ILLINOIS POLLUTION CONTROL BOARD

CITY OF DEKALB,	)	
	)	
Petitioner,	)	PCB NO. 96-246
	)	
v.	)	
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	DeKalb County Municipal Building, DeKalb, Illinois
Respondent.	)	August 5, 1996

Hearing commenced, pursuant to assignment, at 1:00 p.m.

BEFORE:
DEBORAH L. FRANK, Hearing Officer,
608 South Prospect Avenue
Champaign, Illinois, 61820

APPEARANCES:
ATTORNEY RONALD G. MATEKAITIS,
DeKalb City Attorney,
200 South Fourth Street,
DeKalb, Illinois, 60115
Counsel for the Petitioner.

ATTORNEY STEPHEN C. EWART,
IEPA Deputy Counsel,
2200 Churchill Road,
Springfield, Illinois, 62794
Counsel for the Respondent.

REPORTER:
Carrie L. Vaske

INDEX

INDEX (Continued)

INDEX (Continued)

EXHIBITS

MS. FRANK: Good afternoon and welcome to the Pollution Control Board hearing in PCB 96-247 (sic), City of DeKalb versus the Illinois Environmental Protection Agency. My name is Deborah Frank and I am the Hearing Officer for today. To my right is Audrey Lozuk-Lawless, she is an attorney for the Board. Out in the audience is Diane Wells, she's a secretary to the Board, and to my left is K.C. Poulos, she is the attorney assistant to Board Member Ted Meyer (phonetic), so that's Board introductions.

I just wanted to give you a little bit of background about this proceeding before we began. First you should know that it is the Pollution Control Board and not me that makes the decision on this matter. Our job here today is to collect evidence on the record which would be a written transcript and then that transcript goes to the Pollution Control Board for review and decision, so it's very important that

whenever we're doing sort of visual things and pointing at things that we give a very clear verbal description of what's going on so that when the Board members read the transcript they can tell from the transcript pages what it was that happened at the hearing.

The Board's rules and the Environmental Protection Act allow for members of the public to make oral and written statements on the record at hearing. When it becomes time for public participation we'll have you come forward. There's a microphone stand here. I believe you have to push the button to turn it on. We'll ask for your name and probably have you spell it for our court reporter. Then we'll swear you in and then you'll have a chance to make whatever statements that you'd like to make on the record.

You are subject to cross examination if either of the attorneys have

questions they want to ask you, but please still feel free to come forward. It's not as scary as it sort of sounds to be subject to cross examination. They may have a clarification question for you or they may not, so I encourage you all to come forward anyway.

The attorneys have sort of informally agreed, and this includes the attorneys for the citizens group, that something that would be beneficial and something that we do sometimes in radium variances is to go off the record before we actually begin and allow the members of the public to ask the witnesses questions. Because the way that things have turned out with intervenor status being denied by the Board, once the hearing formally begins the members of the public will not be allowed to ask the witnesses any questions. So this sort of would be an opportunity for you to maybe ask some questions and get some

background information.

The thing I want to make very clear is that you still need to make whatever statement it was that you came to make on the record because anything we do off the record will not be seen before the Pollution Control Board. They won't know what we did or what we talked about. It's really just a chance for you guys to talk to the scientific people and maybe answer some questions, but it isn't the record of the proceeding. So it's a time for questions and to maybe get some information that will help you make your statements, but you need to remember that you still need to make your statements on the record at hearing.

And if people who are asking questions end up sort of making statements I'll probably interrupt you and say no, no, that's something you need to say when we go back on the record. You'll get a chance to say that. So you know, we'll see how it

goes. It's worked very well at some other hearings that we've done, and we'll allow it for as long as it kind of seems to be working. I'm thinking probably in the half hour range at this point. If we need to go a little longer we can, and so I'll just -- you know, we'll take questions from the audience.

But before we do that what I want to do is have the City and IEPA introduce the -- attorneys introduce themselves and their witnesses and kind of give a little bit of a background so that the members of the public will know who it is that's sitting up here. So if we could go ahead and begin with the City.

MR. MATEKAITIS: My name is Ron Matekaitis. I'm the City attorney for DeKalb. Testifying in this matter on behalf of the City will be, in order, Gerry Bever. Why don't you go ahead and stand up so people can associate a name with the face.

He's our water superintendent. Ronald Naylor, who is our director of public works; Larry Thomas, who is a consulting engineer with the firm of Baxter and Woodman; Mark Biernacki, who is our planning and development director; Ken Bowden, who is a citizen, former chairman of the citizens' ad hoc committee; and Dr. Rowland, who will be testifying as to the health risks associated with radium.

MR. EWART: Yes, my name is Steve Ewart. I'm Deputy Counsel for the Division of Public Water Supplies for the Illinois Environmental Protection Agency. To my right is my only witness today. Her name is Tracey Virgin. She's a toxicologist with the Illinois Environmental Protection Agency. Also in the audience I have with the Agency, Connie Tonsor who is an attorney for the IEPA, and Susan Councilman (phonetic) who is legal assistant with the Illinois EPA.

MS. FRANK: Are there any other preliminary matters before we go off the record? Do the attorneys have anything? Okay. Then let's go ahead and go off the record.

(A discussion was held off the record.)

MS. FRANK: If we could go back on the record. Sir, why don't you state your name.

MR. ROCHELEAU: Bruce Rocheleau.

MS. FRANK: And you had something that you would like entered into the record?

MR. ROCHELEAU: Well, yes, this article from the Chicago Tribune, July 25th, 1996.

MS. FRANK: It will be marked as Public Comment No. 1 from the hearing. If you would bring it forward.

(Public Comment Exhibit No. 1 was marked for identification.)

MS. FRANK: I saw one more hand. Who else wants to speak? We'll take these last two questions and then we are going to go

ahead and begin the hearing. Off the record.

(A discussion was held off the record.)

MS. FRANK: We're going to go ahead now and go back on the record. What we will do is proceed with the hearing, although if there are any members of the public that have to leave early and wish to make a statement on the record before they have to leave, you just need to let me know and we will break between witnesses and give you a chance to make statements.

I'd like to remind the members of the public that the Board's rules disallow repetitive testimony, so you need to be careful about not just restating what someone else has said. Additionally, the Board's rules state that the information must be relevant, and I remind everybody that we're talking about the new variance at this point and we're not here to argue the

grant of the past variance. So any information you have to give us on whether or not this new variance should be granted will be information that we will happily receive.

At this time I would ask the City begin and go ahead and call the first witness, and if our court reporter could swear the witnesses.

MR. MATEKAITIS: First witness I would call would be Gerald Bever.

GERALD BEVER,

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

DIRECT EXAMINATION

BY MR. MATEKAITIS:

Q. Please state and spell your name for the record.

A. Gerald Bever, B-e-v-e-r.

Q. And what is your occupation, Mr. Bever?

A. Water superintendent for the City of DeKalb.

Q. And how long have you been employed in that

capacity?

A. Since February of 1995 -- '85, excuse me.

Q. And would you describe your professional qualifications as they pertain to that position.

A. I became a certified water operator through the Illinois Environmental Protection Agency in 1975. I received my Class A certification in 1976. I'm also a certified director for the City's microbiological laboratory since 1990.

(Petitioner's Exhibit No. 1 was marked for identification.)

Q. Mr. Bever, I hand you what's been labeled at this point Petitioner's Exhibit No. 1 and ask you if you recognize that item.

A. Yes, I do, that's my certification.

Q. Is that, in fact, a copy of that certification?

A. Correct, a copy.

Q. As a public water supply operator?

A. Correct.

Q. Mr. Bever, would you please describe the City of DeKalb's potable water distribution system.

A. We have nine wells within the community spread out throughout the distribution system. All nine wells pump directly into the distribution piping. We have four elevated storage tanks equaling 5 3/4 million gallons total.

Q. What is the approximate number of miles of water mains utilized in the water distribution system?

A. We have approximately 107 miles of water mains ranging from 4 inch up to 24 inch in diameter.

Q. Is the City of DeKalb part of any regional public water supply?

A. No, we are not.

Q. Does the City of DeKalb have a deep well or a shallow well water supply system?

A. We have a deep well water supply.

Q. Could you at least briefly describe the

differences between those supply systems.

A. Deep wells are extending beyond the thousand feet typically, and anything less than that would be classified as a shallow well or surface well.

Q. And what is the estimated population served by the City of DeKalb's water distribution system?

A. Our 1990 census for DeKalb was 35,076.

Q. And do you have any number of approximate residential, commercial and industrial users?

A. We have approximately 8,300 service connections, and we divide those up. Residentially, approximately 7,500 customers, connections; 609 commercial connections. We have 50 industrial connections, and then we also -- since we service Northern Illinois University we count those individually, and that's 53 connections to supply water to the University, and that leaves approximately

100 unaccounted for in what I've previously named that are not counted in any one of these others individually.

Q. Could you describe the methods of water treatment currently utilized by the City of DeKalb.

A. We chemically treat our water at each well location in three manners. We add chlorine for disinfection purposes in the distribution system. We add a hydrofluosilicic acid to maintain an optimum level of fluoride for dental caries prevention, and we add a polyphosphate substance which acts in two manners. It helps to reduce the amount of oxidation of iron in the water so it reduces the amount of rusty water complaints, and secondly it has been found to help reduce the level of leaching of lead and copper from a customer's piping within their homes that would dissolve back into the water.

Q. Are you aware of whether or not the City of

DeKalb currently exceeds the maximum allowable concentration of combined radium 226 and 228?

A. Yes.

Q. And when did you as water superintendent first become aware that the City exceeded those concentration levels?

A. A letter that we received from the Illinois Environmental Protection Agency in January 4th of 1991.

Q. And are you aware of what the current standard is for those levels?

A. Yes.

Q. And what is that?

A. 5 picocuries combined, radium 226 and radium 228.

Q. To your knowledge is the City of DeKalb currently on the restricted status list?

A. Yes, we are.

Q. And how did you become aware that the City is currently on the restricted status list?

A. We previously had a variance from restricted

status which expired in June of this year, and as of that date we were then placed back on the restricted status list.

Q. Does the City of DeKalb's water supply exceed the maximum allowable concentration per gross alpha particle activity?

A. No, we do not.

Q. And how was that determined?

A. Quarterly samples are taken from each one of the nine wells, and those samples are analyzed by a laboratory for the Environmental Protection Agency. Those results are then passed along to the Illinois EPA as well as back to the City of DeKalb.

Q. Are you aware of whether or not the City of DeKalb's water supply currently exceeds any other maximum contaminant level?

A. No, we do not, not to our knowledge.

Q. And are you familiar with the variance granted to the City of DeKalb by the Illinois Pollution Control Board in 1991?

A. Yes.

Q. Are you familiar with the conditions contained in that variance as they relate to the testing and submission of water samples to the Illinois Environmental Protection Agency?

A. Yes, I am.

Q. Has the City of DeKalb complied with those testing, sampling and reporting requirements for water sampling?

A. Yes, we have.

(Petitioner's Exhibit No. 2 was marked for identification.)

Q. Mr. Bever, I'll hand you what's currently been identified at this point in time as Petitioner's Exhibit No. 2 and ask you if you recognize that document.

A. Yes, I do.

Q. Did you prepare that document?

A. Yes, I did.

Q. And how did you obtain the information that was utilized in preparing that document?

A. The document is a radium analysis from 1990 to 1995 for all nine of our City wells, and it lists the wells individually, the sampling year, the levels of radium 226, 228 that were analyzed by the Illinois Environmental Protection Agency laboratory and the composited total for that year.

Q. Is the information contained on Petitioner's Exhibit No. 2 true and accurate to the best of your knowledge?

A. Yes, it is.

Q. What actions has the City of DeKalb taken since 1991 to lessen the amount of combined radium 226 and 228 contained in the City's public water supply?

A. At the recommendation of our ad hoc water quality group the City tried to reduce the amount of pumpage from our two highest radium producing wells. Well No. 4 and well No. 6 were identified at that time as having the highest levels of radium in their composite analysis, and so by minimizing the

amount of usage from those two wells we felt that we would minimize the introduction of radium into the distribution system as well.

Q. Have you calculated a weighted average consumption of combined radium 226 and 228 for the users of the City of DeKalb's public water supply system?

A. Yes, I have.

(Petitioner's Exhibit No. 3 was marked for identification.)

Q. Mr. Bever, I'll hand you what's been labeled at this point in time Petitioner's Exhibit No. 3 and ask you if you recognize that document.

A. Yes, I do.

Q. And did you prepare that document?

A. Yes, I did.

Q. How did you obtain the information that's contained in that document?

A. This document is a comparison using weighted averages of the radium content in DeKalb's water within the distribution system. The

reason I compared this document -- prepared this document to begin with is that the City of DeKalb is unique in that it pumps all of its water during the evening hours, after 10 p.m. and we stop pumping before 9 a.m. in the morning. By doing that the majority of our water is then stored in the four elevated storage tanks for use by the community throughout the daytime hours.

And because of our wells being tied into the distribution system throughout the community, it also allows the water to be blended, and by blending that water we felt that we wanted to get a more accurate analysis of what the radium content was throughout the community. So the weighted average was determined by taking the annual pumpage from each individual well, dividing that into the overall total pumpage of all wells for that year to get the percentage of water from that well, this was provided to the community, taking that percentage and

multiplying it by the radium content from that well's most recent composite analysis for that same period of time to determine the amount of radium that was actually introduced into the distribution system from that particular well for the annual period of 1995.

Q. And did you determine a weighted average --

A. Yes, I did.

Q. -- for 1995?

A. For 1993, 1995, and 1995's was 7.3 picocuries per liter on the average, so the water that a consumer would be receiving would be on an average of 7.3.

Q. And did you determine what the average calculated weight was for the period 1990 through 1995?

A. Yes, I did.

Q. And what is that figure?

A. 1990 was 7.6. The weighted average for the time period of our last variance was 6.6, so for the last five years our average

consumption of radium for our consumers was 6.6.

Q. And is the information contained in Petitioner's Exhibit No. 3 true and accurate to the best of your knowledge?

A. Yes, it is.

(Petitioner's Exhibit No. 4 was marked for identification.)

Q. Mr. Bever, I'll hand you what's been labeled at this time Petitioner's Exhibit No. 4 and ask you if you recognize that document.

A. Yes, I do.

Q. And did you prepare that document?

A. Yes, I did.

Q. And how'd you obtain the information that's contained within that document?

A. This document is a weighted average comparison of DeKalb and other Northern Illinois communities based upon the 1995 consumption and pumpage. What I did was I called or notified ten communities that I had knowledge of their having received or in

the process of receiving a variance from restricted status due to the radium content in their water.

From those ten communities I've indicated four communities that did respond and give me their pumping totals for their wells during the year 1995 as well as the radium composite analysis for that same time period. By gaining that information I then calculated the weighted average for their communities in 1995 for the radium content and compared that with DeKalb's.

Q. With respect to each of the communities that you received information from, how does DeKalb's weighted average compare to those other communities?

A. We are equal to the community of Ottawa in that our weighted average and theirs was 7.3. Oswego was 8.5. Batavia was 9.6 and Plainfield was 8.8, so the other three were all higher and one was equal to.

Q. And Mr. Bever, is the information contained

in that document true and accurate to the best of your knowledge?

A. Yes, it is.

MR. MATEKAITIS: At this time, Madam Hearing Officer, I'd move for the admission of Exhibits City 1 through 4.

MS. FRANK: Is there any objection?

MR. EWART: I have no objection at this time. I do want to ask some questions on cross.

MS. FRANK: Then the Exhibits 1 through 4 are admitted into evidence.

MR. MATEKAITIS: That's all the questions I have at this time.

MS. FRANK: Okay. Cross examination?

CROSS EXAMINATION

BY MR. EWART:

Q. Mr. Bever, are you familiar with the Pollution Control Board order in PCB 91-34 granting the --

MS. FRANK: Mr. Ewart, you're going to have to use your mike.

Q. -- with the Board that granted the variance in this proceeding?

A. Yes.

Q. Are you also familiar with a provision in there with regard to requiring DeKalb to issue semiannual progress reports?

A. I am aware.

Q. Did you -- do you recall or do you have information to know whether you completed this information, this requirement?

A. That was not something that I was involved with.

Q. Is there somebody else that I could ask that question to?

A. Yes.

Q. Well, then I will withdraw that at this time and I'll ask this question. Who will that be?

A. That would be our director of public works.

Q. Okay. With regard to Petitioner's Exhibit No. 3, the weighted averages, would you once again go over how you derived the weighted

average. Did you include the volume from each one of these wells, 4 through 14?

A. Yes, I did. I did that individually. I took each well's annual pumpage from 1995. I divided that by the total pumpage of all wells in 1995 to get a percentage. Then I multiplied that percentage times the radium content, the composite analysis for that particular well during that same time period and that gave me the amount of radium that would have been introduced into the distribution system for that particular well. And then I did that for each of the nine wells. Totaling the end result for each nine wells gave me the -- for example, 1995, the 7.3 picocurie, that would be the weighted average of the radium content within the drinking water for that year.

Q. Now, you also stated in your testimony that you -- that the nine wells filled four distribution tanks.

A. Correct.

Q. Did you take -- did you analyze for radium in the distribution tanks?

A. No, we did not recently. We did that earlier during our initial studies in 1991. We did take from the four elevated storage tanks at different times of the day and we also did from our nine well locations during different times of the day even though they were not pumping but they have distribution taps coming back into those wells.

Q. Did you include the information, the radium results, from the four storage tanks in your calculation of the weighted average and the average per year?

A. No, I did not. I simply figured that all main wells were pumping into the distribution system and took the weighted average from each of those wells.

Q. Mr. Bever, with regard to Petitioner's Exhibit No. 4 in which you received information from Oswego, Ottawa, Batavia and Plainfield, did any of them go to the extent

of providing with the information on radium 226 and 228 or combined radium -- strike that, combined radium from each of the wells as you did in developing this average -- annual average?

A. Yes, each community gave me the 1995 totals pumpage from each individual well and then their composited analysis for each of those individual wells.

MR. EWART: Thank you. I have no further questions.

MS. FRANK: Is there any redirect?

MR. MATEKAITIS: No redirect.

MS. FRANK: Then you may call your next witness.

MR. MATEKAITIS: I would call Ronald Naylor.

MS. FRANK: Please swear the witness.

RONALD NAYLOR,

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

DIRECT EXAMINATION

BY MR. MATEKAITIS:

Q. Would you please state and spell your name for the record.

A. Ronald Gene Naylor, R-o-n-a-l-d, G-e-n-e, Naylor, N-a-y-l-o-r.

Q. And what is your current occupation, Mr. Naylor?

A. Director of public works.

Q. And how long have you been employed in that capacity?

A. Been employed since September of 1973.

Q. And do you have supervisory responsibilities for the water division in the City of DeKalb?

A. Yes, I do.

Q. And is one of the responsibilities in your position to monitor compliance with the conditions contained in the variance from

restricted status granted to the City of DeKalb by the Illinois Pollution Control Board in 1991?

A. Yes.

Q. Would you please describe what the City has done to comply with the conditions listed in that variance.

A. If I may, may refer to our June 24th communication.

MS. FRANK: You need to speak into your microphone to make sure they can hear you.

(Petitioner's Exhibit No. 5 was marked for identification.)

Q. Mr. Naylor, I'll show you at this time what's been labeled as Petitioner's Exhibit No. 5 and ask you if you recognize that document.

A. Yes, I do.

Q. And how is it that you recognize that document?

A. It's a summer document that I've prepared on June 24th, 1996.

Q. With respect to the actions the City has taken to comply with conditions listed in the variance, the variance set forth specific conditions that the City should observe in complying with that variance. Would you please detail under each paragraph as a condition what the City has done within that area.

A. There were, I believe, 14 conditions set forth, and citing from the variance petition commencing with Paragraph B which is titled, "Variance shall terminate on the earliest of the following dates," and then it gives three dates, number one being analysis pursuant to 35 Illinois Admin. Code 611.731, Subparagraph A or any compliance demonstration method then in effect shows compliance with any standards for radium in drinking water then in effect; or 2, two years following the date of the US EPA action; or 3, June 20th, 1996.

Response was, "The earliest date

that is achievable remains in pursuit. However, given the uncertain status of the radium rules and the current position of the Agency and the US EPA's position regarding the compliance with the present standards, the City's ad hoc waterfall advisory committee report of November 16th, 1992 regarding radium compliance is prepared with the assistance of Baxter and Woodman, the environmental engineers of Crystal Lake, provided directions to achieve the compliance within the shortest practical time, two years or less, upon the adoption or the decision not to adopt the revised radium standards by the US EPA."

MR. MATEKAITIS: Madam Hearing Officer, can we go off the record for a moment?

MS. FRANK: Yes.

(A discussion was held off the record.)

MR. MATEKAITIS: Okay, we can go back on.

With respect to Paragraph C, the condition contained therein.

A. Paragraph C is, compliance shall be achieved with any standards for radium then in effect no later than --

MS. FRANK: Sir, you need to really speak into your mike.

A. I'll start again then. Paragraph C, "Compliance shall be achieved with any standards for radium then in effect no later than the day on which the variance terminates."

With regards to this article, "Again, we as a part of our compliance report being prepared and due to the uncertain status of the radium rules and regulations to be adopted by the US EPA, again, our completion of this is dependent upon the adoption or the decision not to adopt the revised standards as set forth by the US EPA."

Q. With respect to Paragraph D which requires a

sampling and a program sending those samples to the IEPA, did the City comply with that provision?

A. Yes, as submitted.

Q. With respect to Paragraph B which required within three months of the grant of the variance in 1991 that the City should secure professional assistance in investigating compliance options, did the City do that?

A. Yes, we did. We employed the services of Baxter and Woodman, Inc., Environmental Engineers in Crystal Lake, Illinois.

Q. Condition in Paragraph F indicates that within four months of the grant of the variance that the name of that professional assistance should be submitted to the Agency, the IEPA. Did the City of DeKalb do that?

A. Yes, we did. We submitted a notification on October 1991.

Q. The condition in Paragraph G indicated that within ten months of the grant of the

variance or three months after revision of the US EPA's standard for combined radium or publication that the standard would be unchanged that the City shall complete investigating compliance methods, prepare detailed compliance report showing how compliance will be achieved within the shortest practical time but not later than five years from the date of grant of this variance, what has the City done with respect to that item?

A. Again, we have commenced our preparation of compliance report, and again, pending the determination of the final standards to be adopted or not to be adopted our compliance report remains in pursuit.

Q. Condition contained in Paragraph H, that within twelve months of the grant of the variance, four months after revision of the US EPA's standard for combined radium or publication that the standard will be unchanged Petitioner shall submit such

compliance report to the Agency if they address or identify the Condition D, that being the IEPA, what has the City done with respect to that item?

A. Similar to the above responses we have commenced and are in the process of completing the compliance report. Again, however, subject to the issuance of the standard by the US EPA.

Q. With respect to conditions contained in Paragraphs I, J and K, all dealt with notifying the IEPA regarding permits that would be taken out to construct the necessary improvements to achieve compliance, what has the City done with respect to those items?

A. All three of those are not applicable at this time due to the fact of our compliance report determination, finalization being incomplete at this time, and again, depending upon the adoption of the new US EPA standards.

Q. With respect to the conditions contained in Paragraph L, that dealing with information that should be contained within water bills sent out on a quarterly basis, has the City complied with that condition?

A. Yes, we have.

Q. With respect to Paragraph M, within the first set of water bills or three months after the date of the order, this being in 1991, and quarterly thereafter, we were to send each user of our public water supply a written notice to the effect that the Petitioner is not in compliance with the standard for radium, that notice further indicating what the average content of radium samples taken since the last notice period appearing which samples were taken, has the City achieved or complied with that provision?

A. Yes, we have.

Q. With respect to Paragraph N, until full compliance is achieved Petitioner shall take

all reasonable measures with existing equipment to minimize the levels of combined radium 226 and radium 228 in the drinking water, what has the City done with respect to that condition?

A. The City has previously testified or testified to as attempted to minimize the level of our combined radium, radium 226 and 228, through the reduction of utilization of our highest producing wells, namely No. 4 and No. 6. We have also expended in excess of $30,000 in exploring means to achieve compliance through the use of consultants as well as through the utilization of a citizens ad hoc advisory water study committee, and as a part of that study and as a part of the committee's findings and recommendations it's been determined that we have mislaid two courses of possible pursuit. The first and the most desirable being that to develop well water supplies from sand and gravel and/or limestone

aquifers that can be used to blend our deeper well water and thereby reduce the concentration of radium to the acceptable levels.

The City has investigated this course of action and the available data indicates that at this time there is a potential area for a source of such water which is located on the western peripheral boundaries of the City of DeKalb and is known more locally as a Troy bedrock valley aquifer, and as a part of our ongoing studies we are continuing to pursue and investigate the feasibility of developing in this particular source of shallow water.

If that is found not to be or is proven not to be feasible, then the City has the alternative to pursue a secondary method of ion exchange, softening of the water or depot water to remove the radium. This option, however, could be implemented in a fairly short period of time by constructing

water treatment facilities at or near all of the existing well sites.

In addition to those actions the City has further explored the needs of the water system and are currently in the process of recommending the implementation of an exploratory research of the available water resources to the western boundary of the City and then to continue upon after that review to pursue the results if that water is available and then hopefully pursue the appropriate course of action to ultimately reduce our radium in our water.

Along the line with our course of study with our ad hoc water advisory committee we also looked at some other issues such as the insertion of liners and plugs in our water wells for the purpose of reducing radium concentration in the wells, and also that precipitated some -- not that particular item, but another course or another issue that we did pursue is

investigate the disposal of radium contaminated waste water that would result from the water treatment plant should we have to, you know, pursue that course of correction of our radium in the water.

Q. Mr. Naylor, Paragraph O of the variance granted in 1991 indicated that the City was to submit written progress reports every six months. Has the City complied with that provision?

A. We complied through June of 1992.

Q. And were individual six month progress reports submitted after 6/92?

A. No.

Q. When did you become aware that the City had not filed those reports as required?

A. It was brought to my attention on approximately the 24th of June.

Q. Upon being made aware of that what steps did you take in response to that?

A. In a conference with Illinois EPA office it was concurred that at that time most

appropriate to compile a summary report that would summarize that time period that was not initially reported.

MS. FRANK: I have a question. I'm sorry. You said June. Did you mean June of '96?

THE WITNESS: June -- when it was first brought to my attention was June of '96, June 24th.

MS. FRANK: Thank you.

Q. And referring to again what's been labeled at this time Petitioner's Exhibit No. 5, is that the progress report summary for that intervening period that you submitted at the request of the IEPA?

A. Yes.

Q. And is all the information regarding the activities that the City undertook in response to Subparagraph O contained within that summary report during that period of time?

A. Yes, to the best of my knowledge.

Q. And did you prepare this document?

A. Yes.

Q. And is it true and accurate to the best of your knowledge?

A. Yes.

Q. Were all the action items contained in the progress reports and progress report summaries performed on a timely basis with the exception of the semiannual reports?

A. Yes.

Q. And what steps did you take to ensure that prospectively the semiannual reports will be submitted on a timely basis as required?

A. We have reviewed our situation here and we have today, this date, by letter and will communicate to the Illinois EPA some action that we will implement in making sure that our checks and balances are expanded wherein we are going to incorporate in our checks and balances the offices of our water superintendent, our City engineer and that we will also expand upon our E-mail network

notebook system throughout our organization a timed calendar adjustment that will notify us in advance of the due date for this particular report, and also to incorporate and to utilize the services of our consultant for assistance in assuring the compliance.

(Petitioner's Exhibit No. 6 was marked for identification.)

Q. Mr. Naylor, I'll show you what's been labeled at this time Petitioner's Exhibit No. 6 and ask you if you recognize that document.

A. Yes, I do.

Q. And what does that document purport to be?

A. That's my letter so stating our efforts that will be undertaken to ensure compliance in this area.

Q. Other than the omission regarding the semiannual progress reports, were all the other conditions contained in the variance observed and complied with to the best of

your knowledge?

