

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Civil Action  
No. 82-1672-S

ANNE ANDERSON, for herself, and as parent and next friend of CHARLES ANDERSON, and as Administratrix of the estate of JAMES ANDERSON; CHRISTINE ANDERSON; RICHARD AUFIERO, for himself, and as parent and next friend of ERIC AUFIERO, and as administrator of the estate of JARROD AUFIERO; LAUREN AUFIERO; DIANE AUFIERO, for herself, and as parent and next friend of JESSICA AUFIERO; ROBERT AUFIERO; KATHRYN GAMACHE, for herself, and as parent and next friend of AMY GAMACHE; TODD L. GAMACHE; ROLAND GAMACHE; PATRICIA KANE, for herself, and as parent and next friend of MARGARET KANE; KATHLEEN KANE; TIMOTHY KANE and KEVIN KANE, Jr.; KEVIN KANE; DONNA L. ROBBINS, for herself, and as parent and next friend of KEVIN ROBBINS, and as Administratrix of the estate of CARL L. ROBBINS, III; MARY TOOMEY, for herself, and as parent and next friend of MARY EILEEN TOOMEY, and as Administratrix of the estate of PATRICK TOOMEY; RICHARD J. TOOMEY; JOAN ZONA, for herself, and as Administratrix of the estate of MICHAEL ZONA; RONALD ZONA; ANN ZONA; JOHN ZONA; and PAT ZONA,

Plaintiffs,

vs.

CRYOVAC, Division of W. R. Grace & Co.; W. R. GRACE & CO.; JOHN J. RILEY COMPANY, Division of Beatrice Foods Co.; BEATRICE FOODS CO.; and XYZ Company (ies),  
Defendants.

THE DEPOSITION OF GEORGE F. PINDER, taken on behalf of the Defendants, pursuant to the applicable provisions of the Federal Rules of Civil Procedure, before Lauren Ascii, Certified Shorthand Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Tuesday, December 10, 1985, commencing at 10:25 a.m.

APPEARANCES:

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- and -

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Cryovac, a Division of W. R. Grace & Co.



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2 MR. FACHER: This is the deposition of  
3 Doctor Pinder, taken pursuant to the Federal Rules.

4 Would you note the beginning time of the  
5 deposition and arrival time of plaintiff's counsel,  
6 please?

7 (Starting time at 10:25 a.m.)

8 MR. SCHLICHTMANN: The arrival time of  
9 plaintiff's counsel to the firm was at 10:10. The  
10 firm was not clear as to where the deposition would  
11 be held. I had to wait several minutes in the  
12 reception room while they found the responsible  
13 attorney.

14  
15 STIPULATION

16 It is agreed by and between counsel for the  
17 respective parties that the witness shall read  
18 and sign the deposition but that the sealing,  
19 filing and certification thereof are waived.

20 It is further stipulated that all objections,  
21 except objections to the form of the questions,  
22 and Motions to Strike are reserved until the time  
23 of trial.

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2                   GEORGE F. PINDER, a witness called by  
3 and on behalf of the Defendants, having first been  
4 duly sworn, on oath deposes and says as follows:  
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6                   Direct Examination by Mr. Facher  
7

8           Q     Would you state your full name please, sir?

9           A     George Francis Pinder.

10          Q     Is it mister or doctor? Do you have any preference?

11          A     I have no preference.

12          Q     Where do you live?

13          A     343 Prospect Avenue, Princeton, New Jersey.

14          Q     What is your business and profession, sir?

15          A     I am a professor of civil engineering, chairman of  
16 the Department of Civil Engineering at Princeton  
17 University.

18          Q     Is that your full-time occupation? Do you have any  
19 business interests of any kind?

20          A     I don't understand.

21          Q     Are you associated with any business?

22          A     I am not formally associated with any firm.

23          Q     You do consulting work?

24          A     Yes.

25          Q     Is teaching your full-time occupation?

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2 A In the sense that you just asked the question.

3 Q When were you engaged, sir, in this case?

4 A I can't remember the exact date, but I would say that  
5 it must be between six months and a year ago.

6 Q Can you fix a time any better at this time either by  
7 season or by holiday or something like that?

8 A Quite honestly, I can't, because I am involved with  
9 so many cases that I simply don't remember the  
10 initiation of each case.

