NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH

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OFFICE OF COMPENSATION ANALYSIS AND SUPPORT

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ADVISORY BOARD WORKGROUP ON BLOCKSON
CHEMICAL SPECIAL EXPOSURE COHORT (SEC)
PETITION

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WEDNESDAY,
OCTOBER 15, 2008

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The Advisory Board Workgroup convened in the Frankfort Room of the Cincinnati Airport Marriott at 9:30 a.m., Wanda Munn, Working Group Chair, presiding.

MEMBERS PRESENT:

WANDA MUNN, Chair
BRADLEY CLAWSON
JAMES MELIUS
GENEVIEVE ROESSLER

IDENTIFIED PARTICIPANTS:

NANCY ADAMS, NIOSH Contractor
BOB ANIGSTEIN, SC&A
HARRY CHMELYNSKI, SC&A
LARRY ELLIOTT, NIOSH
LIZ HOMOKI-TITUS, HHS
EMILY HOWELL, HHS
TED KATZ, Designated Federal Official
JIM NETON, NIOSH
CHICK PHILLIPS, SC&A
KATHY PINCHETTI, Petitioner
HAROLD RINGER, Public
JERRY RINGER, Public
WILLIAM THURBER, SC&A
TOM TOMES, NIOSH

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P-R-O-C-E-E-D-I-N-G-S

(9:37 a.m.)

MR. KATZ: This is Ted Katz, and I'm the DFO for the Advisory Board on Radiation and Worker Health, and this is the Blockson Chemical Workgroup. And sorry we're a little bit delayed. We had some technical difficulties. They may crop up again, but we're going to try to go forward.

So first off, we're just going to do roll here. We'll start with board members in the room identifying themselves, please.

CHAIR MUNN: This is Wanda Munn. I'm Chair of this working group.

MR. CLAWSON: Brad Clawson, working group member.

DR. MELIUS: Jim Melius, working group member.

DR. ROESSLER: Gen Roessler, working group member.

MR. KATZ: And on the phone, Mike Gibson, are you with us? Okay. Well, Mike

did inform me that he probably wouldn't be able to attend. Just checking. Then now starting with NIOSH ORAU team, if you'd identify yourself and also address conflict of interest, please.

MR. ELLIOTT: Larry Elliott, Director of the Office of Compensation Analysis and Support at NIOSH. I have no conflict regarding Blockson.

MR. NETON: Jim Neton, NIOSH Office of Compensation Analysis and Support. No conflict.

MR. TOMES: Tom Tomes, NIOSH Office of Compensation Analysis and Support. I have no conflict.

MR. KATZ: And on the telephone, please?

DR. CHMELYNSKI: Harry Chmelynski, SC&A, contractor support. No conflict.

MR. KATZ: NIOSH on the telephone? Okay. Then in the room, SC&A?

DR. ANIGSTEIN: Bob Anigstein, no

conflict.

MR. KATZ: And on the phone, do we have another SC&A?

MR. THURBER: Bill Thurber, no conflict.

MR. PHILLIPS: Chick Phillips, no conflict.

MR. KATZ: And I think that's all that we're expecting today. Now, going on to members of Congress or their representatives. Are there any on the phone with us today? Okay. And then how about worker representatives or petitioners from Blockson? Okay. Other federal employees in the room?

MS. HOWELL: Emily Howell, HHS, no conflict.

MS. ADAMS: Nancy Adams, contractor with NIOSH.

MR. KATZ: And on the telephone?

MS. HOMOKI-TITUS: This is Liz Homoki-Titus with HHS.

MR. KATZ: No conflict, right? And

then any other members of the public? Okay. Just a last note then for those of you on by telephone, please use star 6 or mute, except when you're addressing us. And if you disconnect, please fully disconnect. Don't put us on hold. It interferes with the call. Thank you. Wanda?

CHAIR MUNN: Thank you, Ted. I believe everyone has received a copy of my e-mail sent on the 12th, which gives a very loose draft. We anticipate approaching our problems and questions before us today. If anyone has anything to add to that agenda, we can do that at any time, this being the first opportunity. If you have something you feel that we need to cover that is not indicated on that brief agenda, please let me know.

Otherwise, we will begin by following the instructions that were given to us by the Board at our last meeting in Redondo Beach, when we presented activities to this date and made a split recommendation. At that

time, the Board asked us to do several things.

The first one was to focus on the radon issue. That's our first item that we have listed here. We've had several documents since that time exchanged by e-mail. We were anticipating John Mauro to be here today to lead this discussion. John has had to be called away on a family emergency, and Bob Anigstein has agreed to step in and do that presentation for us. We appreciate you being here, Bob, and we'll leave you to lead off with our overview on the facts relative to the radon issues at Blockson Chemical.

DR. ANIGSTEIN: First, I'd like to start off with completing my own thinking on this problem, as I got into it, and so I think the first order would be a quick primer on radon. I know many of you here are probably very familiar with it, but bear with me. Radon-222 is generated when radium-226 decays. When radium-226 decays in a mineral matrix, in any case but I'm focusing on mineral

matrix, what you have is a very energetic alpha particle coming off with something in the order of 4 or 5 MeV. The alpha particle has an atomic mass of four. Then what is left behind is the radon-222, which has a mass of 222. So you have a mass ratio now of about 1 to 50 between this past projectile and this heavy one, it goes in the opposite, and the effect is very similar to if you fire a heavy-caliber pistol. The fast-moving bullet comes out, the gun kicks back, the recoil. Because there is Newton's law, the momentum starts off at zero and has to end up at zero, so the momentum of the particles are equal.

So the radon-222 travels right through the rock matrix, given enough of an impetus, typically 20 to 70 nanometers, which would be roughly 120th of the micron. So that's many, many, many atomic diameters. But it is still a very short distance compared to the structure of the rock. Now, this is called rock. That's a trade term, but it may

actually be confusing because we're talking about particles or about .85 millimeters or 850 microns.

When they mine the rock in Florida, it goes for a process called beneficiation. So they prepare it, so before they ship it they separate it out or they take out the big pebbles and they use them in road construction, and they take out the very fine dust. And what's left is what goes through a sieve, and that's the .85, it's actually less than, because that's the maximum that will go through that sieve. But it's on that order of magnitude, probably not much smaller.

So that is much, much bigger than the range of recoil of the radon. The question is, well, how does radon ever get out? Because even these little grains are not really solid. They have what is called nanopores in them. Nanopores because they're on that order of magnitude of nanometers. And so the radon recoil may shoot it out of the

solid matrix into one of those nanopores. It may also shoot it, if it's dry, nanopores are filled with air, will shoot it right through the nanopore into the opposite side and, again, embed itself in the matrix.

However, if it's wet, the water tends to stop it. So, interestingly enough, you have, and this was measured more specifically for Florida phosphate ore, you have an emanation coefficient of about 11 percent for dry, the dry ore, and roughly 30 percent if it's wet.

So the ore comes shipped by a freight car or a barge up to Blockson, and it got unloaded in silos. And according to an EPA report on phosphate mining, phosphate processing, they keep it wet. It's typically ten percent moisture. So the pores are, pores in aggregate material, like in soil, typically are about 35 percent of the volume. So ten percent moisture means that the pores are partially filled but not completely filled

with water. So you will have an emanation coefficient that's somewhere between 11 percent and 30 percent while it's sitting in the silo.

The next step is the calciner. And it goes from the silos to the calciner oven, which is outdoors, and it gets heated to 1400 to 1600 degrees Fahrenheit. At that temperature, actually the water mobilizes, and even if there's air there, the steam, you have like a steam cleaner. The steam will just dry the air out and any radon that's accumulated in either the water or the air in the pore spaces will be driven out.

So now you are left with the ore that has no radon, no free radon. It still has radon in the matrix in those fine grain -- because, again, it's not a solid. Even the 850 microns is not a solid piece. And under a microscope, it's composed of little grains, which are welded together. I'm not a mineralogist, that's just my understanding.

And Bill Thurber is on the line, so, Bill, feel free to correct me if I'm grossly wrong on anything.

MR. THURBER: Charge on.

DR. ANIGSTEIN: Okay. Bill Thurber is the person we turn to in the company for expertise or research on industrial processes. Once it's been dried in the calciner, we have up to 70 percent of the radon that may have accumulated over time is left in. It could be less maybe because there may be some, that 30 percent emanation, that's what gets out. Some may still stay in the nanopores, but that was measured in equilibrium. So that's an upper limit and highly unlikely to be more than 70 percent.

The dry ore then goes in through a screw conveyor, so it's a continuous process. As it gets baked, it goes into Building 40. And the dry ore now has an emanation coefficient of about 11.

Then the first thing that it will

come through is the grinder. So in the grinder, it gets ground down about tenfold. And, again, it has to pass through a sieve, and now we're talking about 74 microns. It's still much less than the recoil distance. It's still three orders of magnitude larger than the recoil distance. So the emanation from this ground powder may be a little less. I don't have specific numbers on the difference between the bigger particles and the smaller particles, but it should not be substantially less.

And then it resides, and this is an estimate that it resides in building for about four hours. And at the end of the grinding process, it gets, by conveyor, up to the second floor, and it gets dumped into the sulfuric acid. This is approximately 30 percent sulfuric acid. First of all, they had, according to one of the workers that we interviewed, the sulfuric acid comes in at a higher concentration, gets mixed with water.

When you mix sulfuric acid with water, it's a high isotonic reaction.

So now you have the ore being dissolved in the hot acid. The radium, the process, there is the ore, I believe it's calcium phosphate with other things in it. This gets dissolved, and then the calcium sulfate precipitates out as radium sulfate. And so you are left with the phosphoric acid, so out of sulfuric acid you get phosphoric acid.

The radon is now liberated. The rock is completely dissolved. Potentially, all the radon that was now stored in the matrix and couldn't get out because it was not in a nanopore can be liberated into the acid. And then the big question is -- the sources of radon in the building are, first, these four hours that the ore has in the building and it's building up radon. But since it has been freed, any free radon goes in. The build-up is on the order of one percent or two

percent, three or four percent, of the equilibrium. But then with an emanation coefficient of 11 percent, you have 11 percent of this 4 percent getting out. It's more like 3 percent. So you have a fraction, a third of a percent, of the equilibrium amount of radon that could potentially come out if the radium were just sitting there as a powder, say, is liberated during those four hours. So it's a very small amount.

CHAIR MUNN: Someone is trying to say something.

DR. ANIGSTEIN: However, once all of the remaining radium and radon is dissolved in the sulfuric acid, potentially all of it or none. There's no literature that I could find on the solubility of radon in hot sulfuric acid. We know that radon is somewhat soluble in water, and, again, even if it was cold water, under equilibrium conditions, or warm water, under equilibrium conditions, most of it would be in the room because what you would

have is the partition between the radon in the air and the radon in the water. And it favors the air on a picocurie per liter basis. So for every picocurie per liter, I'm just reporting numbers from the top of my head, but for every picocurie per liter of radon in the water you will have about two picocuries per liter in the air. But that's equilibrium. Now, you don't get how long it takes with something else. Here, you probably don't have equilibrium. Here, it's a continuous process.

So the first thing I did was a Monte Carlo analysis. So this is the model. I won't try to go through it in any detail but just to give you -- I won't explain every term, but this is, basically, this is the rate of the ore comes in, the specific activity of the ore. The specific activity, we based it on rock in central Florida that was published activity. That was the more conservative assumption. Northern Florida has much lower radium, so we took a central Florida rock, and

we don't know where the Blockson ore came from, whether it came from northern Florida or central Florida.

And this term is simply the amount that's liberated in the air prior to going into the acid. The fraction there is about one-third.

And now here is the most important and least known factor: the fraction of radon and sulfuric acid. And in our model, we just say it could be zero to one. This is the most important term. And on the denominator, we have the volume of the building that I'll get to in a moment; the air exchange rate; and the decay of the radium.

Now, the air exchange rate is much faster than decay of the radon, so the lambda does not have a strong -- But it would always go to zero. So we did two things. First, we did a Monte Carlo analysis where every one of these terms was given a range except, of course, the decay rate of radon is very well

known and the processing rate of the ore is given in the TBD and it was based on literature, so we treated that as a fixed number. We didn't have a range for that. Everything else there was a range, which the radium is based on measurement, and we have a published value of the mean and the standard deviation and normal distribution. The time of residence of phosphate rock, that's an industrial estimate by Bill Thurber, and so we just said four hours is the best guess. It could be from two to six hours triangular distribution. And then the emanation coefficient wasn't dry. Again, based on measurements, there is a range of distribution for each one of those.

But then we tested the model by determining, as you can see, the two most important factors are the air exchange rate and the release fraction from the acid. So we took the median or mean value of each of the other parameters that could vary and just

focused on these two and did a range of numbers. These are deterministic of five by six, so you have 30 values there, and they go all the way with a zero release fraction from the acid, which is the only source of radon is from the ore, as four hours approximately that it sits in the building and the highest air exchange rate, which was 5.5, which you could have in the summer if, for a while, everything was overloaded.