A. Yes.

Q. Does the City of DeKalb have any plans to extend new water mains within the next five years?

A. Yes, we do.

Q. And drawing your attention to Paragraph 35 of the City's petition, do the projects listed in that paragraph include projects for which new water main extensions are planned in the near future?

A. Yes, they do.

Q. And to the best of your knowledge are most of the projects listed in Paragraph 35 in the City's petition that include new water main extensions engineered, designed, funded and intend to be completed within the next six months to three years?

A. To the best of my knowledge, yes.

Q. Does the City of DeKalb foresee extending its water main to new users if the requested variance is granted?

A. Yes.

Q. And do the projects listed in Paragraph 35 of the City's petition include locations which new users are intended to be served by the extensions of new water mains?

A. Yes, they do.

Q. Would the construction of water main extensions improve fire flow for fire suppression activities for existing residences as well as for new residences in the areas served by such main extensions?

A. Yes, they do. They also improve through normally the looping effect that normally would occur. They can improve the circulation of the water throughout the area and the quality of the water as well.

Q. Mr. Naylor, with respect to the information and statements contained within the City's petition, are they true and accurate to the best of your knowledge?

A. Yes, they are.

MR. MATEKAITIS: I have no further

questions of this witness at this time.

MS. FRANK: Mr. Ewart?

CROSS EXAMINATION

BY MR. EWART:

Q. Mr. Naylor, with regard to your petition and Paragraph 35, do you have any estimate as to how much additional water demand will be on your facility as a result of connecting all these facilities? There's a page of facilities here.

A. I don't believe we have that information available at this time based upon these projected developments.

Q. Well, then do you have the capacity to serve all these new facilities?

A. At this time it is to the best of our knowledge, we do, yes.

Q. With regard to Petitioner's Exhibit No. 6, your letter dated August 5th, 1996, did you send that this morning?

A. Yes.

Q. So it's on the way to our offices --

A. Yes.

Q. -- at this point? In your opinion does this meet or exceed the requirements for the past Board order as far as semiannual progress reports?

A. Our compliance would exceed.

Q. Do you also have provision noting of course the public interest here in boasting something like this?

A. Yes, we do.

Q. There's no requirement, of course, but I would recommend that you also perhaps post this in a place too so that people could casually see how you're -- what kind of progress you're making in regards to the radium compliance with the radium sample.

A. We can do that, yes.

MR. EWART: I have no further questions.

MS. FRANK: Is there any redirect?

MR. MATEKAITIS: No redirect. I would ask for the admission of Petitioner's

Exhibits 5 and 6.

MS. FRANK: Is there any objection?

MR. EWART: No.

MS. FRANK: Okay, then Petitioner's Exhibits 5 and 6 are entered into evidence. Before we start with the next witness, since we have so many people from City here, is there any way that we can get the air conditioning on a little bit higher? It's really hot in here.

I also need to note for the record that I referred to this case as PCB 96-247 earlier. Its number is actually 96-246.

MR. MATEKAITIS: Thank you. That saves a lot of revisions.

MS. FRANK: Do we need to take a five-minute break while they do that or can you go ahead and go on? I don't know who just left.

MR. MATEKAITIS: If you want to take a five-minute break that would be fine. We can do that.

MS. FRANK: Okay. Why don't we take a five-minute break and come back.

(A recess was taken at 2:15 p.m. and proceedings resumed at 2:27 p.m.)

MS. FRANK: I'd like to go ahead and get started. Mr. Matekaitis, do you want to go ahead and begin.

MR. MATEKAITIS: Thank you. I'd call City's next witness, Larry Thomas.

LAWRENCE THOMAS,

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

DIRECT EXAMINATION

BY MR. MATEKAITIS:

Q. Would you please state and spell your last name for the record.

A. My name is Lawrence Thomas, T-h-o-m-a-s.

Q. And what is your occupation Mr. Thomas?

A. I'm a civil engineer with the firm of Baxter and Woodman Consulting Engineers in Crystal Lake, Illinois.

Q. And how long have you been employed in that

capacity?

A. 19 years.

Q. Would you please describe your professional occupation and training -- professional occupational training.

A. I have a bachelor's of science in civil engineering from the University of Illinois in Champaign. I have a master's of science in environmental engineering from the University of Illinois. I am registered as a professional engineer in the State of Illinois and I am also registered as a diplomate of the American Academy of Environmental Engineers.

Q. Have you provided professional assistance to any communities whose public water supply systems have exceeded the standards for combined radium 226 and 228?

A. Yes, I have.

Q. And what are the names of those communities?

A. West Chicago, Mission Brook sanitary district, Plainfield, DeKalb, Round Lake and

Yorkville.

Q. What was the nature of the assistance that you rendered in each instance?

A. On each of those cases we were doing general planning work, shallow well exploration, putting together the alternatives for each of those communities to consider as far as ways of reaching compliance with the radium standard.

Q. Has your firm been retained by the City of DeKalb to provide professional assistance in exploring alternatives that would enable the City to meet the current standards for combined radium 226 and 228?

A. Yes, it has.

Q. Have you been primarily assigned by Baxter and Woodman to provide that assistance to the City of DeKalb?

A. Yes, I have.

Q. As part of your assistance to the City of DeKalb have you determined what alternatives are available to the City to meet the

current standards of Ra 226 and 228?

A. Yes, we're looking at primarily two means of achieving compliance. One is through blending with shallow well water, and the second one is providing treatment for the existing water supply wells for the actual removal of the radium.

Q. Would you describe what is involved with respect to the blending option.

A. With the blending what we're doing is we're actually mixing water from a different source that's low in radium or absent of radium with the water from the sandstone wells that do have the radium in them. To achieve compliance we actually have to meet the standard at the point where the water enters the distribution system, so that means that we have to bring the blending water to each of the well sites or bring the untreated water from each of the deep wells to a point where we can blend it with the shallow well water before it enters into the

distribution system.

Q. What are the pros and cons, if you will, associated with the blending option?

A. The blending option has the advantage of having lower cost for the production of the water because we're not pumping it from so deep a depth. The disadvantage of it is that having taken a look at the geology of the area we don't feel that under most of DeKalb it's possible to generate very much shallow well water. The formations that we need just aren't present.

Taking a look at the geology over a wider area we find that the Troy bedrock valley is immediately to the west of the community and that valley with the sands and gravel formations that are supposed to be in it looks to be our best opportunity for developing shallow well supplies of large quantity.

Q. With respect to the blending option, are there any unresolved issues with respect to

that alternative?

A. Because the Troy valley is outside the City limits we have the problem of gaining accessibility to various properties. Many times when we're drilling wells we use properties that are supplied -- either they're already owned by the City or they're supplied by developers for that use.

Going outside the City we'll have to obtain drilling rights from private property owners, and we also have to look at having to extend water mains and potentially sanitary sewers out to those well sites in order to be able to provide the treatment and then disposal of the treatment waste.

Q. With respect to the treatment waste, what by-product is realized through the blending option?

A. The shallow wells generally have a high amount of iron and manganese in them, and as results you end up with a water that may comply with water quality standards but

aesthetically it's not desirable because it can stain laundry and it turns orange after it stands for awhile. To prevent this, with the shallow wells we generally have to filter the iron out by oxidizing the iron first to put it in a solid state and then passing it through gravel medium, sand medium or charcoal in order to be able to remove that -- the solids and the iron.

That creates an iron sludge that then has to be disposed of, and we will probably have to have permission from the DeKalb Sanitary District in order to be able to connect to their system for the disposal of that iron residue.

Q. With respect to the treatment options, would you please describe what is involved with the treatment option alternatives.

A. We looked at various options for treatment. We considered ion exchange using conventional resins such as people have in their homes. We considered resins that were

weak acid and strong acid so that we wouldn't have to add sodium to the water supply.

We also considered reverse osmosis and other more experimental processes. We dropped back to using ion exchange for the purposes of our study because it was the least cost alternative for complying with the standards. We also took a look at different ways of trying to minimize the cost. Because we have nine wells we end up with it being very costly. We don't have all our water coming from one location, so we took a look at using centralized treatment where we would bring all of the raw water from all the wells to a central point, treat the water and then redistribute it throughout the system.

We looked at using regional water treatment plants where we could tie three or four of each of the wells together so that we could try and minimize the number of

water treatment plants. But again, we had to bring in raw water from each of the well sites and then redistribute it back into the system.

And then finally we looked at individual treatment plants at each of the well sites. That minimizes the feeder mains that we have to run around town and try and get the water back to where it belongs.

Q. What are the advantages and disadvantages with respect to each of the treatment options you just outlined?

A. With the centralized treatment the main problem is having the feed -- bring all the water from the different wells. The wells are scattered throughout the community, and as a result our feeder main construction gets very large. We have a great deal of length to put in.

Then we also have to -- because we brought all the water to one point we have to bring it back out and be able to

distribute it into the system so then we have to end up putting some reinforcing mains in the community in order to properly distribute the water, and that drives up our costs.

With the regional treatment we ran into similar but not as bad problems as far as putting in the feeder mains. In the individual, what we run in to there is the fact that we would have nine water treatment plants to have to maintain which is a fairly substantial number and would require additional staffing to do so.

Q. With respect to the treatment options you outlined, are there any unresolved issues with respect to any of those options?

A. We again will have to have permission from the sanitary district in order to be able to discharge the wastes into their sanitary sewer system. With using ion exchange we'll be discharging a salt brine to the sanitary sewer just as the home softeners do. We

have discussed this issue with the sanitary district and they on a preliminary basis have said that they will consider allowing us to make those discharges but that we also will be charged as an industrial wastewater discharger to be able to do so, and that cost was about 60 cents per hundred cubic feet of waste.

Q. Have you tendered what the estimated cost would be if the blending option is selected?

A. Yes. Using reasonable assumptions as to the number of wells that we would need for the blending and the location of those wells, we project that the cost for the shallow well blending option is about $9 million.

Q. And length of time it would take to construct the necessary improvements for that option is what?

A. We project that it will take about a year to do the exploratory work, to locate the best locations for those wells, to purchase or get options on the property that we need to

be able to build the treatment facilities and construct the wells and likely another two years in order to be able to go through design, get IEPA permits and then actually complete the construction of those facilities and the water mains, bringing the water back into town, so we're looking at about a total of three years to achieve that goal.

Q. Have you determined the estimated cost associated with each individual treatment option you outlined?

A. Yes. It was hoped that by bringing everything to one location that we could cut down our costs, but we found that the feeder main construction really made this option very expensive, and it was to provide a centralized treatment plant we're looking at a cost of $12.1 million.

To provide a regional facilities -- three to four regional facilities and feeding the wells to those locations, we're

looking at a cost of approximately $7.4 million, and for individual treatment plants at each of the well sites we're projecting a cost of approximately $6.8 million.

Q. Now, with respect to each cost that you outlined for the various options, the blending and the treatment options, in addition to those estimates do we then have to include the costs charged by the sanitary district for the treatment of various by-products under those options?

A. Yes. I have not included operational costs in those numbers. Those are just straight capital costs.

Q. What is the annual estimated cost associated with the disposal of the by-product under the blending option?

A. Brine disposal for this option we project will be approximately $27,000 per year. We also have the purchase of salt on an annual basis which is expected to be in the neighborhood of $75,000 per year.

Q. With respect to the treatment options and the disposal of that by-product, what are the estimated annual costs of that?

A. Excuse me? Oh, okay. The disposal of the sludge -- the ion exchange creates about two to four times as much residue as does iron removal, so our costs for disposal of the iron removal sludges should be in the range of 10 to $15,000 per year. There would be no salt costs in this case.

Q. In examining the length of time it would take to construct the necessary improvements for each treatment option, how much time would be needed to reach the central, regional and individual treatment options?

A. We're estimating that for the centralized treatment we're probably looking at a three-year time frame. For individualized treatments we're probably in the range of at least two years to achieve compliance and it could possibly be three years because of the number of facilities that we would be

attempting to construct.

Q. As part of your professional assistance to the City of DeKalb, have you been involved with preparing a report on the City of DeKalb's potable water supply needs to the year 2010?

A. Yes, I have.

(Petitioners Exhibit No. 7 was marked for identification.)

Q. Mr. Thomas, I'll hand you what's been labeled at the time Petitioner's Exhibit No. 7 and ask you if you recognize that document.

A. Yes, I do.

Q. And what is that document?

A. This is the July 24th, 1996 copy of the water system planning and computer model update for the City of DeKalb.

Q. Was that the study that I referenced of DeKalb's water supply needs to the year 2010?

A. Yes, it is.

Q. And is it in a final or draft form?

A. It is still in a draft form subject to review by the staff and by the City Council.

Q. And did you prepare this document?

A. Yes, I did.

Q. And is the information contained in that document true and accurate to the best of your knowledge?

A. Yes, it is.

Q. Within the document itself what information is contained that relates to the City's efforts to reach compliance with the existing combined radium 226 and 228 standards?

A. This report focuses on meeting the quantity requirements of the City but it also looks at the impacts of the different options on the radium levels in the water system. For instance, we took a look at using some existing deep wells that are owned by an industry and took a look at the cost of bringing those on-line and using them in the

system, but at the same time we point out that those wells would not do anything to reduce the radium concentration in the City's water supply because they would be anticipated to have the same amount of radium as the existing wells that are nearby.

Q. And are you familiar with the City's plan in existing water main extensions and existing and proposed well sites?

A. Yes, I am.

(Petitioner's Exhibit Nos. 8 and 9 were marked for identification.)

Q. Mr. Thomas, I'll show you what's been labeled at this point in time Petitioner's Exhibits No. 8 and 9 and ask you if you recognize those.

A. Yes, I do.

Q. And how is it that you recognize those documents?

A. These documents were prepared under my direction.

Q. And what's been labeled Petitioner's Exhibits No. 8 and 9, are they also pictorially represented in the same fashion up here?

A. Yes, they are.

MR. MATEKAITIS: By here I'm indicating to an easel.

MS. FRANK: Thank you.

Q. With respect to the proposed extension of City water mains and specifically with proposed well sites, tank and well sites, would you please describe where they are and why they are located as proposed on Exhibit No. 9.

A. On this particular exhibit we're looking at the extensions of mains beyond the current limits of the water distribution system. We've identified potential locations for wells if it works out that way. One location is over in the southeast corner of the community where we're looking at a commercial industrial area in the potential

that we would either place a ground level reservoir or an elevated tank down in that corner.

That site could potentially act as a well supply site. If there is a well located there it will very likely have to be a deep well, and if we use a deep well there and we are to comply with the 5 picocuries per liter we would have to provide softening at that site.

We are also showing another ground level reservoir and well in the northeast corner of the community near the airport. Again, if there is to be a well located at that location it would likely have to be a deep well and subject to treatment to meet the 5 picocuries per liter if that's necessary.

Then we're also showing on this exhibit the approximate boundaries of the Troy bedrock aquifer. They're shown in green on the exhibit. As you can see, the

centerline of the bedrock valley is west of Nelson Road, and the eastern boundary of it comes pretty much along the western boundary of the community. It's in that area that we're hoping to be able to explore and to be able to develop some shallow well water supplies.

And in that location we've shown a proposed well and water tank, but I'd like to point out that we anticipate that if that area is productive that we would end up having multiple wells throughout that area and very likely having centralized or regional treatment plants that would feed two or three wells to each one.

Q. Mr. Thomas, Mr. Ewart, Counsel for the IEPA, had asked a previous witness for the City if he was aware of whether or not the City has existing capacity to service the extension of proposed water mains to service the proposed projects and new users contained within Paragraph 35 of the City's petition.

Specifically then with respect to that, does the City have sufficient capacity to meet the needs of the intended new users and water main extensions as contained within Paragraph 35 of the City's petition?

A. Yes, it does. What we have right now and it's shown on Exhibit 1 of the report is that running the wells eleven hours per day we can meet the average daily demand and have excess capacity. On peak days, however, the demand of the community exceeds the production of the existing wells during that eleven hours. So the community has the option and has done so in the past when it needed to, was operating the wells into the electrical demand period or using the generators to operate the wells so that the production of water can continue beyond the normal eleven-hour period and thereby meeting the peak day demand.

So we have plenty of water, but what we want to continue to do is to be able

to stay within the eleven hours, and that's why we're looking at additional supply wells in order to be able to maintain the use of that lower electric rate.

Q. Mr. Thomas, one of the items of previous witnesses for the City has testified to related to the City's efforts in reducing the amount of radium within its existing water supply by reducing the pumping in wells 4 and 6 where the highest concentration of radium is found.

Do you have any information with respect to the volume differential that was used in reducing the number or the amount of radium contained within the public water supply by reducing the pumping in wells 4 and 6?

A. Yes, I do.

Q. And what is that information, please.

A. This is for well No. 4. In 1990 well No. 4 produced on an annual basis 123,501,000 gallons of water. In 1995 the production

from this well was 90,433,000 gallons.

Q. For a net reduction of?

A. About 33 million gallons per year.

Q. With respect to well No. 6, what are the figures for that well?

A. In 1990 well No. 6 produced 123,800 -- excuse me, 123,813,000 gallons. In 1995 well No. 6 produced 111,398,000 gallons for a reduction of approximately 22 million gallons.

Q. With respect to the information contained in Petitioner's Exhibit 8 and 9, is that information true and accurate to the best of your knowledge?

A. Yes, it is.

Q. And does the information presented on Exhibits 8 and 9 fairly and accurately portray the information contained therein?

A. Yes.

Q. Finally, Mr. Thomas, with respect to the petition that the City has filed in this instant matter, could you comment upon

whether or not the City is seeking a variance from the radium standards themselves or rather they're requesting a variance from the standards for issuance and from restricted status.

A. The City in its petition is not requesting a variance from the radium standards. It is requesting a variance from the 35 Illinois Administrative Code 602.105 B, standards for issuance, and 602.106 B, restrictive status. These two provisions deal with the Illinois Pollution Control Board placing the City of DeKalb on restricted status and not allowing the further extension of its water mains until the community achieves compliance.

Q. So regardless of whether or not the City's petition is granted in this case before the Pollution Control Board, will the City of DeKalb still be subject to the standard of 5 picocuries per liter?

A. Yes.

MR. MATEKAITIS: I have no further questions of this witness at this time.

MS. FRANK: Mr. Ewart?

CROSS EXAMINATION

BY MR. EWART:

Q. Mr. Thomas, have you had occasion to analyze the water in the Troy bedrock valley?

A. We have not done any exploration in that bedrock valley at this point. We have researched all the available information from the Illinois geological survey and from the water survey.

Q. You've not taken any samples for radium analysis?

A. No, not from the shallow wells. We have not had the experience of ever finding radium in shallow well water.

Q. How about for iron and manganese.

A. As I said earlier, I would fully anticipate finding fairly high levels of iron and manganese thereby requiring its removal. I would be very surprised if we found it to be

low.

Q. Mr. Thomas, with regard to the information you provided on well No. 4 and well No. 6 in the DeKalb systems which are currently being operated, are there plans to further reduce the levels of pumpage from well No. 4 and well No. 6?

A. They currently have the wells at the very bottom of their matrix so that they are the last two wells called for. I'm not aware of any plans beyond that at this time to reduce their usage below that.

Q. Is there any way that the system could be operated by not using well No. 4 and well No. 6?

A. I think that question would be better directed at Mr. Bever.

MR. EWART: Fine. I will withdraw that question and call Mr. Bever as my witness if there's no objection.

MR. MATEKAITIS: No objection.

MR. EWART: At a later time, of

course. I have no further questions.

MS. FRANK: Is there any redirect?

MR. MATEKAITIS: Briefly, thank you.

REDIRECT EXAMINATION

BY MR. MATEKAITIS:

Q. Mr. Thomas, have you calculated the estimated costs to sink a test well to determine capacity and water quality in the Troy bedrock valley assuming the logistics of securing a site are worked up?

A. Do you want the cost for one or do you want the entire program?

Q. One.

A. For the construction of one test well in the Troy valley we would be looking at a cost in the neighborhood of 30 to $40,000.

Q. Is that the complete cost associated with the determining capacity and water quality for a single well?

A. We were anticipating doing an entire analysis of the Troy valley or a thorough one so that we could judge that it could

produce the amount of water that we're looking for. To do a complete well site evaluation of the Troy valley we're looking at a cost in the neighborhood of $320,000.

Q. And in your opinion is that the type of testing that should be done in order to complete and determine whether or not that source will satisfy the City of DeKalb's needs both with respect to quantity and quality of supply?

A. Yes. Because of the capital improvements that are necessary and the commitment to purchase the property it's important to know that you're going to get the quantity of water that you anticipated.

MR. MATEKAITIS: No further questions.

MS. FRANK: Mr. Ewart, is there anything else?

MR. EWART: I have no further questions of this witness.

MR. MATEKAITIS: Then at this time I would ask for admission of Petitioner's

Exhibits 7, 8 and 9.

MS. FRANK: Is there any objection?

MR. EWART: No objection.

MS. FRANK: Okay, then Petitioner's Exhibits 7, 8 and 9 are admitted. Before you call your next witness, I'd like to know if there are any members of the public who for any reason need to leave and would like to make a statement on the record at this time. Okay, then you may continue.

MR. MATEKAITIS: Thank you. I would call Ken Bowden, please.

KENNETH BOWDEN,

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

DIRECT EXAMINATION

BY MR. MATEKAITIS:

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

A. Kenneth L. Bowden, B-o-w-d-e-n.

Q. And what is your current occupation?

A. I teach at Northern Illinois University in

the department of geography.

Q. Did you have occasion to serve on an ad hoc citizens committee regarding the City of DeKalb's water supply system beginning in November of 1991?

A. Yes, I did.

Q. And in what capacity did you serve on that committee?

A. I was the chairman.

Q. What did you understand the charge of that committee to be?

A. First of all we were advisory to the City Council and the City Council sought -- was seeking our advice and recommendations concerning how to best meet the water quality standards for our drinking water supply.

Q. And did the committee in your estimation carry out that charge?

A. Yes, we did.

Q. And did the committee submit a final report containing its findings and recommendations?

A. Yes, we did, in November of '92.

(Petitioner's Exhibit No. 10 was marked for identification.)

Q. I'll show you what's been labeled as Petitioner's Exhibit No. 10 at this point in time and ask you if you recognize that document.

A. Yes, I do.

Q. And what is that document?

A. This is the report that we submitted to the City Council where I -- as chairman I had written it up and submitted it on behalf of the water quality committee.

Q. And to the best of your knowledge is that report accepted and approved by the City Council?

A. Yes, it was.

MR. MATEKAITIS: I have no further questions.

MS. FRANK: Mr. Ewart?

MR. EWART: Can we have a minute to read the report?

MS. FRANK: Certainly. Do you want to take a five-minute break?

MR. EWART: Yes, thank you.

MS. FRANK: Why don't we come back at 3:10, 3:15.

(A recess was taken at 3:00 p.m. and proceedings resumed at 3:08 p.m.)

MS. FRANK: Let's go back on the record.

CROSS EXAMINATION

BY MR. EWART:

Q. Mr. Bowden, as chair of this committee you had a fairly diverse group of recommendations. Is it not true that you had two that recommended 5 picocuries per liter, four that recommended to go with the federal standard if it became accepted and three who recommended to treat to the level of 10 picocuries per liter? Is that not accurate?

A. That is an accurate representation. I tried to represent in the report the difference in

opinion that existed there, and I think when the City Council appointed the committee they assured that there would be a diversity of opinion.

Q. Now, did you -- later in your report you talk about public notice or public information, public education sessions. What, if anything, has been done with regard to those sessions?

A. I was reading this report over anticipating coming here, and I thought that was one of the areas where we obviously failed. We did have a fact sheet that we handed out at Earth Day celebration that included not only a discussion of the committee's recommendations but also if people were still anxious about the safety of the water, some alternatives that they could explore on the individual basis. Even though we didn't recommend them we felt that we should make them aware of it.

We also handed out similar

information, I believe, at a City function called the Barbed Wire Fest (phonetic), so there were a couple activities like that, plus I think two different appearances on a local radio program called Party Line discussing the recommended drinking water after this report had been handed out.

Q. Mr. Bowden, with regard to incidence or your recommendation of use of bottled water in home treatment and/or home treatment for people who personally feel that the level of radium is too high, are you -- is your committee -- are you or your committee aware of the incidents in use of bottled water and/or treatment in this community?

A. In this community some people do use bottled water but I couldn't give you any particular information about it.

Q. Is there -- I briefly read this, but is there a reverse osmosis treatment system that's available?

A. No. There were one or two members of the

committee that were advocating it. I strongly feel the -- well, I'll back off and say a majority of the committee, and I concurred with them, felt that the City probably should not get in the water business of having reverse osmosis unit available, but that was one of the things that was discussed and we included it in the report for the council to consider.

Q. Was this a small volume of reverse osmosis for retail use or something?

A. I think there were several people who were concerned of any radium in the water, much less exceeding the 5 picocuries per liter, and the intent was to have a centralized -- they were proposing having a centralized small reverse osmosis unit where the people could come and pick up the bottled water and take it home. There was some feeling they were already paying for their water supply, the City should supply it. The committee -- ad hoc committee did not recommend that per

se.

Q. What, if anything, did this committee do with regard to the recommendation on the high radium wells that exist in this City?

A. We were the ones that recommended that the use of the high radium wells be passed on and that the lower radium wells be the prime source of the water supply. We also looked at the idea of going out to the Troy river valley. These were a couple of the recommendations.

I'm not sure. We may have gotten the reduction in use of high radium wells coming in as testimony to the committee, but we were certainly sympathetic to it. We did encourage the City to explore the shallow aquifers out in the Troy river valley recognizing some uncertainty there, plus you're trading contamination, because with the shallow aquifers you run a greater risk of herbicide and fertilizer contamination from surface sources.

MR. EWART: Thank you. I really don't have any more questions of this witness.

MS. FRANK: Is there any redirect?

MR. MATEKAITIS: No redirect.

MS. FRANK: I have a question, Mr. Bowden. In looking -- kind of glancing through it in the time that we had, we noticed that you talk about daughter, each daughter of radium. Can you explain that term.

THE WITNESS: There are two separate radioactive isotopes. Basically the radium is coming from uranium or thorium so they often are referred to as daughters and sons.

MS. FRANK: That's fine, thank you.

MR. MATEKAITIS: I would simply ask at this time the admission of Exhibit No. 10 of the Petitioner's.

MR. EWART: I have no objection.

MS. FRANK: Okay, then it's admitted. Please call your next witness.

MR. MATEKAITIS: Call Mark Biernacki.

MARK BIERNACKI,

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

DIRECT EXAMINATION

BY MR. MATEKAITIS:

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

A. Mark T. Biernacki, B-i-e-r-n-a-c-k-i.

Q. What is your occupation, Mr. Biernacki?

A. I'm the director of the City's planning and development department.

Q. And how long have you been employed in that capacity?

A. Since April of 1989.

Q. As part of the responsibility of your position, do you have occasion from time to time to make estimations as to the population that will result from new residential development?

A. Yes, I do.

Q. And did you make such an estimation as to the population that will result from the

residential projects listed in Paragraph 35 in the City of DeKalb's petition?

A. Yes, I did.

Q. And what parameters did you use in making your estimations?

A. My department receives and processes all development inquiries and proposals including residential proposals. This responsibility allows us to confidently estimate the expected number of new dwelling units to be constructed within the City of DeKalb's city limits. In this instance within the next five years we estimate approximately 805 new dwellings to be constructed. From this number then we can estimate the expected populations to be residing within these new dwellings.

Q. And what is the estimated number of persons that would be served and therefore adversely effected over the next five years if the City's variance request is denied?

A. With these 805 new dwellings to be expected

to be constructed and using a population coefficient of 2.8 persons per dwelling unit, which is a coefficient I have drawn from data following the 1990 census, using this information it is our estimation that the number of persons to be served by this expected residential development to equal 2265 new persons.

Q. And as part of the responsibilities of your position, do you have occasion from time to time to make estimations as to the fiscal or economic impact residential, commercial and industrial development has on the City of DeKalb?

