STATE OF MICHIGAN
WAYNE COUNTY CIRCUIT COURT

ALFRED LEIJA and SANDRA F. LEIJA,
Plaintiffs,
VS.
No. 96-617531-NO
MARATHON OIL COMPANY, an OHIO corporation; LARRY M. ECHELBERGER; ARDELL K. JOHNSON and GREGORY W. MULLINS, jointly and separately,
Defendants and
Third-Party Plaintiffs,
VS.
DOWNRIVER MAINTENANCE CORPORATION, a Michigan Corporation,
Third-Party
Defendants.

**DEPOSITION OF OTTO WONG**
San Francisco, California
**Tuesday, March 23, 1999**

Reported by:
LYNNE M. LEDANOIS
CSR No. 6811
Job No. 7065

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Deposition of OTTO WONG, taken on behalf of Plaintiffs Alfred and Sandra Leija, at 555 North Point Road, Room 545, San Francisco, California, beginning at 9:26 a.m. and ending at 10:45 a.m., on Tuesday, March 23, 1999 before LYNNE M. LEDANOIS, Certified Shorthand Reporter No. 6811

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San Francisco, California, Tuesday, March 23, 1999
9:26a.m. - 10:45 a.m.
OTTO WONG,
having been first duly sworn, was examined and
testified as follows:

EXAMINATION
BY MR. BARRIE:
Q State your name for the record, please.
A Otto Wong.
Q Where do you reside, sir?
A 181 Second Avenue, Suite 628, San Mateo,
California 94401.
Q And the phone number there, sir?
A (650)347-7898.
Q Is that a business address?
A Yes.
Q How long have you been there?
A For almost nine years.
Q What's the name of the firm or company?
A Applied Health Sciences, Incorporated.
Q Tell us what Applied Health Sciences is.
A Basically, it's a contract research
company. We specialize in doing epidemiologic studies
for the industry, and we also do consulting for

different groups of people.
Q How long has this company been in existence?
A Since 1991.
Q Who owns the company?
A I do.
Q Solely, 100 percent?
_ A Well, half of it is owned by my wife, as anything else in this state. So basically I own the company, yes.
Q When you say, "half owned by your wife," you're talking about a community property issue?
A Yes.
Q Have you always owned 100 percent of the company since 1991?
A Yes.
Q You say that the purpose of the company is to provide consulting services to industry, among other groups?
A Also to major projects, if you count that as consulting as well.
Q For whom?
A For industries, mainly.
Q Okay. My name is Martin Berrie and we introduced yourselves prior to the deposition. I'm

here to take your testimony with respect to the facts, circumstances and opinions that you've arrived at in the Leija case. Do you understand that?
A Yes.
Q You've given your deposition numerous times; I've read just about every one of them, so I'll try not to duplicate many of the questions, but I do need to be sure when you respond to my question, be sure you understand it. Will you do that for me?
A Yes.
Q When were you first contacted in this case?
A I think sometime in early 1998 or late 1997.
Q Who contacted you?
A A lawyer by the name Michael Latiff.
Q Michael who?
A Latiff.
Q And he was a lawyer that was retained by Marathon Oil Company?
A Yes, he's in Detroit.
Q Okay. And what did Mr. Latiff ask you to do?
A Basically asked me whether I'm interested in working with him in the case, and sent me some

materials to read, background materials in the case,
and also, I guess, be prepared to form an opinion.
Q With respect to what?
A With respect to exposure to benzene
petroleum products, and the risk of developing chronic
myeloid leukemia.
Q How many times have you spoken with
Mr. Latiff?
A Probably about six, seven times on the
phone.
Q Have you spoken with anybody else aside
from Mr. Latiff?
A Regarding this case?
Q Of course.
A I have spoken with Mr. Lou Woolf.
Q Who's sitting to your right?
A Yes.
Q Anybody else?
A Maybe somebody in the offices, their
secretary or -
Q Aside from talking to Mr. Woolf or to
Mr. Latiff or their secretary, have you spoken to
anybody else about this case; for example, have you
spoken with anybody at Marathon Oil Company, any
coworkers of Mr. Leija, the plaintiff in this case,

any industrial hygienists for Marathon, anything like that?
A No, I have not.
Q Do you plan on doing so?
A Not at this point.
Q How many occasions have you worked with and/or for Mr. Woolf?
A I probably have about four or five cases ongoing at this point, and he contacted me regarding this case some time ago. Over the years I may have worked for him for some other cases. I don't recall the numbers.
Q The current cases that you have, do any of those cases involve allegations of benzene exposure in leukemia?
A I think most of them involve exposure to benzene or petro chemicals. I think one or two cases may be some form of leukemia.
Q Do any of those cases of leukemia have anything to do with chronic myeloid leukemia?
A There may be another old case, still active, I have not looked at the case for some time. It may be another chronic myeloid leukemia case.
Q And what would be the name of that case?
A I don't remember the name.

Q Do you remember the lawyers, aside from Mr. Woolf, that are on the other side of the docket, for example, the plaintiff's lawyers?
A No.
Q You were involved in the Skeen Case, as I recall?
A That's many, many years ago, yes.
Q But you were involved in that case, there was a case in Texas involving chronic myeloid leukemia and benzene exposure; correct?
A Yes.
Q And you gave testimony in that case?
A Yes.
Q What materials were provided you by Mr. Latiff originally in this case?
A Some medical records, some M.S.D.S., depositions of coworkers, depositions of the plaintiff.
Q Anything else?
A I think that's all I can recall.
Q And you've been retained in this matter as an epidemiologist; is that correct?
A Yes.
Q You have not been retained as an industrial hygienist?

