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 Admistratrix 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.

THIRD DAY OF THE DEPOSITION OF GEORGE F. PINDER, taken on behalf of the Defendant Beatrice Foods Co., pursuant to the applicable provisions of the Federal Rules of Civil Procedure, before Lauren E. Asci, 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 Friday, January 10, 1986, commencing at 10:10 a.m.

APPEARANCES:

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ALSO PRESENT: Stavros S. Papadopulos

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Q What staff, if any, can you name today that would be working on that?

A Although I have no intentions particularly to employ Mr. Ahlfeld in that capacity, he certainly would be qualified to do that kind of work.

Q Is the term "calibration" used in your field of endeavor?

A Use.

Q What is your understanding of the term "calibration" as you use it in your field of endeavor?

A "Calibration" is a term that normally is identified with ground-water modeling, ground-water transport and other areas of mathematical physics that require the use of mathematics to represent physical systems.

As I use the term, it represents a step in the representation of a physical system by a physical mathematical system. It is the step whereby one attempts to have a physical mathematical model produce results or calculations that are deemed consistent with the major physical observations made in the real world.

In the case of ground-water models, the parametric output that would be normally employed in the calibration process would be the fluid potential

and the chemical concentrations.

Q Have you as yet conducted the step of calibration with respect to the computer model which you developed for this case?

A No.

Q When do you expect to calibrate the model?

A I believe that we will attempt to calibrate the model between now and a period of time approximately two weeks prior to the deadline for the presentation of information for the preparation of exhibits.

Q Is calibration of a model an essential step in your opinion?

A No.

Q Does it happen on occasion that you cannot calibrate a model with which you have been working?

A I have not personally experienced that.

Q Can it happen?

A I think that persons not qualified to use mathematical models may find that they are unable to provide a model that would in the sense that we have described it generally be considered calibrated.

Q Is there some measure of what is a reasonably acceptable degree of calibration?

A There is no generally accepted criteria.

Q Do you ever use the term "sensitivity analysis" in your field of endeavor?

A Yes.

Q What is your understanding of "sensitivity analysis" as used in your field of endeavor?

A "Sensitivity analysis" is a procedure whereby one uses parametric information in a mathematical model that is other than that information the analyst believes to be the most probable information.

The model output is then examined to establish the changes in the parametric output due to the known changes in the parametric input.

Q What is the purpose for which sensitivity analysis is performed?

A It's generally done for illustrative purposes to allow the analyst to communicate with the nontechnical professional the sensitivity of the parametric output to changes in the parametric input.

Q Is it ever done to gauge the signigicance of errors in the parametric input?

A I don't believe that it's used in that way by the analyst. It may be interpreted that way by the nontechnical professional.

Q Do you intend to perform any sensitivity analysis

with respect to the work on this case?

A Probably.

Q For what purpose would you undertake a sensitivity analysis in this case?

A Because the purpose of the model is to illustrate my opinion, I think it may be prudent as part of that illustration to demonstrate to those individuals who are not familiar with mathematical simulation the impact that changes in parameter input might have on parameter output.

Q If you are to perform any sensitivity analysis in this case, when do you expect to do it?

A That would be the last calculation that I probably would make prior to the preparation of the court exhibits.

Q In terms of successive steps, would it be after you calibrate the model?

A Yes.

Q Do you in your field of endeavor ever use the term "probability analysis"?

A

A "Probability analysis" is a generic term, and it is found in my discipline as in most.

Q In your discipline, what is -- what is your common

understanding or meaning of the term?

A Would you repeat the term, please?

Q The term is "probability analysis".

A "Probability analysis" in my field would be the application of methodology associated with the subdiscipline of statistics known as probability to problems in engineering analysis.

Q Has any part of the work that you have performed thus far in this case involved any probability analysis?

A No. I have not done any probability analysis in this case.

Q Do you expect to do any probability analysis in this case?

A Probably not.

Q If you were to do any, when would you do it?

A I don't know, because I probably won't do it.

Q When you say "probably won't do it," it implies to me that you could do it or might do it. My question is: If you did it, when would you do it?

A Not to mislead you, Mr. Rodburg, I have no intention of using probability analysis. Consequently, there is no way for me to estimate at what point in my calculations it may be employed.

Q Have you done any sensitivity analysis in the course

Q In all of the documents that we have marked -- strike that. It would take forever to answer.

Let's go back to an opinion that you expressed at the first deposition, and I will read to you from page 46, Line 1.

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

Do you recall that was the opinion you expressed on December 10th in answer to a question?

A Yes, sir.

Q In reaching the opinion that you so expressed, did you have any hydraulic conductivities available to you which you used in forming that opinion?

A Yes.

Q Which hydraulic conductivities did you have available, and which did you use in forming that opinion?

A The opinion was formulated not on the basis of one single value of hydraulic conductivity but rather on my opinion as to what is the representative hydraulic conductivity on the Riley site based on all the information I had available to me at that time.

Q Do you remember any value which you used for the

representative hydraulic conductivity in reaching your opinion?

A The value of hydraulic conductivity that I believe to be representative of the Riley site and which I would base my opinion upon would be something greater than 2000 feet per day.