Again, we have no knowledge of the air exchange rate there. We don't even have a consistent information of the way the building was ventilated. We interviewed three workers, and we got three different opinions.

So we just went by published literature, measurements of industrial building, and it could go as high as 5.5. It could go as low, the lowest range here, 0.5, just for convenience, making the table. Actually, it can go as low, we used 0.1 in the analysis at the lower end of the range, given a uniform

distribution, which is probably, again, unlikely on the low side.

And so we get a huge range. We go from 0.04 picocuries per liter to 91 picocuries per liter, assuming the lowest of the air exchange rate and the highest release fraction. Everything that gets dissolved in the acid comes out.

Then we did, using this Crystal Ball, which is an add-on to Excel, we did the Monte Carlo analysis ran quickly, so did 100,000 events, randomly selecting each of the parameters. And you see the peak here is at the very low value, the curve comes up to 3.2. This is just how Crystal Ball works. How it chooses these ordinate values, I don't know.

So we have a mode here at a very low value. Then it goes up to a higher value. And then here's the distribution. So the median, which is higher than the mode, is 7.7 picocuries per liter. In 95th percentile, it's 62.

So if we want to be very conservative, highly claimant favorable, and say, well, if we assign the 95th percentile, it's highly, highly unlikely that you'll get higher than that. But even that, even this distribution has some conservative assumptions, like all the rock came from central Florida. So that basically sums up the model.

CHAIR MUNN: Thank you very much, Bob. Does anyone have any questions of Bob?

DR. MELIUS: Yes. That's the model you put in Appendix B?

DR. ANIGSTEIN: Yes.

DR. MELIUS: Okay. So that's not changed since then?

DR. ANIGSTEIN: No, definitely not. As exactly we detailed in Appendix B, the report also briefly refers to a preliminary investigation that we had done actually prior to the last workgroup meeting, which was a scoping calculation with, I would say, non-

mechanistic. We didn't really go into the details at that time.

CHAIR MUNN: Thank you, that's helpful. Any other questions?

MS. PINCHETTI: I had one question. This is Kathy Pinchetti from California. Why would it be highly unlikely to attribute more than 95 percent? Because there's quite a jump in the value between 61.95 and 651.

DR. ANIGSTEIN: That would be, that one is the extreme upper end, which out of 100,000 trials you get that once, that number. So when I say highly unlikely, it's because 95 percent seems to be sort of considered to be a very conservative number.

MR. NETON: This is Jim Neton. There's also some empirical evidence to indicate that that would be unlikely based on four that had been processed similarly at a facility known as Mallinckrodt where they processed four that was up to 70 percent

uranium by weight, as opposed to this ore which was less than 0.02 percent uranium by weight. That is 3500 times higher, and it was unlikely, the measured values of 600 were not seen at Blockson with any amount, I mean Mallinckrodt.

As a matter of fact, the average values were much, much, much lower than that. So we do have some evidence that in processing of uranium, I mean of ore of this type and extracting uranium that the levels never really reached those high values that the Monte Carlo calculation predicts.

CHAIR MUNN: Any other comments with respect to that specific issue? If not, the next item on our agenda is to review the bounding value determinations and discuss whether it is, indeed, the appropriate task. Jim, would you like to undertake that?

MR. NETON: Sure, I'll start off the conversation. I think Bob has done a great job and SC&A, particularly, Bob has done

a great job modeling the information and, indeed, has shown that quite a bit is known about what happened at Blockson in relation to the entire process and the source term and the radionuclide content of the materials. So I think that's a good example there.

I'd just like to get back a little bit, though, as to what I believe this analysis was originally intended to do, and that was we had proposed this 2.33 picocurie per liter value that was based on some information we obtained from the Florida Institute of Phosphate Research. And there was some general belief among, I think, at least one or more working group members that that value was pretty low. It didn't seem to ring true because you can see value that high in homes and such.

And so this analysis, my recollection was to undertake as sort of a scoping analysis to say does this value make any sense at all, given that the model rate on

radon is one of the few source terms that are using the model, as Bob has demonstrated. And I think the analysis has demonstrated that. In general, the predicted value of radon in the building, at least the 50 percentile, is not that different than the value that we proposed. And, in fact, I would argue that, given the conservatism built in to some of the parameters that we can talk about later, that it's very likely that our value is well within that range. And, in fact, I think someone yesterday acknowledged that, that our value is not necessarily inconsistent with what the model has predicted. I guess I can leave it at that, and open that for discussion.

MR. CLAWSON: So let me get something -- now, for Blockson, do we know where all of the ore came from?

MR. NETON: Bob could probably answer that better than me, but I do believe we know the assay of the ore pretty well.

MR. TOMES: Well, it did come from

Florida. I can't tell you exactly what place in Florida. There may be some information that I don't recall. But we do have the concentration that they typically receive.

MR. CLAWSON: They typically got, but we don't have anything for sure of exactly what they had or --

MR. TOMES: Not in each and every time, but we do have data on what it was from estimates. Of course, I don't have data on each and every shipment they got.

MR. NETON: But I think it's generally known, generally considered, that ore coming from Florida would be no more than 0.02 percent uranium by weight. That's sort of the number I have in my mind. I think Blockson was actually slightly less than that, maybe 0.018 percent or something like that. But it's a fairly low uranium content material.

MR. CLAWSON: The reason I'm bringing this up is because even with mining

before, I know that we always had a general per ton this is what we've got here. But there was a lot of times where we got into way, way higher than what the normal offset was. And it's kind of interesting to me that we know the general amount that it was rated at and so forth, but we don't even know where it came from basically.

DR. ROESSLER: Brad, you're talking about uranium mining, not phosphate rock. I think phosphate rock concentrations are fairly well defined, or at least there's certainly a bounding from Florida rock.

MR. NETON: And I think the plant assayed it at some point, and I believe that was covered in the technical file somewhere.

MR. TOMES: The research chemist at Blockson, he found some values that he published, 0.014 percent and 0.011 percent. So he did two different documents.

MR. NETON: And I believe the model that SC&A developed used slightly higher

values than that.

DR. ANIGSTEIN: I have it in becquerel per kilogram. It's 1263 becquerel per kilogram was the mean.

MR. NETON: Somewhere in your model you talked about --

CHAIR MUNN: But in any case . . .

DR. ANIGSTEIN: Well, that was our preliminary, they were our preliminary model that was a very indirect approach to the concentration.

MR. NETON: Actually, the source term was 0.014 percent is what it says.

DR. ANIGSTEIN: Yes. That was our preliminary model. I think in this one I used the published --

MR. NETON: You were higher than 0.014 percent?

DR. ANIGSTEIN: Again, I have to convert from becquerels and milligrams. So if I remember correctly, it was something like, oh, 25,000 becquerel per gram. I'll get that

ready in a moment.

CHAIR MUNN: The salient point is not, as you know, the content of each batch that comes in. The salient point is that you know the maximum that could possibly be, and it's included in the range of the computation that's been done, as I read the report. Is that correct?

MR. NETON: Yes.

MS. PINCHETTI: Can I mention something? My dad actually says that the rock came from Texas, so I don't know if that has anything to do with anything. But I just thought I'd bring that up.

MR. KATZ: I'm sorry. Can you identify yourself again, please?

MS. PINCHETTI: I'm sorry. This is Kathy Pinchetti.

MR. KATZ: Pinchetti. Thank you, Kathy.

MR. NETON: Well, that's the first time we've ever heard anything of that nature.

CHAIR MUNN: Your father said it came from Texas?

MS. PINCHETTI: Yes. My dad, the petitioner for 58, yes, he says that the rock came from Texas.

CHAIR MUNN: Now, what was his relationship to those shipments? I guess I'm not questioning what he's saying, I'm just -- this is an entirely new statement. Perhaps someone else on the Board has heard this, but I've never heard that before, nor have any of the workers in any of the Blockson meetings that I attended personally ever referred to shipments from Texas. They all said the same thing, that it came from Florida. And Florida is the most common source for this particular type of ore, so this is a real shocker. If your father has, if he can provide any additional information, it would certainly be of real interest. If he has anything concrete that we could refer to that would give us that additional information, that would be most

helpful.

DR. ROESSLER: Even so, I think the Texas rock is pretty well characterized. I would guess that it might be lower, but I think if Chick is on the phone he might have some information on that.

CHAIR MUNN: Are you there, Chick?

MR. PHILLIPS: Yes. That is my recollection, too, but I can't put my finger on what I can verify that. But I believe that's correct.

CHAIR MUNN: That Texas ore would have, in any case, been lower concentration?

MR. PHILLIPS: That's correct. I'm looking through some things here, and I may come up with something in a minute so . . .

CHAIR MUNN: Thank you. Do you recall ever having seen any evidence of shipments from any place other than from Florida?

MR. PHILLIPS: Are you speaking to me?

CHAIR MUNN: Yes, I am.

MR. PHILLIPS: No. This is the first that I've heard of this. Every indication is, I think it was June, said that we have had from the workers' meeting, the transcripts, etcetera, indicate the ore came from Florida.

CHAIR MUNN: Yes, I agree. Thank you. And if you find any additional information while you're checking your sources, please interrupt us to let us know.

MR. PHILLIPS: Okay. I'm looking now. Thank you.

CHAIR MUNN: Thank you. Any other comments about --

MR. RINGER: I have a question.

CHAIR MUNN: Yes. Please identify yourself.

MR. RINGER: Yes. My name is Harold Ringer from Joliet, Illinois.

MR. KATZ: I'm sorry. Can you say that again?

MR. RINGER: Yes. My name is Harold Ringer. I'm from Joliet, Illinois.

MR. KATZ: Harold Ringer?

MR. RINGER: Right.

MR. KATZ: Thank you.

MR. RINGER: Okay. Could you give me a mandate when this material was delivered to Joliet at Blockson?

CHAIR MUNN: The period of years covered. Just a moment.

MR. TOMES: This is Tom Tomes. Blockson was already receiving the material before the AEC became involved with their contract with Blockson, and the AEC started their first contract with Blockson in 1951.

MR. RINGER: Okay. 1951. Can you give me a date on that in 1951? My father started October of 1950, and his evaluation wasn't started until about the mid-1951. Is that supposed to be correct or not?

MR. TOMES: Well, the research contracted Blockson to develop the process,

but the contract was signed in March 1951.

MR. RINGER: Okay, thank you.

DR. ANIGSTEIN: I have a number, and the number we used actually is lower. It's roughly 0.005 percent. So I was just using, off the top of my head, the conversion for the specific activity of uranium. So it's about one-third, so actually that's a low number. I think that the 0.014 percent was an optimistic number. That's what they hoped to get. They were trying to convince the AEC to get the contract; so, naturally, like a contractor does, they tend to highball the results. From all the literature that I found, they never actually had an assay. So I think, if anything, the number we used was on the low side.

MR. NETON: It had a range on it, or was that --

DR. ANIGSTEIN: Yes, yes. The range, it was basically based on ten assays. No, there were ten samples and 13 analyses. I

guess some samples were analyzed more than once. And the mean was 1263 becquerel per gram, the standard deviation was 442, the range was from 848 to 1980. So it's, roughly, three, no, roughly twofold range.

MR. NETON: And the assay was done by?

DR. ANIGSTEIN: Hull and Burnett. Burnett, I spoke to several times the professor at the University of --

MR. NETON: Florida?

DR. ANIGSTEIN: No, Florida State University, two different universities. And he's the one who also, I guess Hull was probably his graduate student. He also did a study. He pointed out to me the study he did for the Florida Institute of Phosphate Research earlier on the emanation coefficient from various Florida rock.

MR. NETON: I think, in general, I would say that the SC&A analysis demonstrates that, given first-term and first principal,

one can model the potential radon concentrations in the building. And somewhat, by definition, that's a founding analysis that can be done. So that analysis indicates that if we can bound it then the debate then becomes what is the real value? Is it the value that we've used, or is it some value more central with the distribution that SC&A proposed? But in my mind, then that becomes a profile issue.

CHAIR MUNN: But in any case, the question of whether the bounding value that's being used is the appropriate value, that is the question that needs, that was raised at the last board meeting and one I hope that we can agree about and come to some conclusion here in this workgroup meeting before we go back to the Board.

MR. ELLIOTT: Well, for some information, I would offer that we feel that the number we're using is a good scientific number and is climate favorable. And we think

that we see that in the outcome of our dose reconstructions for claimants for this facility. We have currently 53 that are greater than 50 percent that are done, and 23 that are less than 50 percent POC. We've completed 117 dose reconstructions out of 121 total claims. So as DOL works these through the adjudication process, we expect to see that, at kind of a POC percentage, continue.

MR. NETON: I have one handout that I e-mailed to people, but maybe you can pass these around. This is to just sort of bracket the issue a little better. I'm a firm believer in data. I mean, models are fine. I like the old adage that all models are wrong, but some are useful. But I think this is a very useful model that SC&A has put together. I put on this little handout, you know, what do we know about radon levels in wet phosphate process buildings? And the literature are fairly sparse in this area, and it's hard to go back before the mid-1970s because, frankly,

they just didn't make the measurements or didn't report them. But Bob is right and SC&A is correct that it's very difficult to come up with some values.

