THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

WORKGROUP MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

PART 2

The verbatim transcript of the Meeting of the Advisory Board on Radiation and Worker Health Workgroup held in Cincinnati, Ohio, on Aug. 4, 2005.

C O N T E N T S

Aug. 4, 2005

TRANSCRIPT LEGEND

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In the following transcript: a dash (--) indicates an unintentional or purposeful interruption of a sentence. An ellipsis (. . .) indicates halting speech or an unfinished sentence in dialogue or omission(s) of word(s) when reading written material.

-- (sic) denotes an incorrect usage or pronunciation of a word which is transcribed in its original form as reported.

-- (phonetically) indicates a phonetic spelling of the word if no confirmation of the correct spelling is available.

-- "uh-huh" represents an affirmative response, and "uh-uh" represents a negative response.

-- "*" denotes a spelling based on phonetics, without reference available.

-- (inaudible)/ (unintelligible) signifies speaker failure, usually failure to use a microphone.

In the following transcript (off microphone) refers to microphone malfunction or speaker's neglect to depress "on" button.

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(In Alphabetical Order)

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P R O C E E D I N G S

(Whereupon, the following occurred after the break. See transcript, Part 1.)

MR. GRIFFON: Hans, are you still there with us?

DR. BEHLING: (Off microphone) Yes, I am.

MR. GRIFFON: All right. We --

DR. BEHLING: (Off microphone) (Unintelligible) my question is does everybody have a copy of (unintelligible).

MR. GRIFFON: Yes, we -- we've got your -- we've got the copy now, so --

DR. BEHLING: (Off microphone) Let me (unintelligible) what I believe is a (unintelligible) of what the problem may be, and I'll (unintelligible) confine myself to the (unintelligible) first set of (on microphone) conversions which (off microphone) converts the HP-10 or (unintelligible).

(NOTE: An apparent malfunction of the telephone connection rendered only random words intelligible to the reporter, but were not in a sequence sufficient to provide any context to Dr. Behling's statement.)

MR. GRIFFON: Well, I -- Jim, if you want to respond now, I -- I think, Hans -- this is Mark

Griffon. I feel like this is a task three issue that's going to cut across a lot of sites, and I'm not sure that it really is in -- I mean even if -- even if this values are incorrect, I don't think it limits us from being able to do dose reconstruction. They just have to correct them if -- if that comes out of our task three review. But I don't -- I don't know that it holds up -- I don't want it to sidetrack our Mallinckrodt process.

Jim, if you wanted to respond briefly --

DR. NETON: Well, I'm -- we -- we've seen this comment before in the task three report and we're -- we certainly feel that it's -- it's a significant issue that we need to address. We're not prepared at this meeting to address that because, frankly, this is not one of the issues raised in the site profile review. I do agree this is more of a generic issue that certainly demands attention, but I'm -- I'm frankly just not prepared to address it here at this meeting.

MR. GRIFFON: I think we'll -- we'll save that for our task three review, which I think is going to be sooner rather than later, so --

Arjun has one point. Hold on.

DR. MAKHIJANI: Yeah, Mark and Jim, the -- the reason that John and Hans and I talked about it -- I've -- just going over all the issues and I was trying to get a grip on what all there is to address, is depending on how the Board acts in Mallinckrodt, if the dose reconstructions are going to be done for Mallinckrodt in an expeditious way, then it presumes that this very major issue will be sorted out and if in fact Hans is right that things need to be adjusted and there's another factor of two because of angle and these dose conversion factors need to be changed, then obviously it needs to be addressed reasonably soon and presumably in principle it can be addressed, I don't know. It's -- it came up in that context and that's why -- I don't know, John, if I'm out of turn, but that's why we thought it was appropriate to introduce it here.

DR. MAURO: Yeah, basically it was my call from talking to -- and look -- you know what really triggered it, when we saw the 2.1 adjustment factor to account for the geometry that was part of your TIB, that's when we decided to

talk about well, are there any other adjustment factors in this -- said well, yeah, but -- and -- and we thought, given the expedited nature of this particular process, we needed to alert the Board as early as possible to this issue and -- as opposed to waiting until October when our task three expedited review would start. So I -- I -- I think we've accomplished what we wanted to --

DR. NETON: Right.

DR. MAURO: -- just simply to alert the Board that we think we have an important issue here, two points that Hans made, the orientation and the dose conversion factors. And I think we --

MR. TAULBEE: (By telephone) (Unintelligible)

MR. GRIFFON: Oh, sure.

MR. TAULBEE: (Unintelligible) couple of things (unintelligible) briefly touch on (unintelligible) we did not (unintelligible) dose reconstruction (unintelligible).

