONSANTO
Sample: 94904
Lab ID: 8804MS13

Date Extracted: 04/26/88
Date Analyzed: 04/28/88
Time Analyzed: 18:31
Analyst: MCR

PCB FRACTION

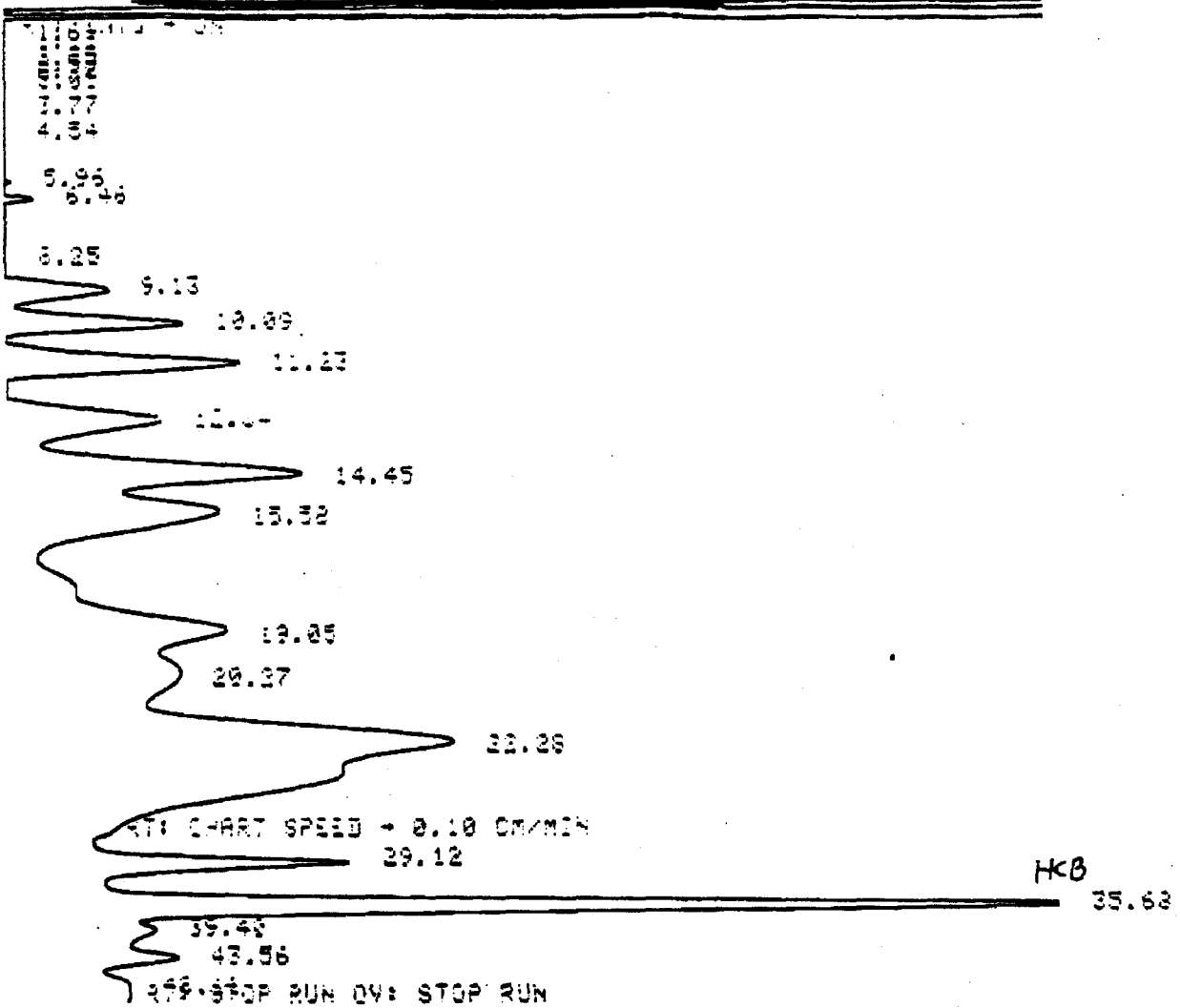
Compound	Chrom. Ret. Time		Sample Concentration (ug/Kg)	MQL (ug/Kg)
	Col. 1	Col. 2 *		
	(min.)			
Aroclor-1016			BOL	14300
Aroclor-1221			BOL	14300
Aroclor-1232			BOL	14300
Aroclor-1242			BOL	14300
Aroclor-1248			BOL	14300
Aroclor-1254			BOL	28500
Aroclor-1260	11.23		56800	28500

Surrogate 2,2',3,3',6,6'-HCB Recovery: 104%

NOTES: MQL: Method Quantitation Limit
BQL: Below Quantitation Limit
* : Col. 1: 6 ft x 2 mm 3% SP-2250
** : Below Quantitation Limit, but Detected
B : Detected in Blank at Level Indicated
MS : Matrix Spike Compound

DSW 022509

EIRA ENVIRONMENTAL INDUSTRIAL
RESEARCH ASSOCIATES, INC.



INP1 58908 SAMPLER INJECTION @ 16:31 APR 26, 1968

SAMPLE # : ID CODE :

17 8904MS13

B11817

AREA %

M1200 A_x = 875195

RT	AREA	TYPE	AREA %
1.03	3335.70	PP	0.147
5.96	13299.40	PV	0.548
6.46	17306.40	VP	0.713
9.13	51345.90	VV	2.116
10.09	58998.40	VV	2.431
11.23	82396.40	VV	3.395
12.84	77017.60	VV	3.174
14.45	124324.00	VV	5.111
15.58	116514.00	VV	4.801
19.05	126052.00	VV	5.194
20.27	87633.90	VV	3.611
22.29	232859.00	VV	9.843
29.12	249637.00	HH	10.287
35.62	953952.00	HH	39.274
39.48	88528.90	HH	3.319
43.56	93643.30	HH	3.918
48.11	53623.20	H HH	2.216

DSW 022510

TOTAL AREA = 2426560.00

MULTIPLIER = 1

ENVIRONMENTAL INDUSTRIAL RESEARCH ASSOCIATES, INC
161 James Drive West, Suite 100
St. Rose, Louisiana 70087
(504) 469-0333

METHODS

Inorganic Analyses on Water and Wastewater:

1. Standard Methods for the Evaluation of Water and Wastewater, APHA, AWWA, WPCF, 16th Edition.
2. USEPA Contract Laboratory Program, Statement of Inorganics Analysis, Multi-Media, Multi-Concentration, SOW 787.

Soils, Sediments and Hazardous Waste Evaluation Procedures:

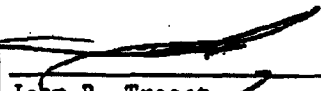
1. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, USEPA Second Edition, Revised April, 1984.

Organic Analyses on Water and Wastewater:

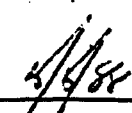
1. "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater", 40 CFR Part 136, Appendix A, USEPA, Amended June 30, 1986.

PCB Fraction

Method 600

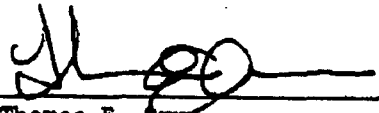


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