A. Yes, I do.

Q. And did you make such an estimation as to the fiscal and economic impact on the City that would result if the projects listed in Paragraph 35 of the City's petition that will be developed over the next five years because water mains could not be extended to serve such developments?

A. Yes, I did.

Q. And what were the parameters for those estimations?

A. Parameters I used are found in a variety of nationally recognized publications in the field of fiscal and economic impact analysis and also in the locally prepared document entitled Development Trends Under Fiscal Impacts which I authored.

Q. And were the revenue estimations that you came up with based upon any standard?

A. These standards were found in the documents I just previously mentioned and in a variety of local data which include construction values, governmental budgets, tax rates, employment figures and the like.

(Petitioner's Exhibit No. 11 was marked for identification.)

Q. I'll show you at this time what's been labeled Petitioner's Exhibit No. 11 and ask you if you recognize that document.

A. Yes, I do.

Q. And what is that document?

A. It is a memorandum to you, City attorney, that outlines the fiscal and economic impact.

Q. Associated with the City's variance request?

A. That is correct.

Q. And did you prepare that document?

A. Yes, I did.

Q. And is that document contained in your population of revenue estimates that you just testified regarding?

A. Yes, it does (sic).

Q. What would be the estimated financial impact upon the City?

A. For purposes of classifying financial impact I split it into two groupings; fiscal impact, that being impacts to local government agencies, and also economic impact, obviously impacts to the local economy.

With respect to fiscal impact, the impact is a result of the EPA restricted

list, would prevent the construction of 805 new dwellings that I previously mentioned, approximately 850,000 square feet of new commercial development and approximately 990,000 square feet of new industrial development.

If they make it to the development it would result in the following fiscal impact: Property tax to the area's local governmental agencies would amount to $3.65 million annually, again, to all taxing districts, of which 240,000 would accrue to the City of DeKalb. Sales tax revenues would amount to $3.2 million annually of which 2.8 million would accrue to the City of DeKalb, and the balance to the DeKalb County Government. And then third, utility tax would amount to $140,000 annually to the City of DeKalb.

The second part of the financial impact is the economic impact, again, impacts the overall local economy, and it is

our estimation that this pending new construction would see approximately $135 million of new construction value along with hundreds of construction jobs, approximately $160 million in gross annual retail sales activity, and approximately 2200 permanent jobs employed by the proposed new commercial and industrial development.

Q. With respect to the projects listed in Paragraph 35 of the City's petition, are there projects listed within that paragraph for which you are unable to calculate population fiscal and economic impacts?

A. That is correct.

Q. And the reason for that would be what?

A. These are initial inquiries of those proposing to perform these developments. The specifics of their projects are not yet known to the City of DeKalb; hence, specific revenue impacts, fiscal impact analysis cannot be performed.

Q. So if any of those developments were to come

in fruition, would that add to the population and revenue impact and fiscal impact which you have testified to?

A. Yes, it would.

Q. And is the information contained in Petitioner's Exhibit No. 11 true and accurate to the best of your knowledge?

A. Yes, it is.

MR. MATEKAITIS: I have no further questions of this witness at this time.

MR. EWART: I just have one question, Mr. Biernacki.

CROSS EXAMINATION

BY MR. EWART:

Q. You mentioned that the construction of the 805 new dwelling units will create an estimated 2200 permanent jobs.

A. No, 2265 new residents would reside in those homes. The construction of the new commercial and industrial development, which is the 850,000 square feet commercial, the 990,000 square feet of industrial, those

figures combined we would estimate would provide jobs to 2200 people.

MR. EWART: Okay, thank you. I have no further questions.

MR. MATEKAITIS: No redirect. I'd ask for admission of Petitioner's Exhibit No. 11.

MR. EWART: No objection.

MS. FRANK: Okay, then Petitioner's Exhibit No. 11 is entered into evidence.

MR. MATEKAITIS: I would call Dr. Rowland.

ROBERT ROWLAND,

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

DIRECT EXAMINATION

BY MR. MATEKAITIS:

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

A. Robert E. Rowland, R-o-w-l-a-n-d.

Q. And in what capacity are you currently employed, Dr. Rowland?

A. I retired from Argonne National Laboratory in 1983. I still am called back to work at Argonne so I am an employee on a part-time basis there and I do private consulting work.

Q. Would you describe your professional education and your relevant work history.

A. Education, I have a Ph.D. in radiation biology from the University of Rochester, New York, and a master's in business education from the University of Chicago.

I started work at Argonne in 1950, and ever since that date I have been involved with one aspect or another of the radium problem, how to measure radium in people, how to evaluate the effects, how to find them, and how to bring them to the laboratory and to be able to measure their body content of radium.

Q. With respect to your work experience at Argonne specifically, what positions did you hold at that facility?

A. I entered as an associate physicist in 1950. I was ultimately promoted to a senior physicist in, oh, I don't remember the date. I left Argonne in 1962 for a two-year period during which I obtained a Ph.D. in radiation biology.

I returned to Argonne as associate director of my division which was called the radiological physics division. In 1967 I became director of that division. In 1967 I also was named director for the Center for Human Radiobiology which was formed at that time to encompass and take care of all the people in the United States known to have internally deposited radium.

I held the position of division director and as director of the Center of Human Radiobiology until 1981 when I was promoted to associate laboratory director for biology in medicine. I retired in 1983.

(Petitioner's Exhibit No. 12 was

marked for identification.)

Q. Doctor, I'll show you what's been labeled at the current time as Petitioner's Exhibit No. 12 and ask you if you recognize that document.

A. This is a summary of my work and educational experience which I prepared myself. Yes, I recognize it.

Q. And is the information contained in that professional resume and work history true and accurate to the best of your knowledge?

A. To the best of my knowledge, it is.

Q. With respect to professional publications, have you had occasion to submit and have published professional publications as it relates to radium and health risks associated with radium?

A. Yes, I have.

Q. And would you estimate the approximate number of those publications.

A. I have somewhere between 50 and 60 refereed publications that have appeared in the

scientific literature and I have published one book on the effects of radium in humans.

MR. MATEKAITIS: At this time I would ask that Dr. Rowland be admitted and acknowledged as an expert in the matters to which he will testify today.

MR. EWART: I have no objection.

MS. FRANK: Do you want to ask any questions?

MR. EWART: No, I don't.

MS. FRANK: Okay, then Mr. Rowland is admitted as an expert in the field.

MR. MATEKAITIS: Thank you.

Dr. Rowland, obviously we're here today because of one word that keeps appearing over and over again. Could you please describe what radium is.

A. There are a number of ways to tackle that question. Let me simply say that radium, as previously mentioned, is a daughter of uranium 238. Uranium 238 is spread very

uniformly across the globe. One of its daughter products that is born by subsequent decays is radium 226 which is characterized by a half-life of 1,600 years.

Radium is remarkably uniformly distributed throughout our environment. Let me illustrate that by saying that we can look up in an encyclopedia and learn that there's about a half to one type of curie of radium per gram of soil, but put it in a different unit, all soil, whether it be our front yard, our garden, the farm fields or what have you, contains radium and many other radioactive materials naturally occurring.

You can take a handful of your garden soil. Let's take a quantity we're all familiar with like an ounce, 16 ounces to a pound. We can hold an ounce of soil in our hand. In that ounce of soil there are approximately 21 picocuries of radium 226.

Now, picocurie or any word using

curie is a measure of what we call activity, and it's really a measure of the number of decays of the isotope per unit time. And so whenever I speak of picocurie or microcurie or curie, I'm talking about an activity which has to do with disintegrations per unit time.

Now, in that handful of soil I have 21 picocuries of radium 226. I have approximately the same number of picocuries of uranium 238, thorium 232, two more very long lived natural radioactive materials. There is -- are also an unfamiliar isotope present called rubidium 87. There will be about 56 picocuries of rubidium 87 in that handful of soil.

But the most common, the most prevalent material in my handful of garden soil is an isotope of potassium identified as potassium 40, and there is something like -- I scratched this number out before coming out here, 336 picocuries of potassium

40 in the soil as compared to the 21 picocuries of radium 226.

I think it answers your question by saying that one radium and many other isotopes are extremely uniformly distributed throughout our world. As a consequence they appear in our food stuffs because we grow our food stuffs in soil. They occur in the meat we eat because the cattle and sheep graze on the grass that's grown on the soil, so radium is truly with us at all times in all ways, whether it be on the tabletop or in my body. There is lots of radium around.

Q. With respect to the presence of radium in different foods, are you familiar with the level of radium that would be present in, say, different varieties of nuts?

A. I would say that if you go to a cocktail party and eat one of my favorite nuts, a Brazil nut, which normally has a concentration of somewhere near a thousand

picocuries per gram, you'll be getting more radium ingested from that one nut than you will in drinking water all year long.

Q. With respect to radium's presence in water supplies, what is the source of radium in water supplies?

A. The source is the uniformly distributed isotope radium 238 which is leached in the deep aquifers that we're referring to from the rocks down below, and it is present on a fairly constant uniform basis; that is, the samples taken year in and year out from the deep aquifers seem to run at about the same level of the daughter product radium per liter of water.

Q. And are you familiar with the various risk models that are employed to determine health risks associated with radium in drinking water?

A. I am familiar with a number of such models and I have published other models myself.

Q. Specifically with respect to the model

employed by the United States Environmental Protection Agency, are you familiar with that model?

A. I'm familiar with the model that appeared in the Federal Register dated July 18th, 1991 in which were proposed the new radium 226 and 228 maximum contaminant levels for the radium isotopes.

Q. Do you have an opinion with respect to the model employed by the US EPA as to any strengths or weaknesses associated with that approach?

A. As long as the Federal EPA is bound and determined to stick to a linear nonthreshold model, that model that I referred to published in the Federal Register has at least been modified so that it recognizes: One, that radium does not induce leukemia in populations that drink the water; two, it has been modified so that the risk approximates what is seen at very, very low levels of intake. So yes, I'm familiar with

that, and I don't believe it's valid, but it's perhaps the best that's available to work with.

Q. Notwithstanding your questions regarding the reliability of that model, have you determined what the potential health risks are associated with the City of DeKalb's variance request utilizing the projected population numbers of 2265 and the last weighted average for the full year for combined radium of 7.3?

A. If I take those two numbers, the population and the concentration of radium in the water, I apply the lifetime risks that I'm referring to and then divide to find the risks for a five-year period and I assume two liters of water ingested per day, I have calculated a risk of radium induced malignancies in a five-year period.

Q. And what is that figure?

A. The figure is 0.006.

MS. BURG: In how many people? How

many people are you talking?

MS. FRANK: I'm sorry, but you're not allowed to ask questions from the audience. This is much like a court proceeding, so I'm going to ask you to be quiet, please.

Q. So Doctor, could you put that in layman's, laywoman's terms, if you will, what the potential health risks then are associated for the period of the variance.

A. For the period of the variance for five years for the stated population of 2,265, there is no such thing as .006 malignancies. Malignancies come in integers. There will be either zero or one or two radium induced malignancies. I happen to believe that the best number is zero.

Q. You indicated you're familiar with various approaches in assessing the health risks associated with radium and drinking water. Have you devised your own approach to determine health risks associated with

radium drinking water?

A. Yes, I have.

Q. And would you please describe what that approach is and the basis for that approach.

A. I will present at a meeting to be held in France next month my own analysis, perhaps the final analysis, from the US Radium Studies, and I will differ from previous models in that I will not accept a linear nonthreshold model, nor will I accept my previous models which postulated the risks equivalent or dependent upon the square of the dose or the intake.

In fact, I have now come to a position of believing that there actually exists a threshold. Below this threshold I do not believe radium can or will induce any malignancies. Above this threshold the risk increases very, very rapidly, and anyone ingesting more than the threshold will probably see a 30-percent chance of

developing a radiation induced malignancy.

Q. What is the professional and scientific basis for your approach, if you would? What forms the basis of this new approach?

A. We have studied at Argonne some 2,283 people who have acquired radium and have come to the laboratory and allow us to make a measurement of how much remains in their body.

Now, these people got their radium in many different -- from many different sources. Some were chemists working to extract radium from basic raw materials. Others were patients of physicians who in the 1920s saw radium as a wonder drug and would give series of intravenous injections of radium for a number of illnesses. It worked fairly well for high blood pressure. It was used for arthritis. It was used for a number of reasons, and obviously now the -- that source has disappeared.

But our best group of patients

were those primarily young ladies who entered what was considered to be an excellent profession, that of painting the dials and hands of radium dial watches and clocks and other items that for one reason or another would glow in the dark so you could see them, whether it was a pull shade on a curtain or something like that.

Now, we were able to obtain a population of 1,530 such women, all of whom painted and entered the industry, I'll say, entered the industry before 1950. Many more entered the industry after that date, but by 1950 if we cut there, then we have about 40 years of experience at least on all of them. So we have 1530 young women average age 20 who worked between the years 1913 and 19 -- started finally in 1949.

That's our ideal population because they're all alike in terms of age. They all happen to be white, and we know a lot about the standard population of white

females in our country, so we know the expected rate of malignancy and alike.

Now, from that population we have found that if we consider the radium to have been ingested, no one who ingested less than 500 microcuries of radium ever developed a radium induced malignancy. Greater than 500 microcuries of radium ingested, many such malignancies were observed.

To give you some relative numbers, there were 126 of those ladies who ingested more than 500 microcuries and they experienced 46 bone sarcomas. The remainder of the 1530 showed no bone sarcomas, so it's a very sharp and distinct cutoff, and it's very hard to put a linear relationship which goes through zero and goes up all the way through a set of data like that.

Q. How many picocuries equal a single microcurie?

A. One million.

Q. Based upon the risk model that you've

described that you will present next month, have you determined the health risks associated with the City of DeKalb's variance request for the period of variance given the population numbers previously stated as well as the weighted average of 7.3 for combined radium?

A. I have.

Q. And what is that number?

A. Zero.

Q. How long would someone have to consume -- for what period of time would someone have to consume the level of radium contained in DeKalb's water before they would exceed that threshold?

A. The number is, I stated earlier, in the thousands of years. It probably is in the tens of thousands of years at two liters per day.

Q. I don't want to oversimplify or mischaracterize your testimony, but do I understand you to say that based upon your

professional experience, education and training that your opinion is that the City of DeKalb's radium level for the period of the variance poses a zero health risk to the users that will be serviced by that variance?

A. It is my opinion based on the model I am presenting in France next month that that risk was zero. You realize that's not far different from the risk of 0.006 that has been calculated from the EPA risk estimate, but I'm coming flat out and saying I believe it's zero.

Q. Is that risk you described applicable to all users or only new users?

A. That's applicable only to the new users.

(Petitioner's Exhibit No. 13 was marked for identification.)

Q. Dr. Rowland, I'll hand you what's been labeled at the current time Petitioner's Exhibit No. 13 and ask you if you recognize that document.

A. Yes, I do.

Q. And how is it that you recognize that document?

A. I received a copy of this document by Federal Express this morning.

Q. And have you had time to review its contents?

A. Yes, I have.

Q. And are you familiar with the author of this document?

A. I know Richard Toohey quite well. He worked for me in the Center of Human Radiobiology for a number of years and is now working at Oak Ridge.

Q. And with respect to the document listed as Petitioner's Exhibit No. 13, do you have a professional opinion as to the remarks and opinions contained therein by Dr. Toohey?

A. Yes, I do. I find he's prepared a well-crafted document which I approve wholeheartedly.

MR. MATEKAITIS: I have no further

questions of this witness at this time.

MS. FRANK: Before we continue, there are copies of Mr. Toohey's written statement that are sitting right here on the table for members of the public if people are interested. Maybe we could set it on that empty chair back there and people can take them. I'd ask that a couple people share because I don't think we have enough for the entire audience, but there are several. I think we have at least 30 copies that are available.

Mr. Ewart, you may continue.

CROSS EXAMINATION

BY MR. EWART:

Q. Dr. Rowland, with regard to the over 2,000 people that you reviewed in Argonne who acquired radium from various sources, what level -- what was the lowest level of radium in their blood for any of those people who experienced a carcinoma?

A. Most, I think all but one, had at least

enough radium in their blood so that it was greater than an ingestion of 500 microcuries of radium. We had one case of a small boy who when we calculated his intake gave a much lower intake of -- than the number I quoted.

Q. Do you recall what that was?

A. I don't recall what the intake level was. Perhaps you can remind me.

Q. 60?

A. Sounds reasonable.

Q. With regard to the model used by US EPA, the linear no threshold model, you stated that you didn't consider it valid. My question to you would be in terms of -- could you define it in terms of stringency or nonstringencies? The more stringent the error or the validity or is it less stringent?

A. Depends upon what we mean by stringent, but I think what you're driving at is if we take the EPA model it increases the risk of

radium, and in that sense it errors in the direction of safety.

Q. So by using this model even with your -- in your opinion with the errors and flaws in it and using it on a national basis it would error on the side of safety.

A. That is absolutely correct.

MR. EWART: Thank you very much. I have no further questions.

MR. MATEKAITIS: Just brief redirect.

REDIRECT EXAMINATION

BY MR. MATEKAITIS:

Q. And again, Dr. Rowland, utilizing even the US EPA's LNT model, what would be the estimated health risks associated with the stated population for the period of variance?

A. 0.006 radium induced malignancies in five years.

MR. MATEKAITIS: I have nothing further of this witness and would ask for admission of Exhibit Nos. 12 and 13.

MS. FRANK: Is there an objection?

MR. EWART: I have no objection.

MS. FRANK: Okay. Exhibits 12 and 13 are admitted into evidence.

I do you have one question, Dr. Rowland, as to the studies at Argonne. Were any of the people within the study people where the ingestion was by water?

THE WITNESS: Yes, but perhaps not the kind of water you're talking about. Well, give me a few minutes to expand on that. Radium was sold as bottled water over the counter in the 1920s and '30s, and you could buy a bottle containing something like 60 milliliters, which is not a very large quantity of water, containing two microcuries or two million picocuries of radium.

If one was to take a bottle a day year in and year out for general good health -- and let me also go on to say that the EPA questioned directly regarding the

young boy who apparently had a very low level of acquired radium and developed a malignancy. He and his brother and his mother were given a bottle of radium water to drink at breakfast every day. We calculate how much radium was taken in by measuring the body burden. We don't get to see these people until they've carried this radium for 20, 30, 40, 50 years, but eventually we get to see them. It's still there in their body and we can measure it.

Then we use what's called a retention curve to go back in time and say if they have this much so many years after they acquired it, how much did they get at the time of acquisition? And we did this for the seven-year-old boy and we got this value I suggested was 60 microcuries.

Interestingly enough his brother two years older when measured had twice that quantity, and his mother had even more, and what this represents we think but cannot

prove is that our model of retention in the body works very well for people who are close to being adult and haven't obtained full size and musculature and weight of their bones.

The children turnover their bones very rapidly because they have to increase their length, they have to increase their diameter, and increasing the diameter they enlarge the cavity inside of a long bone; that is, they turnover their bones very rapidly and we think the seven-year-old subject eliminated much more radium than his nine-year-old brother, and hence, our estimate of what is erroneously low.

We've also found the same thing when we've looked at the children born of dial painters when they were conceived in utero while the mother was still painting. Most of them have no radium. Now, we know full well that radium crosses the placental barrier very, very easy,

almost as if it were placid, so that we know that the child grew bones from his mother's calcium and we assume he deposited radium at the same rate.

But a newborn baby grows very rapidly and the bones turnover so rapidly that there's probably none left of the original fetal bone by the time the child is eight or ten years old. So we're not surprised to find no radium in children born or I should say conceived while the mother was still ingesting radium as a dial painter.

MS. FRANK: Are there any other questions for this witness?

MR. EWART: No, not at this time.

MS. FRANK: Okay.

MR. MATEKAITIS: The Petitioner would rest at this time.

MS. FRANK: Okay. Thank you, Dr. Rowland. Mr. Ewart, you may call your first witness.

MR. EWART: Thank you, Miss Hearing Officer. At this time I would call my one witness, and that is Tracey Virgin.

TRACEY VIRGIN,

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

DIRECT EXAMINATION

BY MR. EWART:

Q. Would you please state your name and spell your last name for the record.

A. My name is Tracey Virgin, spelled V-i-r-g-i-n.

Q. And what is your place of employment?

A. I am employed with the Illinois Environmental Protection Agency.

Q. At what location?

A. At 2200 Churchill Road in Springfield, Illinois.

Q. And what length of time have you been employed there?

A. I have been with the Agency for eight years.

Q. And what are your responsibilities?

A. I review and conduct risk assessment, human risk assessment, environmental risk assessment. I review toxicology data and I review superfund documents.

Q. Are you familiar with the current literature on the health effects of radium?

A. Yes, I am.

Q. Could you briefly, very briefly, identify one or two documents that you've reviewed in the past week or so.

A. I have reviewed some studies, Canadian studies, Philippian studies, toxicological profiles. I have reviewed the Federal Register documents on the proposed lymphoceles for radium and the Agency for Toxic Substance and Disease Registry toxicological profile on radium and some Canadian studies. Those are all that I can recall at the time that I've reviewed the last couple of weeks.

Q. Would you please state for the record what your education as a toxicologist is.

A. I have a bachelor of science in biology from Southern Illinois University and a master of public health and environmental health from Yale University.

Q. When did you do your master at Yale?

A. I graduated in 1986.

Q. What was the subject matter of your master's thesis -- your master's program, rather?

A. It was environmental health.

MR. EWART: At this time, Miss Hearing Officer, I offer this witness as an expert in the field of radium.

MS. FRANK: Are there any questions or objections?

MR. MATEKAITIS: No questions or objections.

MS. FRANK: Okay, then Miss Virgin is qualified as an expert.

Q. Miss Virgin, are you familiar with the drinking water standards for radium that have been promulgated by US EPA and also those that have been proposed?

A. Yes, I am.

Q. Would you describe how these current standards were derived.

A. Well, the current standard is set at 5 picocuries per liter for radium 228 and 226 combined, and how US EPA set that, they use what's called a dosimetric approach which means that they look at a lot of different studies, both human studies and animal studies, and combine them into one model which is then used to predict risks from several radionuclides.

And they have reanalyzed the data that they used to set the 5 picocuries. Most of the data that was used came from radium dial painters, mainly from those studies, and the original model that they used had some flaws with it. It didn't predict some things well. They found that the observations didn't meet the predictions. They went back and reanalyzed this data and made some corrections to this

model, and their prediction or the new standard now is set at 20 picocuries per liter for radium 228 and 20 for radium 226.

Q. With regard to the new standard, first of all, just state for the record what the new proposed standard for radium is.

A. It's 20 picocuries per liter for radium 226 and 20 picocuries for radium 228.

Q. And how is this standard derived in a fashion that was different from the 5 picocuries combined schedule?

A. Well, they reanalyzed the radium dial painter studies. Mainly they found that the previous model had underestimated the amount of radium that was ingested by the radium dial painters.

Q. Is that the only study that was looked at?

A. That was the main study.

Q. Miss Virgin, you were here during the testimony of Dr. Rowland.

A. Yes, I was.

Q. In your review of your toxicological

research, what, if anything, would you find regarding the lowest total intake level of radium that was associated with a malignancy?

A. Using Dr. Rowland's level of -- his level of 100 microcuries and making the assumption that a person would drink two liters of water per day for a 70-year lifetime here in DeKalb and using the 13.7 picocuries per liter as the maximum amount of radium that was found in DeKalb's water supply, that is equivalent to 0.7 microcuries lifetime intake of radium. It's about 143 times lower than Dr. Rowland's threshold of 100 microcuries.

And also I did a quick calculation. Someone had asked a question previously, how many liters of water in how many years it would take to reach that level. Well, that comes out to over 36 million liters of water or 49,995 years.

Q. So in summary it would take approximately

50,000 years to ingest that amount of water at two liters per day to reach the level of 100 microcuries in the body.

A. Yes, correct.

MR. EWART: I don't have any further questions of this witness.

MR. MATEKAITIS: Thank you.

CROSS EXAMINATION

BY MR. MATEKAITIS:

Q. Miss Virgin, are you familiar with the standards that are being proposed by the US EPA with respect to radium?

A. Yes, I am.

Q. And do you have any information that would suggest that the US EPA is considering or would recommend a standard of lower than the existing standard of 5 -- combined 5 picocuries per liter?

A. No, I do not. I've talked with a few people at US EPA and they indicate that that will -- the 20 will be the proposed standard, and the time frame on that is more

a question rather than the number.

Q. Now, the current is a combined standard. The total of each individual isotope cannot exceed 5 picocuries per liter; is that correct?

A. Correct.

Q. And the proposed standard, as you understand it, will be 20 for each individual isotope.

A. Correct.

Q. Now, drawing your attention to Petitioner's Exhibit No. 2 which has been admitted into evidence, entitled radium analysis, 1990 and 1995, in reviewing the samples of each isotope of each well in each year, is there any sampling period from any well for either isotope wherein the level would exceed the proposed standard of 20 picocuries per liter for the individual isotope?

A. No, all the sample results are below 20.

Q. In fact, all the sample results for the individual isotopes are all below ten; is that correct?

A. Yes, for the individual isotopes they're below ten.

Q. Have you had occasion prior to today to review the written testimony of Dr. Toohey as submitted in Petitioner's Exhibit No. 13?

A. Yes, I have.

Q. And do you have a professional opinion as to the remarks and conclusions contained therein by Dr. Toohey as to their reliability or accuracy in those opinions?

A. I think Dr. Toohey did an accurate job of summarizing the information that's known about radium and US EPA's position on the proposed standard of 20 picocuries.

Q. And then hearing the testimony of Dr. Rowland as presented before the Hearing Officer today, do you have any professional basis to disagree with the conclusions of Dr. Rowland regarding the potential health risks associated with the new users population of 2265 for the period of variance?

A. No, I do not disagree with Dr. Rowland.

MR. MATEKAITIS: I have no further questions.

MS. FRANK: Mr. Ewart?

MR. EWART: Just one quick question with regard to the timing of the proposed standard.

REDIRECT EXAMINATION

BY MR. EWART:

Q. Have you had occasion recently to be in contact with US EPA, particularly US EPA hot line, to determine what the status of the proposed regulation is for radium 226 and 228?

A. Yes, I have, and they indicated that they will be coming out with a time frame for the promulgation October -- I believe it's October 21st of this year.

MR. EWART: Thank you very much.

MS. FRANK: Can we go off the record for a second.

(A discussion was held off the

record.)

MS. FRANK: Mr. Ewart, you may continue.

MR. EWART: I have no further questions of this witness nor do I have any other witness to present before this proceeding.

MS. FRANK: Mr. Matekaitis?

MR. MATEKAITIS: Just one question on recross.

RECROSS EXAMINATION

BY MR. MATEKAITIS:

Q. Miss Virgin, do you have any -- strike that.

In your professional opinion do you believe that the US EPA will promulgate and issue the standards that you referred to as 20 per -- picocuries per liter for each individual isotope within the period of the requested variance?

A. Yes, I believe they will.

MR. MATEKAITIS: Nothing further.

MS. FRANK: Okay. Mr. Ewart, then do

you have any further witnesses?

MR. EWART: No, I do not.

MS. FRANK: Mr. Matekaitis?

MR. MATEKAITIS: No.

MS. FRANK: What I'd like to do now then is break until about 4:20, that's ten minutes. We will come back at that point and begin statements from members of the public. We'll turn it over first to the two attorneys who are here representing the citizens groups. I believe they have some introductions they would like to make and then we'll begin from there.

Again, if there are any members of the public that need to leave for any reason, you need to make that clear so you can come forward in the first group and make your statement on the record before you leave. Thank you.

(A recess was taken at 4:08 p.m. and proceedings resumed at 4:21 p.m.)

MS. FRANK: At this point both sides

have rested. The Board's procedural rules require that I make a statement about witness credibility, and I found all witnesses to be credible.

We are going to begin the public participation portion of the hearing as I stated right before the break. We will start with the attorneys for the citizens group. I believe they had an introduction that they would like to make, and from there we will take interested members of the public.