DR. BEHLING: And I agree with you, Tim, but (unintelligible).

MR. TAULBEE: (Unintelligible) particular comment and (unintelligible) appropriate (unintelligible).

DR. BEHLING: (Unintelligible)
MR. GRIFFON: I think we're -- I -- I think we need to address this under task three. I do understand the question of, you know, it does roll into feasibility. It's not within these priority issues, though, as laid out.
I would say on -- on John's point, I don't know that it has to wait for this October review. I think this was in the initial task three procedures review, so I think some of these items we'll be able to address and I -- I think this will be on the schedule for the next meeting coming up in St. Louis at the end of the month. So you know, I think it needs to be addressed sooner than later, I agree with that. I don't think it's within the scope of what we're discussing today, so -- any other comments on...
(No responses)
Maybe we can move on to item four?
DR. NETON: (Off microphone) Okay. Item 4 is related to the use of the chronic exposure intake assumptions versus acute intakes that may have -- may have occurred in the course of the workplace. And I put together -- actually

Dave Allen, with my oversight, has put together a -- a workup on this to provide some example cases. We're passing around to the Board -- and there's certainly copies available at the back of the room -- these examples, but they really lend themselves to presentation format. I just provide them for -- for the record, and what -- what we've done is -- and I'll set the stage and then I'll let Dave explain the logic sequence behind what we have here.

But we tried to take a worker who had a fair amount of bioassay data, and that's what you see presented on the screen here and in Table 1 of -- of the handout. Clearly this person had a fairly high amount of uranium excretion over a decade period. This is actually Mallinckrodt data. It's -- I'm wary of using hypothetical data anymore so this is real -- a real worker. And what you see here is a combination of fairly large exposures coupled with some non-detectables, and then some -- you know, much higher exposures by a factor of five or six, these 43 picocurie per day intakes. So this is a mixture of a -- what you might think as a chronic and acute exposure scenario.

I think what we have here is scenario number one, which is if NIOSH were to take and model this person's exposure using a complete chronic exposure sequence. In other words, just assume he was chronically exposed from day one, and you see the fit curve through the -- through the analyses. And that -- that results in a -- an intake of 1.94 time ten to the seventh picocuries of uranium. Now that's ignoring all of those acute intakes that occurred that are above that line -- it doesn't ignore them, it just -- it just does not model them explicitly. And I think what you'll see is as you try -- as you go closer and closer to reality in modeling this person's intake -- I won't -- don't want to give away the story here, but the intakes actually drop as you start getting closer to reality. Maybe Dave won't have to talk. I'm doing pretty good so far.

MR. ALLEN: (Unintelligible)

DR. NETON: He'll be the judge of that. He'll answer any of the questions after I muddle the works here. Oop, I skipped a scenario.

All right, scenario number two is an -- is the same urine data where we've said okay, well,

what if we do model one of these acutes specifically -- or explicitly, and I think this scenario included an intake on January 15th, 1950, which is the mid-point between the highest sample on June 6th and the previous sample, so you'll see that here graphically depicted, the high spike that goes off the scale what the predicted excretion value would be. But we've added -- Dave has added one acute intake into this chronic exposure scenario to model the worker's case. And what you end up seeing here is the intake is 1. -- about 1.8 times ten to the seventh picocuries lower than what you'd expect just using a chronic model.

Okay, chronic intake number three -- or number three was the same -- and by the way, these all assume a chronic intake, and then we're adding in acute intakes on top of that. So intake scenario number three, we have a chronic intake, but we also had an acute intake -- I think it was -- was it on the first day of employment, Dave, or --

MR. ALLEN: (Off microphone) Halfway between the start of employment and the first sample.

DR. NETON: Okay, so halfway, which is the traditional intake analysis. You pick at the midpoint and you -- you model it, and what ends up happening here in scenario three is the dose -- the intake is 1.4 times ten to the seventh picocuries per (unintelligible). Remember the first exposure scenario was 1.9 times ten to the seventh. These are all variants of ten to the seventh, I think.

Scenario number four says okay, well, there -- there are a lot of datapoints above that chronic line. Let's model two acute intakes in here, and you can see that we're starting to connect the dots more and more, and this is really the ultimate game of bioassay analysis intake is to connect the dots and you get the total intake. As you connect these dots even more with two modeled explicit intakes, the intake now projects to 1. -- about 1.3 times ten to the seventh picocuries, so that's scenario number four.

Scenario number five says let's take the chronic intake and I think what happened here is we moved it around to do a little better fit to some of the data. It's a similar situation,

but what you end up with is -- let me see here -- again, 1.4 times ten to the seventh.