A No.
Q You have not been retained to give testimony with respect to toxicology issues on toxicological causation issues; that would be correct?
A No.
Q No, that's correct, or yes, it is correct? You have not been asked to give testimony as to toxicological issues on causation, have you?
A No.
Q You have not been asked to give medical opinions as to causation, if at all, have you?
A No.
Q You have not been asked to give any opinions as to engineering design issues, have you?
A No.
Q And, again, Dr. Wong, in that same light, you have not been asked to do any opinions or calculations with respect to dose modeling, that is modeling of dosage of exposure with respect to inhalation and/or dermal exposure, that's not been one of the issues you've been asked to address, is it?
A No.
Q So, really, your area of focus, as it were, is really in the field of epidemiology?
A Yes.

Q And, as I appreciate and it may be a very rudimentary definition of epidemiology, but it would be more or less evaluating cohorts or groups of people; comparing them together, if they are matched as close as possible, to see whether there is an incidence or an elevation in the disease or an illness relative to another group that may or may not be exposed to a particular chemical; would that be a very bad, rough thumbnail sketch?
A This is part of what we do, but that's not the entire picture.
Q And the other picture would be looking at risk assessment?
A Well, you're talking in a gray area, risk area, whether that's epidemiological or not, maybe part of it is.
Q Is that something that you were focused on in this case in terms of risk assessment?
A It depends on what you mean by "risk assessment." Risk assessment means different things to different people.
If you're talking about the EPA-type regulatory risk assessments, no, I'm not doing that. But if you use the word "risk assessment" in a general sense, assess risk, then I would say yes.

Q So in addition to looking at the plaintiff's exposure, one of the missions that you were asked to address, the second would be looking at risk in terms of what the plaintiff, Mr. Leija, would have been in this case; would that be accurate?
A Basically, in this case, it's my assignment really to look at the causation.
Q Well, does epidemiology look at biological causation in individuals?
A Again, that's kind of in the gray area. We do find a group of people exposed to certain chemicals have an increased risk of certain disease. Certainly it would be wonderful if we can find some explanation for that in terms of biological mechanism. But sometimes we may not be able to do that. So biological mechanism is part of the overall picture. But, again, it depends on how advanced we are in that area.
Q But isn't it true that epidemiology does not look at causation of chemical exposure in individual people, what it looks at is groups of people to see if there is an inference of causation; isn't that what epidemiology is about?
A Well, there is a couple of things in your statement I do not agree.

Q Tell me.
A I don't care what discipline you are in, you cannot look at a single individual case and come to some kind of causation conclusion. The best you can do is to use epidemiologic data and apply that to someone with certain exposure profiles.
Q But data is looking at groups of people; correct?
A Yes, we look at groups of people.
Q Okay. And from looking at groups of people, you try and ascertain whether there is a risk that an individual within the group may have for developing, say, in this case, chronic myeloid leukemia?
A Yes.
Q Is there any materials, other than the medical records of the M.S.D.S.s, depositions of coworkers and plaintiffs, that you received and reviewed in the formation of your opinions in this case?
A Of course I reviewed some studies, epidemiologic studies.
Q We're going to cover that, but I'm talking about what you actually received from either Mr. Woolf or other Marathon lawyers in this case. Was

there anything else that you received?
A Those are all the things that I can recall.
Q Is there anything that you've asked for that has not been sent to you that you would like to have to review and evaluate in coming to your conclusions in this case?
A No, I have not.
Q Is there anything that you're aware of that's outstanding, something that they said they're going to provide you but you have not received to this date?
A I think yesterday Mr. Woolf and I talked about the deposition of Dr. Titlebaum in this case.
Q You have not reviewed Dr. Titlebaum's deposition?
A I don't think so.
Q Is that something that you'd like to look at and review?
A It's always fun to read his deposition transcripts.
Q It's always fun to review and read everything, including your depositions, but in truth of fact, is there something out there that I need to know about that you need to review or evaluate that

you have not done so at this point prior to the formation of your final conclusions? For example, I don't want to walk away from here at the end of the day and have somebody send you something that you've been looking for that you say, you know, I really need this to look at prior to the formation of my final conclusions. Is there anything like that out there?
A No.
Q With Mr. Woolf's permission, if there is something out there that you need that may change, alter or modify any of your opinions, would you be kind enough to let Mr. Woolf know so he can let me know, so I can, if I have to, come and just ask you briefly about those questions to see if it changes your opinion; will you do that for me?
A Absolutely.
Q Have you had any meetings or discussions with Dr. Irons in this case?
A No.
Q Have you had any meetings or discussions with any of the industrial hygienists that have been retained by Marathon in this case?
A No.
Q Have you had any meetings or discussions

with any of the causation experts in this case that Marathon may have retained?
A I have not talked to anybody -- not that I know what you mean by "causation experts."
Q For example, Marathon may have an individual that -- a physician that may come in and testify that in his opinion, A does not cause B. I mean, have you talked to anybody in Marathon, or Marathon's experts, that may be rendering opinions in this case?
A No, I have not.
Q Do you plan on doing so?
A No.
Q Have you drafted any exhibit in this case, anything you intend to rely on at the time of trial?
A No.
Q Do you intend on doing so?
A Most likely, if it does go to trial.
Q If you do -- so, once again, I'll ask permission of Mr. Woolf, if you can let him know so he can let me know so I can see those exhibits; would you do that for me?
A Absolutely.
Q I'll just cover, if I can, you received