People will need to come forward, be sworn and state your name and spell your last name for the record and for our court reporter. I ask that everybody speak slowly and clearly if we -- we may have to remind you of that, but our court reporter needs to get all of what you have to say.

The other thing I'd like to remind everyone of is that if you have a written statement that written statements are

entered into the record as if read. There is no reason to read word for word your entire written statement. What you can do is summarize your written statement and then admit it into the record and the Pollution Control Board will then review the document as a whole.

So that said I invite the attorneys to come forward and state their names and make appearances on behalf of their citizens groups.

MR. HITE: Again, this is going to start maybe a firework show. I'm only going to light the fuse. If there are people -- we have maybe an hour, hour and a half of presentation we'd like to give straight through. If anyone wants to make a presentation that doesn't have an hour and a half to wait around, please interrupt me now.

MS. FRANK: And also, in between each of the people you're going to have speak I

am willing to allow people who are not members of the citizens group to come forward if for any reason they need to leave.

MR. HITE: I understand that too.

ATTORNEY JUDSON HITE,

being first duly sworn, testified as follows:

MS. FRANK: You need to state your name and spell your last name for the record.

MR. HITE: My name is Judson Hite, H-i-t-e. I'm a lawyer with Altheimer and Gray in Chicago. I'm representing four individuals on a pro bono basis that are citizens of DeKalb.

MS. FRANK: Just a moment. Can everyone in the back hear? No. You need to speak into your microphone, please.

MR. HITE: Again, my name is Judson Hite, H-i-t-e. I work for the law firm of Altheimer and Gray from Chicago. I'm representing on a pro bono basis four

individuals: Miguel Checa, we heard from earlier; Jeff Houghtby, we also heard from earlier; Linda Lahey and Margaret Zonca, and on their behalf citizens called Citizens Advocacy Network which is a nonpartisan organization trying to increase public awareness and participation of DeKalb politics.

I along with another attorney, Ellen Partridge, who you will also hear from this afternoon on behalf of our clients tried to intervene in these proceedings, and the Board ruled that there was no such status in a variance proceeding for citizens to participate in this -- in this proceeding as partisans.

We welcome the opportunity to make our public statement, but I want to address what our clients' concerns are. They believe that there is a significant issue with the safety of DeKalb's water supply. They don't know if it's safe or it's

unsafe. They don't know what the appropriate standard is. But more importantly, they feel they've been denied the opportunity to participate in the public discourse of this product.

They did not deny their intervention status in this proceeding which may or may not be valuable, but moreover, more importantly, they feel from the City's perspective they've been cut off, uninformed and not really given an opportunity to understand what the issue is and help participate and develop a practical solution.

Ultimately what they are seeking in these issues is a commitment from the City that there will be a forum that they can participate meaningfully in and that this issue will be addressed as an issue. It won't be something that's dealt with on a committee basis where there's not full disclosure, where there's not full

understanding, but all that want to be informed of what the problem is. And moreover, they want the City to dedicate itself to implement a compliance schedule with real practical results.

Briefly what I want to do is just summarize what you're going to hear for the next hour and a half. Basically the overview of the presentation is going to discuss the history of noncompliance with DeKalb's water supply system, the health effects or the concerns regarding health effects with radium ingestion and the issue of costs necessary to put the system into compliance and other costs being expended by the City and by citizens to deal with water problems.

Briefly, the history of noncompliance, it's our understanding that from 1979 the City knew its alpha standards were in such a level that it should have conducted investigations into, you know,

specific radionuclides and started to inform the public of what the problems were.

We know that in 1991 is the first time that the City disclosed publicly, that's 12 years after the City should have known, that there was a radionuclide problem.

Secondly, the nine wells that DeKalb operates, five have consistently failed to meet the current and enforceable Illinois and Federal standard of 5 picocuries per liter. Two of the wells have failed five of the last six years and the other two wells have failed half of the time, so overall for the last six years the majority of the water supply, at least as measured from the wells, nine different wells have exceeded Federal and Illinois enforcement standards by twice the regular standard.

We have no information concerning what the finished water supply might be to

people in their homes. It's possible, for instance, that the sludge or accumulated deposits in the piping system of which there are over now 107 miles may also tend to concentrate radium particles and possibly release them. We have no information on that.

Finally, with respect to noncompliance, there was a 1991 variance granted to the City that had 12 specific requirements for the City to obtain. They failed with respect to seven of them. There is a compliance report that was required within I believe 18 months showing how the City would -- the City was to investigate and then to prepare reports summarizing how it obtained compliance in the shortest practical time, but in no event later than June 26th of 1995 with this 5 picocurie per liter standard.

This report was not prepared. Secondly, this report was not submitted to

IEPA. Thirdly, there were no permits applied for with respect to construction of the equipment to install the changes that would be required to obtain compliance. There were no bids solicited for performance of this construction.

Finally and fifthly there was no completion of construction by June 26th of 1995. Sixthly, under the variance there was a requirement that users of the system be notified that the City was granted a variance in 1991. With respect to the notices that we've reviewed there is no indication that the users were ever given that notification. They were notified that the water system didn't comply. There was no indication in the water bills that indicates that the City was indeed granted this variance in 1991.

And then finally, seventhly, there was absolutely no compliance obtained with the 5 picocurie per liter standard, so with

respect to the 12 different actual requirements that the City was obligated to meet in 1991, it didn't meet seven of them. I don't see how this demonstrates compliance or good faith efforts and therefore we should then continue to grant its variance.

Secondly with respect to health effects, great issue has been made of the fact five years ago the US EPA proposed to raise the standards for radium from 5 to 20 picocuries individually with the radium 228 and 226, but in point of fact, the last 20 years the 5 picocuries per liter has been the standard. It remains the standard today. There's no indication for sure that this 20 picocuries per liter standard is, in fact, ever going to be enacted. There's just a lot of innuendo.

Secondly, well, possibly as a reason thereof we've heard from a very convincing expert that there is no risk associated with the 5, possibly even the 20

picocurie per liter standard; however, there are other experts who disagree who present evidence that indeed there are issues associated possibly with long-term exposure, with childhood exposure, overexposure for pregnant women. In fact, possibly some of this material might be thought over-persistent, that our people are going to present more evidence on that than I am able to summarize.

And then finally with respect to costs, we've heard information that the City estimates it would cost between 6 and $12 million to upgrade its system to obtain compliance with this 5 picocurie per liter standard, and then in turn in incurring this cost it may be downright ridiculous in so far as if the 20 standard were adopted such expenses would be necessary.

It also -- the City also claims it has spent $30,000 in the last five years complying with the 1991 variance. That sum

doesn't appear to be a very significant sum with respect to the possibility of whether a life may be lost or that one cancer may have been induced. $30,000 to the high of $12 million seems to be a relatively paltry sum. Moreover, $30,000 is a small sum compared to the fact that the City has exposed itself to litigation for having not complied over this five-year time period with the actual enforceable standard.

And then finally under cost, the City claims that to be denied this variance would be an arbitrary unreasonable hardship. However, we haven't really been given any dollars or indication to show what types of hardships the City's really going to incur. We had some information indicating that $376,800 in tax revenues might be lost in the City; however, we don't have associated -- we don't have a balance against those potential costs of approximately --

MS. FRANK: Mr. Hite, you're going too fast. I don't think our court reporter got the last thing you said. You need to slow down a little bit.

MR. HITE: We had some evidence presented that $376,800 of lost tax revenues would be lost by the City if its variance were denied; however, what we don't have balancing those costs are the costs associated with what the City expended in increasing in the five years that the variance has been in effect from, I believe its 90 linear miles to 107 linear miles, the size of its distribution system. I don't know if that is a year, $12 million, what it would cost to construct equipment that would clearly meet the standard, but it's something that should be addressed.

And then moreover, there are costs associated with people. There was an indication that people might drink bottled water. Well, maybe more than just some

people drink bottled water. If you take as an estimate there are 38,000 residents in DeKalb and maybe half of them drink water or maybe the cost associated with that water on one matchbook, you know, is $728 per year. Maybe it's 130. Take the low end, $130 per year for somebody to drink bottled water. If only half the residents of DeKalb drink bottled water, that's $2 1/2 million per year the people are already expending to get better water.

And I guess finally what I want to say now is I don't know if the City's ever looked into finding alternative funding mechanisms to help pay for these costs to make a system that meets the current enforceable standards. I'm done.

MS. FRANK: Thank you. I just remind everyone it was very hard I think for Miss Vaske to follow Mr. Hite. It's really important that our court reporter get what you're saying, so speaking slowly and

clearly into the microphone is important, and I may have to interrupt people. I'm not doing it out of disrespect. It's to make sure we get everything on the record. Do you guys now have an order of witnesses?

MR. HITE: Yeah, people will just come up to the microphone if that's all right.

MS. FRANK: That's fine. Okay, thank you.

DORY BURG,

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

MS. FRANK: You need to state your name and spell your last name.

MS. BURG: Dory Burg, B-u-r-g, and I have the county statistics. I didn't bring the book up here but I have the statistics that I published out of the county statistics to show that in our female children age 5 to 14 we have a rate per hundred thousand of nine bone cancers in that population of children. And if you

take the model per hundred thousand of that population for the state you will have .6.

Our female children in this county in the grade school time up until seventh grade from kindergarten have a 15 times greater bone cancer rate in this county than in the entire rest of the state.

MS. FRANK: Ms. Burg, I need to remind you to talk to our court reporter.

MS. BURG: Okay, thank you.

Now, what that means is that's for one year. There are nine per 100,000 in this county. The five years of the variance, that's nine times five is 45. In the 20 years of the law, that's times 20. Nine times 20 is 180. 180 per this county population of our children who are at the three times to five times greater risk.

For the entire State of Illinois the rate -- if you force that model as Toohey has said before, Dr. Toohey has forced a model on another model. If you

force the model of the 10 picocuries in our county and you force that on the population of the state, instead of the six and if you have nine for -- it's .6 and if you have nine the rate at our county that you would find over the time of the variance there would be 1440 female children. That is quite a big number. That's almost the number in our county of that population of child.

Now, what I have here is a talk but what I'm going to start with is something that I mentioned before, the City of DeKalb's water report. I found it on the shelf of the library, and the reason I looked for this was because at the last hearing in 1991 Dr. Toohey spoke to the public and he said that everybody was in compliance, that Miss Bennett, the compliance monitor for the Pollution Control Board said that we were in total compliance. Dr. Toohey spoke off the

record --

MS. FRANK: Ms. Burg, the issues -- you need to confine your remarks to the issues in this variance.

MS. BURG: Yes, okay.

MS. FRANK: We are not revisiting the prior granted variance, so Mr. Toohey's remarks in the prior hearings are not really relevant.

MS. BURG: I'm just saying that he told us the reasons why -- he told us some interesting things. He told us that our City was not in compliance. He showed us in his book. He showed the public here in this courtroom off the record. In his book he said, your City is not in compliance. I said, why do you say that our City can have more cancer when we already have a lot of cancer, and he said -- I really don't believe this either, but he said, somebody has to write these reports. I'm not the only one that writes things that I don't

believe.

And he showed me and the other people in the room that were with him that our City did not have the right dates to meet compliance, and I went to look for that, and I could not find it. We asked him, where do we find this information? He said, your City must have it. So I went to the City of DeKalb water district and I went and I looked among the books and I couldn't find it.

I called Dorothy Bennett in Springfield and she gave me the test dates with her signature on it. I will present that here. Dorothy Bennett has given us the fact that -- and I found this report here that we gave the wrong data to exempt us from public notification in 1979. In 1980 the federal regulations stated very clearly that we were to begin -- all states were to be in compliance sampling of four quarterly samples by 1979 in June.

We were to have four quarterly samples by June of 1980. We did not have those four quarterly samples. The state was to take those samples. I have the -- the state has shipped me. I have on the floor there a huge amount of documents that they xeroxed overnight for me and sent them overnight mail so I could bring them to this hearing. I have taken the two most important ones out and I am going to submit them. It's from the DeKalb water report. I have xeroxed a page where it says, and I will read it to you. They have a printout of all of the wells and they state, and this is signed by all the alder people and the mayor.

It says in this report, "With respect to radiation, DeKalb status is again moderately uncertain as with barium. Gross beta readings fall well below concentration, but one gross alpha reading falls below the stated maximum, but a secondary requirement

states that whenever gross alpha exceeds" -- this is in the law, the Federal Register. It is current now. It has not changed. "Whenever gross alpha exceeds 5 picocuries per liter additional testing for specific radionuclides is necessary," and that means radium.

On that basis six of the nine wells would require additional tests.

MS. FRANK: Ms. Burg, you need to slow down a little bit and speak to our court reporter. I don't think she's -- we want to make sure she gets it all.

MS. BURG: "All of the above requirements for radiation are imposed by the federal government under the Safe Drinking Water Act. The State of Illinois has not yet adopted any radiation standards and is not equipped to make radiation tests. We believe the state will not do so until 1979 at the earliest. We believe" -- this is the last sentence. "We believe the

significance of the present radiation criteria," that is the law, "should be minimized for three reasons. The first, No. 1, current standards might be changed."

This is dated February '79. The standard has not changed in 20 years. The document states that. The standard has not changed. And when I did some research and I called the US EPA, I have the documents they have sent me. They have said that there have been many rumors by our state to blow off, I don't know a better word for it, but to minimize the Safe Drinking Water Act and the Safe Air Act, the Clean Air Act.

And one of the ways in which they do this is to hold hearings at which people have no intervention status. That means as a public you are dependent on the state's recommendation to you. And when the state does that through water reports and through pressure, through peer pressure and through all the different ways that the state makes

the pressure, it does not give you the right information.

When I called this last time for this last hearing, I got the information that I was allowed to intervene. That means I was allowed to come and represent my children at this hearing.

MS. FRANK: Ms. Burg, the information you received was that you may file a motion to intervene, not that you would be allowed to intervene. There's a distinction there.

MS. BURG: Well, what I asked for is I said I would like -- and I asked the state EPA and the Pollution Control Board, Dorothy Gunn, Marie Tipsord (phonetic), I asked Deb Frank, and I said, I would like to represent the interests of our four children at this hearing that is coming up, their health concerns. We have two grown children who grew up on this water. I would like to represent their interest because we were not told from 1979 until 1991 that there was

radiation and radium in this water, and I said I would like to make sure that at this hearing I get to cross examine the people that said it was okay to have that and find out what is their expertise. Did they know all about radiation when they told us that we could have it for 12 more years at that level of risk to our children? And I was told that the only way I may represent my children at this hearing is to hire a lawyer or is to have a lawyer to intervene for me.

MS. FRANK: No, what you were told was that you may file a motion for intervention, and I specifically talked to you, and we had a discussion that you could do that on your own, that you did not have to be represented by counsel.

MS. BURG: Yes, but I said I would like to represent my children, and I was told that I may represent nobody but myself unless a lawyer files for me, and I said, because I would like to represent my

children I would have to have a lawyer? And so I hired a lawyer and I was walked through the process of intervention. I was given the books. I was told by Deb Frank, look at page -- look at Page 30 and Page 3 where it says intervention, and it was in subsection -- I'm not sure, it's C or F, and so I went through the process.

It took me a long time. There was a paragraph this long on what kind of paper I was to use, and Deb Frank was as kind as to tell me it was okay if I just used, you know, as recycled paper as I could find, that they would waive all of these requirements for me.

And the recommendation that came back from the state after we went through this process was signed by Mr. Ewart. It said there is no -- the recommendation is denied on the basis of that there is no intervention status for citizens.

Now, what happens to that is I

called the Federal EPA and I asked them what happened, and they said that our City and the cities that have not met the federal standard are currently in violation of federal standards that are enforceable. Any person in this state, any person in this country may and often does sue a city that is not in compliance for drinking water standards for safety.

We are in jeopardy of paying more money than we would like to, than we would pay of the biggest treatment problem if anybody sues for these problems. The EPA has given me documents. I had intended fully to present them all to the City. I want the City to see what we have collected. We have collected data from the US EPA to say that the US EPA has told the State of Illinois in the '70s and '80s, you may not write the kind of variances you are writing because you are only writing construction variances when you must have

compliance, and you must have compliance by certain date with federal requirements.

And the State of Illinois -- and I was told by Charles Bell on the telephone and many of you will recognize his name. I was told by -- I have all the notes from each person and when I spoke with them, that I was told that the State of Illinois decided that it would not follow the federal guidelines. It would not have variances. They would not give the proper variances. The variance was for compliance with the federal standard by a certain time. In that time we must have all the compliance done.

What happens here in this hearing is graphically described in the conversation with Dr. Toohey and Mr. Matekaitis at the last hearing. When Mr. Matekaitis asks, he is so good as to ask the real questions to Dr. Toohey.

MR. EWART: Excuse me, Miss Hearing Officer. Could we refocus and could you

restate the issues that are to be addressed at this hearing.

MS. BURG: I have comments that were denied --

MS. FRANK: Ms. Burg, please let Mr. Ewart finish.

MR. EWART: The concern as you stated, Miss Hearing Officer, is with regard to this present proceeding that was filed in --

MS. BURG: Can --

MS. FRANK: Ms. Burg.

MR. EWART: These conversations that she's had with Mr. Bell and Miss Bennett --

MS. BURG: This is from the hearing.

MR. EWART: -- are all in regard to the past variance proceeding --

MS. BURG: They're in regard to now, the present.

MR. EWART: -- and therefore are not relevant. I would hope that the Hearing Officer could remind the citizen witness that the relevant material is in with regard

to the four corners of this current proceeding.

MS. FRANK: Ms. Burg, the testimony of Dr. Toohey from the past variance proceeding is not a part of this record. Any comments you have about his past testimony are not relevant to our proceeding.

MS. BURG: May I use the testimony for his present one that you have given out?

MS. FRANK: Yes, you may.

MS. BURG: I will speak to that then. In Dr. Toohey's testimony Dr. Toohey says that we will force a model on a population that already has significant extra cancers. We have very significant extra cancers. He is only granting us two kinds that we may speak to. According to Dr. Toohey we may only speak to cancers of the bone and cancers of the head. Those include cancers that make -- of all the soft tissue cancers, the ones that make you blind, the ones that cause deafness, the ones that cause breakage

of the jaws of the tooth at the gum line. I will speak to those kind.

He has said that according to his best information that what the Federal Register has said about the aggregate dose level is not so. He has said that we may measure a population at a small risk for a very rare cancer against itself in a population. When they set the 5 standard they set it because in order to find the small amount of risk of the extra people you must measure that population against another population that does not include that population so that the small -- really small numbers don't get lost in the shuffle. Those small numbers are our children.

Now, when we say that we have 15 times the bone cancer rate in this state, that does not include the leukemia rate, it does not include all the things that according to the studies that I have here from the IIEQ, it is a very most prestigious

organization in the world, it was the environmental quality -- it has page after page of all the government agencies, and scientific organizations in the world that were in its reference.

It says that in Argonne studies they have found many different exposures of low level radiations. I'll explain a few of them, but what Toohey has done is he has taken our population --

MS. FRANK: Ms. Burg.

MS. BURG: -- already at risk for bone cancers at 15 times the rate and said that we -- says that we may have more. Not only more but we may have -- if the rate rises from 5 picocuries per liter of combined radium to 24 each, 20 times two is 40, we may have 40 instead of five. And at his linear, he used the linear equation to calculate that we would get that much times less. Well, the multiplication tables work for us too. We may be denied many things,

but we may also -- we may not be denied the multiplication tables, and we may know that when we have cancer risks in our population, bone or whatever, and our children are dying and our population is -- has enough. We may say to whoever says we may have more that they can keep those.

Now, Baxter and Woodman, our City did a wonderful job, I believe, with the information that we had. We had very little information. We were told standards were going up. Well, to us in this community standards going up is a very important thing. We have high standards here so when we hear that we think that standards are really going up. Well, the standard that was going up was the amount of picocuries per liter for radium in our drinking water. It was going up by possibly eight times.

The reason it was going up, this is according to the US EPA, and I have the documents here and I will bring them out and

I will show you. I may not read them I'm told, but I will summarize them. The documents are from Region 5. They tell us that because our state took a head count of cities that could not come into compliance, with no one speaking up many people didn't know for a long time they had the right to speak up; that we were told that we may not -- that we will be -- what's the word? We were told that the -- Federal EPA was told that the State of Illinois could not possibly meet these levels and that we needed the amount of radiation in general raised, and the Federal EPA says, well, you wrote a lot of variances that wouldn't -- this kind of variance hearing does not allow people to speak up or bring their risks. The federal government says, you must consider the risk of this population.

Every single one of those variance hearings that I have read, I have read the little Village of Oswego. All the people

came out. The first person who spoke said to Tracey -- well, the first person who spoke said, my mother and father died of bone cancer. I called his family. I spoke with his children and his wife. He was at work. He was a real person. His wife said that he had -- his mother and father had died of bone cancer. Many people spoke that that was a population that did not want any more bone cancer. They did not want the variance. They wanted their City to do the few things they could to clean up the water. They were denied and we are denied our right to intervene, but our officials are so kind as to give us the time to speak, and that says a lot for our officials.

The important thing to remember here is that we have a problem. One of the things Baxter and Woodman was so kind to do, and Mr. Bowden, was to bring a man named John Jensen who is from Northern Environmental to come and speak about plugs

and casings. This is something that has been used in cities. I talked to Brett Hansen (phonetic) from the Illinois EPA in Rockford, and he said that our City can use plugs and casings. He said our City drilled two extra wells into already contaminated aquifers in violation of the federal standard.

We apparently were confused about that. He said he would send Bud Lindstrom (phonetic) here to stop us, and our City said no, do not come. We were confused about what we were to do. At this point I went and I called -- we contacted a lot of people. One of the people we contacted was the company of -- was the Northern Environmentals. They were so kind as to give me this. I'd like to give it to you, the City. It is their proposal for $1,000.

This is the senior hydrologist from this company. I spoke with him at length. This man was understood that our

City would like to do the best that we could, so he said that he would come here -- here is his proposal. I'm going to give you the whole thing -- for two to three days, and he guaranteed that for $1,000 he would look at the plugs and casings. He would do the whole proposal for what we needed and every single thing, and he would guarantee his work.

MS. FRANK: Ms. Burg, that document if you want it entered into the record needs to go to the Pollution Control Board and not to the City.

MS. BURG: Okay. I don't want it entered. I would like to give it to the City later. Thank you. And I would like to read the rest of my --

MS. FRANK: If you are not going to use that document as part of the record you need to move on then.

MS. BURG: Then I have my statement. I'll just sort of skim it over.

MS. FRANK: If you could summarize your written statement. You've been speaking for almost a half an hour now and there are other people in the audience who would like a chance to speak, so if you could summarize your statement for us and we will admit it as read into the record.

MS. BURG: Thank you very much. I appreciate everybody's helpfulness. What I'd like to say about the difference between the high radiation and the low radiation, I was born in Yokohama, Japan. My parents worked for the state department. In the seven years -- my mother did the seven-year research of the Hiroshima survivors, the walking dead who died over a period of seven years. They all died, every one, with an exposure the size of a small sore. It was called a searing sore. Anyone who had the X-ray of -- anything X-rayed to them died.

My uncle is a famous psychiatrist at Tokyo University. He worked for

McArthur's Secret Army. My parents, my father, I have a picture of him. He's standing at the epicenter of the Hiroshima bomb. I want to say that what they did there is they measured the population, and what some folks are doing is they are taking this secret information -- no scientist has been able to get the first five years of that study that my mother went around and did with two doctors. Nobody is privy to that. Only certain people may have that and what is -- what few studies they have used, the radium dial studies, the poor women unsuspecting workers that got doses, high doses.

What happened is -- and the few mental patients who were injected possibly against their will. If you're a mental patient, it's hard to know if you have a will at a certain point.

MS. FRANK: Ms. Burg, you need to confine your statements to the record,

what's relevant.

MS. BURG: So the study that we are getting from certain doctors who are paid by the state are studies that use a population who has died terrible deaths. The people in Hiroshima died horrible deaths. That five years they lived with exposures they puked their guts out to die. It was a mercy for them to die.

We have used their statistics to force on a population that already has enough cancer more cancer when it is really easy. It is a very easy thing. The senior hydrologist from the world renown -- this man has been around the world for 20 years and I spoke with him. I got the feeling from him that he would never have sent me that proposal had he thought it would be part of a mudslinging or anything that was not helpful.

And so I'd like to say the last thing in closing is the difference between

the high radiation and the low radiation is the particle activity that from alpha particles are stopped by the thickness of a piece of paper. But when they are ingested they go to the organ that collects and concentrates them. That is the bone marrow. Then they are absorbed into the blood. In each cell of bone marrow what happens is they begin -- one particle activity turns the cell liquid, the water of the cell into hydrogen peroxide which breaks down the health of the cell. It breaks down the -- it breaks down the chromosomes and it breaks down the organelles of the cell.

Then the nuclear disintegrations which are stopped by a piece of paper thickness are stopped by hitting and breaking our DNA. This is going on at a consumed rate. It is concentrating in the cells. Our children are at the highest risk according to the Department of Nuclear Safety by three to five times.

We must remember when people come and are paid, that is their job, to give us more cancer. We must think for ourselves and there are very good solutions to our water problem. I hope we have given you a few today. Thank you very much.

MS. FRANK: Ms. Burg, you referred to several documents that you sort of waved around during your statement and said that you were going to enter into the record. If we could -- if you could hand those to me so we can state what they are and give a number to them and get them entered into the record, that would be very helpful.

MS. BURG: Okay, well, let's see. I would like to submit the Environmental Protection Act that is --

MS. FRANK: Ms. Burg, you don't need to enter the Act, the Board can take notice of that. They work with the Act every day and you don't need to enter that into the record.

MS. BURG: It's the first page where it says, "To establish a unified statewide program supplemented by private revenues to restore, protect and enhance the quality of the environment and to assure that adverse effects upon the environment are fully considered and" --

MS. FRANK: Ms. Burg, the Board is well aware of what the Environmental Protection Act states.

MS. BURG: Okay. I would like to give the -- okay, I would like to give a copy of our current federal law into compliance --

MS. FRANK: Again, the Board will take note of the current federal standards. The Board is well aware of the current federal standards.

MS. BURG: This is the '79. I got this from the US EPA.

MS. FRANK: Ms. Burg, you may move on to your next document.

MS. BURG: My next document, I would

like to give them -- oh, here is the county statistics. I think these are very relevant.

MS. FRANK: The county -- you're just telling me what you're entering. You've already described them for the record in your statement. The county statistics will be marked as Public Comment No. 2. The first Public Comment was the Tribune article we received earlier today.

(Public Comment Exhibit No. 2 was marked for identification.)

MS. BURG: I would like to give the recommendation by Steven Neward (phonetic) that we have no -- that we are supposed to meet the compliance with the federal standards.

MS. FRANK: That does not need to be entered into the record. The Board has copies of that.

MS. BURG: I would like to give a copy of the advisory -- Illinois Institute for

Environmental Quality, their report on radium 226 in drinking water. The documentation --

MS. FRANK: The IIEQ report will be marked as Public Comment No. 3.

(Public Comment Exhibit No. 3 was marked for identification.)

MS. FRANK: Did you have --

MS. BURG: I would like to give the well -- the well data for our City. It is the wrong data. It is signed by Dorothy Bennett. Dorothy Bennett said about this that it was a common practice --

MS. FRANK: You've already made your comments about the document. You just need to state what they are so that we can enter them into the record. This will be Public Comment No. 4.

(Public Comment Exhibit No. 4 was marked for identification.)

MS. BURG: I would like to save the rest of the documents for our City. I would

like to commend Dr. Sam Baldwin's letter from the DeKalb Clinic to our City to deny the variance.

MS. FRANK: Okay, that will be Public Comment No. 5.

(Public Comment Exhibit No. 5 was marked for identification.)