11 Q By whom were you engaged?

12 A I was formally engaged by Schlichtmann & Associates.

13 Q Prior to that time, had you had any conversations or  
14 meetings about your engagement with anyone, excluding  
15 Mr. Schlichtmann?

16 A Not to my recollection.

17 Q Did any of the plaintiffs talk to you at any time?

18 A In the presence or not in the presence of  
19 Mr. Schlichtmann?

20 Q Well, either one. Just yes or no.

21 A I don't recall discussions with any of the members  
22 involved in this case prior to my discussions with  
23 Mr. Schlichtmann.

24 Q Were you engaged by telephone or by face to face?

25 A Face to face as I recall.

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2 A To the best of my knowledge, the rates in duration of  
3 this test would replicate what was going on at that  
4 time.

5 Q The rates in duration?

6 A Yes.

7 Q For how long a period of time is this test to  
8 continue?

9 A It's my understanding that it's a 30-day pump test,  
10 which is a rather standard period of time.

11 Q What information did you obtain on December 4 that  
12 was of value to you?

13 A I recorded observations of change of water level in  
14 selected wells on the Riley site, on the intervening  
15 site, up as far as Well 22. It was 22 that I  
16 personally was measuring.

17 Q Did you need that information for some purpose?

18 A It's my opinion that that information could be used  
19 to substantiate my hypothesis regarding the behavior  
20 of that site.

21 Q Was that the purpose for which you gathered it?

22 A Yes.

23 Q Have you reached an opinion, a definite certain  
24 opinion satisfactory to you in this case, with  
25 respect to the Riley and Beatrice property and ground

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water flow?

A Yes.

Q Do you need any more information? Would any information that might be forthcoming change or alter that opinion?

A I believe any information that I would collect from this point forward would tend to illustrate and substantiate opinions that I have already drawn.

Q You don't think there is any likelihood that your opinion would change by additional information?

A I think that it's probable it will not change.

Q Would you tell us, sir, then what your opinion is?

A I have many opinions. I will focus on my general global-type of opinions.

Q All right.

A It's my opinion that the contamination from G and H originated from the Riley and Grace properties.

It's my opinion that the contaminants observed in G and H at the time of the EPA testing is essentially the same suite of contaminants that had existed at G and H during the period of time that it was pumping.

It's my opinion that the contaminants from the Grace property moved to Wells G and H within a

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2 three-year time frame. It's my opinion that  
3 contaminants from the Riley property moved to the  
4 pumping Wells G and H within a one-and-a-half-year  
5 time frame.

6 It's my opinion that the contaminants observed  
7 at G and H are not indeed the maximum concentrations  
8 that we would have expected to find at those wells  
9 during the pumping history of those wells.

10 It's my opinion that the contaminants arriving  
11 at those wells were substantially, significantly in  
12 excess of concentrations generally considered to be  
13 within the EPA water quality guidelines; that they  
14 almost certainly exceeded tens of parts per billion  
15 within the first few months of pumping and at times  
16 were significantly higher than what we have observed  
17 to date in the pumping history.

18 I think those are my major opinions.

19 Q All right, sir.

20 Now, you say -- one of your opinions was that --  
21 perhaps the overall opinion is that the contamination  
22 of Wells G and H originated from the Riley and the  
23 Grace property.

24 Are you speaking of the contamination that was  
25 found to exist when the well closed in 1979?

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2 A That is correct.

3 Q When did the wells open as far as you know, sir?

4 A In the mid-'60s.

5 Q How long a period of time were they pumping?

6 A The pumping history is one of pumpage, lack of  
7 pumpage, pumpage. The details of that we have to  
8 determine by looking at the record of pumping, which  
9 exists in documentation.

10 Q Did you look at those records?

11 A I have looked at those records.

12 Q Was it seasonal?

13 A I don't recall it being seasonal.

14 Q Before I return to your opinion, what did you do,  
15 sir -- I have asked you what information you  
16 received. I have asked you for your observations.