Exhibit No. 1, which is the notice of your deposition,
the subpoena duces tecum?
A . Yes.
Q That requested that you bring with you
various documents?
A Yes.
Q Have you done so?
A I believe so.
Q Is there anything that was required or
requested by way of that subpoena that you did not
bring with you?
A Number 2, copies of all certificates and
publications authored by him, meaning me. I think
that request is a little bit unreasonable because I
have authored some 120 publications, and not all of
them are related to or pertinent to this case. So I
have not brought them.
Q But those would be reflected in the C.V.
that you also handed me?
A Yes.
Q Is that an up-to-date C.V?
A Yes.
Q Is there a date on this?
A No.
Q Just for the record, prior to the

deposition, Dr. Wong provided me through Mr. Woolf this C.V. And the materials that you're referencing not bringing here today, Item Number 2, are those reflected on this C.V., would that be correct?
A Those would be all the articles I authored.
Q Would there be any of the articles that are reflected in your C.V. that you will be intending to rely upon in the formation of your opinions in this case, or have you brought them all here today?
A At least the ones that I think I would be asked questions about I have brought them.
Q For example, if I handed you your C.V. and asked you just to go through the entire list of all your publications, is there several in here or any of them in here that you would say, yes, I intend to rely on this one as well that you did not bring here today, or in summary, the ones you brought here today, they are the major ones?
A They are the major ones.
Q There may be something in here that may tangentially relate to the formation of your opinions, but in sum total, what you brought here today are the articles that you intend on relying on in the formation of your opinion; would that be accurate?

A Yes.
Q Aside from Number 2 on Exhibit No. 1, the subpoena, are there any other items that you did not bring with you today?
A Number 4, basically you asked me to bring all of the documents provided to me by the lawyers. And I talked to Mr. Woolf yesterday and he said that I don't need to bring them.
Q That would include the depositions; correct?
A Deposition transcripts, medical records, M.S.D.S. and so on.
Q Any other items on the subpoena duces tecum referenced as Exhibit 1 that you did not bring with you?
A No. That's it.
Q Let's go over those items, if we can, very briefly. I'm handing you a folder that's been marked by the reporter as Exhibit Number 2. Tell me what that is.
A These are correspondence between myself and the attorneys in this case.
Q Is there anything in this Exhibit Number 2 that aided or assisted you in the formation of your opinions?

A Not really.
Q I'll show you an article that's entitled, "Cell Type Specific Leukemia Analysis and a Combined Cohort of more than 200,000 Petroleum Workers in the United States 1937-1989" by yourself and Raabe. Are you using that article in any way in the formation of your opinions in this case?
A Let me explain to you what this is. These are articles that I, because of my C.V., that I was asked by Mr. Michael Latiff to send to him. And I did that last year. And all those articles that I sent to him I included in the articles that I have with me today.
Q Okay. But my question was: How did you use this article, if at all, in the formation of your opinions that you're giving today?
A Well, because we talked about chronic myeloid leukemia in that paper, so I do rely on that.
Q I appreciate that, and I've read this article. What I'm saying is are these pages from various articles, are they -
Again I have not compared these to the ones you actually brought, but are these the articles that are being used by you in the formation of your opinion today about chronic myeloid leukemia?

A Yes.
Q Are these front pages, do they match the
actual articles that you brought?
A Yes, some of them, not all of them.
Those are articles that I wrote.
Q I appreciate that, but I want to know
whether they match. So if we went through the other
exhibits here, whether I would be able to find each of
the articles -
A Yes, you will be able to find them.
Q Okay. Exhibit Number 3, what is that?
A That is simply my notes of the
plaintiff's employment history.
Q And how did you use that?
A Well, just to remind me of some of the
dates and so  on.
Q Dates with respect to what?
A Dates with respect to his employment.
Q Okay. Have you ever met the plaintiff?
A No.
Q Have you ever been to the Marathon,
Detroit plant facility?
A I don't believe so.
Q Have you ever actually been in the plant
looking for the types of operations and practices that

Mr. Leija would have been performing?
A No.
Q Have you ever asked to do so?
A No.
Q Has Marathon ever invited you to their plant facility to take a look around and review and evaluate the types of work practices that Mr. Leija may have performed to aid and assist you in the formation of your opinions?
A No.
Q Have you ever contacted Downriver Maintenance who's the contractor that performed maintenance services in the Marathon plant?
A No.
Q Have they ever asked you to come out there and take a look at their work practices and procedures to investigate the types of work practices that Mr. Leija would have performed as a maintenance worker?
A No.
Q Have you ever asked to look at any - strike that. Have you ever asked to look at any of the personnel records for Mr. Leija, either from Downriver Maintenance or Marathon Oil Company?
A No.

Q Have you ever spoken with any industrial hygienist, whether it was at Marathon Oil Company or Downriver Maintenance, to review and evaluate the type of work practices that Mr. Leija may have performed to clarify in your mind, or help you in formation of your opinions with respect to his exposure to petroleum products including benzene?
A No.
Q Do you intend on doing so?
A Not at this point.
Q Exhibit No. 4, tell us what that is.
A These are the bills that I sent to attorneys for the time that I spent on this case.
Q Is each one a separate invoice? There are four pages.
A Yes.
Q Is each one a separate invoice?
A Yes.
Q Can you tell us, just basically, what your billing practices are?
A Basically we bill it by the end of the month, unless we only have like one or two hours for the month, we want to accumulate that in the following month.
Q Okay. But specifically, I mean, do you

charge by the hour?
A Oh, yes.
Q Okay.
A If that's what you mean.
Q I don't mean to be evasive, but just how much do you charge per hour, for, for example, a review of cases?
A In 1999 it's 400 an hour; last year it was 380 an hour.
Q Is that for deposition testimony or review testimony?
A It's everything.
Q Okay. So as of 1998, it was $380 an hour whether you were testifying at trial, whether you were doing depositions or research?
A Right.
Q And in 1999 it's $400 for all those activities?
A Yes.
Q Can you give us an idea approximately how much time you've put into this case? And if you would like to do it by -
A 30, 40 hours.
Q That would be at a $400-per-hour rate?
A No, some of them. Actually, most of the