But if you look up all these measurements, they are all below and mostly very much below the value that we're using in our site profile. There was some concern that the 2.33 number that we came up with was bias low because the values were from Florida where it was a more, at least thought to be, a potentially more open structure, an open building with better ventilation. So I went back and pulled out some values that were taken in Idaho at various facilities in 1975 by either the EPA or NIOSH had done some work in 1976 in a western Idaho plant. And all these values again are fractions of the value of 2.33 picocuries per liter that we're ascribing. I might have do a little bit of conversion. Some of the value reporting and working levels, if there was 100 percent

equilibrium of the radon with the progeny in the air, the working levels would be equivalent times 100 picocuries per liter. That's probably not the case, but to give you some rough comparison values.

These are all very low values. Admittedly, they were in 1976, not in the 1950s when what we're trying to develop. But then remember we have these values in 1983 in Blockson that were taken in that one industrial hygiene study that's listed here at the second to the last location on this sheet. And there's just not very much radon there. Then the question became, well, okay NIOSH has 2.33 picocuries per liter. We're using it as an upper bound. We have a measurement in 1983 in the facility that is at least a factor of five, it's about a factor of five lower than what we're ascribing. And then the question came about, well, are there differences in ventilation?

So then we went on this path of

interviewing workers and such, and, lo and behold, there were some differences in ventilation or some upgrades in ventilation in the 60s and 70s, that sort of thing. And then the central question became, well, since radon concentration is directly proportional to the ventilation rate essentially, would there have been a factor of five increase in ventilation between 1953 and 1983 so that the values would be lower than what were actually measured? We see nothing, in my mind, to indicate that that's the case.

So I still feel that our number of 2.33 picocuries per liter is bounding for these exposures, given that just not much radon occurs in these plants during these processes. One thing I'll mention, as Bob pointed out very clearly, that the digester tank, the sulfuric acid digester process, is probably, except for the ventilation, the most critical value. How much of that radon gets out of that tank?

I would suggest that this is a hot sulfuric acid tank that was not directly vented to the facility itself. You could choke the workers. You can't hot sulfuric acid vent. So workers did indicate that, even in the 1950s, there was ventilation over the top of these tanks. There were improvements later on but --

DR. ANIGSTEIN: Now, according to one worker, again, there were three workers interviewed, one would not even work in the building, so you really go down to two. And one of them said that there was a plastic cone that he called like an inverted ice cream cone that was installed over the digester tank later in the 60s and 70s. And sulfuric acid is not volatile. It has a very, very low vapor, particularly if it's mixed with or diluted with water. So you don't get fumes from sulfuric acid.

MR. NETON: When it's heated?

DR. ANIGSTEIN: Pardon?

MR. NETON: When it's heated? I beg to differ.

DR. ANIGSTEIN: Well, I mean, okay, it's very acrid, so a very small amount would be. But I think, just based on my experience, I was a chemist before I was a physicist --

MR. NETON: So was I, so let's compare notes.

DR. ANIGSTEIN: -- and I don't think 30 percent sulfuric acid would give out much uranium. That's a purely, you know, it's not a scientific opinion.

MR. NETON: Well, I would say that they saw these cones over tanks, but, Tom, you can help me out here, I believe that they indicated that they were vented. The cones actually just created a better capture, you know, situation for the fumes.

MR. TOMES: They improved the ventilation by those cones.

DR. ANIGSTEIN: There was no forced, that in the 50s there was no forced

ventilation. Another one said there was. One said that it was upgraded, and another one said it was installed later, that earlier there was no forced ventilation. So, again, it's a 50/50 proposition who you believe.

MR. NETON: And another thing, I've been looking through this quite a bit, and I've gone back to the Mallinckrodt scenario, which was not a phosphate plant, but they digested uranium ore, extracted the uranium, slurried it, a very similar process, had it in specific digester tanks, sulfuric acid precipitation, that sort of thing, and ORAU, in the 1980s, did an analysis of the workers at Mallinckrodt specifically for radon exposure. In between like 1946 and 1953, which were the peak years when there was some very high levels of uranium-bearing ore coming through there, the highest worker, by far, they calculated had an exposure that was no greater than 15 times what we're assigning for Blockson Chemical, even given that the radium

source term was 3500, up to 3500 times greater. And this was back in the early 40s or late 40s - early 50s, when the ventilation was not very good in that plant. So I have trouble reconciling those two facts.

DR. ANIGSTEIN: Wasn't some of the Mallinckrodt, I remember going over the Mallinckrodt report, wasn't a lot of the Mallinckrodt ore pre-processed to remove the radium?

MR. NETON: The Belgian Congo ore was not. It was 70 percent uranium by weight. Some of this later stuff was, but Belgian Congo ore, when it came through there, was about 70 percent uranium by weight and, presumably, that was an equilibrium with the rating. That's where they got in trouble with this. They had very high concentrations in some of the storage areas. By and large, the plant concentrations themselves were of a value, on average, typical to what the 95th percentile projection that Blockson come up

with, which makes me somewhat suspicious. How can you have uranium ore that's a thousand or more times higher in radium and had levels that are matching what the model predicts?

DR. ROESSLER: To me, the number you came up with really depends on your equation where you have the F in that. I'm kind of remembering it now. We really don't know what F is, but it goes between zero and one. Now, and then when you say one, there's where you really come up with that high value, and, to me, that's really stretching it. There must be a reasonable number that you can model. It's not reasonable that it's zero. It's not reasonable that it's one. You know that. So I think that by putting that range in there and then doing your Monte Carlo, it's just stretched it way out of reason.

DR. ANIGSTEIN: Well, the problem with that guidance which I got second hand while I worked on a study for NRC where they did, again, tiny radiation doses for purposes

of clearance of materials from nuclear facilities, and the rule was that if you don't know, if lack of better information, if you have a range and all you know is the range, you have to give it uniform distribution from the lowest to the highest round.

DR. ROESSLER: And was that with regard to F?

DR. ANIGSTEIN: Pardon me?

DR. ROESSLER: That was with regard to this --

DR. ANIGSTEIN: No, no, no. I'm just saying --

DR. ROESSLER: Just in general?

DR. ANIGSTEIN: -- general principle.

DR. ROESSLER: I think what I'm saying is your range does not make any sense. It's not reasonable at all. It's just far out.

CHAIR MUNN: It's too great a range.

DR. ROESSLER: Well, I mean, to go from zero to one is --

DR. ANIGSTEIN: I mean, basically, it's a statement of our ignorance. We don't know.

MR. NETON: Well, the other thing that's driving this also is the fact that I think the lower limit of the building ventilation rate is 0.1 turnover.

DR. ANIGSTEIN: We have seen, there is a --

MR. NETON: I think that's way, way low. I mean --

DR. ANIGSTEIN: Again, I was referring to a published study --

MR. NETON: I know you read Battelle.

DR. ANIGSTEIN: Pardon?

MR. NETON: Yes, go ahead.

DR. ANIGSTEIN: Yes, by Battelle where they had a warehouse which had no forced ventilation. And during working hours they

said they took two measurements, one in the morning and one in the afternoon, and they came up with 0.05 and 0.2. So they just took the average of that, the mean --

MR. NETON: The warehouse --

DR. ANIGSTEIN: - the median, the geometric mean and called it 0.1.

MR. NETON: Yes, I'm not sure how representative that is. I mean, you've heard John Mauro spoke to Mort Lippmann, an expert in industrial hygiene ventilation issues, stating that one would certainly be a lower bound for building ventilation for a building of that type.

DR. ANIGSTEIN: Well --

MR. NETON: And I have to point out if you move this F value to a reasonable value and building, the 0.1, which drives the high value that's been modified a little bit, I think you're going to end up with a value that's similar to what we're proposing is where I'm coming --

DR. ROESSLER: Not just a reasonable value but a reasonably high value.

MR. NETON: Yes, I think so.

DR. ROESSLER: Because one is not reasonable.

MR. NETON: And I guess that's my point. We can quibble on the parameters that SC&A has selected. I don't quibble about the model. I think the model is done properly. But if you adjust the parameters, that's where we're at. We're coming down to what are the appropriate parameters and how does that compare to the value that NIOSH has proposed? And I would still assert that that is not an SEC issue. That is a matter of where that fixed value or that distribution of value lies. I think we have plenty of data in a number of different facilities to indicate radon exposures are fairly low. How low they are is in debate right now. If not, can we put an upper limit on the radon level in a facility to process or that have up to 0.02

percent uranium by weight. I can't imagine we can't bound it. I think we have.

DR. MELIUS: Can we go back to your one-page handout? Are these reports on the O: drive where we can see them?

DR. ROESSLER: I think they are.

DR. MELIUS: I think we've already talked about the last report.

MR. NETON: I believe they are. I'd have to go back and check. It's been such a long time since we've talked about this, but I believe all of these were used in our -- certainly, the FIPR report is on there, the Blockson report is on there. The two NIOSH reports I'm not certain.

DR. MELIUS: Because I recall at one point either NIOSH or SC&A were looking for additional reports from other -- those are, I think, sort of a geographic question. Could we get reports from northern --

MR. NETON: Right. And that's why --

DR. MELIUS: I guess I'm asking two questions. One is what's here on the O: drive. Secondly, is what's here the universe of what was found when you went looking for these reports? I recall someone saying there was very few little data, so I'm not surprised that this is it. I'm just --

MR. NETON: I believe this is the universe of reported radon levels in phosphate plants that we have.

DR. MELIUS: Okay.

MR. NETON: I cannot guarantee you that all of these are on the O: drive. We can check.

DR. MELIUS: And then the Mallinckrodt data that you referenced, it's been a long time since we looked at Mallinckrodt.

MR. NETON: Well, these are all right out of Mallinckrodt's profile, so they're out there.

DR. MELIUS: Okay, okay. I haven't

looked for --

MR. NETON: I just excerpted the pages right out.

DR. MELIUS: Get it off my mind, right?

MR. NETON: Yes, that ORAU study they did in `85 as part of an epidemiologic evaluation.

DR. MELIUS: Investigation.

MR. NETON: It's fairly interesting to me. They did a time-weighted average using all the radon value around the plant, and they couldn't get above 1.5 working level months per year in any of those workers. And then there was a couple of job categories, and then it dropped down precipitously from there. And we are assigning 0.12 or something of that nature working level months per year.

MR. PHILLIPS: This is Chick Phillips. I think you were referring, I looked into the study that's referred to here as the Pocatello study, the EPA study, and

tried to verify that those measurements, particularly those in the grinding building and the control room, were made in an enclosed building, and I was never able to verify that.

DR. ROESSLER: Why would they make them, other than they say the grinder building. Maybe I misunderstand. Why would they make them anywhere other than in the building?

MR. NETON: Well, Chick just said they might have been open buildings.

DR. ROESSLER: Open.

MR. CLAWSON: Well, you've also got to understand what this report comes from, too, and the reason that it's the EPA is because we have to tear up 350 miles of road, we have to tear out over 100 homes because they had taken the rock because it was so nicely refined and crushed they put it into asphalt and put it out on the roads, which the EPA basically came back in and that there was endangerment to the lives of people and so

forth, and we had to dig up all these roads and homes.

DR. MELIUS: Fifty streetlights.

MR. CLAWSON: That's where a lot of this came into, and they were trying to figure out what they were actually waiting for. And I could tell you the name but under privacy and everything else like that. But we remember this quite well because one of the sites we had to tear down part of the foundation because they had used rock from Pocatello, and it was a very higher rate of radon. That's what created the issue.

DR. ROESSLER: What impact does that have on the numbers do you think?

MR. CLAWSON: Well, basically, I've been hearing a lot higher numbers than that. I was hearing numbers, especially in enclosed buildings and so forth like that, of radon levels; but I'd have to go back and look at what we were doing. The reason that this just sparks to me is because we had began to build

a facility out there which used a contractor from Pocatello that used their cement plant, and we couldn't use some of our radiation, our CAMs, or anything else like that because there was too much radon. It was over over-REM-ing us, and they had come to find out that's kind of what started the background into it was that they were using this material and it had, was putting off radon and so forth. This was part of that.

DR. ROESSLER: Well, I've never been to Pocatello in the winter, but I had a hard time picturing that they would be doing grinding outdoors. What is --

MR. CLAWSON: They're open buildings, meaning the buildings got sides, the roof has come up, and they've got gaps up to the top that basically run through there. And they use the natural convection to be able to clear out the facility. If you go out Pocatello headed toward Boise, you'd see all the facilities along there and what type of

buildings that they are. They go in a random start where the cars come in. Now it's a slurry mix coming, and it starts at one end and works all the way out to the other end. They're not heated buildings. A lot of them aren't heated and so forth like that, only the objects that need to be kept freezed or heated. They're just an open building.

CHAIR MUNN: They were doing highway with phosphate rock?

MR. CLAWSON: Yes, after it had run through the process.

DR. ANIGSTEIN: That's the major use of phosphate rock that pass through the --

MR. NETON: They built a number of school foundations out west out of that.