17 What did you do -- if you can give it to us  
18 chronologically, fine -- and what steps did you  
19 take -- what did you take into consideration in order  
20 to reach your opinion? How did you arrive at it, and  
21 what did you do both mentally and physically?

22 A Generically, it proceeds in the following way:

23 I read those reports available to me at the time  
24 that I was asked to look at the site. Based on those  
25 reports, I formulated hypotheses. I then requested

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that additional information be obtained to substantiate those hypotheses.

As that information became more complete, I turned to standard engineering analysis to establish questions of ground water flow directions, rate of movement and general porous flow calculations.

Q That is mathematical calculations you are talking about?

A Mathematical calculations, yes.

Q Continue, sir, if there is any more.

A Then I would observe the results of these combined steps, perhaps revisit one or more of those steps.

For example, I might, based on what I observed from my mathematical calculations, feel that I needed additional information in the field and request such information. So the whole process is somewhat dynamic in the sense that there is a feedback between any one step and any previous step.

Those are fundamentally the three steps.

Q Is there some relationship between mathematical calculations and what is going on at the site?

A I don't understand the question.

Q Is it important to you to know the physical characteristics? Is there some contact between the

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information you received from the site or some relationship received from the site and the mathematical calculations you were making?

A The material properties obtained at the site constitute information that is put in to establish the engineering formulae from which one obtains information on which to base an opinion.

Q You said you formulated a hypothesis after receiving the information that was sent to you following your being engaged as an expert.

A Yes.

Q Was that hypothesis that the wells had been contaminated by ground water flowing from the Grace and the Riley properties?

A Yes.

Q That was your working hypothesis?

A Yes.

Q Then as a scientist you have to go about getting data to establish it?

A Establish it.

Q Sometimes you do and sometimes you don't with hypotheses?

A That is correct.

Q That hypothesis was formulated, I take it, early this

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year; would you say?

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A Early in the calendar year?

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Q Yes.

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A I think that my initial working hypothesis was established within a few months of my first exposure to the information that was available to me, and we were not able to pin that down; but it probably was within the last calendar year.

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Q When were you ready, if that's the right word -- when had you finally formulated your opinion with sufficient scientific certainty to testify to it under oath?

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A I think that I had several pieces of my opinion -- I would say subsequent to the pumping test I felt that I had adequate information to draw my conclusions and verify in my mind the validity of my working hypothesis.

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Q So it would be in the last week?

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A That is correct.

21

Q And you say there is nothing further about the pumping test or things that are being done by the EPA that would cause you to change your opinion?

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A I do not believe so.

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Q Have you discussed your opinion with other experts in

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contaminants were there in the mid-'60s?

A Restate the question, please.

Q Is it your view that the contaminants that you read about from the EPA and from other sources as being present in Wells G and H in '79 were in the wells in 1964 in your opinion or the mid-'60s in your opinion?

A Yes.

Q All of them?

A All of the ones that we have documented with -- the way you asked the question, the answer would be: Yes.

Q Everything that was in the well in '79, all the chemicals that were found in the well, it's your opinion that all of those were in Wells G and H in the 1960s?

A Yes.

Q Do you have any opinion of which of these chemicals allegedly came from Riley and which of these chemicals allegedly came from Grace, Grace or Riley properties?

A I think all of the compounds have been found at both sites and consequently that they came from both sites.

Q Have you now given us all of the information that was

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provided to you by the attorney as to the contaminant history at the site?

A All of the information that formed my opinion that was transmitted to me by the attorney I believe I have provided you.

Q And that in substance basically is that you were to assume that Grace introduced contaminants in the early '60s and Riley introduced contaminants in the mid-'60s; is that correct?

A Basically.

Q And you cannot tell us that those contaminants were identified either by name or by quantity at that time?

A I don't recall it.

Q Was there any other attorney or person who provided you with the contaminant history at the site?

A No, not that I can recall.

Q Were you advised in what manner these contaminants were introduced into the soil?

A I can only speak to general physical behaviors that I have some recollection of having heard, because it indeed does not have anything to do with the formulation of my opinion.

I recall some recollection of contaminants

1  
2 associated with a drain at Grace, some recollection  
3 of information to the effect that some contaminants  
4 had been disposed of improperly in the buildings  
5 around -- in the area around the buildings at Grace.