work was done last year.
Q So most of it would be at $380 an hour?
A Yes.
Q Do you have any work that you plan on doing if this case goes to trial, is there anything outstanding that you plan on doing?
A The only thing I can think of is to prepare some exhibits.
Q Anything else?
A Maybe read some experts deposition transcripts.
Q Anything else?
A I can't think of anything.
Q The court reporter has kindly marked Exhibit Number 5. Please tell us what that is.
A In a Notice for Deposition you asked for a list of the cases that I have testified in. And this is a list that I come up with.
Q And what are the dates that is inclusive in this exhibit?
A It goes back to 1994.
Q 1994 to 1999?
A Right.
Q Do you have any list or have you compiled any list or requested to compile any list for cases

you have been involved in prior to 1994?
A No, I don't keep that.
Q You don't keep a list?
A No.
Q You never compiled one?
A They always ask for the last four or five years.
Q Do any of these cases involve cases where you're testifying on behalf of a plaintiff?
A No.
Q Would it be accurate to say that for all these cases you've been retained on behalf of industry or the defendant in the case?
A For defendants.
Q And the defendants would be reflected as, for example, in 1994 Shell Oil Company?
A Yes.
Q Tosco?
A Yes.
Q Amoco?
A Well, I may not work for Shell Oil in that case, it's just that -- what do you call that - the title of that case or the name of that case.
Q  Okay.
A But I would be working for one of the

defendants.
Q Would you be providing -- as working for the defendants, would you be working for all of the companies or it's exclusive for one of the companies?
A Sometimes it's one, sometimes it's two, sometimes I don't even know.
Q Speaking of the testimony that you provided, have you ever been retained or provided services -- strike that.
Have you ever, in your capacity as providing services in the area of epidemiology, have you ever given testimony for a worker who's exposed to chemicals in an allegation against a chemical company?
A No.
Q In terms of your affiliation with defense lawyers who are representing companies, have you ever had occasion to give any talks or seminars, however informal, to defense companies or their lawyers?
A I was asked by the Oregon Bar Association to talk to both plaintiff attorneys and defense attorneys at one time to talk about epidemiology in general.
Q Do you recall giving a talk to Shell Oil Company regarding the Skeen Case? That's the case involving chronic myeloid leukemia and benzene

exposure that was tried in Texas. Do you recall giving a talk to Shell Oil Company and their lawyers?
A We had a meeting in the law firm in Houston. I don't know all of the people in the audience. Most of them may be from Shell Oil.
Q Do you recall Richard Faulk being there?
A Maybe. He is in Houston, so it's very likely. It's a long time ago.
Q Do you recall giving out a publication or handout regarding your opinions regarding the Skeen Case specifically, and allegations of chronic myeloid leukemia and benzene exposure; do you recall handing out a pamphlet in discussion about that?
A I think we talked about the Skeen Case but I don't remember handing out anything by myself. I don't think I -
Q You don't recall?
A No.
Q Let me ask you right off: What opinions have you formed in this case?
A My opinion is that there is no causal relationship between benzene exposure or exposure to other petroleum chemicals and the risk of developing chronic myeloid leukemia.
Q Any other opinions?

A This is the major one.
Q Any others, however minor?
A That's the one that I have been asked to look into.
Q So basically, sitting here today, just getting ready for trial, your opinion in this case is that there is no causal relationship between benzene exposure and the risk of development of chronic myeloid leukemia; is that the opinion?
A Right.
Q No others?
A No.
Q And what do you base this opinion on?
A Based on my own research, as well as studies done by other investigators.
Q And those have been produced by you today?
A Yes.
Q Are you aware that there are studies, epidemiological studies, that support the relationship between exposure to benzene and the risk of leukemia, specifically chronic myeloid leukemia?
A When you say "support," what does that mean?
Q They make the connection, the cause

between benzene exposure and the risk of development of CML.
MR. WOOLF: Counsel, I would ask if you have any such studies to show the witness so he will know exactly what you're talking about.
BY MR. BARRIE:
Q I'm asking you, Dr. Wong, as an epidemiologist, are you aware of studies that show the relationship between benzene exposure and the risk of development of chronic myeloid leukemia?
A No.
Q You're aware of none?
A No.
Q No?
A You always ask double negative questions. I find it difficult to answer.
MR. WOOLF: His testimony is he's not aware of any such studies.
BY MR. BARRIE:
Q Are you aware of any such studies that support the relationship between benzene exposure, at whatever dose, for whatever duration, and the development of chronic myeloid leukemia?
A No.
Q Let's talk a little bit about some of the

studies that you've done.
When you, as a company, epidemiology services, provide services to a sponsor, how does that work?
For example, when I was at the university level doing research and we went out for a grant, for example, from NIH or someplace else, we had a protocol that we submitted and we had a budget we were trying to get. And in order to perform the services, we had to put in a bid and had to have a bunch of discussions in order to get the grant money.
When you perform services, whether it's for Mobile, whether it's for Shell, the studies you've done, whether it's for the MCA or the API, or whoever you're doing studies for, how does that procedure work?
In other words, walk me through the initial contact, the exchange of information, the data assembly, the acquisition of data, the data analysis, the reports, and then the final article, walk me through that.
A It's similar exactly to what you just described, most of the time, unless a project is very, very small. I can give you an example.
We have done a very large study of

gasoline distribution workers for API, at the American Petroleum Institute. And basically we submit a proposal. to API, and my understanding was that there were like ten different institutions asked to submit proposals, and most of them they submit a proposal to API. That includes -- in fact, most of them are university investigators.
And API went through the selection process, and so on, by committee, and we were selected. In our proposal, we have an outline of what we will do, what it will cost to do it, and we follow the protocol submitted in the proposal.
- Q Let's start at the beginning. How do you know that such a study is going to be requested by the Manufacturing Chemists' Association, Chemical Association, the MCA or API, the American Petroleum Institute?
How do you know to even submit the proposal in the first instance; does somebody call you on the phone and say we're interested in doing a study on gasoline, we're interested in doing a study on benzene exposure, or whatever? Give us a protocol. Or is there a letter that's sent out, or do you actually call them first?
Tell me how you actually get to make the