MS. FRANK: I want you to know though any document that you give to the City is not entered into the record and will not be considered by the Pollution Control Board, so it's your decision, but if you give the documents to the City the Board has no way of seeing them so they will not be considered in this proceeding. I just want you to be aware of that.

MS. BURG: Okay. Well, I think I'll take that chance that our City will do the best they can with what they have, and I thank you very much. I intend to give the rest of the documents to our City. I think they would be more important to our City,

and I thank you very much. I think everybody else knows all the other stuff, so.

MS. FRANK: All right, thank you. Again, I'd like to remind the next person that information needs to be relevant to this proceeding. You need to address your comments to our court reporter. There's a hand up in the back. Did you have a question? Please come forward. Just a moment, ma'am.

(A discussion was held off the record.)

MS. FRANK: At this point -- I'm sorry. I know we have two people up here. Ms. Burg, I need to recall you. The City has some cross examination, so you need to be available for questions. We will ask the next witnesses in just a second to come up. Ms. Burg, come on up.

Mr. Matekaitis, please begin.

MS. BURG: Can I ask you why the City

gets to cross examine me and I don't get to cross examine them.

MS. FRANK: Because that's how it's set up and that's how the Environmental Protection Act reads. If you don't want to make a public statement and be subject to cross examination you don't have to, but once you make a public statement under oath you are subject to cross examination. That's a choice you need to make when you come up.

MS. BURG: Okay, that's fine. Thank you.

MR. MATEKAITIS: Thank you.

MS. BURG: Please be fair to me.

MR. MATEKAITIS: I always am.

CROSS EXAMINATION

BY MR. MATEKAITIS:

Q. Ms. Burg, are you familiar with communication -- a written communication from Baxter and Woodman to the City's ad hoc water quality advisory committee dated

August of 1992 --

A. Yes.

Q. -- that specifically addressed --

A. Yes, plugs and casings.

MS. FRANK: We can't have both of you talking at once. She can't transcribe that.

Q. And are you aware that that written communication put forth disadvantages associated with the liner proposal that you discussed?

A. Can you say that again.

Q. Are you aware that the written communication from Baxter and Woodman that I referenced dated August of 1992, which would be ad hoc water quality advisory committee, listed the disadvantages associated with installing liners in City's wells?

A. I know that there was a difference in price of nine -- of many thousands of dollars. There was $100,000 per well for the Baxter, Woodman and for the man that is in Wisconsin

from Northern Environmental, he has offered us $10,000 if even one well needs to be redrilled, and he does not feel that looking at -- that the numbers in our wells would mean that we would really have to do a whole well.

Q. Are you specifically aware of two disadvantages stated in that communication, the first is that there is no assurance that a liner will provide a meaningful reduction in the concentration of radium in the water, furthermore the reduction will be temporary, and additionally there is a risk that the production capacity of the wells would significantly be reduced by the liner if it blocks off a zone that produces a large portion of the water that enters the well. Are you aware that that written communication contains those disadvantages?

A. I am aware that the disadvantages are some and I am also aware that the amount of plugging that you may do is per strata of

the well; that you may plug certain hot spots. I have spoken with cities that have done that. Many of the cities that were suburban cities met their compliance by putting plugs in their hot spots in the -- within the well, and what happens, the Illinois EPA did a big report on this --

MS. FRANK: Ms. Burg, you need to just confine your remarks to the question asked, and that is were you aware of the communications in the letter?

MS. BURG: I'm speaking to the communications.

MS. FRANK: But the question was not what was your reaction to the communication. The question was, were you aware of the communications in the letter?

MS. BURG: I was aware of some of them. If you let me explain I can get to that and maybe he can ask me another question.

Q. My question specifically was were you aware

of those two stated disadvantages?

A. I'm aware of some disadvantages.

Q. Thank you. Are you aware of the communication from Karen Grush, public health administrator from the DeKalb County Public Health Department, that she communicated to Mr. Naylor, a copy of the 1987 to 1991 cancer incident statistics for DeKalb County wherein she states, "Statical tests show that DeKalb County's rates of cancer are not elevated compared to statewide level."

A. Okay, that --

Q. Are you aware of that?

A. I spoke with her at length and I also --

MS. FRANK: Ms. Burg, you need to answer the question that is asked.

MS. BURG: If you're just going to use your questions to get something that is untrue, I cannot speak to them.

MS. FRANK: Ms. Burg, you may have a chance at the end to say what --

MS. BURG: Just let me answer him, okay? I will answer him this way, that the incidents of cancer is insignificant when the children get older, that --

MS. FRANK: I would ask -- Ms. Burg? Ms. Burg?

A. -- is the most significant cancer by double of the last time.

MS. FRANK: Ms. Burg, you had a chance to speak on the record and say whatever it was that you wanted to say.

MS. BURG: That's the answer.

MS. FRANK: The turn now is for the City Attorney to ask you questions. If you don't know the answer you need to just simply say that you don't --

MS. BURG: I know the answer very well.

MS. FRANK: If you do then you -- Ms. Burg, only one person can talk at once or the court reporter can't report it.

MS. BURG: Yes.

MS. FRANK: It's very important now

that you realize that you had your chance to speak and it is now time for the attorney for the City to ask you questions.

MS. BURG: And when I answer may I answer his question?

MS. FRANK: You may only answer --

MS. BURG: Okay.

MS. FRANK: You may only answer the question that is asked of you. You may not expand upon that. You may not add your commentary to it. That was what your chance was earlier today. Now you need to answer the questions that are asked of you and I am directing you to do that.

MS. BURG: Okay. I will answer the question.

Cancer is insignificant in an older population. In the younger population it is very significant according to Karen Grush whom I spoke with at length on --

MS. FRANK: Ms. Burg, that is nonresponsive to the question that was

asked.

MS. BURG: That's the best I can do.

MR. MATEKAITIS: I have no further questions.

MS. FRANK: Mr. Ewart, do you have any questions?

MR. EWART: No, I do not.

MS. FRANK: Thank you, Ms. Burg.

JESSICA BROWN,

being first duly sworn, testified as follows:

MS. FRANK: You need to state your name for us and spell your last name.

MISS BROWN: Jessica Brown, B-r-o-w-n.

MS. FRANK: Okay, then you may go ahead and make your statement.

MISS BROWN: God created us to be healthy. We want to keep it that way, so we want to keep the water good. People are dying from bad water and we don't need more people to die than have already died. We need good water, and whoever wanted to do

this is going to drink this water and not like it, so why even make it worse? So please, make it better for us.

MS. FRANK: Thank you. Are there any questions for Miss Brown? Okay, then the next witness may come forward.

LINDA LAHEY,

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

MS. FRANK: Please state your full name and spell your last name.

MS. LAHEY: My name is Linda Lahey, L-a-h-e-y. I don't have the stamina of Dory Burg so my statement will be comparatively short.

City officials state that DeKalb's drinking water is safe, but a comparison of the radium levels in our wells took federal standard shows that this is not true. The federal standards for combined radium 226 and 228 is 5 picocuries per liter. That has been stated a number of times. This

standard has remained constant since June 1977. Protection of the public is the primary aim of this standard.

The Federal Environmental Protection Agency is aware that radium 226 replaces calcium in bone and that it can lead to negative health problems. An estimated relationship -- I'm sorry, an established relationship of bone and head cancers due to ingestion of radium is well documented by Dr. Richard Toohey in his 1985 testimony before the Illinois Pollution Control Board.

For the past five years the City has acknowledged 5 picocuries per liter is a dangerous level of radium in DeKalb's water. This acknowledgment on the back of your water bills states, "A dose of 5 picocuries per liter may result in the development of bone cancer in a small portion of the population."

DeKalb's nine deep wells have

radium levels that range from 5 to 14 picocuries per liter. Three wells have levels of 10 or more picocuries per liter, twice the federal standard. Four wells range from 6 to 9. At no time were more than two of the nine wells in line with the federal standard.

I do have a transparency. Is it all right if I read what's on it?

MS. FRANK: That's fine. Are you going to enter the transparency then into the record?

MS. LAHEY: Yes, I'll read it in.

MS. FRANK: Okay, but are you also going to give us a hard copy?

MS. LAHEY: Yes.

MS. FRANK: Okay.

MS. LAHEY: The following is a general description of what happens in the body once radium is ingested. This information is taken from the background documents on radium and drinking water by the Illinois

Department of Nuclear Safety. As a DeKalb child drinks his or her morning orange juice reconstituted with tap water, the absorption of radium begins in the intestines. In a vested state where this is the first intake of the day the gastrointestinal transfer may be greater.

The ingested radium passes from the gastrointestinal tract into the blood and then to soft tissue bone surfaces, compact or outside bone and calcium outside bone. The unabsorbed radium is excreted. This is just the beginning because the acquired radium is absorbed to the blood and either excreted or redistributed in tissues. Roughly 20 to 30 percent is transferred from the gut to the blood. About 20 percent of the radium reaching the blood is believed transferred to bone. As much as 4 to 6 percent of radium intake from the blood reaches the skeleton. The remaining radium is distributed throughout

the soft tissue.

A long-term health study on the effects of radium in our water has never been done in DeKalb. The City could have initiated a system to gather health information five years ago relating to the 10 picocuries in our drinking water. There are numerous health risks from radium other than bone cancer which -- many of which are not being monitored by federal regulatory agencies.

In a report from the Childhood Cancer Research Institute, Concord, Massachusetts, Dr. Seth Tooler (phonetic) finds that, "Besides bone cancer radium has also been found to be associated with anemia, cataracts, fractured teeth and cancers of the paranasal sinuses and the mastoid air cells. Both are cavities in the head bones." These are the head cancers referred to earlier.

Radium breaks down the radon gas

which exits the body from the lungs, mouth and nose. This passage of radon gas irradiates the sinuses rendering the person susceptible to head cancer. Experts on radon and radium 226 refer to these activities.

In the Federal Register, September 1986, which I will attach, Dr. Tooler further explains, "As a contributor to radiation exposure radium is a particular concern for its effects on children and fetuses." Attached is a summary of studies prepared by the Childhood Cancer Research Institute along with Dr. Tooler's complete statement.

World renown scientists and biostatistician Dr. Rosalie Bertel (phonetic), president of the International Institute of Concern for Public Health in Ontario, Canada has submitted a statement attached along with her credentials. Dr. Bertel comments, "Radium is stored in

the bone marrow. It is well documented to cause bone cancer, leukemia and congenital malformations. It can harm the placenta and contaminate an embryo or fetus. Water is also added to infant formula and is basic to cooking most foods."

Dr. Bertel also states, "Radium is also likely to cause blood abnormalities, iron deficient anemia in children and mental retardation. There is epilepsy, congenital blindness and deafness and long bone malformation in those exposed in utero." Dr. Bertel believes that, "To relax the permissible levels of radium will inevitably and eventually raise the level of ill health in the population. The increase will be noticeable first in newborns."

Scientists have always agreed that it is the children who are most vulnerable to radium as they absorb it more quickly and retain it for longer periods of time. This is particularly true during the times of

rapid growth and bone formation, zero to one year and 10 to 16 years. To illustrate, the Illinois Health Department statistics for 1987 through 1991 states, DeKalb County girls age 5 to 14 years have a 15 time greater likelihood of developing bone cancer than the state average. Bone cancer is the most common primary malignancy in childhood.

This is true for the 5 to 14 year population in DeKalb County. The 21 types of cancer listed for the state in the Illinois Health Department statistics, only three types showed a higher incidence than bone cancer. Any reference to the insignificance of bone cancers appears to refer only to adults, and if this happens to you as an adult it's not very insignificant.

As I finish I will say DeKalb's continuing rapid development is bound to be reflected in a corresponding rapid

population growth of children. These children will be drinking radium in water at home and school each day. The Illinois Parent Teachers Association is on record opposing any variance allowing more radium in water. Each child is special. Each year should be special for them.

By removing radium from the drinking water DeKalb's legacy to its children will be a major contribution to their good health in the future. Not to protect our children as well as our population as a whole from radionuclides in our public water supply is a flagrant breach of the public trust in its elected municipal officials.

I feel that there's one more article that I would like to enter as evidence. This is a risk factor determined by Dr. John Goffman (phonetic), and in it he does take the risk factor for the population at the time he did this, it was 5 years ago,

so we had a population of 33,000 people over a five-year period ingesting almost -- well, he's got 9.8 picocuries per liter, not two liters, but one liter, and he did get a result of 1.86 fatal cancers produced in this population of 33,000 in the five-year period, so roughly one cancer every two and a half years, so I will enter this also.

MS. FRANK: Okay. If you want to bring -- are you finished at this time?

MS. LAHEY: Yes.

MS. FRANK: If you want to bring forward the documents you want entered we will identify them for the record and get them marked.

(Group Public Comment Exhibit No. 6 was marked for identification.)

MS. FRANK: For the record so we can identify things, Ms. Lahey has provided everything in a group so it will be marked as Group Public Comment No. 6, and it will contain the written comments of Linda Lahey;

a copy of the City of DeKalb public notice for radium; the Childhood Cancer Research Institute statement to the Illinois Pollution Control Board July 25th, 1996; a copy of the Federal Register dated September 30th, 1986; a letter from the International Institute of Concern for Public Health dated July 19th, 1996; again, a copy of the County Cancer Institute incidence from the Illinois Department of Public Health, 1987 through 1991; an article -- a group of articles actually on radiation effects; and then the final page is information from John Goffman and Rosalie Bertel regarding level of alpha radiation in DeKalb drinking water. That will all be marked as Public Comment No. 6. Is a copy of what was in the transparency part of your written comment?

MS. LAHEY: Part of my written comment.

MS. FRANK: Okay, then the Board will have that. Were there any questions for this witness? Ms. Lahey, I believe there's

some questions from the City.

CROSS EXAMINATION

BY MR. MATEKAITIS:

Q. Ms. Lahey, I believe your earliest remarks in your testimony today indicated that you had a concern that the City was not meeting the existing standard of 5 picocuries per liter; is that accurate?

A. Yes, yes, it is.

Q. And would it be fair to say that you place some faith and credence in that level as set by the US EPA?

A. It's what we have had for -- since 1977 so I believe that is what I would consider --

MS. FRANK: You need to speak in the microphone.

A. That is what I would consider the standard.

Q. And you are aware that that same agency that established the 5 picocurie per liter standard has now indicated that they are likely and will propose a 20 picocurie per liter individual standard for each isotope.

Are you aware of that?

A. I understand that's a possibility as it has been for some time.

Q. If the US EPA issues that standard and that is, in fact, adopted, will your opinion then change that since the City of DeKalb would then meet that standard?

A. No, I feel we should have more stringent standards. Additional information will follow soon and you will understand why I feel that way.

Q. And you were present during Dr. Rowland's testimony, were you not?

A. Yes.

Q. Where he indicated that his estimation using the US EPA's LNT model for health risks associated with the population to be served during the period of variance at .006 cancers. Did you hear that?

A. I did. That's why I submitted Dr. Goffman's equation there too.

Q. And Dr. Goffman's equation was based upon

the entire City of DeKalb's population; is that correct?

A. That's correct.

Q. And not in the limited population that would be served by new water main extensions to the limited period of variance; is that correct?

A. That's correct, but the same water would be going to all of us.

Q. But you understand the requested variance does not affect existing water users. It is only intended to affect new water users served by the new water main section.

A. I don't believe the water will be divided.

MS. FRANK: At this point I need to remind the members of the audience that it is not appropriate to call out and speak during these proceedings. Your chance to speak is to come forward. Additional outbursts may result in me asking people to leave the hearing. We need to get through this as quickly as possible and in a

professional and civil manner.

Q. Do you understand that the City is not seeking a variance from the radium standards themselves, only from the standards of issuance on restricted status?

A. Yes.

MR. MATEKAITIS: Okay. Nothing further.

MS. FRANK: Mr. Ewart?

MR. EWART: I have no questions of this witness.

MS. FRANK: Ms. Lahey, do you have any additional comments?

MS. LAHEY: I hope we all come to an understanding on this very soon, the federal level, the state level, very soon.

MS. FRANK: Okay, thank you. Will the next person wishing to make a statement please come forward. Sir, do you have to leave early?

MR. MIKE BROWN: No, no.

MS. FRANK: Please continue. State

your name and spell it and also be sworn by our court reporter.

MR. SANDMAN: My name is Dr. Terry D. Sandman, S-a-n-d-m-a-n.

TERRY SANDMAN,

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

MS. FRANK: You need to speak into your mike. I know it's hard for taller people.

MR. SANDMAN: I am a practicing board certified radiologist in the State of Illinois currently completing a master of public health degree in community health here at Northern Illinois University. I've been asked to make some comments concerning health effects in drinking water on humans based on available information, including current literature, and that's what I'll do.

I'll be using some overheads which essentially is a summary of what I will be saying, so I'll essentially be entering it

into the record, and my written testimony I will be submitting will be containing hard copies of these overheads.

MS. FRANK: Is it possible to give us hard copies now so that those of us who can't see the projection can look at them or do we need to get up and move?

MR. SANDMAN: It maybe not be necessary. They're just sort of outlines of what I'm saying so the people who are following me -- I'm just making it easier to follow. I'll essentially be reading just a few lines from each.

MS. FRANK: Okay.

MR. SANDMAN: If you want to take a look at them, feel free to do so. So if you want to put the first one up. The approach I'm taking is more from a clinical approach. There's a lot of data available. I've met different models that have been thrown about, but I'm going to take a different approach as to potential health

risks and how they may differ at low levels as opposed to high levels.

I want to start off by just talking about bone cancer. We tend to use that word as if it was one particular disease. Bone cancer, as this overhead reads, and under it, top line says bone cancer. Under it lists the three types, primary, secondary and metastatic.

Primary bone cancer is -- and let's talk about it for a second. We've narrowed it down actually to primary osteosarcoma. Bone cancer is basically a general term and it encompasses many types of malignant lesions. Primary bone tumors are generally classified by a tissue of origin and their cell type. These include osteosarcomas, fibrosarcomas, et cetera.

Osteosarcomas by far are the most common primary bone tumor in childhood. It's the second most common primary malignancy in the adult. It's also probably

the second most common primary malignancy of bone overall no matter what the age group is. Osteosarcomas are aggressive and they're histologically varied which means they're cell type different, they're not the same lesion. An osteosarcoma has a subclass depiction which I'll briefly describe.

If we talk just about osteo-sarcomas now, realizing that there are more than one type of bone tumor out there, osteosarcomas being the most common one and the one that happens to be associated with radium and we're using that as the model, a primary osteosarcoma is a lesion that affects children, usually within the second decade. There are cases of children below the age of ten who have had osteosarcomas, but the primary incidence is within the first two decades. There is another peak incidence at later life; however, that is not really primary osteosarcoma as I described.

The lesion is very characteristic in its location. It tends to be metaphyseal in location, the flared-out part of the bone where the long bone begins to flare out and tends to be localized to that area. They tend to begin in bone that is otherwise normal, doesn't have a preexisting condition to it which is an important consideration. Recent considerations on etiology or cause of osteosarcomas include genetic factors in development of osteosarcomas and the effect of radiation on these genetic factors.

Patients with genetic retinoblastomas who show a point mutation at a particular chromosome, which more details will be in my written testimony, demonstrate a 500-fold increase of developing osteosarcoma. There also is some evidence that radiation destroys the remaining normal copy of a particular gene. That was done by a study by Fried, F-r-i-e-d, in 1988.

Other studies have also supported

a possible gene etiology and its possibility that radiation can begin this particular carcinogenic event. The prevalence of these genes I'm not aware of. That doesn't mean they don't exist, I'm just not aware of that fact. That's primary osteosarcomas. That's the lesion we're talking about in childhood.

Secondary osteosarcomas are similar in cell type but they develop in an older age group. They develop secondary to a previously diseased bone, such as Paget's disease, boney infarct and after exposure to a mutagenic event such as irradiation. So we see these in people who have high doses of radiation to the bone in a short period of time. Secondary osteosarcomas also occur in the diaphysis or the shaft of the long bone as opposed to the flared-out portion, so it is distinctly different.

Cell type, the similarity again is in the cells, but they have different

characteristics. We can also then subclassify these osteosarcomas by -- more so by their cell type, each one having a different radiographic appearance, again, different location, also a different clinical presentation. Some of the names of these are -- maybe I'll just include this in my written testimony, but some of the more easy ones to pronounce would be sclerosing or osteoblastic and chondroblastic osteosarcomas.

In addition to that there's another type referred to as juxtacortical which means it's adjacent to the cortex. It means that the periosteum, the lining of the bone, and those arise essentially on the surface of the bone. And these can also be subdivided into periosteal, parosteal and high-grade osteosarcomas.

So the point is is that basically bone cancer is not just a disease. We've been throwing around bone cancer and the

risks of cancer as if it was one particular disease. It is not, and I will later describe why I think this is important in describing the risk of radium in the bone.

The literature, we've reviewed that, so I'm not going to belabor that. If you want to put on the second overhead which lists the things I'll be referring to. Previous literature has already been discussed in some detail. It involves, of course, the radium watch dial painters. We're familiar now with how that happened. The bottom line is that these people received large amounts of radium in a relatively short amount of time. I guess it varied.

The incidence or the chance of developing osteosarcoma was very significant. It was a very strong association between the amount of radium they took in and the chance of these people developing osteosarcoma. Other studies that

came from -- this was touched on too, that radium was used for therapy for certain diseases, arthritis, tuberculosis, et cetera, as early actually or as close as the 1950s or until about the 1950s.

So again, these studies demonstrate a very strong association between ingestion of large amounts of radium 226 and the development of bone cancer, particularly osteosarcomas.

The doses received by the dial painters is estimated to be in the order of thousands of rads. I don't know if Dr. Rowland has described rads, but the numbers he mentioned would correspondence to thousands of rads, and some of this, in fact, comes from his 1978 study.

The studies, particularly the -- particularly the radium dial painter studies served as a base to the model that we certainly use to extrapolate downwards to the risk of levels on the order of magnitude

of one over a thousand rads, so we're extrapolating from thousands of rads down to one over a thousand rads or 5 million millirads to 15 millirads, a long way to go.

Several studies have attempted to find an association between drinking water and adverse health effects. The most notable one was a 1966 study authored by Peterson but is in cooperation with the US Public Health Service and Argonne National Laboratory. This study showed an association between osteosarcoma or bone cancer and levels of radium as low as 3 picocuries. Other studies have also demonstrated association with other diseases, but that's not the thrust of what I'd like to talk about.

The major weakness of a study, and to be clear, these studies or that particular study are referred to as ecological studies. They're observational.

We look at what happened. Then we try to correlate it with something. There's a lot of potential in accuracy; however, despite that they have some inherent weaknesses in establishing a specific cause or a specific association, there's still an important first step in establishing the etiology of a disease or adverse health effects. These type of studies are essentially scout studies that prompt an astute observer to continue and do other studies.

If it wasn't for observational studies we wouldn't have much of a science. That story of the apple falling on Newton's head, that did happen, although it allegedly didn't, who knows what really happened, so he was an observer, and that's what these studies show is they don't attempt to prove anything. They just are looking for association and they often start something, so much of science research begins with observations.

More recent studies published in -- from Canada by Dr. Murray Finkelstein, he used a different type of study design called a case-control study. So instead of looking at the levels of radium in a particular town and looking at the levels of bone cancer and then seeing if there's any association between those two and then compare it to a town that doesn't have those same levels of radium, what a case-control study design essentially does is it takes people who already have osteosarcoma or in this case he used people who died from osteosarcoma, children in Ontario who died of osteosarcoma, and then he measured their birthplace level of exposure to radium.

He didn't just assume the town had 5 picocuries, therefore this person had probably 5 picocuries out of their tap. He measured individual birthplace exposure. Then he took other group of youths in Ontario who died from anything except bone

cancer, and from that method of design he determined an odds ratio. What's the chance of dying that that death in that child was from osteosarcoma?

His study, as you can see this on the overhead, and I'll be submitting this again, the Canadian case-control study basically stated there was a 58 percent more -- let me say this again. That Ontario youths exposed to levels of -- certain levels of radium were 58 percent more likely to die of bone cancer.

Now, the odds ratio is listed as 1.58. It's a ratio. It has no units to it. And I will address some of the issues that have also been addressed within the article itself about some of the weakness in the article. It's important to understand that I'm not saying this is fact and we should just go by this. There are some things that do have to be addressed with these issues.

The first thing I want to point out though is that this 58 percent that were more likely to die of bone cancer, that was in association found with levels on the order of magnitude of .2 picocuries per liter, okay? Not 7, not 50, not 20 that we've been throwing around. 20 picocuries is not a big deal, but .2 picocuries. So I think his article uses the more common and more modern terminology called a becquerel. And he measures the level in a million becquerel. One million becquerel is -- or rather 1 picocurie is equivalent to 37 million becquerel. If you feel like doing the math, you can, but it comes out to .19 picocuries per liter for 7 million becquerel.

The point is is that it's very low exposure levels he found in association with osteosarcoma. The association wasn't incredibly strong. It wasn't a strong association. 1.58 is not considered

statistically strong. The confidence level, was measured in the 90 percent confidence level. Most scientists will use 95 percent as the confidence level, but that's arbitrary. It's an arbitrary unit. It doesn't necessarily have to do with significance, especially clinical significance. It has nothing to do with clinical significance. It has to do with statistical significance and what is arbitrarily accepted as significant, but it doesn't affect the clinical significance of certain findings. Again, its another suggestion that we have found an association.

And just as an aside, 5 picocuries per liter, that would be standard now, is essentially 185 million becquerels. Again, he found the association with 7. So it's important again to realize some of the weaknesses in that study, but it's also important to realize that again it's another

association. And when dealing with a childhood disease, especially bone cancer, it's more important to realize the clinical association or clinical significance.

The study also recorded that there was a statistically significant exposure response level which means the higher you went up in your exposure the greater your odds ratio or odds of developing or dying from this case, from osteosarcoma. And that was significant in what's called a .045 level which means it was only a less than 5 percent chance that those results occurred by chance, 5 percent probability that those results occurred by chance.

Dr. Finkelstein followed that article in 1996 which will be a reference that will be submitted as part of my testimony. That study, what he did is essentially measured lifetime ratios, lifetime exposure levels, and again he found an association between radium and

osteosarcomas; however, he had a difficult time showing adult response relationship. He states that the reason for that is -- this is true for those who know the epidemiology, I'm sure some of us here do.

He believes that that was to do -- had to do more with the reflection of inadequate statistical power, the low numbers of cases he had to deal with, than it had to do with what is really true. Of course as a scientist you have to go with what is written, not by what might be.

Another concern to address in the study is the apparent lack of cases among dial painters at lower doses, less than a thousand rads. There didn't appear to be any cases, especially that hypothesized the absence of a threshold. The authors contended that it may be because dial painters were exposed as adults, not as children, when the bony metabolism is different, and the other thing is that it's

been suggested that exposure to alpha radiation may be actually more hazardous at lower doses.

I've been in contact verbally and written with Dr. Finkelstein, and he holds doctorates of both physics and medicine. He's been in -- he has 18 years of experience as an occupational physician and epidemiologist on the Ontario Ministry of Labor. Comments written by him will be attached to my written testimony and a part of my written testimony.

His basic comment is specifically this: He comes up with a formula which I'll just mention right now to describe the estimated levels, and it seems to be consistent with some of the things that have been brought up already. His estimation was it was 1.81 times the dose in rads. That would be his formula for the numbers or risks, rather, of sarcoma per 100,000 people per year. That's based -- okay, basing

that -- I did some work.

If you use 5 picocuries, that comes to a risk of .09 per hundred thousand per year. That's the risk. So let's assume it's 1 just to make things a little bit simple. That means in a population of DeKalb you're talking about .3333, et cetera, per hundred thousand per year. If we only include the 2,000 people, just to save the question, and divide by 100 we come up with an estimated risk per year of .02. And you may have to check that. I was doing that while I was standing on the side here, so this is my basic conclusion and I'll -- I think I have the next overhead.

MS. FRANK: You need to speak into the microphone. Our court reporter's having trouble.