CHAIR MUNN: Yes, I remember that. So we've heard a considerable amount of discussion about the bounding value determinations here. The question that the Board asked us to identify is whether the bounding value that was being used was the

appropriate value. It appears that -- is there any argument over the fact that it's possible to bound this? There's no disagreement --

MR. CLAWSON: I guess my thing is is, sure, I can throw any number out there. I can throw a number out there and say, sure, this is going to bound it, but is it feasible that that's right or not would be my question.

CHAIR MUNN: And that's the question we're trying to determine here. That's what I'm asking. We have the data that's been set before us with respect to the ore itself, what the product was, what the possible exposure could have been. Is there any valid reason to believe that the value that's been chosen as the bounding value for determination in the claimant cases is not an appropriate value?

DR. MELIUS: What number are you referring to? You're referring to a NIOSH number?

CHAIR MUNN: Yes, the number that's being used to bound --

DR. MELIUS: Okay. Based on the --

CHAIR MUNN: -- for dose reconstruction.

DR. MELIUS: Yes, I think there's valid reasons. The valid reasons are contained in this report, the SC&A report.

CHAIR MUNN: And they are? Let's enumerate them for the record. Those reasons are?

DR. ROESSLER: Are you looking at Bob's report that came just a couple of days ago? Is that what you're --

DR. MELIUS: I don't have a report from Bob that came a couple of days ago.

DR. ROESSLER: I'm wondering what report you're looking at. Can you --

DR. MELIUS: The SC&A report we got in August, I believe.

DR. ANIGSTEIN: You didn't send anything else.

DR. ROESSLER: I'm looking for it. I can't find it. Is it on the web site?

CHAIR MUNN: Evaluation of radon levels in Building 40 at Blockson Chemical.

DR. MELIUS: Yes, so August --

CHAIR MUNN: Dated August 12th.

DR. MELIUS: -- 12th was the Privacy Act cleared one.

MR. NETON: What Bob presented.

DR. MELIUS: Yes.

CHAIR MUNN: Okay. That's a considerable text and explanation.

DR. ANIGSTEIN: The block diagram I don't have but everything else was listed from the report.

CHAIR MUNN: Including the Monte Carlo analysis?

DR. ANIGSTEIN: Yes.

CHAIR MUNN: And the modeling of the facility?

DR. MELIUS: Appendix B has the Monte Carlo analysis.

DR. ANIGSTEIN: Yes.

DR. MELIUS: That's what I asked earlier.

DR. ANIGSTEIN: It had the details all along the front part.

CHAIR MUNN: Have you found it, Gen?

DR. ROESSLER: Yes.

CHAIR MUNN: Fairly comprehensive report.

DR. ROESSLER: So what are your recommendations, Jim, based on that report then?

DR. MELIUS: What I'm trying to do is learn what information is available. Jim has presented some new information. We've heard, at least from my first time, I have a clear understanding of what SC&A is approaching. There's a disagreement between SC&A and NIOSH on the implications of SC&A's modeling let's call it, and Jim has presented saying, well, he would rather rely on

available sampling data from various sites, which is a legitimate argument. And he's presented some without a lot of detail, but there's not much time, and that's why I wanted to look at the reports.

And I think you have raised some issues about the SC&A model, as has Jim, as to whether the parameters in there are appropriate, at least the range of parameters. That's fair to do and legitimate, and I think we need to look over that. I'm not sure changing the range of parameters changes the basic distribution that much. It will change the tails of it, the 95th percentile, but how much of an impact it would have on what their overall argument is I don't know. But I --

DR. ROESSLER: But you agree, I would assume from saying that, that this can be bounded?

DR. MELIUS: No. I mean, there are ways of bounding it, are they appropriate ways for this program?

DR. ROESSLER: So how do we get to that point?

DR. MELIUS: Well, I don't know if we can.

DR. ROESSLER: What do you --

DR. MELIUS: Without data, how do we get to that point?

DR. ROESSLER: Well, I've presented a lot of data, some of which I think is not appropriate. It certainly is way, way, I don't think the word is even conservative. But it certainly includes the extreme upper bounds.

DR. MELIUS: Yes, but listen. I think any place in this program we can come up with extreme upper bounds for anything. So the question is are those, you know, justifiable upper bounds?

DR. ROESSLER: Exactly.

DR. MELIUS: I think that's what we're struggling with in the absence of data, primary data from the site.

CHAIR MUNN: Would it be of any value to us to take a short period of time to review the material that we have in front of us right here? Or are we asking the wrong questions in order to try to find an answer to is this an appropriate value? It's difficult to know how to proceed in the face of information that we have that we've had for quite some time. We've attempted to come to some conclusions with the data presented. Given what we know about the low quantities of exposure that are possible from this type of ore and from this type of process, it's difficult to see a path forward beyond what we've done.

We have accumulated a significant body of information and have very well-qualified individuals providing that information to us. So if nothing more can be presented in the way of material, if we cannot get other expressions of what an appropriate value would be in limited exposure situations

like this, proceeding is difficult. Is it the feel of the folks who are here that, looking at this material a little bit, will bring us any additional clarification or any change in position or not?

DR. MELIUS: Well, my understanding was that Jim presented this table or circulated this table last week as new information or an expression of maybe old information in this setting, which I think that's legitimate and I'd like to take a look at those reports. It's not something I was aware of earlier, at least not all of them. And I --

MR. CLAWSON: I believe somebody is trying to talk.

CHAIR MUNN: No, I think they're talking behind, I think they have not muted their phone and their conversation is coming through to us.

DR. MELIUS: And I think that either Larry or Jim presented, which I didn't

see from the last meeting but maybe I missed it, I mean I missed the meeting, but I didn't see in the transcripts. So I understand NIOSH's position is that you're sticking with your original radon report recommendation?

MR. ELLIOTT: We feel it's sufficiently accurate.

DR. MELIUS: Okay. I missed that last time. And last time, I was confused, I think, about the SC&A report. It was arguing with itself. I mean, I couldn't -- I mean, it's sort of playing NIOSH and SC&A, and I couldn't tell what the bottom line was.

MR. NETON: Yes, and I really thought, as I said earlier, the SC&A report was, I believe, initiated as a reasonableness check on the number that we were using. And, in fact, they've come out with a distribution which includes our value. Admittedly, it's at the 15th or 17th percentile their distribution, but then we're left at the situation now where we believe that model has

some ultra-conservatism built into it that if we adjusted the parameters to reflect reality a little better, our number is right in there. I think, to some extent, SC&A has provided some validation to our model, if we can agree to adjust the parameters to where we think they are.

That's the best case. The worst case is they've demonstrated that the bounding values can be generated, given the knowledge that we have of the site: the source term, the release rates of radon, that sort of thing. If there's anything that can be done with a source term model, radon is probably the poster child for that because of its noble gas qualities.

CHAIR MUNN: Chick, are you still on the line?

MR. PHILLIPS: I am.

CHAIR MUNN: Do you have any comment or anything to add to this current discussion?

MR. PHILLIPS: I think what we have done is to do exactly what I believe Jim said, and that is that we have attempted to look at the situation and, you know, do a scoping analysis of what it potentially could have been. And, of course, when you do that, if you consider the full range of potential values, in particular Bob earlier referred to two of those values that have a great impact on which we have no way of really evaluating, and that is the release fraction from the ore during the digesting process and then, in fact, what the effective ventilation rate is in the area of those digesters, not just the building but those digesters. And that was referred to earlier about the ventilation specifically for those.

So in the absence of that, just putting in the full range of values, you see the potential. That is, if you believe in the model, and I think the model is good, you see what the full range of values you can get and

then you try to temper those against what the measurements that were made, including one that was made in that building itself. And so then you have to make a decision as to which one, you know, how reasonable are those full range of values. You know, I haven't added anything to the conversation, but I think that's where we are.

CHAIR MUNN: Well, Chick, let me ask you one more thing. It's our understanding from everything that the workers have told us that this building was a very low habitation rate building. There were very few workers in there at any given time and that the workers who were there did not have an assigned job that they stayed with all day long, that they moved about from one to the other job either during the day or during the week or during their period of employment. So it's not one of those cases where we can identify a worker as having been in a specific area of the building for the preponderance of

the time worked. They instead had many areas in the building that they routinely went through.

Now, given that and what you have just said with respect to the difference between SC&A's approach to doing these bounding calculations and the NIOSH approach to the bounding calculations, I'd like to ask one other thing. It's been stated here today that there's a difference that is perceived as significant between the SC&A's position with regard to these bounding values and to the NIOSH position regarding bounding values. Is that perception accurate? And if so, can we resolve that here today?

MR. PHILLIPS: I'm not sure exactly what -- is the question is there a difference between the proposed bounding value that NIOSH has presented and the scoping analysis that SC&A did? Is that the question?

CHAIR MUNN: Essentially, what is the current position between SC&A and their

bounding value calculations and NIOSH's position with respect to bounding calculations? Is there a significant difference, and if there is can we resolve that here today?

MR. PHILLIPS: I can't answer the last part of whether that can be resolved today, but I think my summary would be the same as -- was it Jim giving the summary? I can't tell from here.

CHAIR MUNN: Yes, it was.

MR. PHILLIPS: The value, the bounding value proposed is included in our scoping analysis. It's a question of, you know, how you view the wide range of values that you can generate when you include all the possibilities. Again, I have to say that you have to temper that against the measurements that have been made, which they have summarized, which NIOSH has summarized in the table, and remember that at least one of those values was made in the building in question.

CHAIR MUNN: I guess perhaps I should ask Jim the same question. Do you perceive there to be a significant difference between your view of how to proceed with bounding values and SC&A? Because it's been stated here that there's a difference, and if there is a difference and that is creating concern for Board members, then it behooves us to try to resolve that difference. When listening to you, what you are saying sounds reasonable to me. When listening to SC&A, it sounds reasonable to me and it sounds to me as though there is really not that much difference between the two positions. But as long as there's a perception there's a difference, we need to either clear up that perception or try to resolve this one way or the other.

MR. NETON: I hate to do this, but I think I'm going to have to answer your question with another question.

CHAIR MUNN: Okay.

MR. NETON: And the question I have is does SC&A believe that the model that they developed represents a plausibly bounding scenario for radon exposure at Blockson Chemical? I think it says so in this document somewhere.

CHAIR MUNN: Yes, it does.

MR. NETON: And if they agree to that, then we both have bounding values. Ours is lower than what they would bound, and I'm not sure whether they're suggesting that the 95th percentile is plausibly bounding or whether some triangular distribution with the 50th percentile and the 5th and 95th as the end point. I'm not sure; but, nonetheless, if they say that they can plausibly bound these values, then we've got a starting point here. We believe that our plausibly bounding value is a little lower than what their central estimate is.

So to that extent, we're not that far off. We just have to figure out where

that value lies within the universe of values that SC&A has calculated. Nonetheless, agreeing that their model contains a plausible value somewhere in there that might need to be refined given our uncomfort with some of the parameter selections, the range of parameter selection.

I don't know if that answers you or not, but you see where I'm going with this. I think that they believe that this is a plausible value. I've heard Dr. Melius though say he's not convinced that the SC&A model is plausibly bounding, and I think Brad expressed some discomfort with that. And so unless that can be agreed to no matter what we argue here, it's not going to go anywhere because then we're just going to be refining a model that no one has agreed to is useful for plausibly bounding these things.

CHAIR MUNN: That's true. And what I was hearing, I think, perhaps I misheard, Dr. Melius and what Mr. Clawson were saying.

But I thought I heard the concern is that there is a difference between the positions of NIOSH and SC&A with respect to whether the bounding value is the appropriate value. Did I mishear that? Is that the question? Or is the issue that a bounding value is not going to be accepted under any terms, given the information we have now?

MR. CLAWSON: Let's turn this question around, Wanda. What you're telling me is that all the information that we have in here is exact and correct and that we have all the information to be able to do this process, that we've got everything that we're going to be able to do on this, bound everything? There's still, in my eyes, there's still, and this is my personal opinion and I'm not speaking for Dr. Melius or anybody else, there is enough -- this information, I guess I would say, you know, we've got a lot of facts, we have a few sample here, and we can arrange a few numbers around and we can come to a

bounding built on any site, any place, that is is, within this law, is it feasible?

I still have, my personal opinion is I still have a lot of mistrust from the information. I think there's still, you know, we've got NIOSH on one side and SC&A on the other saying, well, you know, we're not quite here. I put myself into the position of the petitioner. These people really can't even agree on a dose. I still have a hard time with the issue. I still have a hard time with the information that we've got. I think that there's still a lot of voids in it. There's a lot of dark area, and I'd just, I take myself into account because I'm sitting there working in a nuclear facility right now with state-of-the-art equipment and everything else like this, and they cannot even take and run our radon. We have a radon in flux, if we lose any kind of ventilation we have to evacuate our building. And we have a hard time monitoring this stuff, and I just, I really

have an uncertainty for it. Maybe a lot of it is just my personal thing there. It's still got a lot of gaps.