proposal in the first instance.
A You would be -- we would receive what we call a request for proposal, RFP.
Q Once that's done, you then prepare the request for proposal, the proposal itself?
A If we're interested, and if we know that we can do it, then we would prepare a proposal.
Q Once the proposal is submitted, is there any exchange between -- let's just say the MCA, for example, let's use them as a sponsoring body, the Manufacturing Chemical Association.
Do they then send back a letter that says your proposal is accepted, or you need to make the following modifications, or why don't you also include these items, or do they just blanketly say yes or no?
A Most of the time it's yes or no.
Q Okay. What about the times when it's not ayes or no, do they say, why don't you also include this, why don't you change the protocol to this?
Do, on occasion, they ask you to do different activities from that originally submitted by you in your proposal; in other words, is there a dialogue that goes on between you and the MCA, or is it just this blind submission of a document and there is a vacuum and nobody hears anything, and then it

comes back yes or no?
A As I said, most of the time it's yes or no. But .I don't think I can rule out that they would not make sometimes some suggestions in terms of the schedule or the budget, or justify certain ways of doing certain things from the reviewers.
Q In terms of suggestions, would they also make suggestions with respect to the protocol, i.e., how you're supposed to do it?
A No. Not on those major issues.
Q Do they make suggestions with respect to the numbers of people or the cohorts of individuals that would be investigated or evaluated?
A No.
Q So it's your testimony that once the proposal goes through, and on those rare occasions that or those occasions that there is dialogue back with you, there really is no discussion about the protocol itself, how it's to be done, the nature of how it should be accomplished, the cohorts that should be selected, that does not occur; is that correct?
A No. But sometimes when we actually go into a study, when we look at the records and so on, and certain assumptions that we have made in the proposal stage may or may not be true.

And in that case, there may be some dialogue between us and the sponsor to try to modify that.
Q Speaking of sponsors, who have been some of the sponsors of your studies?
A Well, you named some, American Petroleum Institute, Chemical Manufacturers' Association, oil companies, Mobile, Chevron, Shell, but I also do a lot of work for non-petroleum companies.
Q In that work for non-petroleum companies, have you ever done any services in the area of epidemiology, particularly just for unions, unions whose workers maybe in refineries?
A Unions and refineries?
Q You bet.
A No.
Q Once you get this proposal, you have had maybe some dialogue and you're selected, what's the next phase, you just go about and do your study?
A Yes.
Q And during study procedure, is there a dialogue with the sponsor?
A Well, the dialogue would be mostly one sided in the sense that we have to provide progress to them.

Q For example, in one of the studies that you performed looking at benzene exposure and manifestations of leukemias, it was necessary for you to rely on data submitted by the oil companies as to exposures that their workers may have been exposed to, specifically benzene; that would be accurate; correct, I mean, you rely on them giving you data as to exposure?
A Yes.
Q You don't go out to the field to corroborate one way or the other whether the exposure is good or bad, the numbers that they are giving you?
A Sometimes we do.
Q Well, tell me the times that you've actually been to a refinery to corroborate the exposures to benzene to see whether in fact it's what the oil company is telling you it is, who have you gone to?
A That study that I am thinking of now is a distribution workers' study that we did for API. In that study, actually we have two components, one was epidemiology, and one was exposure assessment. And for the exposure assessment component, a Professor Thomas Smith at Harvard University was in charge of that, but I worked with

him in that study.
And basically oil companies provide us with industrial hygiene data, with information on engineering changes, controls, and so on. Over the years, we also did some assimilations as well.
Q And that's what I'm talking about. I'm not talking about an oil company who's sending you some industrial hygiene data; I'm not talking about them sending you data.
I'm talking about you going out there physically, yourself, talking to somebody at the refinery and maybe doing an assimilation to say, yes, you know, this oil company gave us some data that goes back to the '40s or '50s or '60s or '70s that says when you're doing this work practice you get exposure to benzene.
They may have been done with a Dreger tube, they may have done it by a continuous monitor, we want to do an assimilation to be sure that, gosh, their numbers are correct. How many times have you personally done that?
A We did that in the distribution workers' study.
Q Was that just on one occasion?
A I think that was the major one, yes.

Q For example, did you do it in this case with Marathon, did you run out there and say, you know, I'm going to make some assumption on whether this fellow was even exposed to benzene, I want to go out there to a tank, to an API separator and run some assimilations to determine whatever data Marathon is telling me is indeed accurate; did you ever do that with Marathon in this case?
A No. This is a case -- this is not a study. No, I did not do that.
Q Do you plan on doing that?
A No.
Q Is it your opinion that regardless of the dose of exposure to benzene, in whatever concentration over whatever length of time and duration, there is just no absolute risk for the development of chronic myeloid leukemia?
A The answer is yes to the extent of exposure of the workers included in the studies that I rely on. I mean, there is a limit of what the exposure range would be.
Q And it would be true, would it not, that most of the exposures that are provided to you are based on historical records of individuals working as employees in a refinery, for example?