MR. SANDMAN: The most troublesome aspect of risk assessment especially with radium and especially with radiation, actually more so in this case in drinking

water, is the various option -- or opinions, rather, as to the proper extrapolation models to use. How do we go from such high doses, like a million millirads down to 50 millirads and come up with some estimate of it. It's all done mathematically, but as has been spoken on before there are lots of models that change as the data changes. We fit the model to fit the data. It changes. A lot of it's based on assumption. A lot of it's based on speculation.

Acceptable exposure levels are therefore based on just that, speculation, not only as to the slope of the curve but also the shape of the curve. There's a lot of potential for error when we're dealing with such large difference in numbers. It's my understanding that the estimated intakes of radium by dial painters, which was mentioned, was underestimated. This might support what's called a nonlinear extrapolation model, such as a quadratic

type of model, but at the same time how would we be certain that these new values are any more valid than the ones we've already used?

Second problem from extrapolation from high to low is the observed or potential health effects at each level, and this is probably the main thrust of what I'm trying to get across is that are the osteosarcomas that we see in the radium dial painters the same as the osteosarcomas we're talking about in childhood? In my opinion the answer is no. They have very little in common except that they have histologic stromal cells, they're called, that are part of the histologic diagnosis of an osteosarcoma.

Basic differences -- we can go to the next overhead. The lesions that appear on the radium dial workers appear to be secondary osteosarcoma, not primary that we see in children. There's several reasons

why I feel that this is the case. The malignancy, first of all, begins in an already abnormal bone. It's the people who are exposed to large doses of radium who have a normal bone one day, then develop an osteosarcoma. There was an event in between referred to as necrosis.

Large quantities -- and I'm quoting this from an article. Large quantities of radium are deposited in bone over many years. Mostly dead osteoid tissue remains. Normal physiology can be erratic and large resorption cavities can form. These errors of cortical resorption are secondary to constant alpha particle radiation. The osteosarcoma in childhood, the primary osteosarcoma, originates in a previously normal bone. There is no intermediate.

Lesions seen in radium dial workers are different in other ways as well. The appearance of an osteosarcoma

seen in dial painters is different radiographically from those in childhood. I mentioned before that the lesions in childhood begin in a metaphysis, the flared part of a bone. Lesions that we tend to see in the radium exposed workers were diaphyseal, the long shaft of the bone. Radiographically they look like secondary osteosarcomas, especially ones that we typically see after radiation therapy.

The lesions are often multicentric, have more than one center of tumor, as opposed to one area develops a tumor and then it grows or just metastasizes everywhere. In conventional osteosarcoma the tumor is generally metaphyseal, again, the flared portion of bone, and is rarely multicentric.

Another point is the latency period. The latency period of tumors seen in the workers was somewhere near 20 years, while in a childhood variety most lesions

are seen within the second decade. They're not even 20 years old. They're 7, they're 5. We're talking about a different lesion.

Another thing that supports the fact that this is a different lesion is the fact that there's biologic plausibility. There is a biological explanation as to why there could be a difference in the type of lesions that appear. With low-level radiation as a cause of primary -- let me scratch that if I can. I don't know if I'm allowed to scratch things.

There is a biological plausibility consistent with low-level radiation as a cause of primary osteosarcoma in childhood. Firstly, the metabolic activity of the growing bone is much greater in a child than it is in the adult, especially in the metaphysis, the flared-out portion. This is where all the bony growth is occurring. There's so much activity going on in this particular location.

That's why Dr. Rowland touched on this. He talked about the fact that we can't find the radium in these cases because the bony turnover is so quick that maybe even the radium that has already started the carcinogenic effect is -- has already been removed -- or excuse me, excreted. Also another important point is that the rapidly growing bone contains undifferentiated cells, cells that are not sure what they're going to be yet, and there's also a rapid turnover of these immature cells.

It is well known that these types of cells are much more sensitive to radiation than are cells that are highly differentiated, for example, the nervous system. Another point is that since there are no known causes of bone sarcoma, proven causes anywhere other than ionizing radiation and certain toxic drugs, it's feasible that radium would account for the bulk of primary lesions.

Other sources of radiation, like background radiation -- as Dr. Rowland also testified, we get radiation constantly. Well, one of the problems possibly would be that the ingestion of radium and the fact that the radium serves -- is very similar to calcium and interacts with the bone very nicely is again the explanation as why the radium causes bone cancer but other types of radiation won't cause bone cancer. There's no plausibility.

Lastly, a carcinogenic event is possible at low doses, but again, because of genetic predisposition. Predisposition has already been described. An article in 1988, Mays, M-a-y-s, suggested that a true threshold might be as small as the energy required to disrupt a single molecule of DNA. In addition to previously cited explanations, the reason that bone sarcomas have not been observed in radium dial workers who received less than a thousand

rads -- remember we mentioned that before, maybe it's because they were adults. Another reason is, and this is my feeling, is that it may be because there is a threshold for the development of the type of osteosarcomas seen in radium dial painters or the latent period is very long in some cases, and these people exposed to radium die before they ever got osteosarcomas.

Their offspring, I'm not sure how old their offspring would be, but we need to still follow them up. I'm not sure how old they would be. I guess 20s and 30s.

MS. FRANK: You need to speak into the microphone and speak clearly. You're kind of mumbling and trailing off.

MR. SANDMAN: Basic summary then is this: There's evidence that shows an association between exposure to low level radiation from radium and the development of bone sarcoma. This was first observed in ecological studies and again in more

rigorous case control studies. Further study with larger number of cases will improve the statistical power.

That's what we need to do. We need to do more studies, not just try to explain away. Every time there's an association we try to explain it away. We say, this can't be, it doesn't fit the mathematical model. We can't look at bone cancer that way. We have to look at why is this occurring. Not it doesn't fit the model, therefore there's no association. It has to be done the opposite way.

What we need to do is do more case study and studies of that type of design to either prove or disprove an association.

Most risk assessment for exposure to the low levels of radium is based on one primary event, the radium watch dial painters. We have a lot of information from that. We have direct communication on radium so it's a good study to use.

Extrapolations from the extremely high doses received to low doses is speculative and based on too many assumptions. The observed health risk, namely osteosarcoma, seen in the radium dial workers might not be of the same type and of the same etiology as those seen in childhood.

The Canadian studies demonstrated a positive association between radium and bone sarcoma at levels as low as .2 picocuries, and although there are some apparent weaknesses in the studies from a statistical point of view, that cannot be written off. The .2 picocuries level is 25 times higher than the current levels allowed by the US EPA. A 20 picocurie level would be 100 times higher. The focus on studying the effects of radium in drinking water needs to be on the development of more careful clinical studies and not on the inconsistent theoretical models. Under the

current situations I feel it is prudent to maintain the current standard of 5 picocuries until further clinical and epidemiological studies can be performed.

And just as a summary to give you an idea, again, this overhead. I'll read it into the record but I do attach a hard copy.

MS. FRANK: If we have a hard copy --

MR. SANDMAN: It's three lines.

MS. FRANK: Okay.

MR. SANDMAN: The current levels of radium in drinking water in the City of DeKalb are 50 times higher than the levels that were shown to be associated with a 58 percent more likelihood of dying from bone cancer, and I'll just leave you with that.

MS. FRANK: Are there questions for this witness?

MR. MATEKAITIS: Yes.

MS. FRANK: Please begin.

MR. MATEKAITIS: Thank you. Is it Sandman?

MR. SANDMAN: Sandman, S-a-n-d-m-a-n.

CROSS EXAMINATION

BY MR. MATEKAITIS:

Q. Mr. Sandman, have you previously testified in a hearing before the Pollution Control Board on this issue?

A. No, I haven't.

Q. You've obviously stated what amounts to an opinion today regarding the health risks associated with the ingestion of radium 226 and 228. Would that be fair to say?

A. Yes.

Q. Has that opinion that you've stated today been submitted in a published form to be reviewed and commented upon by professional colleagues?

A. It -- currently it is not.

Q. Have you published any papers with respect to the effects -- health effects of the ingestion of radium?

A. No, I haven't.

Q. You're familiar with Dr. Rowland's testimony

with respect to the radium dial painters, specifically as he indicated that following these persons throughout this period of time, that no cancers were observable related to radium at the level below 100 microcuries.

A. Yes, I remember that.

Q. Do you concur that that is an accurate statement?

A. I would have to -- I would assume that it's correct. I have read that in several articles that refer to that threshold.

Q. And you understand that that threshold obviously then is several times the amount of the existing level of radium in DeKalb's water.

A. Yes, but the health risk is -- we're talking about a different lesion.

Q. You indicated that the lesion represented and observed in the radium dial painters may be different than that observed in children. You also allowed to say may --

that it may not be or that there is no correlation.

A. I don't understand that part.

Q. By making the statement that the lesions experienced or observed in radium dial painters may or may not -- may be different than the lesions observed in children, did you make that observation or statement?

A. Well, yes, and I listed why they are different. There are definite differences, yes. There are differences. It's not that there may be differences. When I say may, I have not -- I've not come across studies that formally investigated the histology involved in comparing two types of studies.

Q. You've also heard the testimony of Dr. Rowland and Ms. Burg as it related to the lowest levels of consumed radium wherein a tie-in was made between the ingestion of that radium and observable cancer being, I believe 60, 65 picocuries. Did you hear that testimony?

A. I don't recall that. I don't recall them saying that.

Q. Are you aware that that's -- are you aware that that has been the most amount of consumed radium wherein -- and related to cancer was observed?

A. Yes, and that was radium that was measured in the bone of the person. Is that correct? If I can ask a question to clarify your question. Do you mean it was observed, measured from the patient's own bone?

Q. Would your observations or opinion differ then as to the lowest levels suggested and found in other areas of the body other than 65 picocuries? What lower levels are you familiar with where cancer has been observed?

A. At .2 picocuries.

Q. And that's based on the Finkelstein study?

A. Based on the Finkelstein and other associations. This is not an end-all study, keep that in mind. It's an association.

It's something we just can't dismiss. It keeps showing up. It has to be explained. That's what a scientist does. Why did this happen? Not it can't happen.

Q. You indicated that the stated confidence level and the Finkelstein studies were the 90 percent level; is that right?

A. Yes.

Q. And are you familiar that the level at which scientific validity would be indicated?

A. It's not scientific. It's statistical significance. That's not necessarily scientific validity. The 90 percent and 95 percent are arbitrary values.

Q. So would you --

A. It's designed to contain a true population parameter. That's arbitrary.

Q. Would your estimate be that a study conducted at a 50 percent confidence level is as valid as one conducted at a 95 percent confidence level?

A. No. 50 percent is too low, but when you're

dealing with 90 and 95 percent you have to take into account what they're measuring. They're measuring bone cancer. Therefore there is a greater tolerance for a wider interval.

Q. Did you have an opportunity to review Dr. Toohey's written testimony?

A. Yes.

Q. In your professional opinion do you disagree with which parts of Dr. Toohey's testimony if you disagree with any part of it?

A. Well, most of his reference seems to be towards, again, using models, extrapolating data from very high doses. It talks about the linear threshold -- rather linear nonthreshold models and fields based on current data that it may not be linear and is quadratic. That might be the case.

Q. Do you concur in his observations regarding ecologic correlation studies?

A. Well, he uses the term notoriously unreliable. That's inflammatory, not

notoriously unreliable. They're good basic scout studies that are done in almost any scientific evaluation. We have to observe something first, and that's what these studies did, and that's what started everything else. Otherwise radium never would have even been thought to be a significant problem.

Q. With respect to his specific criticism that, "The chief criticism of these studies is that the types of cancer reported were definitely not increased in the radium dial workers cases; there is no biological reason for supposing that radium could cause one type of cancer at high levels of exposure and completely different types at low levels"?

A. Yeah, he's referring to the studies where they tried to show an association between I think leukemia -- or bladder cancer and breast cancer and exposure to radium, and I'm not addressing that.

Q. With respect to the EPA, US EPA's LNT model, do you support or disagree with that model to measure health risks?

A. It's really difficult for me to comment on that. That I think requires a more mathematical and physicist type of background. I think it's a classical model to use. It works well with a lot of high to low extrapolations, but in this particular case I really can't be of an opinion, a personal opinion on that. I can tell you that Dr. Finkelstein, however, does base his -- which will be submitted, his formula on a linear nonthreshold model.

Q. If you suggest that childhood sarcomas are different from radium induced sarcomas in adults, which will allow for the fact that they might not be induced by radium at all --

A. Yes, that's possible, but there's no other association with osteosarcomas except with ionizing radiation and a certain kind of

toxic drugs, so there's no reason to assume there's an association with anything else. I'd be more interested in finding out where the radiation is coming from.

Q. You're familiar with Dr. Rowland's testimony wherein he indicated that in studying incidences of cancer in children who were exposed while in utero to -- by women who were working in the radium dial factory. Are you familiar with the absence of any detected cases of cancer in that group?

A. So far.

Q. And you're aware that that study has gone on for 20, 30, 40 years?

A. There's a peak incidence of osteosarcoma over the age of 50.

Q. And you also indicated that sarcomas in children would be observed in the second decade.

A. Most of them, yes, the incidence is most common in the second decade.

Q. Do you have an explanation for why there's

been no incidence of cancer observable in the second decade of children born in radium dial painters?

A. Possibly because again we're dealing with the higher levels. This is where it's total speculation. We're dealing with a different type of -- the high doses create a different type of response in the bone. Possibly the high doses are excreted at greater rates, and that I don't know. Again, also important point, I think, is the molecular or genetic factors.

Q. You heard Dr. Rowland testify with respect to the threshold approach that he's indicating that he advances and will support and will so publicly indicate in a paper to be presented in France next month. In your professional opinion is Dr. Rowland in error with respect to that approach?

A. Well, I alluded to that in my statement, that I felt that because they're different lesions there was a threshold for the radium

in the radium dial workers induced osteosarcoma but not in the childhood.

Q. And did the Finkelstein study detail the differences in sarcomas?

A. No, he just measured low level. He was measuring primary osteosarcoma levels. He was measuring the type we're referring to as primary or childhood osteosarcomas.

MR. MATEKAITIS: I have no further questions at this time.

MS. FRANK: Mr. Ewart?

MR. EWART: Dr. Sandman, just one point for point of clarification.

CROSS EXAMINATION

BY MR. EWART:

Q. When you were referring to Dr. Finkelstein's studies, you were referring to not only his 1994 study but his 1996?

A. I made reference to both of those things.

Q. You did, okay.

A. And it will be referenced in my submitted testimony.

Q. As a point of interest, what area of -- are you getting into as far as your master's in public health?

A. What area? Primarily environmental epidemiology.

Q. And you're taking that here?

A. Yes.

MR. EWART: I have no further questions.

MS. FRANK: Is there anything else?

MR. MATEKAITIS: (Shakes head.)

MS. FRANK: Okay. We will mark your testimony and attachments as Public Comment No. 7, and I believe our court reporter needs to change paper so we're going to go ahead and take another ten-minute break and we'll come back after the break.

(Public Comment Exhibit No. 7 was marked for identification.)

(A recess was taken at 6:14 p.m. and proceedings resumed at 6:30 p.m.)

MS. FRANK: We're going to go ahead and

go back on the record. Before we resume with the public testimony, I would just like to remind everybody that your written testimony is entered into the record as if read. What we'd like is for you to come up and give a summary of your written testimony but not to read word for word, page for page all of your written testimony.

The goal is to allow everyone who wishes to speak a chance to speak. By reading every page and every word in your written testimony, it's taking up more time and we want to be able to allow as many people to speak as possible, so a summary of your written testimony hitting your highlights and then submitting your written testimony into the proceeding would be the preferable way to go.

If someone has strong preferences that they want to read the entire thing, I'm not going to prevent that, but just remember that that does take up additional time for

other people to have a chance to speak.

Along those lines, Ms. Burg, you stated that you were going to submit written testimony. You submitted lots of documents but I don't have anything that is written testimony from you, and I'm wondering if that was something that you needed to submit.

MS. BURG: I have a week; is that right?

MS. FRANK: Yes.

MS. BURG: I'll write that out, most of what I said and probably more. I'm planning on submitting that. I do have one other thing though.

MS. FRANK: Why don't you come forward.

MS. BURG: This is the Illinois Department of Public Health Cancer Incidence in Illinois by County, '85 through '87. It is the first highlight of this book, and it describes DeKalb County was the highest --

in the highest of counties of all three sites in males. That's the three sites of cancer that they tested for, prostate, colon and lung.

MS. FRANK: That will be marked Public Comment No. 8.

(Public Comment Exhibit No. 8 was marked for identification.)

MS. BURG: And also the prostate cancer in males was the highest in DeKalb County in any county in the state.

MS. FRANK: For the record, Ms. Burg is not submitting the entire document. She is submitting Page 1 and Page 35 of the document, so Page 1 and Page 35 of the Illinois Department of Public Health Cancer Incidence in Illinois by County 1985 through 1987 supplemental report will be entered as Public Comment No. 8.

Okay. Sir, please come forward.

MIKE BROWN,

being first duly sworn, testified as

follows:

MR. MIKE BROWN: Yeah, my name is Mike Brown, B-r-o-w-n, and I just -- I've been sitting here most of the day, and I just wanted to voice a few observations.

First of all, I think the whole case is titled wrong because it says the City of DeKalb versus the EPA, and I think it should be the City of DeKalb and the EPA versus the Citizens of DeKalb, because I think they've done very well in supporting each other's case, and that's enough.

And I'd also like to point out something that I noticed of Dr. Rowland, is it?

DR. ROWLAND: (Nods head.)

MR. MIKE BROWN: Yes, Dr. Rowland was talking about the one case where there was a case of bone cancer from ingestion of water, and he was talking about radium water, and he mentioned that three people were drinking radium water, a bottle of it every day, and

that the mother had really high levels of radium in her bloodstream and the older brother had really high levels of radium in his bloodstream, but the youngest of the three of them didn't have high levels of radium in his bloodstream, and he is the one that came up with cancer. And it seems to me that this is more than adequate proof that children are more sensitive to it.

And just for the heck of it, I'd like to know how many people on this side of the fence -- on this side of the fence --

MS. FRANK: Sir, you can't ask the witnesses questions. You can make statements.

MR. MIKE BROWN: I can't?

MS. FRANK: No.

MR. MIKE BROWN: Then I'll make it this way. I would imagine that there is a majority of the people that are representing the EPA or the City of DeKalb that live in DeKalb that have bottled water. Thank you.

Any questions for me?

MS. FRANK: Mr. Matekaitis?

MR. MATEKAITIS: No.

MS. FRANK: Mr. Ewart, do you have any questions?

MR. EWART: I have no questions of this witness.

MS. FRANK: Okay, thank you. Yes, ma'am, please come forward.

MILITSA SAMARDZIJA,

being first duly sworn, testified as follows:

MS. FRANK: Please state your name and spell your last name.

MS. SAMARDZIJA: My name is Militsa Samardzija. That is spelled M-i-l-i-t-s-a, and the last name is spelled S-a-m-a-r-d-z-i-j-a, and I'm not an expert on anything. I just wanted to make a statement.

In this hearing today we've had an overwhelming amount of data tossed about,

but the fact is most of us don't deal in terms of picocuries or promulgations (sic). We live day to day worrying about the health and welfare of our children, our parents and ourselves. We all know data can be manipulated to suit anyone's agenda. Today's hearing is no exception to that.

When you get right down to it, however, this debate is more about politics than it is about scientific studies. It's more about power and money than it is about the health and welfare of the people. This is an election year as is the next year when we will elect a new mayor and councilmen, and in years like this no politician or bureaucrat wants to rock the boat. No politician or bureaucrat wants to spend the money needed to correct this problem.

When you have to spend millions as the City contends this might cost, you'll have to raise taxes, and if you raise taxes, you lose votes. You also might scare off

the wealthy developers who want to come here and build their malls and their superstores and their subdivisions.

The City of DeKalb and its leaders are intent on making our town another clone of Schaumburg or Naperville, but the people of those suburbs are escaping those congested areas for small towns like ours. The problem is we're fast developing the very problems they're trying to escape. Besides worrying about drugs and gangs and the rising cost of living, they now have to worry about the water they drink.

When civilization gets down to that bottom denominator it's pretty pathetic and it should be shocking to us, but it's not. What I'm hearing from the people regarding the situation is that they're deeply, deeply concerned. We need clear, definite information. We need clear, definite leadership and action. We don't want to be patronized with witty retorts

about it taking a lifetime's worth of drinking water to introduce a minuscule amount of radium in our bodies.

We may not be scientists all of us, but we are certainly not dolts and we don't want our public servants to whittle out of this problem by passing the blame to the US EPA standards or by seeking yet another variance. We people -- what I'm seeing is that the people really want to rock the boat because their health and their welfare depend on it. What they see is a boat that's sinking and hardly anyone who's trying to do anything about it.

It used to be when a boat was sinking that you would save the most vulnerable among us, the women, the children and the elderly, but instead what I see are the bureaucrats and the politicians tossing off those people in order to save their political hides. These experts and politicians are telling us that there's

nothing wrong, there's nothing to be concerned about, the water is fine.

But if that's the case, then why is it the City manager of DeKalb has bottled water in his office? If it's fine, then either the City and the EPA, state and the government, whatever, should buy all of us bottled water or they should pay the money now to fix it. What's good enough for the politicians and the bureaucrats should also be good enough for the people. At least that's how I thought it used to be. Thank you.

MS. FRANK: Are there any questions for this witness?

MR. MATEKAITIS: No cross.

MS. FRANK: Who else would like to speak? Yes, ma'am, please come forward.

DIANA STRAUSS,

being first duly sworn, testified as follows:

MS. FRANK: State your name, please.

MS. STRAUSS: My name is Diana Strauss, S-t-r-a-u-s-s. I am here to read the comments to the Board written by Dr. Eugene Perry, Professor of Geology at Northern Illinois University. Dr. Perry cannot be present but he is concerned about the excessive radium in DeKalb's drinking water and its effect on children. His concern is great enough that he took time to write these comments during a two-day stop in DeKalb between a trip to Russia and to NASA in Houston, Texas, where he is presently working this summer.

Dr. Perry's letter follows: "Thanks for sharing with me the latest information on radium in DeKalb groundwater. As you know, my expertise is with the geologic association resulting in high radium concentrations rather than in health hazards associated with isotopes of this element. I am disappointed that little or no effort seems to have been directed at

ascertaining why some DeKalb wells have higher levels of radium than others."

"As a citizen there are two things that bother me about the way in which the health risk aspect of the radium problem is being addressed. One, not everybody is at equal risk. The group we have the greatest responsibility to protect, young children, is the group likely to suffer most greatly from long-term exposure, and this is the group most likely to concentrate radium because that element substitutes for calcium in bones."

"The literature you sent contains analogies of how many cigarettes are equivalent to how many glasses of water. These analogies are misleading because they fail to distinguish who, child or adult, is drinking that water and who is smoking the cigarettes. I never encourage my children to smoke any cigarettes."

"Two, I understand that developers

are impatient to turn our cornfields into housing developments, but I hope we can encourage them to be patient. If standards are not valid they should first be changed. Then we can follow the new standards."

"I am not happy with the rationale that, A, the radium standards are too stringent and will eventually be relaxed; therefore, B, let's pretend they have been relaxed. Until the standards are changed they should be enforced."

"My dictionary has this to say about the word standard, 'A rule or principle that is used as a basis for judgment; the authorized exemplar of a unit of weight or measure.'"

"Surely rule, principle, judgment and authorized are words recognized and respected by those who espouse 'family values.' Sincerely, Eugene Perry."

MS. FRANK: Are there any questions?

THE WITNESS: I have something

further. These are attached -- there are attachments that I will not read but wish to submit for Dr. Perry with his comments. These attachments contain two groups of Dr. Perry's papers on radium drinking water. First, Dr. Perry's letter to DeKalb city officials which expresses his concern about radium during the first five years of the original variance. Included for this same time period are concerns by Dr. Perry's department of geology colleague, Dr. Paul LaBerry (phonetic).

These letters are important because they contain suggestions for correcting the radium contamination and suggest offers to help from the NIU geology department. These offers of help came at a time when City officials were under orders of the Illinois Pollution Control Board to comply with the current federal standard of 5 picocuries per liter of combined radium. Dr. Perry understands that the federal

standards and the IPCB order remains.

Second, Dr. Perry wrote extensive comments to the Federal Environmental Protection Agency in 1991 during the formal period for public input on the radium standard. Also mailed to the EPA during the same time period is a critique of the Federal EPA criteria documents on radium, TR-1242-85, by Dr. Paul LaBerry. This is also attached. I submit this statement and these papers on behalf of Dr. Eugene Perry.

MS. FRANK: Are there any questions?

MR. MATEKAITIS: No cross.

MS. FRANK: Mr. Ewart?

MR. EWART: I have no questions.

MS. STRAUSS: Thank you.

(Public Comment Exhibit No. 9 was marked for identification.)

MS. FRANK: The documents will be marked Public Comment No. 9.

Yes, sir, please come forward.

SHAWN BROWN,

being first duly sworn, testified as follows:

MS. FRANK: Please state your name and spell your last name.

MR. SHAWN BROWN: My name is Shawn Brown, B-r-o-w-n, S-h-a-w-n. A couple of things to say, I was kind of surprised because I didn't really hear anything today that I thought was conclusive as far as the effects on children. If there hasn't been any research done on the effects of children or the effects of radium on children and the health of infants, senior citizens, how do you possibly come up with it's okay, it's fine, 40 pics?

I've heard a lot of suspicion from the citizenry, and I might tell you why. The focus of this hearing is the safety and well-being and the health of the citizens, and I find it abhorrent that the structure excludes citizens from asking questions of

the panelists, the purpose of which would be to hold them accountable for the statements that they have made here today and to promote further understanding by the citizenry of why so much time and money has been spent on evading the federal laws that protect us and not on solving the problem.

And I'm speaking not as an expert but as a concerned member of the community. By simply speaking before these panelists I'm placing myself at the risk of being discredited by carefully worded questions designed by legal minds, and I as a citizen am not even permitted to attempt to ask what I deem to be pertinent questions of these two panelists that are in agreement with each other. There's not a lot of balance.

So, you know, if I was able to ask those questions, maybe I could understand the motivation of my government. In addition to that, panelists do not represent separate points of view, and I'm put in the

position, as are all of us, of listening without questioning two panelists representing my government of the people by the people and for the people with no recourse but to accept any contradictions, misinformation and special interest.

Questions have been raised regarding how long it was known that this violation of federal water safety law was going on before it was deemed necessary to inform the citizenry. Experts from these panels have been contradicted by experts provided by the citizens group, and with so much distance between what the citizen experts and the government experts testify to I might ask, if permitted to ask a question, questions that would qualify for me the honor or the motivation of these panelists so that I might make a fully informed decision about the problem for myself.

However, this opportunity is not

afforded to me by this panel or Board or whatever it is, and that only serves to fuel my suspicion, and therefore these panelists not being required to answer me might make me ask what they're afraid of. Thank you.

MS. FRANK: Is there anything?

MR. MATEKAITIS: No cross.

MR. EWART: No cross.

MS. FRANK: Yes, ma'am, please come forward.

JULIE DUBICZ,

being first duly sworn, testified as follows:

MS. DUBICZ: Hi, my name is Julie Dubicz, spelled D-u-b-i-c-z. Good evening, everyone. I moved into this community in January of this year. I'm married and have three young daughters. As a new member of this community I'm truly sorry to say how extremely disappointed and disgusted I am by the contaminated water here. I would like to move and perhaps will.

My husband brings home $27,000 a year, 795 of it which goes back to rent alone. As a mother of three gorgeous little precious daughters I refuse to allow them, I forbid my children to drink this poisoned water from this community in DeKalb, Illinois. Just to boil noodles for our dinner I need nearly a gallon of bottled water, using a minimum of two to three gallons -- I'm really nervous, so excuse my shaky voice.

MS. FRANK: That's okay.