6 I think that basically constitutes it.

7 Q Did you read any court papers such as interrogatories  
8 or anything like that that dealt with this subject  
9 that you remember?

10 A Not that I can remember anything about.

11 Q Were you told to assume that any other property or  
12 business had contaminated either the Grace or Riley  
13 property or any surrounding or adjoining property?

14 A Let me ask you to ask the question again.

15 Q Sure.

16 You were advised to assume that Grace and Riley  
17 had introduced these contaminants in the time periods  
18 that you just described. Were you advised to assume  
19 that any other company had contaminated the soil?

20 A During that time frame?

21 Q Yes.

22 A No.

23 Q Did you know whether Whitney Barrel, for example, was  
24 the source of any contamination of Wells G and H?

25 A No.

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2 Q Did you know whether Industriplex was the source of  
3 any contamination?

4 A No.

5 Q Or UniFirst?

6 A UniFirst, but not that time frame.

7 Q What do you mean by that answer?

8 A You asked me a very specific time frame. That's why  
9 I asked you to define it.

10 My answer to your question is: No.

11 Q UniFirst came later in the information given to you?

12 A That is my understanding.

13 Q In when, in the '70s?

14 A Yes.

15 Q You were told to assume that UniFirst had contributed  
16 to the contamination in the '70s?

17 A The question is too broad. Can you narrow it down?

18 Q Were you advised and told to assume that UniFirst had  
19 introduced contaminants into the property in the  
20 '70s?

21 A Yes.

22 Q That was by Mr. Schlichtmann as well?

23 A Yes.

24 Q Is there any other company or any other source of  
25 contamination that you were told to assume?

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2 A No.

3 Q What was the level of contamination of the Aberjona  
4 river in 1964?

5 A I do not know.

6 Q How about with respect to contamination of what you  
7 have called the intervening property, were you asked  
8 to assume that any contamination had taken place on  
9 that property?

10 A No.

11 Q And these assumptions that you were asked to make  
12 provide one of the four bases for the opinion that I  
13 first began to ask you about?14 A That information constitutes part of one of the  
15 bases, yes.16 Q The Aberjona river appears to roughly separate the  
17 Riley and the Beatrice property, is that correct?

18 A Yes.

19 Q Does the existance of that river play any part in  
20 your opinion? Does that river, it's flow or what  
21 happens to the river when wells are pumped, play a  
22 part in the opinion you have just given us?

23 A No.

24 Q So the river doesn't act as any of kind of barrier to  
25 prevent the flow of ground water from Wells G and H

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in your opinion?

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A The river doesn't constitute a barrier.

4

Q Did wells G and H draw any water -- that might not be the right scientific verb.

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A I understand.

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Q Did Wells G and H draw any water from the Aberjona river in your opinion from the time they were in operation?

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A Yes.

11

Q And did that have any effect with respect to the contamination of Wells G and H in your opinion?

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A Can you ask it again?

14

Q Well, you said that water from the Aberjona river was drawn by Wells G and H when they were in operation in your opinion.

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Did that play any part in contaminating or in your view that the wells were in fact contaminated in the '60s and '70s?

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A As I understand your question, the answer would be no.

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Q I am not sure I understand your answer.

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What do you understand my question to be so that I can understand your answer?

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A All right.

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MR. SCHLICHTMANN: Let's have an understanding.

THE WITNESS: If I can paraphrase your question.

MR. FACHER: Sure.

THE WITNESS: You are asking me if the water moving from the river to the well in and of itself resulted in contamination of the wells?

MR. FACHER: Yes.

THE WITNESS: The answer is: No.

Q Let's assume for a moment, just to test your hypothesis, assume that the river was contaminated with the same chemicals found in the well.

Would your answer still be the same, that the pumping of Wells G and H would draw the river water into the wells but that the wells would not thereby be contaminated in your opinion?

A If the concentrations in the river were not substantially different than my recollection of the information transmitted to me in that regard, I see no way that the river could influence substantially the concentrations in G and H.

Q You didn't have any information on what the contamination of the river was in the mid-'60s, did

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you?

A No.

Q How about the -- again, excuse my terminology. How about the pumping effect of the Riley wells?