What we're trying to show here is it's fairly insensitive to how you model these -- these intakes -- acute intakes in the middle of these scenarios.

Now number six is a little different. We said well, what -- what happens if we just throw these datapoints out? We took the two highest datapoints that are on this graph here in scenario six and said they never even occurred; we didn't even know about them. And then you fit a chronic intake.

The first intake, the pink graph that you see on the screen is -- is the first intake that we got, which is 1.9. You throw those two datapoints out completely, you end up at about 1.4 picocuries per liter, which is very cons-- 1.5 -- not per liter, times ten to the seventh picocuries, which is not that different from the intakes when we started to model those separate acute intakes.

So the whole point of this analysis, and we can look through it, is -- is the -- this is a fairly -- the chronic intake scenario that's

selected is fairly insensitive to all these acute intakes that -- that were modeled.

And I think the last part of this presentation speaks to -- the total intake that you want to project from a bioassay analysis is really related to the area under the curve. In other words, if you collected all -- connected all the dots of a person's excretion pattern, you would end up with a unit of picocurie per liter days, that's the -- an integration of the entire person's urinary excretion. That's not exactly what their intake was, but their -- their dose is directly related to how much uranium they excreted. So the more you connect the dots, the more accurate picture you get of that person's intake.

When you start using and applying these chronics that overestimate a lot of points, you end up over-predicting the intake using the chronic model -- as in this demonstration -- rather than connecting all the individual dots, and that's really the point of this Table 2. It shows as the goodness of fit gets better to the individual points, the intake goes down -- the projected intake goes down. And that's

because these chronic, over-arching values, these little -- the blips of acutes above the chronic intakes are not so significant that they -- they make up massive amounts of extra dose or -- or intake.

I think that's it in a nutshell, Dave. If there's anything else you want to say here that -- that I've missed, then please do.

MR. ALLEN: No, you did a good job, Jim.

DR. NETON: Thank you.

MR. ALLEN: I just wanted -- I think Jim pointed it out. I just wanted to basically reiterate, it's that from all the modeling we've done so far in this program it just always seems like the -- the chronic is where the big bang for the buck is, so to speak. It just takes a small change in the chronic intake rate and you're essentially multiplying it by thousands of days 'cause we're modeling careers. So even a small change in the chronic intake rate can make a large difference in the dose. Any time you add an acute intake or an assumption to modeling the urinalysis, that chronic intake rate drops. And even a small drop can make a huge difference in the total

dose that this person's getting.

DR. NETON: Right. In other words, there's competing interests going on here. As you add acute intakes, the assumed chronic model has to drop to accommodate the residual excretion from the acute intake and therefore you're subtracting from your long-term total intake by -- by explicitly adding these chronics. So it's been our experience, and Dave summarized it well, that the -- it really is -- at the end of the day, the chronic models are -- and I think most dosimetrists that you'll talk to that do this on a day-to-day basis would agree with that.

DR. MAURO: Jim, I have a question, and this is -- when we're in a situation like this I'd like to sort -- I take my hat off and say -- and just step away from our roles and ask ourselves a question. This is certainly a very compelling argument. There's no doubt about it, the example you have here. And I like to ask the question that says well, are there certain circumstances where we could be surprised. In other words, certainly in this example, bulletproof.

But as -- let's say a person's sort of exploring the idea of (unintelligible) IMBA and dealing with the real world of people who get exposed to different radionuclides and using the bioassay data, are there circumstances that you -- you -- you folks as experts and they say well, you know, there are certain circumstances where spikes could really result in a surprise and we'd better watch out -- 'cause I don't know of any, but I was wondering if you folks have any thoughts on that.

DR. NETON: You know, certainly, you can always be surprised. I mean Dave -- Dave might be able -- he's done a lot more cases than I have, but you can be surprised. I think, you know, we need to look at the totality of the picture here. I mean we're talking about a case file, a worker with bioassay. We -- we've done some interviews. Could there have been an intake of -- an acute intake of sufficient magnitude to completely rock this whole premise and -- and make it errant -- I've tried to do that. I tried to think -- and this is -- I got together with Dave. I tried coming up with my own scenarios. One could come up with these in

scenarios, but they're extremely implausible. You end up having -- let's say, for instance, we were just showing ten to the seventh, ten to the sixth picocurie per year intakes from a chronic model. That's microcuries per year intakes, huge. For one then to speculate that there may have been a -- an -- a couple acute exposure scenarios that would completely negate that analysis is pretty hard to project. You know, you would -- for uranium, for example, you would have to get into hundreds of MAC air for a very extended period of time, which at some point I'd argue would become chronic. But to have like a one-hour -- what -- what you hear anecdotally from workers a lot is there was an incident that -- and I left the area. Well, there you're talking about a one, maybe two, three-hour exposure. It would have had to have been -- in relation to this ten to the fifth, ten to the sixth, ten to the seventh picocurie intake -- somewhere close to that to even make it -- a huge difference, and we've already demonstrated that even that in itself would bring the chronic model down. So I -- I think it's hard -- it's hard to come up with,

but never say never. I mean I'm sure one could -- could finagle some calculation that would -- would maybe show this is not perfect, but I -- I think it's -- it's reasonable. I think that's as far as I can go.