A Well -
MR. WOOLF: Object to the timing of the question and the inference that it applies to all of the literature that he relies upon, because the literature that he relies upon includes more than just studies that Dr. Wong himself has done. You may reask the question and you may answer it.
BY MR. BARRIE:
Q You can answer it.
A I was going to say that I don't just rely on the studies that I have done, I rely on studies that other people have done. Any study that talks about benzene or petroleum exposure and chronic myeloid leukemia.
Q And I appreciate that. But what I'm saying is as a historical nature for epidemiological studies, they are relying on data submitted by the oil companies to you with respect to industrial hygiene and the concentration that benzene people may be exposed to, but it's limited to employees, it does not include contract workers; would that be a fair statement?
A Studies based on company employees, of course, would not include contractors unless some of the contractors -- contract workers have worked for

them as an employee later on in life or early on. We cannot rule that out.
Q Certainly. But, for example, when you work for the CMA, Chemical Manufacturers' Association, or the old MCA or the API, the American Petroleum Institute, you're working for the participants of those organizations, for example, the various oil companies; correct?
A Yes.
Q And they are supplying data based on their employees, would that be accurate, they are not supplying data for contract personnel who come in and . out of the plants, except as you suggest, if they later turned out to be employees?
A No. Some of them would be personal samples, some may be area samples, so that would apply to anyone who worked there.
Q In this particular case, did you see any industrial hygiene air sampling, whether it was direct, personal monitoring or area monitoring for Mr. Leija?
A There was some industrial hygiene data sent to me, yes.
Q Did you see any specific air monitoring data specific for Mr. Leija, any personal monitoring?

A Not on him, no.
Q Let's go through these documents, and the court reporter has kindly marked them as Exhibits 6-A through 6-W.
Dr. Wong, those exhibits, as I appreciate your prior testimony, are the articles that you're relying on in this particular case to support your opinion that under any dose, any duration of exposure to benzene, there is no risk for the development of chronic myeloid leukemia; is that correct?
A I thought we agreed to the wording of the "major" articles.
Q I thought we did too, but you didn't use "major."
A Well, I just wanted to be sure.
Q Let me just ask you.
A It depends. If somebody asks me at trial a question about general epidemiology, of course I have authority -- some articles on general epidemiology. If somebody asks me some questions on meta analysis, of course, I refer to my articles on meta analysis.
Q But -
A But let me finish. But the key is really these are the major articles that I am going to rely

on.
Q We can agree on that, these are the major articles, I appreciate that, and I'm not trying to put you in a corner. I appreciate there may be questions that Mr. Woolf may ask you about your meta analysis or about general epidemiology. You may say here's a paper I've done.
But getting down to nuts and bolts, meat and potatoes, as we say, we're talking about these are the articles that support your opinions?
MR. WOOLF: These are the major articles.
BY MR. BARRIE:
Q These are the major articles; would that be correct?
A Yes.
Q Let me bounce around to a couple things.
In prior deposition testimony you've indicated that there is a part per million years risk for the development of leukemias.
And I just want to ask you: In one occasion you testified, I believe it's accurate, that for benzene to cause a risk for the development of leukemia you needed 60 part per million years. .
Correct me it I'm wrong, am I accurate there, is that still your opinion?

A That must be very, very old information before we have -- before we have analysis on specific forms of leukemia.
Q Many times epidemiological studies do not break down benzene in specific cell types; is that correct?
A A lot of studies the authors do not report results by specific cell types for a number of reasons.
Q And they amalgamate or bring together a lot of the different types of hematopoietic diseases that IOC codes may be related to lymphomas, lymphatic diseases or leukemias; in other words, they group them all together?
A Well, epidemiologic studies -- in cohorts of studies we analyze different causes of death. And, I mean, above all we have all causes of death, that would include everything, cancers as well as non-cancers. And then we break down into different systems. So yes, the hematological system would be one of the categories that we look at overall.
Q In some of the epidemiological studies that have looked at, ICD groups of hematopoietic or blood diseases, they found that increased risk for the development of these diseases from exposures to

benzenes had a statistically significant elevation;
would that be correct?
A. No, that's just a way the reporting goes.
In those studies, I'm sure you will find that they are
also providing a-risk ratio for all causes of death,
and for that, most of the time, you would be
significantly low.
Q It's been reported as low, it's been
reported as high, that would be accurate; correct,
whether it's reported as a relative risk or whether
it's been reported as an SMR; correct, it's been
reported both ways?
A For what?
Q For benzene causing an increased risk for
the development of blood cancers including leukemia.
A I have to look at this. If you tell
me -- if you give me a study I'll look at it.
Q I understand that. Sitting here today,
as an epidemiologist rendering an opinion in this case
that benzene is not related to chronic myeloid
leukemia, have you seen articles that have linked all
hematopoietic diseases such as leukemias, CMLs, not
broken it down by cell type, have you seen those
cancers that report an increased SMR or relative risk
for the development of those diseases?

A Yes. There are studies reporting an increase for overall leukemia, but it may or may not include CML.
Q That brings me around to my first question, which is what is your opinion today about the increased risk for the development of all leukemias as a result of exposures to benzene in part per million percent or part per million months?
A Based on what we know now, I don't think that's a correct question to ask. We do not look at leukemia as a single disease, but rather it's a group of different diseases.
Q And so you can't give me an answer as to all leukemias?
A No, I cannot.
Q You're familiar with the Yin study or the Yin paper that was published; you're familiar with that paper?
A Yes.
Q The Chinese paper?
MR. WOOLF: Which?
MR. BARRIE: The Chinese paper.
MR. WOOLF: The reason I came up is that I don't know whether you're talking about the study as a whole, or whether you're talking about various

papers that Yin is an author of, and those would be two different questions.
MR. BARRIE: I'm talking about the Chinese study where he found that there was increased risk for the development of certain cell types of leukemia in China.
Q Are you familiar with that study?
A Yes.
Q Do you have any criticisms of that study?
A Yes.
Q What are they?
A Number one, people keep referring to the Chinese benzene study. The first part is true, it's Chinese, because all the work was in China. The second part of that characterization is not completely true, benzene, because it's not a single industry or single company study. It's a study that consists of many, many different industries in China. And the workers were exposed to benzene in addition to a variety of different chemicals. So definitely confounding exposure to other substances would be a serious problem in that study.
Q Any other criticisms?
A The second one would be in this country