For the record, Riley property had wells it was using for water purposes in its operation; right?

A Yes.

Q Does the pumping of the Riley wells play any part in your opinion?

A No.

Q So the Riley wells wouldn't draw away any contaminants, if I may use that phrase?

A No.

Q And thereby prevent them from reaching G and H?

A No.

Q In your own mind, scientifically are you sure of that?

A Yes.

Q Did you see the Riley wells in operation?

A I saw a Riley well.

Q Did you have any information on the rate of pumping?

A Yes.

Q Do you know what the relationship was of the timing between the Wells G and H pumping and when the Riley

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wells were pumping?

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A I don't have a detailed recollection of that.

4

Q If they were both pumping at the same time, would that in any way affect your opinion?

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A If the Riley wells were pumping at the levels that were reported to me at the time of my visit to the Riley site, they would not impact.

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Q In December 1985 you are talking about?

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A Yes.

11

Q Well, if they were pumping, let's say, 500 gallons a minute to take a figure, would that have any affect on your opinion, that Riley wells were pumping 500 gallons per minute and Wells G and H were pumping at the same time?

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A I don't think the well is capable of doing that; but if we were to assume that it was somehow possible to do that, my opinion would not change.

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Q What is your knowledge as to what the well is capable of pumping, a couple of hundred?

20

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A Yes.

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Q You are not a chemist or chemical engineer?

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A No.

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Q That is not your field?

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A You are the second person that asked me that. In my

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entire history, two people have asked me that.

Q Who was the first one? He was the first one,  
Mr. Schlichtmann?

A Another case.

Q It's a common question when you are dealing with  
chemicals.

A There were two questions on cross, and that was one  
of them. I couldn't figure it out.

MR. SCHLICHTMANN: You are going to get it  
again. Do something about it. Get a degree in  
chemistry.

MR. FACHER: That is right.

MR. SCHLICHTMANN: Jerry, it's 12:30 now.  
We have been going for two hours. Do you want to  
break for lunch now?

MR. FACHER: Whatever your preference is.

Would you promise to be back by 1:30?

MR. SCHLICHTMANN: Yes. Give me 10 minutes  
traveling time, an hour and 10 minutes.

MR. FACHER: Where are you traveling?

MR. SCHLICHTMANN: My office, an hour and  
10 minutes.

MR. FACHER: Okay. I don't want to fight  
about how many times we lost 10 minutes times 10

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2 times a hundred.

3 MR. SCHLICHTMANN: Yes.

4 (Lunch recess at 12:30 p.m.)  
5

6 AFTERNOON SESSION  
7

8 (Resumed at 1:47 p.m.)  
9

10 Q (By Mr. Facher) Doctor Pinder, did you assume any  
11 particular concentration or quantities of any  
12 particular chemical had been placed or disposed of on  
13 the Riley or Beatrice properties?

14 A In my opinion --

15 Q Yes, in your opinion.

16 A Yes.

17 Q What quantities did you assume?

18 A I did not assume any quantities.

19 Q You did not assume any quantities of any particular  
20 chemical?

21 A Correct.

22 Q What chemicals did you assume had been disposed of in  
23 the properties?

24 A I considered TCE, trichloroethane, trichloroethylene,  
25 transdichloroethylene, chloroform,

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Riley?

A No.

Q As far as you know, you are the first one to reach that conclusion?

A Please state the conclusion.

Q The conclusion that in the mid-'60s contaminants moved from the Grace and Riley property to Wells G and H and took respectively three years and a year and a half to do so?

A To the best of my knowledge.

Q Are you able to tell us what quantity of contaminants moved from the Grace property to Wells G and H?

A Only as I stated in my original opinion.

Q I am not sure I understood that your original opinion had a quantity in it. Perhaps you could give it to me again.

A Ask the specific question, and I will try and give you a specific answer.

Q I did ask a specific question.

Do you have any information as to what quantity of contaminants moved from Grace's property to Wells G and H?

A Yes.

Q How much?

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2 A In excess of tens of parts per billion of organics  
3 upper bounded by some number greater than several  
4 hundred parts per billion.