CHAIR MUNN: We are never going to have perfect information on any site we go to ever. No one has ever anticipated that we would have perfect information. We will always have people who will feel that there are gaps in information that is the best information available anywhere in the world. This isn't one of those places, and we have never said that it was.

MR. CLAWSON: So aren't we supposed to err on the side of the claimant?

CHAIR MUNN: What we're supposed to do is do the best science possible and to make sure that what we do is reasonable. That's our responsibility here. And the argument that there's a difference between what is happening, what SC&A's position is and NIOSH's position is a bit questionable because what I'm hearing and what SC&A has said from the

outset is we're good to go here. Their expectations incorporate that they are larger than, they expand further than, but they incorporate the values that have been determined by NIOSH.

Now, we're not going to have every question that is raised answered. It's impossible. But we do know a great deal about radon, about how it behaves. We know a considerable amount of information about this ore. And even though we do not have absolute numbers to say this is what happens everyday in this plant, we never have that anywhere, we, nevertheless, have valid information that any reasonable person would accept as it couldn't have been larger than that. Given the circumstances that we know to be real, it couldn't have been greater than that.

Let me read verbatim what the evaluation of radon levels at Building 40 at Blockson Chemical, which was provided by SC&A following our first concerns that were raised

in the working group about this. "The results indicate that the default value of 2.33 picocuries per liter selected by NIOSH in OTIB-0043 falls within the range of values that may, in fact, be an appropriate value, especially if only a small fraction of the radon in the ore entered Building 40 escapes from the ore during the grinding and digesting process and enters the Building 40 atmosphere. However, given the large uncertainties in radon release fractions from the ore during crushing and digesting and the uncertainty in the air exchange rate for Building 40, a higher default value may be needed. For example, the result of this analysis indicates that one can be 95 percent confident that the average airborne radon concentration in Building 40 during the qualified period was less than 42 picocuries per liter."

That does not seem to be any great disagreement with what NIOSH has proposed. NIOSH is proposing a default value that is

larger than this 95 percent confidence level.

MR. CLAWSON: I think you are misinterpreting that.

CHAIR MUNN: We can be 95 percent confident that the average airborne radon concentration was less than 62 picocuries per liter.

MR. CLAWSON: And then there's one right here, concentrations in Building 40, for instance. And, you know, something I really love is the caveats that's in a lot of this because I've just been listening, should not have been, could may have been, you know, and I guess that brings in a little bit, but I'll just continue, "For instance, it's quite unlikely that the average concentration would have exceeded 62 picocuries, 95 percent value of the probable analysis."

You know, you're right, Wanda, we'll never have all the information. We're trying to reconstruct everything from many, many years ago. And as you well know and as I

know, I want to make sure that this is as claimant favorable as possible, especially using, in my eyes, as little data as we do have. Now, we can construct data and we can try to put a bounding dose on it and so forth. I just want to make sure that we do the best job that we can for the claimants and that we have done all that we can to, under the information that we actually have, is valid and correct. And I know that we're trying and we've got some wonderful people working on that, and I respect what Jim has said and I respect what SC&A has done. And I just want to make sure that when we vote on this that it is the best that we have and that we have got the information because we're trying to -- Larry can attest to this because I was at the first meeting when they talked about how they were going to do this. I have an individual at work that I go into with a problem, and his first question for me is how do you want the outcome? And the reason for that is because

he can make the numbers talk to whatever he wants or what I want to get to the bottom line. And I want to make sure in my mind that we have got everything and that it is credible and that it has covered it.

CHAIR MUNN: And, Brad, what do you think the desired outcome is for the people who are sitting around this table?

MR. CLAWSON: I don't know. I guess that's what you'll have to look at inside yourself. What I'm looking at is do we feel comfortable with this? And granted I --

CHAIR MUNN: Is there a question in your mind that the people sitting around this table do not want the best, most accurate information and calculation that we can get for each one of these claimants?

MR. CLAWSON: No, I never said that. I'm just --

CHAIR MUNN: I just wanted to make sure you didn't doubt it.

MR. CLAWSON: Well, and that's a

good point. Well taken.

CHAIR MUNN: Because that's exactly what these people are trying to do. If we didn't care about this then, believe me, as chair of this group, I would not have you back here again for the about fifth time going over these same issues. Every person here wants to see that the best job that can possibly be done is done for these claimants and that the best science that we can get comes out of it because it's really important not only to the clients but to us and to the entire nation, not to mention the nuclear technology as a whole. What we do here matters, and it matters greatly, not just for the claimants. For us to do anything other than the best job we can is shortchanging them, as well as us, and no one here wants to do that. I don't see a single face at this table who would be willing to do that. That's not what we're here to do.

So we have to be able to resolve

issues that have minor differences in them based on the much, much improved knowledge of dose reconstruction and of dose measurement and of potential exposure that we know now that we did not know 50 years ago. We've learned an enormous amount about this science in the last 50 years, and we must apply the knowledge that we have now to situations that occurred 50 years ago. That's what we're having to do with Blockson.

DR. ROESSLER: I'd like to address Brad's presentation on how he feels this is so uncertain, and I think if you go back, and Bob did a very nice presentation with his equation. And if you look at that equation and understand what goes into it, some of the terms are absolute numbers; there's no question about it. The others that he put into it I think he took the whole bound, the absolute whole bound. There's no question about what those numbers are. So he's gone back and he has shown by going to the source

term and putting in numbers that, you know, are the upper bound that he comes up with something like SC&A has agreed that's in the range that NIOSH does. I think that when you're saying these things are so uncertain that's a real misrepresentation of what's been done.

MR. CLAWSON: You see, that's part of the reason why this Board has been locked together the way it has and the different aspects of it is so that we cover everything we do. And I agree. I agree that they have gone into a lot of in-depth study, and I still have a hard time with it. Maybe we never will come to a conclusion that will make me happy. I don't know.

MS. PINCHETTI: This is Kathy Pinchetti again, and I just wanted to note that in the August SC&A report, even on the first page where it starts going into the review, it says, "Nevertheless, we found it difficult to conclude that the radon

measurements made in `83 can be considered representative or bounding of the radon concentrations present during the qualification period." So throughout the whole report, it kind of contradicts itself back and forth. You know, it's kind of like thinking out loud, like how is it that Florida information or information, you know, from `83, which was 30 years after the petition date that we're looking at, is even applicable. So I need to agree that there is a lot of question and there's a lot of unanswered things, so we can come up with any sort of data and postulate, well, maybe this and maybe that, but that doesn't make it so.

CHAIR MUNN: Well, we have to be aware of the fact that the results that we have here are not all postulated from the 1983 data. There's a considerable amount of other information that went into that. It was a single item that they were inferring, as Brad has inferred, has uncertainty involved with

it.

MS. PINCHETTI: It looks like the focus is on Building 40, and there's no bioassay information out of Building 40 at all. I mean, we went from Building 55 to Building 40. The only urine analyses were from the guys in Building 55. There's nothing from Building 40.

MR. NETON: This is an old question. This is Jim Neton. The Building 55 is the covered facility at Blockson Chemical, and there's a parenthetical that says "and other associated activities," which we believe to interpret to mean the addition of the oxidizer in the process to enhance the uranium recovery and a few other issues like that, a few other pieces like that. But by and large, Building 40 where, you know, that process was there before, during, and after the AEC commissioned Blockson to pull off uranium product. Those are part and parcel to the fact that they're there, whether or not the

agency ever commissioned Blockson to make the uranium or not.

It's the radon that we're worried about because that was where the oxidizer was added and a person could have been exposed to radon. You raise a good point that right now we are assigning concomitant exposure to Building 55 to the person who was drumming the uranium and all this radon on top of it. I mean, that's somewhat claimant favorable from that perspective because the radon value that we're calculating are the maximum values that would have occurred in Building 40. In fact, Building 55 was removed from those prophecies and there was no real radium source term in Building 55. So, in fact, the levels that the operators at Building 55 experienced would be substantially lower than any value that we're calculating here, in my opinion.

CHAIR MUNN: So we are at a point where the bounding value that is expressed by NIOSH is within the bounding value that the

contractor agreed would, in fact, cover all cases from the Blockson site. Is it the appropriate value? That's the question we started with. It's the question we still have before us. It's the question that we have to report back to the Board.

DR. MELIUS: Which is the appropriate value? The NIOSH value or the -- I mean, one's a range and the other is a value, I guess.

CHAIR MUNN: Yes. And the question is are we using the range, or are we using the defined value?

MR. ELLIOTT: We're using a defined value, and I think that's what the Board is charged with looking at. That's being reviewed here --

CHAIR MUNN: That was my interpretation --

MR. ELLIOTT: -- to have another point of comparison in the modeling range that's been provided. The question goes to is

the NIOSH value an appropriate value?

MR. NETON: I'd certainly be interested in hearing the opinion of the working group as to whether or not they feel that the SC&A value range is more appropriate and why. I'd be interested in discussing that.

DR. ROESSLER: Let me ask a question. Let's assume that we said, okay, the SC&A value is the appropriate value. Let's say we agreed on that. If we did that, would that then close the issue for some of our workgroup members?

MR. ELLIOTT: What value? 62 picocuries or --

DR. ROESSLER: Well, let's just say --

MR. ELLIOTT: Well, I think you have to specify the value because it could be our value.

DR. ROESSLER: Yes. Okay. Let me just say if we said, and I don't agree with

it, but let's just say that we picked 62.2 or whatever the number is, would that then answer the questions for our other workgroup members? We still get back to the question of do you think we can bound?

DR. MELIUS: Can we come up with a plausible bound.

DR. ROESSLER: Yes, yes.

DR. MELIUS: Which is where I think Larry is coming from; is that correct?

MR. ELLIOTT: Well, we feel --

DR. MELIUS: The plausible bound is 2.33.

MR. ELLIOTT: Yes, we feel that that has been proven in the modeling effort that SC&A has done. And if you would remove those extreme points of range in the two variables it's even going to tighten it down toward where we're at. I mean, out of a thousand runs in the Monte Carlo simulation run, they had a high 100,000, they had run high extreme value of 560 something --

DR. ANIGSTEIN: Six hundred.

MR. ELLIOTT: Six hundred; I'm sorry. And if you take that one out, it's certainly going to draw it down.

CHAIR MUNN: Take the nothing out.

MR. ELLIOTT: Take the nothing out.

MR. NETON: I personally think if you take 62 it gets into the realm of implausibility as a fixed value, as a constant for all workers. Although, I would suggest that the Board, if the working group was willing to entertain this distribution, I mean, it's possible to entertain distribution and look at the, you know, is their number, seven picocuries per liter, the 50th percentile? And the upper bound would be, you know -- implausible, but if it's got some credibility, the 62 could have been there at some time, there's some credibility it could have been as low as whatever the 5th percentile was, so you end up with this triangular distribution of values that

essentially the SC&A model would predict. If we were going to use any model at all, it would not be a fixed upper 95th percentile using the --

MR. ELLIOTT: Extreme range.

MR. NETON: -- extreme ranges because then you end up way out of there. In my mind, it becomes implausible when you compare it to other facilities, like Mallinckrodt and such.

DR. ROESSLER: And then we're not consistent.

MR. NETON: Right. But if one starts to talk about distributions and a central value, which maybe, you know, it's seven under the current constraints of their model, that's a debatable issue. But the Board, the working group has to come to grips, I think, with is this approach even valid? I'm hearing discomfort that that approach is not even an a tenable upward bound for any of this. And if that's true, then we may as well

--

MR. ELLIOTT: You're at loggerheads.

MR. NETON: There's nothing to do. We're at a stalemate.

DR. ROESSLER: I think a couple of the workgroup members are not accepting the SC&A report. I don't think there's any consistency in it really in their wording, and I think that we need to hear from you do you accept the report or not? Maybe that's where we start our discussion.

DR. MELIUS: Accept the report for what? As an upward bound, as a plausible upward bound --

DR. ROESSLER: But do you accept that much?

DR. MELIUS: -- or as a piece of information? The answer is no as a plausible upward bound. Do I accept it as a modeling information that's useful in trying to understand what exposures might have been at

Blockson in that building? Yes. It's a useful piece of information, just as the information from Florida may be or from Pocatello, wherever.

DR. ROESSLER: I'm not sure --

DR. MELIUS: Is it adequate to do or sufficient for dose reconstruction purposes? I'm not sure.

DR. ROESSLER: So we're at loggerheads regardless. I think, you know, we might as well get to the point. You haven't given us anything to really focus on that we can do because no matter what we do I think you're still at loggerheads. Is that the bottom line?

DR. MELIUS: It may be, but I think Jim has given us some new information, Jim Neton, today, which we'll look at, which I'll look at, and we've heard more from SC&A. I understand what they did better now, which I couldn't understand from the transcripts.

CHAIR MUNN: So are we going to

have an opportunity to -- if we take a longer than one-hour lunch break, is that an adequate amount of time for any additional absorption of information here, or is it not? The real question being can we resolve any of this today on this specific issue? Can any one begin to feel that if 2.33 is not the right value is some 50 percent figure a right value? Is there any possibility that today we can address this question and come to any further point of agreement than we have right now?