when we do a follow up to find out whether people are still alive or not, we have certain databases to go to.
In China they don't have that. They don't have a centralized place that they can use. And that's the reason why they have to have what we call an ad hoc comparison group, a group of workers not exposed to benzene -
Q Are you talking -
A -- for comparison.
Q I don't mean to interrupt you, but are you talking about the internal comparison group or a
13. national comparison group, for example, groups within the same industry who have no exposure, or groups outside of the industry similarly compared that do not have the exposure; in other words, internal comparison versus, say, like national statistics?
A Well, in the Chinese study, it's neither one of them. In China they do not have national mortality rates going back to what they want, or break down by the specific disease category that they want. So they have to rely on some ad hoc group.
Now, I don't like to use the word internal comparison because they are not internal groups. They are workers in some entirely different

industries. So they are not internal, so to speak, internal workers.
Q But your criticism would be that that group does not exist?
A I don't follow what you're saying.
Q I'm just trying to understand what the second criticism is. We've got the first one, the confounding variables that you feel for other exposures; second is that they have no comparison group and they have to use an ad hoc comparison group?
A Right.
Q That may not be from the same industry?
A They are not from the same industry. And that group is very small by comparison. And the rates, the disease, the mortality rates in the comparison group are highly unstable because of the small number of deaths or cases due to specific diseases.
Q Would you agree or disagree that small groups present confounding issues for causation or lack of causation when you're doing epidemiological studies?
A I'm not even talking about that. I'm saying when you compare, for example, a benzene exposed group to the national average, using the

national rates, the national rates are very stable, that's what we use in this country.
In China, they don't do that. They compare to another group; that group is, by comparison, much smaller. For example, if you looked at the chronic myeloid leukemia findings, they have only two chronic myeloid leukemias in the comparison group, so the entire basis for comparison in the Chinese study is based on two cases only of chronic myeloid leukemia. And if you have one more or one less, the results were completely different.
Q I understand that. I guess, as a general proposition, which I think was my primary question, as a general proposition, when you're doing epidemiological studies, is it true or not true that when you have small numbers or small cases that you're looking at, you have a problem with either over estimating or underestimating the results?
A Well, when you have a small group, you should really look at -- well, for any study results, you should look at what we call the 95 percent confidence interval.
If the study is small, what we are saying is that the estimate, the risk estimate may not be that reliable and you will see a huge, 95 percent

confidence interval.
So if you're talking about certain diseases that that rate is not that high, then by looking at smaller studies, yes, your finding will not be that conclusive.
Q Other than those two criticisms, are there any others?
A Another major criticism of the Chinese study would be underestimate of the exposure.
Q Anything else?
A For some of the diseases, the diagnostic accuracy is also very low.
Q Anything else?
A Those are the major ones.
Q In your two papers that are referenced as Exhibits K and L, have you gone back to reevaluate the data that was used in the publication of these two studies?
A Since the publication?
Q Yes, sir.
A No.
Q Where does the data for these two studies exist?
A I don't even know. That was done when I was with a different company, a different place. CMA

may have it. I don't know.
Q Was there a file tape that was kept; in other words, an electronic -- like a diskette or something that this data was used on for use on computers?
A We didn't have diskettes then, we had tapes.
Q You have tapes?
A We had tapes at that time. I'm sure at that time we have a copy of the tape.
Q Where would that be?
A Now?
Q Yes.
A I don't know.
Q Is it typical after you get the study done and then you go -- you issue a report, does the report go then back to the sponsor?
A Of course the report goes to the sponsor.
Q Is that the final report or is it a preliminary report?
A Most of the time we have a draft report sent to the sponsor and they may comment on that, and if we accept the comments, we may incorporate that into the final report.
If we don't, we may explain why we do not

accept those comments, but there would be a draft report and a final report.
Q If the draft report goes up and there are comments suggested by the sponsor, if the suggestions are made, are they incorporated into the report or do you make a decision one way or the other whether to follow those recommendations for changes and then issue another draft report?
For example, I submit my thesis to my doctoral committee; it goes up to my doctoral committee group and my group takes a look at it and they say, uh-huh, here's this guy's thesis and he is saying this, that and the other thing.
We think we ought to change A, B, C and D. It comes back to me, I then redo it; it goes back again. You've been through this routine. It comes back again. There is a constant -
A I did not go through that routine. I think they accepted my thesis the first time around.
Q You are a fortunate gentleman.
A No, I'm not fortunate. I'm just better than you are.
Q That we shall see.
A I'm just kidding you. Don't get offended. I'm kidding. I don't remember how many

times my thesis got sent back.
Q But in all seriousness, there are changes that are recommended, usually in studies, candidly, and they come back for revision and go back again. I'm asking you, when somebody -- when a sponsor sends back an answer or a critique or something, they are the people that are paying for the study, number one, and number two, you're going to incorporate them somehow. And I'm just asking you: Is the draft that goes up that comes back, that may go back up again, that may come back down, is that always , referred to as the draft?
MR. WOOLF: Counsel, I object to the colloquy and move to strike the characterization of what the witness has already testified to your original question, on the same subject, is that if suggestions come back from the sponsor, they are considered and sometimes they are accepted and incorporated in the final study, that is the final report, and sometimes they are rejected and not incorporated in the final report. Your colloquy suggests that the suggestions are always incorporated in the final report, and that's not what the witness said. So I