5 Q Once again, that is your conclusion and your opinion?

6 A That is correct.

7 Q Did you form any opinion as to when the contaminants  
8 first arrived at Wells G and H?

9 A Yes.

10 Q When was that, the minute they opened?

11 A It's my opinion that the contaminants, organic  
12 solvents, existed at the well location prior to its  
13 pumping.

14 Q So they were already there?

15 A Correct.

16 Q And when the well was turned on, they immediately--

17 A Correct.

18 Q Were sucked into the well, if that's the right way?

19 MR. SCHLICHTMANN: Isn't that horrible.

20 That is the tragedy of Woburn.

21 MR. FACHER: It's horrible as a theory.

22 That is the tragedy of your case.

23 MR. SCHLICHTMANN: Unfortunately, there  
24 will be other people to judge that.

25 MR. FACHER: We never know, Jan. We might

1  
2 judge between us.

3 MR. SCHLICHTMANN: You always get the last  
4 word.

5 MR. FACHER: I am sorry about that. It's  
6 my house. I can get the last word.

7 Q What kinds of physical documents or materials do you  
8 have, Doctor, that demonstrate or substantiate these  
9 time periods of one and a half years and three years?

10 A I have the results of the calculations that I have  
11 performed.

12 Q These are all mathematical calculations, complicated  
13 equations, things like that?

14 A No. They are very simple equations, which I can  
15 right down very easily.

16 Q For me, every equation is complicated.

17 A It's a very basic equation. It's found in all  
18 branches of physics.

19 Q Is it a form of mathematics that has enabled you to  
20 reach that conclusion?

21 A Mathematics is a language of physics. In that sense  
22 it's a mathematical statement of physics phenomenon.

23 Q You said that the contaminants observed at G and H  
24 were not the maximum that you would have expected to  
25 find during a pumping history.

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Am I correctly summarizing what you said?

A Yes.

Q Just to see whether I understand it, does that mean it's your opinion that had you gone out there in 1969 you would have found even greater levels than what were seen when the wells closed in 1979?

A I am saying that it is highly probable that concentrations in excess of those that were observed in '79 occurred at that well during its pumping history.

Q Can you pinpoint the times?

A No, I can't.

Q Would that vary by season?

A No, not by season, only in that it would affect the pumping.

Q Does the water table go up and down?

A Yes.

Q At different times.

Does that have any effect on pumping tests; that is, isn't that why you need a 30-day period, so you can get a long enough period so you can check it?

A No.

Q That's too simplistic?

A Well, I can understand why you might feel that way;

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but it's not true.

Q In any event, you say that there would be no seasonal changes with respect to contamination?

A Not directly related to the seasons.

Q Would the seasonal changes have anything to do with the speed or velocity at which contaminants move?

A Nothing that would affect my opinion.

Q Are there in your opinion any contaminants which moved independently of the ground water?

A For example?

Q Well, I don't know. I am not sure -- you mean for example -- let me give you a homely example. Then you can perhaps understand.

A Um-hum.

Q Assuming a rock was dropped into water and was then moving down a slope, would that move at its own velocity as opposed to the velocity of the water?

A The rock?

Q Yes.

A The rock would move at a velocity related to but distinctly different than the water.

Q I am trying to relate that to chemicals, that is, moving at a velocity different from the water?

A Not to my knowledge, other than as I have stated the

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2 MR. FACHER: Why don't we take a couple of  
3 minutes, no more than three. Then I think Mike will  
4 take over.

5 (Five-minute recess taken.)  
6

7 Cross-Examination by Mr. Rodburg  
8

9 Q Doctor Pinder my name is Michael Rodburg. In Jerry  
10 Facher's absence, I am going to continue the  
11 questioning. Although, I can't tell you I will  
12 follow necessarily the line that he may have had in  
13 mind.

14 I would like to go back to your first expressed  
15 opinion that the contamination in Wells G and H  
16 originated on the Grace and Riley properties. Is it  
17 your opinion that all of the contamination found in  
18 Wells G and H originated on the Grace and Riley  
19 properties?

20 A No.

21 Q Do you have an opinion as to how much of the  
22 contamination found in Wells G and H originated on  
23 the Grace and Riley properties?