DR. MELIUS: The answer to that is no on the bigger question. If others would find it useful for NIOSH and SC&A to try to agree on a more reasonable or what NIOSH would feel would be more reasonable parameters for the model and what the information from that model would be useful in some way, I have no objections to that.

CHAIR MUNN: What do you feel would be more reasonable?

DR. MELIUS: Nothing. I don't have

any feelings about reasonable.

CHAIR MUNN: Rather than proceed with this issue right now, I would suggest that we take a ten-minute break and come back for about 45 minutes after that before we go to lunch and move on to the other items that are on our list. If we can address any one of those and at least remove those items from the list, that would be helpful. For the moment, we are setting aside focusing on the radon issue. We will get back to it after lunch. For the moment, let's take a comfort break and be back in no more than 15 minutes, preferably ten if we're all back.

(Whereupon, the foregoing matter went off the record at 11:28 a.m. and resumed at 11:42 a.m.)

MR. KATZ: We can go, and I don't think I need to make any comments in advance.

CHAIR MUNN: No, I don't think so.

MR. KATZ: Restart.

CHAIR MUNN: We're back in session

here, and we're going to move down our list of issues that the full Board had asked us to address, the next one being revisiting the suitability of surrogate data use. There had been some expressions of concern with regard to the use of data from anywhere else. I'm not sure who to ask to address that to begin with. If there's some specificity to those concerned, this might be a good time to hear those. Jim, Brad, do either of you have specifics relative to surrogate data use that you wanted to reiterate for us to use as a starting point for the discussion?

DR. MELIUS: I mean, I think we've been, before we've been talking about using surrogate data, using the Florida phosphate data, and I think that's what we're talking about, is that appropriate or not. And I think we said earlier the justifications for that are, one, the SC&A model, and number two is the limited data from Blockson and then the data from the other sites that Jim has talked

about and presented in that table. I don't think at this point there's anything further that can be said about that.

CHAIR MUNN: Jim, do you have any --

MR. NETON: I was just prepared to say a few comments about how this fares in light of the IG-004, which is NIOSH's document on the issue of surrogate data. I think the approach that we've adopted fulfills the guideline that they've been written in there, which is that we need to know something about the source term. We have a lot of information about the source term that Bob has used in his calculations. If we're going to have _____ facilities with similar processes, these are all wet phosphate facilities, a couple from the north, the south admittedly. So it's a similar chemical process.

The only thing that right now is clear cut in our mind but the temporal considerations have to be considered, and we

fully admit that there is a disconnect between the earliest data in 1976 and the data that we're trying to reconstruct in the 50s. But we believe that the factor of five conservatism built into that value more than makes up for the differences in the ventilation rate during that time period. So at this point --

MR. ELLIOTT: It's not necessarily a disconnect. We've just not shown a connection to the `76 data and the 1950 era circumstances.

MR. NETON: Well, the disconnect in my mind is that we don't have measurements other than at Blockson in 1950. I mean, it would be nice if we had 1950 measurements at all these other facilities, and we don't, you know, with similar ventilation rates. But we have a measurement in 1950 or in 1983 that we can go back and use scale based on the plausible ranges in ventilation rates. And couple that with the fact that we believe the

estimated model has clearly shown that our value was in the realm of possibility. It's not a 1 percentile or 0.1 percentile. It's in the mix, especially if you re-analyze the range of values that we use in that model. I was prepared, so I threw it out there.

DR. MELIUS: I want to attack you on the if we change the model, it will be fine.

CHAIR MUNN: Jim, I wanted to ask you --

DR. MELIUS: Who refined -- I'm sorry. Go ahead.

CHAIR MUNN: No, I'm sorry. I didn't mean to interrupt you.

DR. MELIUS: No, no, go ahead.

CHAIR MUNN: In view of the fact that you and _____ have been putting together some thoughts with respect to guidelines in this regard, is what's transpiring here going to fit reasonably with -- we know those haven't gone before the Board yet. They're

not approved, but you've been working on them and we have material to deal with. Do you see any major conflict in what you've been doing with surrogate data issue and what we have here at Blockson?

DR. MELIUS: I think the issues are the same as what Jim brought up. I don't think that the draft guidelines, I think it's too early to say whether they support or don't support this approach. I think it's an issue of application.

CHAIR MUNN: But you don't see any glaring difference between what's being proposed and what we --

DR. MELIUS: I think that the, to say this correctly, that the parameters Jim talks about, temporal time period, nature of the data, how robust the data is, I don't think are different. What the conclusion would be are how those are applied, I think. We just don't know yet. I don't want to speculate --

CHAIR MUNN: No, understand.

DR. MELIUS: -- one way or the other.

CHAIR MUNN: I wouldn't want you to. I just wanted to make sure there was no, in your mind, any obvious difference between this approach, the items that have been under consideration --

DR. MELIUS: I don't think there's any other factor that's being considered.

CHAIR MUNN: That's really --

DR. MELIUS: Fair?

CHAIR MUNN: -- the real question. Good. Glad to hear that. So far as we know now, the surrogate data used suitability is something we're going to revisit when we go back and talk about the radon issue, right?

DR. MELIUS: Correct.

CHAIR MUNN: All right. Provide specifics of the coworker model for uranium exposure. That's a part of the information that was just sent to us last week to take

another look at. Jim?

MR. NETON: Actually, it was SC&A that had been tasked with generating this evaluation of our coworker model, and I believe John Mauro sent an e-mail that summarized that opinion on that model. I'm sure if John were here he would be happy to talk about it. But by and large, my take on what he wrote was that we use the generated 95th percentile distribution of chronic exposures for the monitor of workers at the facility and we generate distribution of chronic exposure models for all the workers that were monitored, the 10 or 12, I forget. Tom could probably fill this in better. And we pick the 95th percentile of the distribution of chronic exposure models, which, in fact, is higher than the highest exposed person by a smidge, not a lot, but it's about 75.

DR. ANIGSTEIN: I think 82 versus about 75.

MR. NETON: Right, yes. So my sense from John's e-mail, and maybe Bob could comment, is that SC&A, at least to my knowledge, has no real argument with the way we reconstructed internal dosage at Blockson Chemical.

DR. ANIGSTEIN: Yes.

CHAIR MUNN: You want to weigh in on that, Bob?

DR. ANIGSTEIN: Yes, I want to weigh in. No, we agree and also answer, Dr. Melius asked the question about did we inventory, I saw the e-mail, basically did we independently try to verify the dosage based on urinalysis, and we did it in a reverse manner, and that is John Mauro took the 82 picocuries per day and says, well, _____ the chronic long-term exposure of a worker that he always had 82 picocuries per day, what would his urine be? And assuming, here's the caveat, assuming the type-M where we do have some question about, but if, hypothetically,

we were to agree with this type-M designation, then it turns out that the urine of that 82 picocuries per day worker, if I remember correctly, would be something like 0.008 picocuries per liter, which is higher than the highest thousand that was actually measured. So that was one thing.

So, yes, we believe that the derived values are consistent with the urinalysis provided. However, we leave in abeyance the issue of whether it is all M or whether some could be type-S. If some of it is type-S, it would change the picture significantly.

MR. NETON: But I think that if the model values themselves, that's part of the question, at least in my opinion Dr. Melius trying to get at, this had more to do with if you have sampling on the right worker. Is there a population out there that were not monitored that could have been higher than the population that we've modeled? I think --

DR. MELIUS: That's one question.

MR. NETON: That's one question. And Tom Tomes has put together this little table that we just passed around, which I think is somewhat instructive. If you'll notice, there are ten different sampling dates on the top column here. Those are the dates at which samples were collected on workers and sent to the HASL Laboratory, now Environmental Measurements Laboratory, for analysis, and you see an interesting pattern here that there are anywhere from ten or so workers that were sampled during every one of these monitoring periods. Now, why is that important? Well, we've been told by workers that there were about ten people working on the project, no more than 20 but 10 or 12 workers that worked in Building 55.

MR. TOMES: Well, different shifts. Yes, total.

MR. NETON: A total of 10 or 12, and so what you see here is a pattern of,

well, as one worker dropped off and maybe went somewhere else, they added some additional workers. So there's a nice clear pattern here, established pattern, of monitoring what we believe to be the workers in Building 55. If not all of them, certainly almost all of them. There may have been some ancillary maintenance staff and such that entered the building that were not sampled here, but we believe that these samples cover the people who were involved in the drumming of the uranium material itself. They were actually involved in the physical process of working, handling the materials.

So in our opinion, we've captured the right population to model. And, in fact, by taking, what Tom has done is developed a chronic exposure model for each of the workers. In other words, he has consistent samples throughout a long period of time and took each of those chronic exposures that he developed and then picked the 95th percentile

of all those chronic exposures on those workers. So in my opinion and in OCAS' opinion, this was the appropriate way to do the analysis. I've had some discussions in the past with John Mauro on this, and I think he's in agreement that this is an appropriate manner to handle these data.

CHAIR MUNN: Tom, do you have anything to add?

MR. TOMES: That pretty much describes what we did.

CHAIR MUNN: So the specifics of the coworker model for uranium exposure are on the table for discussion. Does anyone find them inadequate, inaccurate? And where are we with the type-M question?

MR. NETON: I can answer the type-M question. That was decided to be a site profile issue many, many, many months ago.

DR. MELIUS: I had another question. There's one worker who had consistently high values, and I was curious

about if we knew anything about that person's job assignment.

DR. ANIGSTEIN: We looked into that interpretive and some of the other information, and, no, there were only job assignments for five of those 25 workers, and none of those were at the high end.

MR. NETON: Well, I think we have some claimant data that might supplement that; I don't know.

DR. ANIGSTEIN: Okay.

MR. TOMES: I am not sure exactly which worker that you're referring to that had higher results, but we do have data on one person who was not the highest person, but who was near that at the upper end who actually drummed material. The highest coworker, I do not have any data on that.

MR. NETON: But that one is a claimant, right, Tom? It's a case that we have for reconstruction.

MR. TOMES: Well, one of them is,

and then there's another one. One of those persons is, yes. Then there was another one who was identified in a worker meeting and what his job is. He was also near the upper end of that distribution, and both those workers handled the ground material at some point in time in Building 55 on a routine basis.

DR. MELIUS: I don't want to ask too many more questions because of privacy -- oh, you're in the room?

CHAIR MUNN: Well, yes. I just wanted to make sure that your question was specifically addressed because you had asked about the highest one.

DR. MELIUS: I believe he did.

CHAIR MUNN: You think he did that? Okay, okay. I didn't want to --

DR. MELIUS: And I'd seen the calculation that was referred to in the last meeting, and I understand that. And I actually think this is a very helpful way of

portraying it. I think it's useful, so thank you.

CHAIR MUNN: Do we feel that there's anything other, any other topic that needs to be covered with respect to the specifics of the coworker model for the uranium? Everyone is accepting what we have here as being adequate and appropriate.

Next issue was a concern that we've also heard expressed in many sites with respect to what assumptions are used for maintenance workers.

MR. NETON: Tom, I think --

MR. TOMES: I believe I can answer that. Our site profile, given the intake that we've assigned -- and also the doses are similar, we assumed that they were exposed at that high level.

CHAIR MUNN: Acceptable response?

MR. CLAWSON: You've got the -- what's the high level?

MR. TOMES: The intake rate is two

picocuries per day.

MR. NETON: We make no differentiation between a maintenance worker and a -- we don't know most of the time where these workers were or even if you have identified a person who claims they were a maintenance worker at a certain point may have been a chemical operator another period of time, but we don't know. So all workers that could have worked in the plant are given the same exposure, one size fits all.

CHAIR MUNN: We've had many expressions from the workers about the flexibility of their job descriptions and how they changed from one to the other over short periods of time and over long periods of time.

MR. NETON: This is not inconsistent with what we've done at other sites where we would select the 95th percentile of the unmonitored worker who could have been working in the plant. We received a 95th percentile for coworker modeling. It's

very similar to what we've done elsewhere.

CHAIR MUNN: Any problem with that response? Acceptable? The final item on the list was concern with respect to data quality. I'm not sure exactly what can be said about that or what reassurance people can be given, but since it was presented as a showstopper at the Board meeting it would behoove us to try to address it here in such a way that we can reassure the Board that it has been adequately covered and that we've given new consideration to their concern. Does anyone want to speak with respect to data quality and what the concern of the Board was?

DR. MELIUS: I don't recall that.

MR. NETON: I don't recall what the issue was, to be honest with you.

DR. MELIUS: I mean, I raised the issue about the uranium sampling earlier that John Mauro may have misunderstood, so SC&A did a report on sort of laboratory quality issues and so forth, which really wasn't -- the issue

I was raising was more about this job title, who was, you know, monitoring sample kind of thing. So I don't think there was ever a question about that. I'm just trying to remember back to the Board meeting and what we said.