Q Is feet per day the common unit of expression for hydraulic conductivity?

A It's commonly used.

Q And the information which you had available at that time in expressing an opinion, did any of it include any actual pump-test information?

A That number that I have just quoted to you incorporates information from a number of pumping test values.

Q Were they pumping test values precedent to December 4, 1985?

A No.

Q So that included some of the data which you had available from the pump tests?

A Yes, sir.

Q I believe that you identified that the pump-test information that you had available as of December 10 is that which is incorporated in Exhibit 4.

representation of the physical system. At that time, I would be prepared to make calculations along the lines that you speak of.

Q When you have done all that, would you expect that the rate of travel time for -- when you have done all that, would you expect it to show that trichloroethylene takes a year and a half to get from the Riley property to Wells G and H?

A I believe that any proper representation of the physical system at the Riley site and the adjacent areas up into the Wells G and H would show a travel time of trichloroethylene under the conditions of the pumping of G and H to be no greater than one and a half years for first arrival.

Q And if it doesn't show that, is something wrong with the program?

A If it doesn't show that, I would not know at this point why it would not show that.

Q Do you intend to calibrate your model to mimic or respond exactly as the pumping test that was recently conducted by EPA?

A No.

Q Why not?

A Because I don't think that any mathematical

representation of that physical system will ever exactly mimic the physical system.

Q Will it be close?

A The model will represent the physical system as closely as I have the technical ability, time and resources to make it.

Q And will it mimic the pump test results within what you would regard as an acceptable proximity?

A It is my intention to probably attempt to achieve that.

Q And if you can't achieve that -- assume that you can't for the moment. Would you conclude anything about the accuracy or veracity of your opinion?

A No.

Q Why not?

A Because my opinion is not predicated on the mathematical model.

Q Would it lead you to reexamine your opinion if you could not produce a mathematical model that would reasonably mimic the pump test?

A No.

Q Why not?

A Because my opinion is not based upon a mathematical model.

Q You said on more than one occasion in the course of this deposition that the model is to give you insight and to illustrate your opinion.

A That is correct.

Q What insight will it give you, if you can't replicate a reasonable proximity to pump test?

A I don't know, because I have not encountered that problem.

Q What insight do you expect to get from the model that you don't already have as of today as you testify?

A What insight will I get from this point forward from the model, is that basically what you are saying?

Q Um-hum.

A I think the model will tend to perhaps refine my thoughts regarding the behavior of the system; but because I have not done the calculations, it is very difficult, if not impossible, for me to forecast what type of information I may indeed be able to obtain.

Q There is no way that the model or the behavior of the model will at all change your opinion?

A It will not, I believe, change my basic opinion, as I stated in my original deposition.

Q Does the model illustrate your opinion any differently than would an artist drawing under your

direction?

A I don't understand the question.

Q Sure.

There is a whole bunch of numbers there on Exhibit 9?

A There are many numbers.

Q And you have a graphics program, and it produces graphs which purport to have some meaning that illustrate your opinion?

A Mr. Rodburg, you have the same program.

Q That's not responsive to my question.

A The answer is: Yes.

Q Could you not direct that graphs illustrative of your opinion be drawn by an artist?

A Based on this, you mean?

Q Without use of the model or any input of the model.

A Could I have an artist prepare drawings that would be illustrative of my opinion without the use of the model, is that the question?

Q Yes.

A Yes.

Q I take it it's fairly expensive to develop, calibrate, input and otherwise use and develop this model, I take it; is that right?

A Yes, I think at least within my idea of what is expensive I would say it's expensive.

Q In all probability, could you get an artist to do it cheeper?

A To illustrate my opinion, I could get him to present an illustration cheeper.

Q What illustration does the model give you that an artist can't?

A The model properly prepared will provide a more cosmopolitan picture of the overall behavior of the entire area than I would be able to do based on data and simple engineering calculations alone.

Q What do you mean by "cosmopolitan"?

A By "cosmopolitan," I mean that it can present ideas that are based on fundamental physical concepts but in a very complicated environment in a way that I believe as a professional hydrologist is more easily understood by the layman or other professional not trained in my area of expertise.

If you wish that I go on, I would try and provide--

Q I am trying to find out -- it seems a Disney cartoonist could do a better job and cheeper than a computer in coming up with a dramatic chart and

graphs and movig pictures.

Do you disagree with that?

A Yes, but I am not really aware of what a Disney cartoonist makes on an hourly basis; nor do I know how long it would take him to try and draw various figures, nor do I think that he can draw the kinds of complicated physical situations that a mathematical model is able to examine.

Q But in terms of the strength or veracity of your opinion, it really wouldn't matter whether it was a Disney artist or a computer model?

A My opinion would not be affected whether my drawings were done by a computer or by a Disney artist.

MR. ELLER: Could we take a break when it's convenient?

MR. RODBURG: We will do it now.

(Recess at 3:34 p.m.)

(Resumed at 3:47 p.m.)

Q Doctor Pinder, I am going to come back to a document that I thought we had exhausted and exhausted ourselves on; but I am constrained to refer you back to Exhibit 7A. Do you have your copy of it? I have a separate copy.

A Yes.