24 A I find the question too vague to answer.

25 Q Have you reached a conclusion in any of your work as

1  
2 to how much contamination found in Wells G and H  
3 originated with the Grace and Riley properties?

4 A The majority.

5 Q Have you reduced that conclusion to any mathematical  
6 calculation?

7 A No.

8 Q Earlier in testifying about the information which you  
9 were asked to accept concerning the disposition of  
10 contaminants on the Riley and Grace properties, I  
11 believe you stated that you were not asked to assume  
12 any mass or volume of contamination?

13 A Yes.

14 Q Would it be consistent with the information you were  
15 asked to assume if you were also asked to assume that  
16 a quantity in the amount of one microliter of the  
17 contaminants was disposed of at the Riley property?

18 A I don't understand the question.

19 Q In stating that you were not asked to assume any  
20 amount, is it your view that amount is irrelevant to  
21 your opinion?

22 A Yes.

23 Q Would your opinion be the same if I asked you now to  
24 assume everything you have previously been asked to  
25 assume, but I do quantify it by stating that the

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2 A No.

3 Q Has he been of assistance to you under your  
4 supervision or control for any other parts of the  
5 project?

6 A No.

7 Q Do you have an estimate at this point in time as to  
8 how many hours you have recorded in your at-a-glance  
9 planner that you have put into the project?

10 A I would say it's greater than 50 and less than 150  
11 hours.

12 Q You referred earlier to your use of a computer. Is  
13 this your IBM-XT computer?

14 A Yes.

15 Q Have you used any other computer besides the IBM-XT?

16 A Yes.

17 Q What are they?

18 A The 3081.

19 Q To whom does that computer belong?

20 A The university.

21 Q Any others besides those two?

22 A No.

23 Q What have you used the computer for?

24 A Making calculations on graphics such as described  
25 before, calculations on transport as described before

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and preliminary calculations on a more comprehensive model.

Q I think this was the first time you did any calculations on transport. What do you mean by that?

A What I mean is that I solved the transport equation.

Q This is the simple one-dimensional transport equation?

A Yes.

Q Did the preliminary calculations, a more comprehensive model, precede the one-dimension, simple one-dimensional transport equation?

A You have to clarify the question.

Q Which did you do first, the preliminary calculations on a comprehensive model or calculations on the simple one-dimensional transport equation?

A Well, they kind of proceeded in concert. My most recent calculations are on the one-dimensional model.

Q What was the reason you did preliminary calculations on a comprehensive model?

A Because I think it will be illustrative of my opinion and provide me additional insight into the physical system.

Q Do you intend to continue to finalize the calculations on a comprehensive model?

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2 A Yes.

3 Q Could the results or output of the comprehensive  
4 model change your opinion in any way?

5 A No.

6 Q Why is that?

7 A Because they are both based on the same physical  
8 laws.9 Q I take it that the use of calculations on a  
10 comprehensive model simply illustrates the opinions  
11 you have already reached?

12 A Correct.

13 Q What else does it do for you besides illustrate  
14 opinions you have already reached?15 A It allows me to communicate with the layman  
16 relatively abstract conceptual ideas.

17 Q Because it produces pictures?

18 A Yes.

19 Q Does it serve any function besides producing  
20 pictures?

21 A It illustrates my opinion.

22 Q Does it quantify your opinion in ways that you are  
23 not able today to quantify?

24 A I don't understand the question.

25 Q For example, you testified earlier that you thought

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that the contamination found in Wells G and H in 1979 were exceeded at times in the past.

A Yes.

Q Do you expect that the complicated model will --

**MR. SCHLICHTMANN: Comprehensive.**

Q -- the comprehensive model will generate concentration of numbers for times before 1979?

A Would you reask the question, please?

Q Do you expect that the calculations done by you on the comprehensive model will produce contamination in Wells G and H for times earlier than 1979?

A Yes.

Q Do you expect that the numbers so generated will be higher than the results found in 1979?

A It's possible.

Q Would it be inconsistent with your opinion as you have expressed it today if it did not so generate a number higher than those found in 1979?

A No.

Q Why not?

A Because they are consistent.

Q Let me go back.

It's your opinion that at times earlier than 1979 there was contamination of Wells G and H at