MS. DUBICZ: -- of bottled water per day costing about $3 per day. It's very draining from our pocketbooks, and as it is, we're barely getting by, and this added expense of approximately 80 to $100 per month is creating difficulty for us financially. I just can't tell you how I feel. I just think it's absolutely terrible that all of these people that are here in this audience are just going to be ignored,

and I think it's really sad.

MS. FRANK: Did you have something you wanted to enter into the record?

MS. DUBICZ: I just handwrote this.

MS. FRANK: That's fine. I was just asking. Are there any questions?

MR. MATEKAITIS: No cross.

MR. EWART: No questions.

MS. FRANK: Thank you, ma'am. Yes, sir.

JEFF HOUGHTBY,

being first duly sworn, testified as follows:

MR. HOUGHTBY: My name is Jeff Houghtby, H-o-u-g-h-t-b-y, a DeKalb resident. I'll be brief. I know this public hearing has almost turned into something akin to Court TV with all the detail and the cameras, and I like Court TV but five hours is a lot.

Anyway, with so much detail I'm afraid that in some ways we're looking at

all the trees and missing the forest. It seems to me that despite some of the conflicting studies that each side has put forth, there seems to be one element of agreement, and that is radium causes cancer. Now, that bothers me because I want to place this hearing today in a larger context, in historical context.

I think it's a fact that we in the United States and western Europe live in the wealthiest societies ever in human history. We have more finances than ever. We have unsurpassed technical knowledge. We have the unfettered ability to communicate almost instantaneously, and I guess one would think within that context we would be talking about how to raise public health standards. It seems to me that this discussion is just the opposite.

What we're discussing here is whether or not we can get away with increasing the level of a known carcinogen

in our drinking water by eight times and whether or not we can get by with it. That really bothers me, and I'll tell you why it bothers me. I am afraid that if we allow ourselves to set low standards for ourselves and we allow ourselves to erode those standards over a period of time, we're not doing anybody a service. We're doing a disservice. So I want to make that point.

Radium is a carcinogen. Everybody agrees with it. It seems to me it would be prudent, especially when both sides make conflicting studies, that we would error on the side of caution and hopefully understand it.

Now, I want to talk a little bit more in detail about the City of DeKalb's argument that it makes that fixing the problem will present an undue economic hardship on the City of DeKalb. I have been active in the DeKalb community now for a couple years as government affairs

coordinator for the Citizens Advocacy Network, the group that requested and was denied intervenor status in this hearing. What I have found over the period of the last couple of years, and I think merely everybody agrees with, is that the City of DeKalb has pursued a very aggressive economic development policy, an economic development policy that is -- that often uses outright city grants to Fortune 500 companies.

I can give you a number of examples. Wal-Mart corporation received $500,000 to essentially move across the street from its present location. That's a grant that we will never see back. We're told we're going to see it in higher sales tax revenues, but I have to be honest, I'm not entirely convinced. Walgreens Corporation was granted subsidies, and people in town are fighting over exactly how much, but outright cash subsidies to bring

in a chain drug store on the side of what was once a historic landmark.

We have granted over $2.4 million in tax increment financing funds to a local car dealership to move from Sycamore to DeKalb. Now, it seems to me that when we are spending that kind of money in outright grants that this City does have the ability to fix the problem. It has simply chosen not to do that.

I think that Militsa Samardzija's comments earlier hit the nail right on the head that there are certain special interests, mainly the developers, who will be very adversely affected if the Illinois Pollution Control Board does not grant a variance and does not grant the City the ability to extend its current service. Think about all those developers out there who aren't going to be able to build their homes. That has to be taken into account.

I also know that the City has a

fairly high bond rate. We're not talking about a City here that's strapped financially. We're talking, in my mind anyway, about a city administration that has chosen to pass off this important public health issue, one that affects every citizen in this town, not just developers, not just renters, not just workers. It has chosen to pass off this important issue to the US Environmental Protection Agency.

That bothers me, and I have to be honest. I'm not asking you, the Board here, to take care of our political problems here in DeKalb. We have an election April 1997, and I trust that we're going to take care of it then, but I want to come back to this issue we talked about earlier, and that is radium is a known carcinogen.

I know it is the Illinois Pollution Control Board's job to ensure that the highest level of public safety are ensured by combating any attempt to erode

current standards. That's about all I have to say, but I'll be glad to answer questions.

MR. MATEKAITIS: No cross.

MR. EWART: I have no questions.

MS. FRANK: Thank you, sir. Are there other members of the audience who wish to speak?

JOHN HEPPERLY,

being first duly sworn, testified as follows:

MS. FRANK: Please state your name.

MR. HEPPERLY: My name is John Hepperly, J-o-h-n, H-e-p-p-e-r-l-y. I'd just like to be on the record that I am opposed to granting the variance to DeKalb because I think that's the only way that the rest of us can ever get our water up to standards. And I have here two letters written by neighbors of mine who wish them to be aired at the hearing. They could not be here.

The one is from Danca (phonetic) Lovings who is concerned about the health of her children, and her husband Tim Lovings comments on the fact that his grandmother died of bone cancer five years ago. She lived her whole life in DeKalb, drank freely the DeKalb water. She did not drink, she did not smoke, and if she can get it, anyone can. Any questions?

MS. FRANK: Is it one letter or two?

MR. HEPPERLY: Two letters on one page.

MS. FRANK: Okay. They will be marked as Public Comment No. 10. Thank you. Do you have anything further?

MR. HEPPERLY: No.

(Public Comment Exhibit No. 10 was marked for identification.)

MR. MATEKAITIS: No cross.

MR. EWART: No questions.

MS. FRANK: Thank you.

JAMES LAHEY,

being first duly sworn, testified as follows:

MR. LAHEY: My name is James Lahey, L-a-h-e-y. I am the spouse of the lady that gave the brief presentation a little while ago, Linda Lahey. I am a resident of DeKalb. I'll be reading two short letters of concern to the Illinois Pollution Control Board. First letter I will read is from Dr. Samuel Goldman, MD, who resided in DeKalb for many years, and he was a practicing physician in DeKalb whose specialties were internal medicine and oncology, which of course is the treatment of cancer.

This letter by Dr. Goldman is dated 7/29/96. "In June of 1991 I expressed my concern regarding the relaxation of acceptable levels of radium in DeKalb drinking water. The avidity of radium or incorporation into the skeleton of children

represents long-term radiation exposure and known cancer risks. For this reason the levels of radium in drinking water must be kept at lowest possible concentrations." Again, that's by Dr. Samuel Goldman.

The second letter I will read is from Miss Gretchen Duguay, Chairman of Environmental Concerns for the State of Illinois PTA. I won't read the entire thing, but there are two paragraphs that are appropriate.

"The Environmental Protection Agency is the federal agency with primary responsibility for the safety of groundwater and of the Safe Drinking Water Act. Standards set by this agency should be strictly in force. The 200,000 members of the Illinois PTA have by convention action endorsed stricter standards of pollution control to protect the health, safety and welfare of the children of Illinois. The Illinois PTA would therefore oppose any

variance allowing more radium in the water."

MS. FRANK: Could you spell her last name, please.

THE WITNESS: D-u-g-u-a-y. I don't know really how you pronounce it.

MS. FRANK: The letter from Dr. Goldman will be Public Comment 11 and Miss Duguay's will be Public Comment 12. Are they all part of one document?

THE WITNESS: They're stapled there but they are --

MS. FRANK: Then they'll all be Public Comment No. 11.

(Public Comment Exhibit No. 11 was marked for identification.)

MARILYN BURRILE,

being first duly sworn, testified as follows:

MS. BURRILE: My name is Marilyn Burrile, B-u-r-r-i-l-e. I'm against issuing of another variance to DeKalb because they

didn't live up to what they were supposed to in the first variance. By their own admission they failed to turn in the reports to the EPA for four years. That means they followed the directions one year and four years they decided it wasn't that important. The EPA didn't even respond or say you're not in compliance, so if you're not going to follow our directive, then the variance will be canceled. They did nothing, so why should the City take the conditions of a variance seriously? I don't believe they will.

Secondly they're supposed to educate the public onto what they're doing. Well, they do send a statement with the water bill. It's on the back of the water bill, and it's on a -- I've never seen that because I don't handle that part. I don't look for the water bill, and I never read it. When I heard that it was on there, I went back and got old water bills to find

it, and what I found was when you pay your water bill that card is ripped in half so you'll have half of whatever was said which makes no sense at all.

The students in DeKalb, which there are about 22,000, I don't know if they all live in DeKalb, but there is a good number that live in DeKalb, never receive a water bill while the ones that stay at the University don't receive a water bill because they don't have to pay it, so they never know. So most of the users are not really being made aware of what the City's doing, and I think that's an important factor.

If a new variance is granted I will -- I feel like the stipulations have to be met and that if they're not there's going to be some penalty to pay. Not just, oh, yes, I'm sorry and we won't do it again; well, we'll really set up a new procedure so that we can get this done like we're

supposed to.

Some of the arguments here you heard were the water is safe and the water is not safe. Well, because the findings are so inconclusive, personally I would take no radium in the water. 5, if they can get away with that, I'll have to accept it, but preferably I would say no radium in the water.

And I think the City officials are supposed to be doing what the public wants. They're not supposed to decide, oh, this is good for you or this isn't good for you. They're supposed to be saying, I think it's good for you, but if you don't like it, if you don't think it's good, I better take that into consideration. And I don't find that the case either. That's all I have to say.

MS. FRANK: Are there questions?

MR. MATEKAITIS: No questions.

MR. EWART: No questions.

MS. FRANK: Thank you.

MIGUEL CHECA,

being first duly sworn, testified as follows:

MS. FRANK: State your name.

MR. CHECA: Miguel Checa, 608 Fairlane Avenue in DeKalb.

MS. FRANK: Can you spell your last name, please.

MR. CHECA: C-h-e-c-a. Please interrupt me because my accent will complicate your work. I'd like to preface by -- well, besides being a resident since '93 I'm a cofounder of the Citizens Advocacy Network, a nonpartisan organization whose mission it is to work for a more open democracy, go back to the roots of this great country.

In prefacing I would like to tell the lady who said --

MS. FRANK: Sir, you need to talk toward the court reporter.

MR. CHECA: The lady who said she was going to leave DeKalb, please don't, stay and let's work together to make this place better. There's another thing that has remained in my mind from reading the Toohey's report -- Richard Toohey's report. He states that it's a personal opinion. I don't see any institute, research institute, not Argonne, with which I am familiar, or any of the other major physics research institutes backing either one of two scientists who are making such important arguments about health.

I'm going to try to cut my presentation as much as possible. A lot has been covered. Among the things that we hear from the National Institute of Health is that we have avoidable risk factors and nonavoidable risk factors. We know about radium. Let's avoid it.

With respect to picocuries, to have a mental picture in our minds, 1

picocurie, which signifies activity, the activity while disintegrating in the nuclear chain of reactions, 1 picocurie is equivalent to 3.7 times 10 elevated to the 10th power, so even if we're talking about pico levels we're talking a lot, about a lot, considerable amount, of atomic disintegration or decay, let's put it that way, in those terms.

If we multiply that amount by five for 5 picocuries we have 185 billion, with a B, disintegrations per liter per second. Frankly, I have some knowledge of biology. I have a BS in biology, but even if I didn't I wouldn't want that water close to any soft tissue.

There's a very persuasive argument that read recently in Paul Hawkins' The Ecology of Commerce book of 1993. He was referring to many toxins that we produce annually in our industrial economy. Nature has not developed all the biological

mechanisms to deal with them. In the case of radioactivity I think nature has not come up with any system to deal with it because biology is about order. Think about the genes and the sequence of molecules and the bridges between the spirals. Radioactivity is about disorder, disintegration. The entity, chemical entity, is changing all the time when there's disintegration.

As part of my testimony I will attach something that I got from a source that I mentioned in my testimony which is the Uranium Series of Daughters or Progeny and the Thorium Series of Daughters or Progeny. We're not talking about only radium 226, radium 228, we're talking about a progeny of 14 radionuclides for uranium and 11 for thorium. Let's relieve all the radionuclides. In every step of disintegration there is some kind of particle or radiation amid it, be it alpha particles, beta particles or gamma rays.

I would like Illinois Pollution Control Board to review the language of the current quarterly notice that we get. It actually has bold faced two sentences which are misleading. The first one is the short-term risk being minimal and no special precautions need to be taken at this time.

The second one is pursuit of correcting the water system deficiency has been initiated. The risk increases in time and with persistent exposure. It is not a short-term risk. The second statement is actually false, as we have heard. We have not done anything to move toward compliance.

What kind of water treatment should we use? I understand the City playing out the water softening just in case they are not granted the variance and need to move toward compliance. Water softening is less expensive. Reverse osmosis removes the radionuclides. Water softening reduces

the amount of radionuclides. Let's do the job right.

Reverse -- water softening would need to be managed in a way that you get the system to remove beyond the hardness, the radionuclides, and it removes a lot of the radionuclides from what I've read. Reverse osmosis, especially as the technology improves really does the job of eliminating as much of the radionuclides as possible.

With respect to how much are we spending on bottled water, in my house we spend approximately $130 per person per year, and we're four. I consider that a hidden tax. We were renters until December of '94, so for eleven years we never received a notice. I wonder how many of the renters in a university town aren't receiving a notice. That's something we should correct right away.

Who benefits from the threat to school? The beneficiary is not a public or

existing community. By existing community I mean the people now living in our community. We have heard that the City is implementing plans to bring 2,000 more people within the next several years. What are we doing about the quality of life of the people who now live here? By granting the variances the IEPA recommends, the DeKalb beneficiaries are the real estate people, not the community at large.

I'm going to submit two videos -- actually we have transferred two video recordings into one tape with the corresponding City Council agendas for the May 28th public City Council meeting and the July 8th, 1996 City Council meeting so that the Pollution Control Board gets a flavor for the kind of reflective comments or not that we have experienced in these two hearings.

MS. FRANK: Are you going to also submit a written statement?

MR. CHECA: Yes.

MS. FRANK: The written statement will be marked Public Comment No. 12 and the videotape and agendas will be marked Public Comment No. 13.

(Public Comment Exhibit Nos. 12 and 13 were marked for identification.)

MR. CHECA: Repeatedly the community went on -- repeatedly the community has provided -- I'm sorry. Repeatedly the community has provided feedback to City Hall to no avail while the City Hall's lack of concern for an adequate source of education towards real issues affect the existing community. I don't want to know about urbanization being a main economic development mode. I want to see that our economy is improving of the existing community.

In reality, City Hall has erected itself a supra real state promotional entity. Its self-imposed mission is, 1, to

lay a velvet carpet for developers; and 2, to guarantee developers will absorb as little cost as possible in the urban expansion projects. City Hall has not yet implemented any impact fees, for example, despite repeated clamor from the public to immediately start imposing them to developers.

In DeKalb now we are not implementing a careful and intelligent economic development strategy. What we see is a mere suburban style scroll that brings minimum or next to minimum wage jobs. The contradiction is enormous when we consider that DeKalb has the second largest university in the state, Northern Illinois University, and that the vigorous economic development going on now in the country is happening in great measure around university centers.

With respect to renters and the sick and the poor and the children, we could

consider it as a form of discrimination if we don't protect them. And I'm just jumping from one sheet to the next so that we all can leave soon.

What have other cities done? I receive a general accounting offices report of testimonies every month or so. There's a recent publication. The title is Water Quality, a Catalog of Related Federal Programs. GAO/RCED '96-173, June 19th, 64 pages. Following I quote the abstract: "This catalog provides information on federal programs and initiative to help states, municipalities and individuals protect and improve surface and groundwater threatened by pollution. GAO identifies 72 federal programs and initiatives that either directly or indirectly support water quality protection and enhancement. According to agency estimates, at least 4.6 billion, with a B, was spent on these programs in fiscal year '95."

With respect to -- these are the last two pages. As a short term I think there's a model of decision here, and the model for the evolution to an adequate response is a continuum of stages at one end, and we have denial, and at the other end a fully developed response to the monetary and treatment needs of our public water supply. The first step is for the Illinois Pollution Control Board to persuade the current City Hall officials to start moving in the right direction, otherwise it's not going to happen.

Early on our community will meet an independent audit by reputable auditing in the environmental area or water quality area. The audit should carefully analyze the past operation of the whole system of water sampling, testing, reporting in hydrographic management of the wells. If we are overpumping, are we extracting more of the things that we don't want? The audit

will provide us with hard answers and information.

We cannot depend on the current City management to provide this information because first, it would be a conflict of interest; second, the public cannot trust the current municipal administration as we know that they didn't comply with the first variance.

Among the needed short-term efforts, supplying top quality water to all the schools in the City of DeKalb is of paramount importance. Another short-term project is to implement a point of supply of radionuclide-free water to all the public who now buy bottled water or will be considering the purchase of a radionuclide removal unit, like reverse osmosis. Instead of paying what is equivalent to a hidden tax to local vendors of bottled water, the municipality should absorb that expense. Perhaps the municipality can correct -- can

contract with one or all of the local bottled water distributors to service the public who are concerned about getting radionuclide-free water.

With respect to the long-term options, I have a concrete proposal for the Illinois Pollution Control Board. After the short-term projects are well under way our community should plan, with the assistance of the findings of the auditors, for the adequate study of the long-term solution options. I suggest that the residents who submitted the objection letters to the Illinois Pollution Control Board that prompted this public hearing, and perhaps the one in '91 in DeKalb, immediately form a safe water citizens board that report to the IEP -- Illinois Pollution Control Board. Its mission would be to steer and oversee the strategic direction of the long-term planning efforts and to be the primary authority to whom the proposed auditor will

report to. This is a way to guarantee our community will implement a serious, honest and thorough oversight and control system.

The costs involved in the long term and complete remediation of the problem can be gradually phased in and spread out through the years. Utmost attention should be given to the prioritization of projects so that available funds are allocated in order of increasing priority over time.

The safe water citizens board should be foreign to local politics and special economic interest groups. Currently all the City Hall commissions are appointed by the current mayor who has held office for around 15 years. The result is that the commission acts more as water standing bodies than those entities that have first the quality of our lives at heart.

The safe water citizens board should establish effective communication links with the IEPA, the US EPA, the Water

Pollution Association, the National Sanitation Foundation and other entities whose role it is to be vigilant about issues concerning a healthy water supply. By learning from what other community have done to effectively remove the radionuclides from the drinking water we can avoid reinventing the wheel.

We would like to see City Hall stop playing the regulation skirting game and start taking action to remove, not only reduce, the radionuclides from our drinking water. I will enter now my 12-page report.

MS. FRANK: Okay. It will be Public Comment No. 12 (sic). Are there any questions?

MR. MATEKAITIS: No questions.

MR. EWART: No questions.

(Public Comment Exhibit No. 14 was marked for identification.)

JACQUE SUDING,

being first duly sworn, testified as

follows:

MS. FRANK: Please state your name.

THE WITNESS: My name is Jacque Suding, and it's J-a-c-q-u-e, S-u-d-i-n-g. I'd like first to enter a correction to the record of testimony by the earlier expert witnesses, and this is from the health effects of radium observed and assumed presented by Richard Toohey on behalf of the Illinois Environmental Protection Agency on July 30th and August 2nd, 1985. This is just to clarify your records. This is from Page 7 of that document.

The lowest intake causing cancer in a dial worker was 40 microcuries. The lowest intake causing cancer in anyone was 9 microcuries. A young boy seven years old was given radium as a medical treatment, and I thought since the number was so different from the 60 to 65 as quoted earlier that we should make that correction, so it's really a reentry to your former record.

MS. FRANK: Thank you.

MS. SUDING: I know the hour is late. I don't have a lot so I won't keep you long. I have with me a letter to the Board from Jacob D. Dumel (phonetic) with an affidavit to enter into the record. Mr. Dumel formerly served on the Illinois Pollution Control Board for nearly eleven years. He holds a BS degree in mechanical engineering and an MS degree in public administration both from the Illinois Institute of Technology. He has been a registered professional engineer in Illinois since 1955.

I am also entering into the record but will not read Mr. Dumel's two descending opinions written earlier, and they are in your records, but this will be a resubmittal in my presentation.

Mr. Dumel's letter reads as of July 28th, 1996: "During my service on the Illinois Pollution Control Board from July

1970 through December 1991 I considered and voted on many drinking water variances where radium was the contaminant of concern. The issues then and now remain the same."

"What is the risk of radium in the drinking water? Is that risk too great? Is there a threshold? The study by Dr. Murray M. Finkelstein published in the Canadian Medical Association Journal in September 1994 finds an association between bone cancer and radium content down as low as 0.99 picocuries per liter. The 1995 data for DeKalb shows wells pumping with radium levels as high as 13.7 picocuries or 72 times higher."

"The risk of increased bone cancer has thus been validated in this recent study. There is no threshold that protects children from bone cancer initiated by radium in drinking water. DeKalb should quickly reduce the radium levels in its drinking water. It had five full years to

do so but elected to not solve its public health problem."

"The bone cancer hazard is real and can be reduced significantly. The IPCB should see that this is done quickly. Sincerely, Jacob D. Dumel."

I want to draw a careful distinction and I must quote to do so. There are only about five paragraphs. On Page 15 of the recommendation for extension of variance entered by IEPA counsel regarding DeKalb, July 16th, 1996, it is stated that, "The Agency observes that granting the variance extension from restricted status should affect only those users who consume water drawn from any newly extended water lines. This variance extension should not affect the status of the rest of Petitioner's population drawing water from existing water lines except in so far as the variance extension by its conditions may change in compliance. In so

saying the Agency has decided that it continues to place a high priority on compliance with the standards."

It will be absolutely impossible for the variance extension if granted not to affect all users of water in the City of DeKalb because the water system is all one system. Creating an extension or extensions of the system for new development does not isolate the current population nor in any way protect the potential new population. We are, as they say, all in the same boat. The radium is in the water supply, folks, and has not been dealt with.

The order of the Board in this matter issued on August 1st, 1996 was very careful on Page 4 to exclude the proposed intervenors as not living "in an area which would be affected by the new water main extension which is the subject of this proceeding." The City in its objections to intervenor status drew a very careful

distinction between the City's general population as not being within the areas to be served by the proposed new water main extensions.

In addition, the order states in the note on Page 1 that, "A grant of variance from standards of issuance and restricted status neither absolves the public water supplier from compliance with the drinking water standards at issue nor insulates a public water supplier from possible enforcement action for violation of those standards." Again, the grant or denial of a variance from standards of issuance and restricted status controls whether the Agency may issue the requisite permits to extend water service. It does not affect the applicability of the maximum contaminant level of combined radium as set forth in 35 Illinois Administrative Code 611.330 A.

As citizens of DeKalb we therefore

demand that the variance as requested be granted only as it applies to any new water main extensions but only if the water which continues to be supplied to the current users meet the standards currently in place of 5 picocuries and further that a period of not more than six months be allowed for an acceptable plan to be put into place to bring DeKalb into compliance with the existing standard. If the City of DeKalb is unwilling or unable to take prudent care of its current population, then there is little or no basis for providing for development in the City through which many more people will be affected by its radium contaminated water supply. Thank you.

MS. FRANK: Are there any questions?

MR. MATEKAITIS: No questions.

MS. FRANK: Your statement and attachments will be Public Comment No. 14 (sic).

(Public Comment Exhibit No. 15 was

marked for identification.)

ELLEN PARTRIDGE,

being first duly sworn, testified as follows:

MS. PARTRIDGE: My name is Ellen Partridge. I'm an attorney from Chicago. I filed a petition for intervention on behalf of Dory Burg, John Hepperly, Marion Brown, Clyde Brown, Jonathan Wright and Children of DeKalb, and that petition was denied, and many of the comments that you've heard today express the kind of frustration there is that this is a hearing where there is no cross examination, where the hard questions aren't asked.

And even without those hard questions being asked there are two issues that keep coming up over and over again, and one is the dissatisfaction, dismay that people have with the way that the government has behaved in this whole variance proceeding that the IEPA does not enforce;

that the Pollution Control Board issued an order and that the City of DeKalb has not complied with that order that very specifically said that they had to do the construction to come into terms with the order within four years after the June 20th, 1991 order.

So one of the things that keeps coming through is that there's a loss of faith in the ability of the government to do what it promises that it will do. The second thing that I think keeps coming through is people's dissatisfaction with only the new users being considered, and the fallacy at this point in time is that even the people who are new users in the last variance are now not considered to have any health -- adverse health effects from the noncompliance with the radium standard.

If people had been able to do any sort of cross examination, these are some of the questions that I think intervenors would

have asked and would like the Board to consider: On what basis does the IEPA consider only the effects on new users and not on current users, including those current users under the previous variance; when does the IEPA plan to begin enforcement of the legal standard with what enforcement mechanism if not with use of the restricted status designation; what other standards is the IEPA declining to enforce; how many standards does the US EPA propose but never promulgate as final standards?

And the whole purpose of the mechanism for having a proposed standard and then a final standard is so the proposed standard may not become the final one, and we have the position here where we have this 15 year running rumor that the US EPA standard was going to be changed, and we have nothing really that backs that up except, you know, the speculation of one person or another and its related political

decision that no one has any greater ability than anyone else to speculate about.

Other questions, I mean, how does the Board choose between the various linear and the nonlinear models and how does the Board decide whether there's a threshold? Other questions, has the Pollution Control Board ever denied a variance for radium to anyone? This is a process that's going to go on and on and on. How does the IEPA address the concerns that were raised by the dissenters to the previous grant of a variance?

There were questions raised about that the radium standard and increased radium standard would affect development, but if there were impact keys that would take care of the cost of meeting the radium standard, would those impact fees deter development? If we use some small part of the additional taxes that come in with the development, would that deter development?

The list I have of remedies that citizens would like at this point is as follows, and there are ten items, and many of these are in response to the previous -- what's happened under the previous variance. So the first one is that the Board's order must include specific penalties for noncompliance in light of its history of noncompliance. The second is that citizens must be permitted to monitor the City's compliance with the Board's order.

The third is that the City must independently audit sampling testing and well management procedures annually. No. 4, immediately put measures into effect at all schools to protect the drinking water of children. If they need to drink bottled water, then put bottled water in the schools. No. 5, immediately prevent overpumping and remove sediments in all wells as an intermediate measure.

No. 6, immediately solicit proposals for well liners and casings as a less expensive method to take the radium out than the ones that were discussed by the City. No. 7, investigate mitigation measures and funding mechanisms within 90 days, and that includes looking at things like taxes, increment financing, any state and federal funding that there might be under the Safe Drinking Water Act and impact fees.

No. 8, keep health statistics of the cancer incidence in DeKalb City. No. 9, begin construction of mitigation measures within six months, and No. 10, achieve full compliance with the US EPA standards of 5 PCLs within one year. Thank you very much.

MS. FRANK: Are there any questions? Sir, if you wanted to come up now, that's fine.

STEVE KAPITAN,

being first duly sworn, testified as

follows:

MS. FRANK: You need to state your name.

MR. KAPITAN: My name is Steve Kapitan. I'm the third board alderman in the City of DeKalb.

MS. FRANK: You need to spell your last name, please.

MR. KAPITAN: K-a-p-i-t-a-n. To provide some context for my comments, I would like to state that my votes on the City Council in favor of the variance is a matter of record, but it should not be seen as an acceptance of 20 picocurie per liter standard that has been talked about. I find myself on the horns of a dilemma. I have the responsibility for the prudent management of taxpayer money, and I have the responsibility to look out for the public health.

If the reasonably safe standard of radium is truly 20 picocuries per liter,

then it would be an irresponsible use of taxpayer money to spend millions of dollars at remediation. If the reasonably safe standard is truly 5 picocuries per liter then it would be irresponsible management of public health not to address the problem.

The Federal EPA's proposal of 20 picocuries per liter in combination with the years of delay in establishing the new standard leaves the community in limbo and leaves the City officials in an untenable position.

In a representative democracy public participation is critical. That's why I would like to compliment the citizens who called for and organized this effort to be heard today. I'd also like to thank the Pollution Control Board for holding the hearing and for giving people as much time as they wish to be heard, but I would also like to address the structure of hearing and point out, as has been somewhat referenced,

the inadequacy of the structure.