would appreciate if you now ask the question without the characterizations and let the witness answer whatever questions you have in mind.
MR. BARRIE: I'm trying really hard to do that.
Q The bottom line is, how many times it may go up and down, even if it's once or zero, is the report always labeled as a draft or is it draft one, draft two, or just draft?
A I think we will label it as draft. And I can't think of too many occasions you would be back and forth several times.
Now, sometimes that sponsor may say wait a minute, you completely left out one analysis that we want to see, or you left out some analysis that you promised to do in your proposal or at some meetings and so on. Then we would go back and do some of those things. But most of the time it would be clarifications of what we did, or maybe provide more discussion on some findings and so on.
Q Do you distinguish the drafts?
A No.
Q If there is more than one, do you say draft one, draft two, or is it always draft?
A I would say it would be draft, but there

would be a date on the report that we can look at.
Q I'm trying to understand whether it would be draft one, two, three or just draft?
A Personally I don't use that system.
Q So it would be draft?
A Yes.
Q Is it still your opinion that there is only one recognized cause for the development of chronic myeloid leukemia, that being ionizing radiation?
A I have not looked at other risk factors of chronic myeloid leukemia. I won't be able to answer your question sitting here today.
Q Did you look at any other risk factors for the development of Mr. Leija's chronic myeloid leukemia to rule them in or rule them out?
A No.
Q I believe -- and correct me if I'm wrong -- I believe you gave a presentation at Rutgers University one time on benzene-related leukemias. Do you recall doing that at Rutgers?
A My coauthor gave or delivered the presentation. I did not.
Q You didn't do that?
A No. Are you referring to a 1995 benzene

-
Q That's correct.
A Raabe, he was the one who gave the presentation, but I was a coauthor of that paper.
Q And .that was a paper that was distributed to the members or the participants there?
A I don't know.
Q Do you have a copy of that paper, if it's not already been presented here today?
A It's based on my 1995 publication. It's the same paper.
Q I just want to be sure it's the same paper.
A Yes.
Q Looking at Exhibit 6-K, which was a paper that you authored, they discuss a variety of plants, facilities, and the paper is rather in-depth about data received, data analyzed. I'm not going through that with you, but just looking here at table one on Exhibit 6-K, you see the plants one through seven?
A Right.
Q Can you tell me what those plants were in numerical area; what was plant one, what was plant two, three, four, five, six or seven?
A I don't remember.

Q Is there any way that you would have documents to refresh your memory?
A No.
Q Do you know where those materials would be maintained, this raw data?
A The sponsor may remember. I mean, the sponsor may have some documents to refer to.
Q Is it your procedure once you finish a presentation or something for one of the sponsors that you just purge all the data or send it back, or what do you do with it all?
A Well, in this study it was done with another company when I was there. I left the company some time ago.
Q That company was?
A The company was -- at that time when I did the study -- was Environmental Health Associates. Later on -- and Environmental Health Associates was merged with another company, LASER Company, and I left them at the end of 1990.
Q Did you leave all the data with them?
A The data was at LASER. I don't know because this is an old study, but, in general, the studies that I did when I was there, the data remained there.

Q Where is NSER?
A I don't even know whether they are in existence or not.
Q Where's the company?
A The company?
Q Is it still in existence?
A I don't know.
Q Where were they?
A They were all over. The headquarters were in Houston.
Q What about Environmental Health Associates?
A It's no longer an entity, it merged with NSER.
Q When did that merger occur?
A 1987.
Q Do you know whether NSER is still in Houston, Texas?
A I have no idea.
Q When you left Environmental Health Associates, who did you report to?
A I don't even remember the names. I was there for a short three years, and they had some people changing positions and so on.
Q Okay. In either of these two studies

that are reflected in Exhibits 6-L or 6-K, did you ever go back to redo the study to include and incorporate contract workers?
A No.
Q What is the name of your company right now? I wrote it down, I apologize.
A Applied Health Sciences.
Q You said they were formed in 1991?
A Yes. Well, actually, I started working there in 1991, but we may have filed for incorporation at the end of 1990 or something.
Q And which state are they incorporated?
A The best state, California.
Q You're talking to somebody from Texas so that can't be true. But seriously -
A California. I am serious, it is the best.
MR. WOOLF: Do you want to ask him or do you want me to ask him?
MR. BARRIE: Let's just wait until I'm done.
MR. WOOLF: That's fine.
BY MR. BARRIE:
Q In the formation of your opinions today, have you made any assumptions? Are you there any

assumptions that you're saying, I base my opinion on the articles, and you've brought them here today, but I'm also assuming A, B, C, D and E, are there any assumptions that you're making here today in the formation of your opinions, aside from the articles?
A Well, I mean, there is some facts that I assumed in this particular case, that his diagnosis was chronic myeloid leukemia. That is one of the assumptions.
Q You're not sure of the diagnosis, that's an assumption you're making?
A That's something that I accepted.
Q Okay.
A I'm also assuming the employment history, which I summarized in one of the exhibits that I provided to you.
Q Why is that important?
A That means that he worked at the refinery for a certain number of years. I mean, that's the part that I have to address.
Q Any others?
A That's it.
Q When people work at refineries, are they at risk for exposure to benzene?
A I would say so. Some are exposed to

higher levels than others, depending on the time period we're talking about.
Q But, as a general proposition, people that worked in refineries in the '60s and '70s and '80s are at risk for exposure to benzene?
A That's correct.
Q You're not telling us today that the plaintiff didn't have any risk for exposure to benzene; you're not telling us that today, are you?
A No.
MR. BARRIE: Dr. Wong, that's all the questions I have at this point.
MR. WOOLF: For the deponent's sake none. that means we're through.
(Plaintiff's Exhibits 1 - 6-W marked)

I, OTTO WONG, do hereby declare under penalty of perjury that I have read the foregoing transcript; that I have any corrections as appear noted, in ink, initialed by me; that my testimony as contained herein, as corrected, is true and correct.

EXECUTED this day of ,

19 , at

(City) (State)

OTTO WONG