DR. MAURO: Thank you.

DR. LIPSZTEIN: (Unintelligible) I didn't hear everything.

DR. NETON: Uh-huh.

DR. LIPSZTEIN: (Unintelligible)

MR. ALLEN: What we're saying is if you assume there was no acute intake and you model the urinalysis as if it was a chronic, then that chronic ends up being increased because of the -- any samples that were taken after that acute in that chronic modeling ends up giving you more total dose than if you realized you had an acute intake and you modeled that in there with it -- in general. There --

DR. LIPSZTEIN: (Unintelligible) modeling the results (unintelligible) intake (unintelligible)?

MR. ALLEN: We're modeling the samples as if it was a constant chronic.

DR. LIPSZTEIN: (Unintelligible) lower

(unintelligible) and after (unintelligible)?

MR. ALLEN: Well, the example on the -- on the -- I know you can't see it, Joyce, but the example here is basically the individual's urinalysis for his whole career, and we simply threw a chronic intake over his entire career. Some of those spikes are -- are most definitely a chronic -- or I'm sorry, an acute type of intake but we just modeled it as a chronic. Then we started to get a little more exact on this individual and modeled some of these acutes along with an underlying chronic for his career, and as we modeled these acutes the chronic drops because the chronic was driven by all the samples. And now when you throw some acutes in there, the chronic is driven by the -- the lower samples. So with the chronic dropping and multiplying that by an entire career, in this case over 4,000 days, you end up subtracting quite a bit just by adding in the acutes. It's kind of counter-intuitive. And in general what we've seen before is the more exact you get in your fitting, the closer you get to connecting the dots, the -- the lower it's going to get compared to just

modeling the entire career as a chronic. It's something that's easier to show than to demonstrate empirically.

DR. LIPSZTEIN: (Unintelligible) you have to (unintelligible).

DR. NETON: Sorry, I missed your last sentence there, Joyce.

DR. LIPSZTEIN: (Unintelligible) I'm saying that (unintelligible).

DR. NETON: Yeah, and that's what we're saying.

DR. LIPSZTEIN: (Unintelligible) not sure (unintelligible).

DR. NETON: Okay. Okay. Boy, does that mean we're down to number five?

MR. GRIFFON: I think we're down to number five, yeah.

DR. NETON: Wow.

UNIDENTIFIED: (Unintelligible)

DR. NETON: That was -- oh, four, is there another part of four? No, that was done, four. Okay, number five, (unintelligible) of dose for unmonitored workers. Okay, this -- this is related to the site profile evaluation that -- that SC&A did where there was some data that indicated there were environmental releases of

at least uranium out the stack. And we -- we went back and did locate the -- the report, it's a couple of pages of data that were not air sample data but were stack emissions, I believe. And, you know, like most facilities -- especially uranium facilities -- there are stack emissions and so then the question is do we assign nothing to people who were not monitored, or what do we assign them.

And we've looked at that and in discussing this among ourselves, we believe that it's going to be unlikely that we can assign zero dose to anybody. I mean many people walked through the plants. They -- they frequented areas, the controls were not as good, so -- I'm stretching here because I forgot exactly what our position was. I think that we're -- it's -- it's in the document that we provided, but I believe that we're going to provide the distribution of -- of exposures for the workers to the unmonitored workers. Is that right, Cindy? Is that what we came to that con-- that would be our -- the distribution itself, because we just don't --

MR. GRIFFON: Instead of the 95th. Right?

DR. NETON: Instead of the 95th. We just don't

know. We just really don't know in a particular -- a person could be recorded as a secretary one day, but then have an unmonitored period somewhere else and you wouldn't -- an unrecorded -- you wouldn't be able to definitively at least defend what we've done, so we're proposing the best we're going to be able to do, we believe, here is to assign the distribution for the doses for the facility.

MR. GRIFFON: Did -- did you -- did you in any way consider that proposal against some of the environmental data that Arjun was discussing and whether the --

DR. NETON: Right.