MR. NETON: Yes. I think Dr. Melius is right. The data analysis was done by the Health and Safety Laboratory, which we've accepted as sort of a de facto quality laboratory for other sites. So I don't think there's any question related to -- unless this refers to the radon data, which we have almost none, so I guess that's --

DR. MELIUS: Yes. I mean, I think there was an issue about the radon, the methodology and so forth for the radon data collected at Blockson.

MR. NETON: Yes.

DR. MELIUS: And I don't remember how that was addressed. I remember it being raised.

MR. PHILLIPS: This is Chick Phillips. You did address that in your earlier report, the draft report, white paper, on the radon measurements at Blockson.

DR. MELIUS: Okay.

MR. PHILLIPS: How it got incorporated in this last one I'm trying to remember.

MR. NETON: I think it is in there, Chick.

MR. PHILLIPS: Okay.

CHAIR MUNN: Do we need to resurrect that white paper, or are we content with where we are relative to data quality?

MR. NETON: You know, I thought that, I agree with Dr. Melius. I thought it was more related to the quality of the samplings of the distribution of employees or something to that effect. That was my --

DR. MELIUS: That was the issue that I had raised earlier. And as I said, John misunderstood me and sort of went back to

sort of laboratory quality issues. There was one report on that. But then the only other issue I remember coming up about, sort of, data quality was more sort of methodology and so forth with those radon samples. That may have just been when they were first presented no one knew where -- I don't recall.

DR. MELIUS: I think it was.

CHAIR MUNN: If that's the case, then we're still talking radon, and we'll just address that when we get back from lunch.

DR. MELIUS: There's a June 5th draft report from Chick Phillips. I have additional information on radon exposures at Blockson, radon measurement in Building 40, and it's 1983, which summarizes, I guess, data Chick took from the Olin report or --

MR. NETON: Correct, yes. That has been incorporated into the current August report on pages 9, 10, and 11.

CHAIR MUNN: Good.

MR. NETON: It's essentially the

analysis of the one sample that Chick went back and re-resurrected what that really meant in terms of working levels, and there's a nice table in there. I think that's in there.

CHAIR MUNN: So can we truthfully say that the workgroup has looked at that particular bullet and do not find it to be a cause for concern?

MR. CLAWSON: I'm just trying to go back in my short memory. Do we know who did the bioassays?

MR. NETON: The Health and Safety Laboratory.

MR. CLAWSON: Health and Safety.

CHAIR MUNN: And I think that may have been one of the things that was troubling someone.

MR. CLAWSON: Well, if you remember, it's right after some information came out about one of the people that had done a lot of the bioassay programs had a problem.

CHAIR MUNN: Apparently not. That

is the last of the issues that I have. It appears that the only outstanding thing that we have, correct me if I'm wrong, our issue with respect to radon distribution is our big outstanding concern here, the one we're going to take a little extra time over our lunch hour to think about. We'll come back here. It's now, by my watch, 10 minutes after 12. We will come back here at 1:30 and we will address this one more time and see if we can come to a conclusion on what any path forward might be, if there is, in fact, a path forward. So we are adjourned until 1:30 Eastern time. We'll be back online then.

MR. KATZ: Thank you, everybody on the phone.

(Whereupon, the above-entitled matter went off the record at 12:08 p.m. and resumed at 1:30 p.m.)

CHAIR MUNN: Thank you all. We've

taken a longer than usual lunch with, hopefully, an opportunity to think a little bit about one outstanding issue that we have left. Of those that were pointed out to us by the Board that they wanted us to continue some concerns with, the only one still outstanding is the initial focus on the radon issue and whether or not the bounding value can be determined to the agreement of all the major parties involved. We have some additional information and have had a considerable amount of discussion here about it and seem to be at a junction where we either have to take some other path than what we've taken or we have to throw up our hands, and I'm not quite willing to throw up our hands yet.

We have agreed that the distribution that has been presented by the contractor is a reasonable statistical distribution, and now the primary concern that we have is how to narrow that to an appropriate value that can be accepted as

being reasonable. If anyone has any suggestion with respect to how to proceed, I would like to see one more effort for SC&A and NIOSH technical folks to sit down and see if the range of distribution that has been suggested can be discussed and can be agreed to be narrowed to the point where we can bring a new suggestion back to the Board and to our other working group members.

Does anyone have any suggestion with how to proceed with that possibility?

MR. KATZ: Before we go on, just let me, as a matter of record, I should have noted that Dr. Melius is not attending at this point.

CHAIR MUNN: That's correct. Dr. Melius has left us over the lunch hour. We're sorry about that, but we'll continue on.

MR. PHILLIPS: Wanda, this is Chick.

CHAIR MUNN: Yes, Chick?

MR. PHILLIPS: I was going to throw

something out before I got sent off on the telephone. I don't know if this will help direct the issue or confuse it even more, but let me take a shot at it. We did have, as I said before and as is pointed out in the table that NIOSH provided, actually three managements that have reasonable belief that those were made in Building 40, the building in question.

MR. KATZ: Chick, are you speaking through the speaker phone, because actually, your voice is not very clear at all?

MR. PHILLIPS: Okay, let me try something real quick. Is that much better?

(Chorus of much better)

Okay. We did have a management, actually three managements, one that gave us a positive value in Building 40. I'm going to be referring here to the August SC&A report, if everybody has that before them, the August 12th --

CHAIR MUNN: Yes, we do.

MR. PHILLIPS: -- Blockson analysis revised draft.

CHAIR MUNN: That's what we've been working from.

MR. PHILLIPS: Okay, all right. And we went through the steps to determine the working level value and radon value for that, which appears to be made in the 40 filtration area, which is close to the digester area. And that comes out to be a little less than, and let's just say it's one picocurie per liter. The question is -- this measurement was made in 1983. What conditions changed in Building 40 or potentially changed in Building 40 between the covered period in the 60s and the measurement that was made in 1983?

CHAIR MUNN: You may recall we pursued that at some length.

MR. PHILLIPS: We did. And, in fact, we went back and did some additional, we, with NIOSH, went back and did some additional worker interviews to try to

determine what changes could have been made, particularly in the ventilation rate. Because if you look at table four in the report that I referred to and you look at the values that affect the radon concentration in the building, to the best of our knowledge the process did not change between the two periods that we're talking about, between the 60s and `83.

CHAIR MUNN: We were repeatedly assured by the workers that the process did not change.

MR. PHILLIPS: That's correct. The one thing that could have changed and, in fact, one of the workers that we interviewed indicated that he thought ventilation had been added above the digester tanks. And the one value in here, then, that could have changed, if you look at all of it, assuming that the process itself did not change significantly, that could have affected the value is really the ventilation rate.

So going back and looking at that, if, indeed, the value was one picocurie per liter at the time the measurement was made, it could be ventilation rate had changed by a factor of two to reach the bounding value as originally proposed by NIOSH, the 2.33. And one would say, yes, that that's certainly a possibility.

Moving down to table five, which is the percentile table coming from our Monte Carlo analysis, look at the 50 percent value, the ventilation rate would have had to change by a factor of seven to reach it. Is that reasonable? Possibly. To reach the 95 percentile value, it would have had to have changed by a factor of 60. Is that reasonable?

So I don't know if this narrows the scope. Again, we have no reason to discount those values that were measured in 1983.

CHAIR MUNN: Some thought that that narrowed the scope. We have one member of our

working group who's not with us today who was very concerned over the ventilation issue and expressed great concern over what the size of the fan or fans might have been, what its rotational speed was, et cetera. And, of course, we don't have access to any of that information at all. We only know that a fan was installed but that it did not noticeably affect the amount of particulate and other residue that was in the building where the people were working. They indicated, if I remember correctly, that there was some improvement. They noticed an improvement, but it wasn't an enormous improvement.

So I appreciate your suggestion. I think it can certainly be taken into consideration and mentioned again when we present this to the Board and would be perhaps helpful if I had some, just thoughts and notes on what you just recorded, for our transcript here, for my own purposes. I'd like to be able to incorporate those same kinds of

thoughts in any presentation that I make to the Board next time.

But in the meantime, we're faced with this very real question regarding the radon concentration and that, of course, being a factor that will obviously become a part of what we'll be doing here. Perhaps we can get some thoughts from our NIOSH colleagues. Jim?

MR. NETON: Yes, Wanda, this is Jim. I think we're more than willing to sit down, if it's the working group's desire, with SC&A to discuss on a detailed technical level the parameters associated with the model they developed and have a free exchange of our ideas as to what we believe to be bounding and not bounding and that sort of thing. And we'd be more than happy to sit down and do that and possibly bring in some of the discussion points that Chick just raised. You know, I'm a firm believer in looking at the real data that we have and see that that sort of rang true, and we have not had that opportunity

yet. We've had an exchange here at the working group level, but maybe that a more in-the-weeds, technical discussion might be in order for us to sort of iron out our differences.

CHAIR MUNN: Bob, are you and Chick going to be able to commit to doing that to some degree in the immediate future? Will you be able to work with your NIOSH counterparts to review this again?

DR. ANIGSTEIN: Sure.

CHAIR MUNN: Chick?

MR. PHILLIPS: Sure. I think that's a good suggestion.

MR. CLAWSON: I would kind of like to, you know, I guess a lot of, maybe, my concerns may be addressed. I'd like to be able to have the ability to be able to listen to that because maybe that will give me the satisfaction that I need or whatever like that because, you know, airflow, to me, that's how we control it at where I work. That's how we

control it is airflow. So it is an issue, and I'd just like to be a part of it.

MR. NETON: I think the way these technical calls usually work is that we post the time that's available for SC&A and NIOSH to convene, but we also would invite any working group member to participate more than likely be a phone teleconference, to listen in and participate.

DR. ROESSLER: So we actually can participate and not just listen in?

MR. NETON: Yes, yes. I think the main idea, though, is it would be SC&A and NIOSH getting down into some real detailed technical discussions, but if the working group had any issues to bring to the table they could certainly participate. And then typically what happens is there wouldn't be a transcription of that discussion made, but there would be a detailed minutes of that discussion and any outcomes that resulted from that meeting.

DR. ROESSLER: I think what you're proposing is you look at the model, which I think of as the equation that Bob presented this morning, you look at certain things of which there's been maybe not the kind of data that we need to satisfy people who question it. So one of them would be the, let me look at this, the exchange rate of air, and the other one I would recommend really looking at and I believe there must be something on it is that release fraction. There has to be better information than zero to one.

MR. NETON: There's not a lot out there, but I'm a firm believer, again, in taking the data that we have for contemporary monitoring and seeing, sort of, a sanity check on the release fraction. I know Bob doesn't necessarily buy that.

DR. ANIGSTEIN: It would take, I mean, I'm referring to what Gen said, this is, again, an idea off the top of my head. This would be a very dandy experiment for some --

DR. ROESSLER: That's what I'm thinking.

DR. ANIGSTEIN: -- in the laboratory. Throw in some powdered --

DR. ROESSLER: Or two academics.

DR. ANIGSTEIN: To throw in some powdered phosphate. It doesn't have to be the size of that, you know, just a small --

DR. ROESSLER: Maybe somebody has done it already.

DR. ANIGSTEIN: I can't imagine why. I just can't imagine why anyone would.

MR. NETON: Well, there are some similar experiments that were done. I mean, I did manage to find a couple of similar experiments about release like this. It wasn't exactly sulfuric acid, though. But we can dig in a little bit more. I mean, I have not spent a tremendous amount of time critically evaluating this model. I think if we spent a little more time and maybe consulted a few experts that I have in mind

that I have not spoken with yet to get some other opinions and then convene with SC&A and throw all those ideas on the table and, you know, let it take us where it takes us. I mean, it may be at the end of the day that there is more uncertainty than we've acknowledged, and then it needs to move a little bit. But I think I'd rather have a technical discussion before we make that decision.

DR. ANIGSTEIN: Yes. I mean, again, if there was, I would say, for instance, the Florida State, William Burnett's group, that something, they had done it in water, so it shouldn't be that hard for them to do it -- but they do it equilibrium. They said they were going to give it six weeks, so we know with equilibrium it's going to come out. The question is, this is not a question of the equilibrium, something that chemists can, you know, know how to do. Kinetics is something much harder.

CHAIR MUNN: An entirely different thing.

DR. ANIGSTEIN: Yes.

CHAIR MUNN: Can we then agree that NIOSH and SC&A will set up --

MR. KATZ: Well, I just wanted to clarify just a question for Brad. I just wanted to understand, I mean, Brad, are you saying that, given that they go through this work with you on the phone, does this have the potential to resolve --

MR. CLAWSON: Yes, it does. There's just a lot of questions.

MR. KATZ: Okay. Just to be clear.

MR. CLAWSON: Maybe I'm looking too simplistic or whatever like that, but there's a lot of things that don't come out in this paper that may address what I've been concerned, so forth like that. That's why it's beneficial for me to be able to listen to these because maybe some of the unanswered questions I have, questions have been

addressed already.