It was pointed out that two parties who cross examined each other were basically in agreement. It did not allow for the alternative position. And secondly, it was illustrated in the cross examination of Dory Burg that -- the limitations of this, because the questions that were addressed by the City attorney were not allowed to be rebutted by her attorney through a redirect and that --

MS. FRANK: Ms. Burg does have the right to come back up and make any additional statements she wishes to make.

MR. KAPITAN: Sure, and that helps, but it still creates a deficiency in the structure of the system of the hearing. I would urge everyone -- well, I would hope that everyone would urge the federal government to resolve the issue of what is a safe standard. I know references were made to politicians such as myself passing it off

to the federal government, but we have to have some mechanism to decide which of the experts we are going to embrace.

The issue of battling experts and choosing statistics, you know, that's all been mentioned already, using statistics to manipulate the process or to prove your point, but we have to have some resolution of the issue. And if people feel through their own research that 5 picocuries is the appropriate level, then lobby the federal government to maintain that standard and to indicate that that will continue to be the standard and then that gives me the position where it gives me the political power to make the case that we should expend the funds to resolve the issue.

But when the federal government continues to hold 5 picocuries as a standard on the one hand and then hold out 20 picocuries on the other, there is not a reasonable resolution that can be made from

this -- arrived at from this problem. If 20 picocuries turns out to be the standard, then these hearings are a monumental waste of time. If 5 picocuries turns out to be the safe standard, then it's a fraud on the public. Either one is not the way that we should do things as a representative democracy. Thank you.

MS. FRANK: Are there any questions?

MR. MATEKAITIS: No questions.

MR. EWART: No questions.

MS. SUDING: I'm Jacque Suding again, just a short comment. It is possible to set a standard within a municipality that is the same or lower than a federal or state standard. We can as a municipality set a standard which we believe in to protect the public health. I cannot give you a document to support what I'm going to say next, but it is our very considered understanding that the State of Iowa decided that the wealth of its citizens was served by setting its

standard at 3 picocuries, and we are working at the moment to obtain documentation for you on that issue.

The point being that you don't always have to believe that a standard is the best for you in a particular situation. The whole country is not subject to radium contaminated water as we are here.

MS. FRANK: Before we start taking comments from people who have already spoken, it's important that we make sure that there are no new people who wish to speak. So is there anyone who wishes to make a statement on the record who hasn't had a chance yet?

Yes, ma'am, please come forward. Please state your name and spell your last name.

MS. ROSCELLI: My name is Symone Roscelli, R-o-s-c-e-l-l-i, and I have stayed here for six very precious hours today.

SYMONE ROSCELLI,

being first duly sworn, testified as follows:

MS. ROSCELLI: There is a ghost here that worries me. I have been a resident of DeKalb for 26 years, and I am out of the country to many different places for extended periods, so I have not been involved in this controversy. However, I find one ghost that worries me and afterward I'd like to give you a very, very complimentary comment.

It seems to me there is a lot of talk of 20 picocuries but I have no -- or maybe I missed where the substantiation for this ghost lies. Is there a substantial background or a documentation for the supposition and the acceptance by the gentleman who just spoke that there is such an intention for the last 20 years of the federal government to change these standards to four times or how many times more than it already is? I would like very much to know

that particular aspect of this discussion because it is very vital and, in fact, as was mentioned because it puts your City government in a quandary as to what to do. But 20 years of quandary is a little too much for me to accept.

I've seen here an example of grass roots democracy that really makes me very happy. I have lived in many countries, both dictatorships, putative democracies that are dictatorships. I have been involved with people who have abused, neglected and murdered by dictatorships, and here we can walk out of here and be free to feel that we are not going to be shot on the street because of our discussions and our views, and I find that to be highly commendable.

However, when democracy is watered-down by callus commercialism by the saving of pennies against the community good, then I find that democracy is lacking and will go down without the care and the

devotion that people here seem to have given of their time, their money, their consideration. If it is not accepted in the manner in which it is given and it is not considered, then we have a very, very sad future for our democracy, and I hope we will not have that, because this has been inspiring to me to live in countries where nobody can get up and talk the way we have talked here. Thank you very much.

MS. FRANK: Are there any other members of the public that have not spoken yet who wish to speak? Okay. At this time I'm going to allow people who have already spoken a chance to come back up if there is something that they feel they need to address.

I'm going to limit you to five minutes apiece though so you need to collect your thoughts and think about what you want to say because we're not going to stay here now for another four hours so everyone can

reiterate everything, but we will allow five minutes apiece of any type of rebuttal or redirect information that you feel needs to come forward.

I remind you that you are still under oath. Mr. Checa, you may come up.

MR. CHECA: I appreciate very much the kind words that we have heard just before me. I have been puzzled by the fact that I don't see this process, something which is very healthy and a natural part almost of the sciences which is scientific peer review. What if the Illinois Pollution Control Board takes initiative, exercises leadership and submits the different scientific reports to the top -- the highest level of independent scientific peer review possible in North America since we have quoted a Canadian and an American study. Why don't we do that?

In science that is how we move from hypothesis to thesis. We are not doing

that and our health is at stake. I really encourage your taking initiative in that directive. Thank you.

MS. FRANK: Is there anyone else who has an additional comment?

MS. BURG: Okay, two comments. One is that the Illinois Pollution Control Board has a 1 picocurie limit for wildlife in any waterways, rivers, streams, creeks. Wherever water flows cannot be above 1 picocurie per liter of water because wildlife must be protected at that level because they are smaller than grown adults, and I would like to ask protection for our children under the Wildlife Act of the Pollution Control Board.

And the other comment is that we were denied -- I was denied -- I was denied intervention on the fact that there was no intervention but also on the fact that I was not timely -- I was not timely filed; that the filing date closed on the 24th starting

on the 3rd of June.

MS. FRANK: Ms. Burg, that is not what the Pollution Control Board's order said. That was an argument from one of the parties. You're misstating the order and the Board knows what its own order says, so you may move on to your next comment.

MS. BURG: I'd like to make the comment without it being cross examined or interrupted, okay? Do you mind if I make that comment? If not, I will just move away. I would like to say the comment without argument because I am not allowed to intervene, so let me just say my one comment.

MS. FRANK: Ms. Burg, I just think that it's important that you not mischaracterize the Board's order. What you're stating was an argument from one of the parties. It was not in the Pollution Control Board order. You may continue.

MS. BURG: May I say what the party

argued in their variance to me?

MS. FRANK: Yes.

MS. BURG: Okay, thank you. The party argued in their -- in my denial that the comment period was from June 3rd until June 24th, one day before the -- one day after -- no, excuse me, one day before the public notice appeared in the paper of June 25th. My comment period ended according to the Illinois EPA was -- Mr. Ewart signed it, I believe, and it said that the comment period closed on the 24th.

The notice began on the 25th to the public to say, do you have any objections, do you have any comments, because there is a variance that will be given by your City. And I think that that kind of argument, and I've seen them on the last variance, where every person who sent in letters, the comment by Mr. Ewart was there were no responses.

And I could have Ellen bring it up

here right now if you'd like to see it. When I gave my variance recommendation all the people -- Midsonca (phonetic), the dates were stamped on her letter the 21st. She sent all her letters in with all the names of people. Petitions were sent, letters were sent, protests were sent.

Mr. Ewart wrote in his comment in the denial -- in the recommendation that he wrote for the Pollution Control Board -- for the Illinois EPA to the Pollution Control Board that there were no comments to the public notice, and I would like to say that when you play with dates like that to exclude the public and when you use those kind of arguments to exclude their hard work and their lives and their taxes and their big feelings that you are playing with something that's even more dangerous than a few radionuclides. Thank you very much.

MS. FRANK: Are there any other comments from the public? Yes, sir. I

remind you that you're still under oath.

MR. HOUGHTBY: When I came up here before I forget to mention that I have lived in DeKalb now for eleven years and I have rented all eleven years. I've been a college student for six. Throughout the entire eleven years I never had to pay a water bill as part of my lease, and therefore I never saw any water bill, and therefore I never saw any of the warnings posted on the back.

Now, I know that that is the case with thousands of college students who rent in this town. Heat and water are almost always paid by the landlord. We have to find more ways, better ways of informing people and I want to -- I want to make that clear to you. We're not dealing here necessarily with the public that entirely knows what's going on. I can guarantee you that we're dealing partially with a public that has no concept, no idea what's going

on.

Regarding this issue of economic development, last summer the City of DeKalb had two -- actually the City Council of DeKalb had two workshop meetings at which economic development incentives, programs, policies were reevaluated as was relocation of businesses affected by developments, and during the course of one of those meetings, I don't remember which one, Mark Biernacki, planning and economic development director, mentioned something that really stuck in my mind.

He made the point that about two-thirds of DeKalb residents cannot afford to buy the new homes; that according to their study, according to their income guidelines two-thirds of DeKalb citizens could not afford to buy all the homes that are being built and could not afford to buy all the homes that are going to be affected by the extension of water service.

It points to a certain schizophrenia that this whole discussion today is the distinction between current residents who have lived here, some people eight years, and potential residents who are not yet here who are going to be affected by this variance. It seems to me very, very odd to be worried about people who aren't even here yet. It seems to me to be very odd to worry about economic development that will supposedly be lost but it was never gained to begin with when we're dealing with thousands of citizens who live in this town, live in this area from day to day to day for years and years and years.

Somebody made the great observation of that we're all in the same boat. We're all floating on the same water. We're all drinking the same water, and that distinction, even though it has a legal basis, I think practically is worthless; that what we are dealing with

here is not with an extension of water service and practice, we're dealing about what me and all the other people here drink on a day-to-day basis.

So thank you very much, and this is one of the few opportunities that I've ever had to be -- we come to the DeKalb City Council and we have three minutes to speak and that's it. There's not much you can say, so thank you very, very much for allowing us more than three minutes.

MS. FRANK: Is there anyone else in the audience who wishes to speak? Mr. Kapitan; is that right? I remind you you're still under oath.

MR. KAPITAN: I will be very brief. I just wanted to voice my support for increased availability of notice for the reasons that have been mentioned. This community has a very high percentage of rentals being a university community.

The issue of the delay by the

federal government, the structure of the hearing and the issue of cross examination among witnesses that are in basic agreement, and thirdly the -- what was the other point? Oh, the use of the numbers for the risk factor applying to only the additional people. Clearly the additional people relate to the extensions. However, it is more of an impact on the people who have been drinking this particular water for all of their lives obviously, and then that adds to the suspicion as well that the structure of the variance request is designed for -- to minimize the risk and engenders a cynicism and a suspicion that it is being made for economic reasons and not for health reasons, and this at a time when cynicism about government is indemnity to society.

MS. FRANK: Are there any other members of the public that wish to make a statement? Okay.

At this time we're going to return

to the attorneys then seeing that there are no members of the public. Do you have any rebuttal witnesses that you wish to call? First the City.

MR. MATEKAITIS: Yes, thank you. I would call first of all Ronald Naylor.

MS. FRANK: I remind you that you're under oath.

REDIRECT EXAMINATION

BY MR. MATEKAITIS:

Q. Mr. Naylor, there were some questions raised in the public portion of the testimony before the Board today with respect to the language that's on the water bills. Would you please describe what the origin of that language is that appears on the water bills.

A. The language that we've used is per the IEPA's approval and direction as to the exact language.

MS. FRANK: Can you speak into the microphone and speak up, please.

A. The language that we have used in our notice to the public on the back of our water bills is the direct -- per the direction and approval of the IEPA and specifically to the content therein and the exact verbiage that has been used.

Q. So to the best of your knowledge the language that's contained on the water bill sent to the City of DeKalb water users is in compliance with all the existing IEPA regulations as to the content of that language?

A. Yes.

(Petitioner's Exhibit No. 14 was marked for identification.)

Q. Mr. Naylor, drawing your attention to what's been labeled at this time Petitioner's Exhibit No. 14, ask you if you recognize that document.

A. Yes, I do.

Q. How is it that you recognize that document?

A. This is a letter from the DeKalb County

Health Department that I received in -- I believe just today dated August 2nd, 1996.

Q. That's authorized by who?

A. Karen Grush, public health administrator.

Q. Did you have any conversations with Karen Grush that indicated that she, in fact, did send you this letter?

A. Yes, I did.

Q. When did those take place?

A. Probably two plus weeks or so ago in response to a newspaper article which Mrs. Grush was quoted in the paper with regards to the DeKalb County incidence rate of cancer, and I called and spoke with her and asked if she would submit her comments in writing to us.

Q. And what's contained in Petitioner's Exhibit No. 14, does that represent those comments?

A. Yes, to the best of my knowledge.

MR. MATEKAITIS: I would move at this time for admission of Petitioner's Exhibit No. 14.

MS. BURG: I object.

MS. FRANK: Ms. Burg, you do not have standing to object and --

MS. BURG: I still object.

MS. FRANK: -- as I stated earlier, outbursts from the public are just not acceptable. We have allowed you more than adequate time, about four hours, to present your side of the case. This is now the time for rebuttal testimony. Continued outbursts will require me to ask you to leave, and I know that you want to be here to hear this, so I ask that you please sit quietly.

MS. BURG: I can leave. I will leave.

MS. FRANK: I'm not asking that you leave. I'm just requesting that you sit quietly.

Mr. Ewart, do you have any objection to the admission of Petitioner's Exhibit No. 14?

MR. EWART: No, I do not.

MS. FRANK: Okay, then Petitioner's

Exhibit No. 14 is admitted into evidence.

MR. MATEKAITIS: City has no further questions of this witness.

MS. FRANK: Mr. Ewart, do you have any questions of this witness?

RECROSS EXAMINATION

BY MR. EWART:

Q. Mr. Naylor, you asked -- you requested Ms. Grush, Karen Grush, public health administrator, to provide these numbers which are adjusted cancer incidents per hundred thousand by size and sex dated dates 1987 through 1991 including all races, and what is this a comparison of?

A. What is this -- this is -- she had responded to a newspaper article stating that the incidence of cancer for DeKalb County during this time period was not -- what's the proper term -- unusual for DeKalb County.

Q. Are the columns labeled DeKalb and the incidence of cancer per hundred thousand projected?

A. These are based upon the statistics for the five-year time period from 1987 to 1991 incident rate per hundred thousand.

Q. And in the right column listed for Illinois, I assume that's the number of incidents of cancer per hundred thousand during this time period?

A. For the entire State of Illinois, yes.

Q. For the entire State of Illinois?

A. Yes.

MR. EWART: I have no further questions.

MS. FRANK: Mr. Matekaitis, do you have anything else?

MR. MATEKAITIS: Not of this witness. I would recall Dr. Rowland.

MS. FRANK: Dr. Rowland, I remind you that you're still under oath.

REDIRECT EXAMINATION

BY MR. MATEKAITIS:

Q. Dr. Rowland, one of the citizens had formed some sort of calculation to try to modify

what 5 picocuries per liter represented. Could you explain or try to put again in layperson's language what that quantity of radium would represent.

A. I'm not sure that I understand your question. Could you tell me who made the statement that you're referring to.

Q. I believe that was Mr. Checa that had made that statement.

A. Oh, yes, Mr. Checa gave a definition of a picocurie, and unfortunately he was wrong by a factor of 10 to the 12th. He said, if I heard him correctly, that 1 picocurie was 3.7 times 10 to the 10th disintegration per second. That is a definition of a curie, not a picocurie, and he went ahead and calculated how many disintegrations per second took place if you had 5 picocuries in the water.

The truth of the matter is that 1 picocurie represents 2.22 disintegrations per minute. It is a very low rate, and I

think this was an error on his part, if I heard him correctly.

Q. Dr. Rowland, with respect to a number of comments that were made with respect to Dr. Finkelstein's study, both the '94 and '96 studies, have you had an opportunity to review the information associated with those studies?

A. Yes, I have.

Q. And in your professional opinion what are the weaknesses associated with the methodology employed in each of those studies?

A. What I would like to suggest is the following. He is implying with the statistics that a very, very, very low concentration of radium in drinking water, many factors below what has been represented, quite a few factors below 5 picocuries per liter, has been causing bone cancer in young people.

I would like to go back to

Dr. Sandman's testimony because he quoted a study by a man by the name of Peterson who looked at the incidence of bone cancer in the entire population for areas in Northern Illinois. I'll remind you that DeKalb by itself is not the only place that's suffering from radium in the water. The whole Northern Illinois that gets its water from deep wells is.

A study was performed in which high radium level communities were compared with so-called low radium level communities, and this was based on the raw water supply presented to the citizens of the communities in which the study was made. And Dr. Sandman stated quite correctly that there was a slight increase in bone cancer in the high radium communities, something like 6. -- a rate of 6.7 and I can't remember the decimals, but per hundred thousand people versus 5.3 in the low radium communities.

If Dr. Finkelstein's findings are correct we would have an epidemic of bone cancer in Northern Illinois. We've been drinking that water for 50 years, and if levels as low as a tenth of picocurie per liter of water are able to induce as many cancers as he sees in these young people, then you and all the other communities would be in an uproar because you would have not a scattering of bone cancer, you would have an epidemic.

And so this I find as the largest fault. He has done a very nice job in looking at his data. He has carefully qualified his findings. He is not saying that this is what the situation is, he is saying that is what we see here, maybe it means there's a problem, and I respect that. I think he's done a very nice job.

I also would like to say I respect the report that Dr. Sandman gave as well, but one comment that I made to Dr. Sandman

and I should make to you, in the report that Peterson published he left out a very interesting fact. The highest incidence of cancer in the population studied was a population of the City of Chicago which gets its water from Lake Michigan which has 0.03 picocuries per liter. It had the highest rate of bone cancer in the area studied.

This again points out that we must look at all the facts that are available, and Peterson deliberately left this out of his paper. Some of us were privy to it because we had a chance to review the original manuscript before it was published, and so even scientists, I beg to confess, are not above leaving out pieces of data if it doesn't fit their hypothesis.

And the Peterson study is a good study. It does definitely prove that Finkelstein's results are not applicable to Northern Illinois, but it still leaves a little impression that high radium

communities have more bone cancer than low radium communities, and they did, but what he didn't tell us is that Chicago with almost no radium in its water had the highest bone cancer rate of any.

Q. Doctor, you've been involved with a study, the effects of radium in one form or another it would appear to be the better part of 45 years, professional education and training and work experience, professional publications, your authorship of a book, your stated research interests and indeed your activities that you're going to present in France next month regarding the health risks associated with radium.

Given that wealth of background and experience, do you have an opinion with respect to whether or not the public water supply of the City of DeKalb is safe with respect to the existing level of radium in its public water supply for not only existing water users but for those many

users that will be served by the extensions of water mains?

A. Let me answer that by saying that I live in Batavia, Illinois. Our postcards say 14.7 picocuries per liter, although the information that was recently gathered here brings us down apparently only to 9 plus a little more.

I raised my children in Northern Illinois. I didn't buy bottled water, and I would like to make a statement that I sympathize very, very much with the citizens of DeKalb and the other communities. Putting water into bottles doesn't take out the radium. You must verify from the producer, 1, that it's either gone through a reverse osmosis process or heaven forbid it's distilled water.

MS. FRANK: Dr. Rowland, with all due respect, if you could confine your comments to answering the questions asked of you. It's almost 8:30 in the evening and so if

you could try to do that I think it would help to speed the process.

A. The question that was asked of me was do I consider the current level of radium in the water to be safe. I'm sorry I expanded that. I certainly do think it is safe.

MS. FRANK: Thank you.

MR. MATEKAITIS: I have no further questions.

MS. FRANK: Mr. Ewart?

MR. EWART: I have no questions of this witness.

MR. MATEKAITIS: No further rebuttal by the City.

MS. FRANK: Mr. Ewart?

MR. EWART: I have no rebuttal witnesses.

MS. FRANK: Are there closing arguments from either side?

MR. MATEKAITIS: Briefly. The burden is on the Petitioner, the City of DeKalb, to present adequate proof that immediate

compliance of the Board's regulations at issue would compose an arbitrary or unreasonable hardship and that such hardship outweighs the public interest in obtaining compliance with regulations designed to protect the public.

The City acknowledges that the requested variance will not change the current standard for combined radium 226 and 228 that the Petitioner must meet; however, it would grant the City additional time to meet that standard. The City has presented testimony indicating that compliance would cost approximately 6 million to $12 million and two to six years to achieve. That represents monies that are not available for additional fire and police personnel, monies to improve the City's storm water system or to improve and maintain the City streets.

The City has presented testimony indicating that water service would be denied to approximately 805 dwelling units

representing approximately 2,265 new residents if the City's petition is denied. Further, the City would stand to lose approximately $3.2 million -- or strike that, $2.8 million in annual sales tax revenues, corresponding losses of $240,000 in annual property tax revenues and $140,000 in annual utility tax revenues with the additional loss of 2,200 new jobs if the petition is denied.

Additionally, fire flows and fire suppression improvements resulting from the looping of new water mains would negligibly (sic) impact the existing residents of the City of DeKalb if the petition is denied. The men and women that make up the City's government, live and work in this community, they and their families consume the same water as the residents they serve. They indeed have nothing to gain from subjecting themselves and their families to an unnecessary health risk.

Still the City is taking steps to move towards compliance with the existing standards. The City has reduced the pumping from wells that have the highest concentration of radium and has reduced the weighted average consumption of radium in the levels of five years ago. It appointed a citizen ad hoc advisory board to review its existing water supply system to make recommendations regarding the steps the City should take with respect to lessening the amount of radium in the water supply. The City has adopted the report of the committee and has implemented some of its suggestions.

The City continues to review methods for compliance and has retained the services of Baxter and Woodman to assist in that process. Baxter and Woodman has identified potential alternatives for compliance and the cost and length of time it would take to construct such

improvements.

The fact remains that there will be little or no adverse impact caused by the granting of the requested variance. The City believes that there will be little or no benefit to the public or the environment in complying with the current standard for combined radium 226 and 228 for the limited period of the variance. Even if the petition is denied compliance with the existing standard would take years to accomplish.

The City has introduced evidence indicating that the weighted average consumption for radium 226 and 228 is less than in other communities that have been granted a variance from restricted status and standards of issuance. The testimony of Dr. Toohey, Dr. Rowland and the overwhelming body of scientific research done to date indicates that the existing level of radium in DeKalb's water supply does not pose a

significant threat to the public and perhaps poses less of a threat now than previously thought.

The US EPA has previously indicated that it believes a standard of 20 picocuries per liter for each individual isotope is sufficient to protect the public's health. There is nothing in the record to indicate that the US EPA's considering anything other than proposing such a standard. Expending 6 to $12 million to meet a standard set by the same Agency that now acknowledges such standards as inappropriate is an arbitrary and unreasonable hardship upon the residents and taxpayers of this community.

We can potentially live in a pollution-free environment, breathing pure air, drinking pure water, driving pollution-free vehicles, but at what cost? Most of us can accept that there are undesirable substances in the air we breathe, the water

we drink and the food we eat. Indeed there are permissible levels of pollutants in our air, water and food as determined by the US EPA Food and Drug Administration and other agencies. The debate is focused on what those levels should be rather than the absence of all the pollutants.

The US EPA, congress and president have all indicated that the repeal of legislation that prohibits the threat of any pesticides in our foods is eminent. They say it's a case of science catching up with policy. We now have instruments that can measure minute amounts of pesticides in our food, and apparently it's been determined that there can be levels of such substance in our foods that do not pose a significant threat to our health.

Scientific health research is not a static activity. As additional studies and research is conducted we have seen that some substances have been determined to be

more harmful than previously thought, for instance, lead and asbestos, while others have determined to be less dangerous than previously thought, for instance, cyclamates.

The Petitioner believes a great weight of scientific research and opinion indicates that the level of radium in DeKalb's water supply does not pose a threat to the consumers of that water.

Given the proposed revisions to the radium standards that would make the expenditure of 6 to $12 million unnecessary, the limited benefits to the public from compliance with the existing standard during the limited period of the variance, the loss of tax revenues and negative impact on new residents by being denied water service, the negative impact on the fire protection services, Petitioner City of DeKalb believes it has met its burden of proof in this matter and urges the Board to concur with

the Illinois Environmental Protection Agency's recommendation and approve the requested variance.

MS. FRANK: Mr. Ewart?

MR. EWART: I just have a few comments. As stated in our recommendation, the Agency recommends grant of this variance not to relieve the City of DeKalb of its responsibility in meeting current radium standards of 5 picocuries per liter combined, but to permit the City of DeKalb to extend water mains to bring in new industry, residents and other measures that would be connected to this.

As stated also in this variance, we contend that there is -- would be an arbitrary or unreasonable hardship would result in this matter if this variance were denied. The Board through this hearing has heard many comments of citizens. There's been a great deal of effort that has gone into the development of their statements.

The Board should consider the statements of these witnesses in light of the testimony of the parties that we've heard today. Thank you.

MS. FRANK: Okay. At this time I would like to thank everyone, the attorneys and also the people who came forward to make public comments and attended today. Especially I would like to thank people who made extra copies of their exhibits. That saves the Board a considerable effort in getting those exhibits out to the attorneys which is something that we will do for the other ones, but having the extra copies is very helpful.

The record in this proceeding needs to close by August 19th because the Board's meeting before the decision due date is September 19th, and the Board requires that records close 30 days prior to their decision so that they made deliberate. Based on that and the fact that the City of

DeKalb has agreed to pay for expedited transcripts, the public comment period to allow for a written comment in this case will go until August 12th, which means that any written comment that you want viewed by the Board pertaining to this case must be placed in the mail by August 12th.

We do not accept faxed filings. I'll be very clear about that. Anyone who faxes something to the Board, it will not be accepted, it will not be part of the record. So if you want the Board to consider it you need to place it in the mailbox by August 12th.

Then on August 19th by 4:30 the parties need to have any rebuttal comments or simultaneous briefs, if you feel briefs are necessary, in to the Pollution Control Board. It is your choice as to whether or not you Federal Express the filing to arrive the next day or you hand walk it in, but in no event should it not arrive at the Board

by August 20th. So if you placed it in Federal Express the 19th they should get it the next day. And if possible get it to each other as quickly as possible. You don't need to get my copy to me that quickly, you can stick it in regular mail.

Are there any other procedural-type questions? I have the address of the Pollution Control Board, who the comments need to be directed to and the Pollution Control Board number which you should add to your comments, and I have it written down which I will bring out to the public so that they can use to copy, and I also have put my phone number on there in case there are any procedural questions after today where members of the public have questions, they can call me. I also have some business cards which you're welcome to take and you are welcome to call me if you have any questions between now and the 12th or the 19th.

Is there anything else that we need to cover from any of the attorneys?

MR. MATEKAITIS: No.

MS. FRANK: Do any members of the public have anything -- any questions about the procedure? Mr. Checa?

MR. CHECA: Not about the procedure, but I acknowledge the mistake that I made about the numerical mistake, and I will be submitting a correction. Thank you.

MS. FRANK: Okay, thank you. Is there anything else at this time? Okay, then the hearing proceeding is adjourned, any future comments to be in written form directed to the Pollution Control Board. Thank you all for coming.

(The hearing was concluded at 8:34 p.m.)

BEFORE THE ILLINOIS
POLLUTION CONTROL BOARD

CITY OF DEKALB	)	
	)	
Petitioner,	)	PCB NO. 96-246
	)	
v.	)	
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	DeKalb County Municipal Bldg.,
	)	DeKalb, Illinois
Respondent.	)	August 5, 1996

I, Carrie L. Vaske, hereby certify that I am a Certified Shorthand Reporter of the State of Illinois; that I am the one who by order and at the direction of the Hearing Officer, Deborah L. Frank, reported in shorthand the proceedings had or required to be kept in the above-entitled case; and that the above and foregoing is a full, true and complete transcript of my said shorthand notes so taken.

Dated at Ashton, Illinois, this 10th day of August, 1996.

Carrie L. Vaske
Registered Professional Reporter
Certified Shorthand Reporter
Illinois License No. 084-003845
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Ashton, Illinois 61006