CHAIR MUNN: I found it enormously valuable in the past, even not --

MR. CLAWSON: So have I. I --

CHAIR MUNN: -- not being involved at all, just listening. It's been very helpful to hear the technical discussions that go on leading up to the presentation that we worked with. So --

MR. ELLIOTT: I applaud your dedication and your interest, Brad, and your open-mindedness to enter into this kind of a technical give and take, and I'd hope that from that, you know, we're going to talk about what we think is plausible in that regard on the ranges that we talked about earlier here, and maybe that will help either give you a sense of comfort or bring more questions to light that we need to answer. So I do appreciate your interest to be involved --

MR. CLAWSON: And I hope that I never offend anybody by questioning, and I

guess a lot of times there are a lot of, I mean this is way over my head. It's out there. These guys are in the scientific end, and I'm down in the trenches where it's going on, and I hope I never have offended anybody by that. But I've always gone from the standpoint of I've got to get a grasp on it, and maybe that's a personal flaw or whatever else like that, but I want to be able to make sure that when I put my name on something I really feel good about it and so forth. And when these papers come to us, there's a lot of questions in here, the airflow and so forth, and I would appreciate to be a part of just listening a little more.

MR. RINGER: I have a question.

CHAIR MUNN: Yes?

MR. RINGER: Yes, my name is Harold Ringer again calling from Joliet, Illinois.

CHAIR MUNN: Yes?

MR. RINGER: Do you know what date was the -- are you sure about this date when

all this material was delivered in March of 1951? Do you have any confirmation on that?

CHAIR MUNN: We are sure of the dates that our concerns cover. We are sure, we're working only with the material contract that was negotiated between this employer and what the predecessor of the Department of Energy, that is to say the AEC during that period of time, and during that period of time is the only period in which we have any concern for Blockson Chemical.

MR. RINGER: I mean, do you have any written documentation on that or no?

CHAIR MUNN: We do have documentation with respect to the period that's covered, yes.

MR. RINGER: Okay. But I mean as far as the delivery of the material?

CHAIR MUNN: As far as the delivery of the material?

MR. RINGER: Right.

MR. TOMES: This is Tom Tomes from

NIOSH. We're a little confused, I believe, on what you mean by the delivery of the material. But what we have documentation on is some government documents to sign a contract with Blockson to extract uranium from phosphate rock that was already being processed at the facility. Blockson was already processing this phosphate rock through Building 40, which we've been discussing, and the contract with the government was initiated initially in 1951 and was subject to divert some of that product to Building 55 and extract the uranium from it. So there was not a unique date associated with delivery of product to Blockson before this work.

MR. RINGER: Okay. Now, as far as the ventilation at Building 55, would you say there was like a piece of plastic on top of the roof or what?

CHAIR MUNN: No.

MR. NETON: It was actually Building 40 is the building that we were

talking about, and I think the piece of plastic you heard us talk about was plastic cones that were put over the top of the digester tanks in the 1960s or possibly 70s.

MR. RINGER: Okay.

MR. NETON: And that was to help capture the exhaust or not exhaust but the emissions from the tank.

CHAIR MUNN: And this was a period of time well after the close of the period that we are concerned with here.

MR. RINGER: Okay. Now, is there going to be another future meeting with you people or what?

CHAIR MUNN: I beg your pardon?

MR. RINGER: Is there going to be another meeting come up or not?

CHAIR MUNN: There will be one more meeting of this workgroup. We will not be able to define when that will be until we have the results of the technical discussion that will go on between our contractor and NIOSH

between now and that time.

MR. RINGER: Okay.

CHAIR MUNN: I'm currently hoping that this meeting will occur no later than shortly before the Board's full meeting in December.

MR. RINGER: Okay, very good. Thank you.

CHAIR MUNN: But there's no way, that depends entirely upon the schedule of the principals involved. We can't second guess that right now.

MR. RINGER: Okay. Thank you very much.

CHAIR MUNN: You bet.

MR. JERRY RINGER: Excuse me. Could I have a possible question answered here?

MR. KATZ: I'm sorry. Who is this speaking now?

MR. JERRY RINGER: My name is Jerry Ringer. I'm calling from Phoenix, Arizona.

MR. KATZ: Yes. And you are related to the petitioner?

MR. JERRY RINGER: Yes, I am.

MR. KATZ: Okay. Thank you.

MR. JERRY RINGER: You're welcome. My question is the property that Blockson Chemical Company is on right now, is this property, right now is this occupied or being used at any time now?

CHAIR MUNN: I certainly can't speak to that. It has no bearing on our activities, so I can't speak to it. Tom, do you know?

MR. TOMES: I know it's fenced off, and I can't say definitively. The plant has been closed for, I think in 1991, somewhere in that. Don't quote me on that, but it closed sometime in the 90s.

MR. JERRY RINGER: Right. But I guess what I was referring to is that since all this, the chemicals and everything that was going into the ground and the water issue

out there, I guess I had this question of if this property is not being used there must be a reason for that.

CHAIR MUNN: No. The reason for it could range from anything from financial catastrophe to the fact that some owner died and decided to close it down. But Bob Anigstein is trying to tell us something.

DR. ANIGSTEIN: Two things. One is based on the latest photographs from Google Earth a good portion of the building have been demolished, others are standing. And a good reason why the plant would not be operating is that it made phosphate, high sodium phosphate which went into Tide detergent. Now, as of some decades ago, all detergents no longer use phosphates because of the environmental problem, so that would have certainly put them out of business.

MR. JERRY RINGER: Right. So it was actually the manufacturing of whatever chemicals was there is may be the reason why

this property is empty at this time, if it is?

CHAIR MUNN: The original purpose of the plant had nothing to do with what we are concerned with here, and their business prior to that time and after that time is --

MR. JERRY RINGER: No, I'm not saying that. What I'm concerned with is that with the contamination of uranium and other chemicals that were used at Blockson Chemical Company at that time, has there been any regard to, you know, if that chemical or whatever else is still in that ground?

CHAIR MUNN: We can't address that for you. The only thing I could tell you is that the quantity of uranium that was handled there was extremely small indeed and would be very surprised if it ever constituted any hazard for either the workers or individuals offsite.

DR. ANIGSTEIN: Yes, there was a FUSRAP survey done back in somewhere around 1990, and they did clear the site. Whatever

they found was cleared. I forget whether clean up or whether it was -- but, I mean, the site was declared clean of --

MR. JERRY RINGER: Okay. So it actually had to be cleared, it actually had to be cleaned and cleared?

CHAIR MUNN: It has been.

DR. ANIGSTEIN: It was clear. Whether there was any cleaning involved, I'm not sure.

CHAIR MUNN: We don't know.

DR. ANIGSTEIN: They may have simply found it to be acceptable.

MR. NETON: We need to be careful. I think the FUSRAP people were only looking for evidence of contamination relative to the DOE, AEC activity.

DR. ANIGSTEIN: Right.

MR. NETON: The fact that there may be commercial residue of radioactivity there from processing phosphate ore was not under FUSRAP's purview.

DR. ANIGSTEIN: Okay.

MR. NETON: So there may still be contamination there related to, radioactive contamination due to commercial activities at the site that are unrelated to the AEC activity. Now, our site profile does cover some residual radioactivity through 1996, indicating that at least part of the exposure to the workers after the AEC period is covered because of the AEC activities for 1996. They must have, in 1996, cleared the site for other activity or maybe that's when the buildings were torn down. I'm not sure.

CHAIR MUNN: And if you're interested in that, you can find that document on the web site --

MR. JERRY RINGER: Okay.

CHAIR MUNN: -- for this organization.

MR. JERRY RINGER: Okay.

CHAIR MUNN: All right?

MR. JERRY RINGER: My concern was,

I guess my concern was if there was radiation or -- my phone may die here and I may have to call back. But my concern was if there's still radiation from Blockson Chemical Company in that soil after this many years, my concern would be the amount of it that was there in the 50s and those years that we're interested in.

CHAIR MUNN: I understand.

MR. JERRY RINGER: I mean, if there's still that type of something in the soil or in the ground or possibly getting into the water, underwater streams or whatever that's in there, and it's still there. I mean, if it's still there after this many years, it had to be fairly potent I would think in the early 50s.

CHAIR MUNN: Well, we can't address that for you, but it's not necessarily true. You know, all of your soil is radioactive wherever you live. It's just a matter of degree.

MR. JERRY RINGER: I understand, but I would think that more --

CHAIR MUNN: We just simply can't address it for you because we don't have data, and it's outside our purview. But thank you for your interest.

Now, we're back to the issue of whether it's possible for us to even begin to establish times for you folks to get together, or are you going to have to do that offline?

MR. NETON: I would like to talk about our schedules a little bit. Nothing is certainly going to happen until sometime in November. Early to mid November is about as early as I can envision getting together.

CHAIR MUNN: I wouldn't anticipate anything earlier than that either. I would hope we'd have an opportunity to do something well in advance of the Savannah meeting since it's -- I'm sorry. I'm determined to put that next meeting in Savannah. It is going to be in Augusta. Everyone please disregard my

preference for Savannah. If we can have that call in perhaps at that time, after we've had that call, and --

MR. JERRY RINGER: I'm sorry. I don't mean to interrupt. My phone died, so I switched to another phone here. So I'm not sure what was said after that, but that was my main, I guess one of my main questions.

MR. KATZ: Thank you, Jerry.

CHAIR MUNN: If we can use as our goal, that December Board meeting, for us to have some additional information, something new to bring to the table, it would be most appreciated.

DR. ANIGSTEIN: And where is the Board meeting?

MR. NETON: Augusta.

CHAIR MUNN: Augusta, Georgia.

MR. KATZ: So now that we've established that, Wanda, I think you'll be pressed to get a workgroup meeting in before the Board meeting in Augusta, but maybe you

can have a phone call meeting, but you're running up against --

CHAIR MUNN: I know I am. I know I am.

MR. KATZ: -- a difficult --

CHAIR MUNN: And I learned yesterday that Mark was not going to have a subcommittee meeting on the morning of Tuesday.

MR. KATZ: Correct.

CHAIR MUNN: So there's always a possibility that we might be able to do that. Any workgroup meeting that we had would, by necessity, be very brief, and that may be the only possible time. We may utilize that time if it comes down to that. But in any case, we'll certainly have to have some recommendations to take to the Board, more information.

MR. ELLIOTT: That presumes Mark is not going to have a subcommittee meeting Tuesday morning, but it presumes the Board

meeting won't start Tuesday morning and it very well could.

CHAIR MUNN: Yes.

MR. KATZ: We have a pretty heavy agenda, I think.

CHAIR MUNN: We may not be able to do it, but we'll do the best we can when we find out what your schedule is going to be. Then we'll try to work from there.

MR. CLAWSON: Also, too, Wanda, you know, we have said the data and this OTIB is a new one out that has not been reviewed. If any way possible, if they could, and I believe Dr. Melius is over that one, isn't he? The surrogate data?

CHAIR MUNN: That's what I was talking to him about this morning when he pointed out they're not to that point yet, but he has sent the material out. Everyone has it.

MR. NETON: I know for a fact Dr. Melius is attempting to schedule a meeting of

the surrogate data workgroup before the next Board meeting sometime in November or early December.

MR. CLAWSON: I know what we talked about it at the last Board meeting and so forth like that, and there was a mis-communication there and now it's out.

MR. NETON: And also I think, it's my understanding that SC&A has been tasked with reviewing that document at the last Board meeting.

MR. CLAWSON: That was my understanding, too.

MR. ELLIOTT: IG-004? This is Implementation Guide 004, which addresses how we go about using surrogate data.

CHAIR MUNN: Yes, it's been announced. All right. I will rely upon NIOSH to get back to me with your schedule for the technical conference call.

MR. NETON: Bob, do you want me to work through you, or should I contact John to

schedule this? How do you want us --

DR. ANIGSTEIN: Well, it doesn't matter, but, I mean, I will, you know, John needs to be in the loop, so probably both of us. He's going to want to be on the call.

MR. NETON: Okay. I'll just make sure you --

DR. ANIGSTEIN: Yes.

CHAIR MUNN: I'm fairly sure John will be back by early next week.

MR. NETON: Just one more question. Is it my correct understanding that we have no further issues related to uranium and the uranium bioassay and dose reconstruction of that source term?

CHAIR MUNN: If I heard correctly, I asked that question at the end of each one of the items that we addressed here today, and I got no indication from anyone that there were unresolved issues with any other item other than this one.

MR. KATZ: We actually had an

affirmative statement that this was decided and resolved.

MR. ELLIOTT: You asked specifically do you accept the NIOSH explanation?

CHAIR MUNN: Yes.

MR. ELLIOTT: On that one, as well as the maintenance worker assumptions?

CHAIR MUNN: Yes.

MR. KATZ: As well as the data quality concern.

CHAIR MUNN: Correct.

MR. ELLIOTT: As well as data quality.

CHAIR MUNN: Yes, I asked that for each of them, so this is our only outstanding issue in terms of agreement from the present Board members. That being the case, I will rely on you gentlemen to notify us of when that call is going to take place, and we'll try to plan accordingly. Does anyone else have any issues that they wish to address

before we adjourn? If not, we will adjourn this meeting, and I will see you somewhere in Georgia.

(Whereupon, the foregoing matter was concluded at 2:05 p.m.)