MR. GRIFFON: -- you can defend the fact that it --

DR. NETON: Well --

MR. GRIFFON: -- be a claimant-favorable approach compar--

DR. NETON: Well --

MR. GRIFFON: -- comparatively? I -- I -- it seems like if --

DR. NETON: You know, we haven't done that definitively, Mark. I think you raise a good point. We probably need to do that, although

we have stack emission data and it's hard for us to imagine that the stack releases would result in higher doses walking about the site than some of these process air -- you know, data -- intakes that we're projecting based on working with the raw material itself. But we -- you're right --

MR. GRIFFON: (Off microphone) (Unintelligible) Arjun (unintelligible).

DR. MAKHIJANI: I -- again, I did a little back-of-the-envelope check because the Mallinckrodt situation was a little bit different than many facilities or the normal stack dispersion modeling that you would do because you've got lots and lots of buildings, and pe-- the workers would be -- when they're outside and therefore susceptible to getting some dose from the stack releases. They'd -- they'd be near buildings and so you wouldn't be able to do dispersion modeling. At the institute where I work, Institute of (unintelligible) Energy and Environmental Research, we had -- in the context of a study we did for assessing doses near a building, we had actually the thing modeled with the wind --

wind tunnel tests that were done with the building modeled and the stacks and -- and cons-- and dispersion factors calculated very nearby for accidents. So if you have an accidental release that -- you could get pretty high doses because the dispersion factors are very large. Our -- the largest wind tunnel calculated dispersion factor near a production building -- of course different geometries, you had more buildings and, you know -- was 3.9 time ten to the minus three seconds per cubic meter. And if you assume even a small release of K-65 type material, you have -- I think you could get pretty significant doses.

DR. NETON: Right, I guess and that sort of confirms our -- you know, our wariness of trying to model these stack emissions and -- and using those to -- to come up with -- with doses, so I think -- you're right, there could be high instantaneous concentrations on-site, but I think if we apply a chronic exposure model for -- for the year to these people and use the distribution for the workers -- I'm -- I'm having trouble thinking why that would not be claimant-favorable.

MR. ALLEN: I think the examples that Joe Guido went over earlier demonstrate that the coworker data is also pretty high and --

DR. NETON: Right.

MR. ALLEN: -- I mean when you're talking stack emissions you're talking about the ventilation system removing air from these people were working, so by definition, essentially the coworker data should be higher than what you would get outside the building from the environmental --

DR. NETON: Well, maybe not.

MR. ALLEN: -- but it's -- almost by definition, especially when you talk about over the -- the entire year versus a -- you know, a short, episodic event.

DR. MAKHIJANI: Yeah, I think on the basis of an annual average and annual average dispersion factors, I wouldn't -- in a normal situation with continuous releases, I think that you would be right. However, we do know that there are episodic -- I mean even in November, 1984 there was a release of 200 kilograms from Fernald, and that's what started the whole argument about, you know, Fernald and its

neighbors found out about -- and so on. So releases of hundreds of kilograms from Mallinckrodt type of facility in -- as an episodic release is certainly possible. And releases of tens of kilograms are certainly possible when you've got a total source term of 14,000, 15,000 kilograms that's partial because not all the plants were taken into account in the one sheet that I found. So I -- I'm happy to kind of share some of the numbers after my colleagues have had a chance to look at them because I kind of, you know, just did a back-of-the-envelope calculation preparing for this. But I -- I think -- what goes up the stack and what's in the workplace are not correlated because --

MR. ALLEN: I would agree with you --

DR. MAKHIJANI: -- in fact they may be anti-correlated.

MR. ALLEN: I would agree with you it's possible to get a higher intake rate outside the building from some sort of event like that. But you have to miti-- I mean you're example's a good example, the 1984 Fernald was actually a dust collector that released all this up the

stack, a dust collector problem. But you've got to remember, everything that got into that dust collector came from the work area where workers were working. It might have taken months for it to get there and then released in one shot, but it was -- it came from there. So the urinalysis from the people working in Plant -- Plant 9, I believe it was for 1984 -- for that year or so ahead of time, you know, for the few months to that event, should be sampling the same kind of air, just over a period of time versus an episodic event.

DR. MAKHIJANI: Actually that's exactly what I don't agree with because when you have a well-ventilated workplace, what winds up in the dust bags is what's not in the work area. Because if you don't have a well-ventilated workplace then the workers are breathing it and then it settles on the plant floor. And of course that was a problem at Fernald. It was all caked up and everything. But -- but what com-- what goes in the dust collectors and the stacks -- so you could have dust collectors that are very dirty and have a relatively clean workplace, provided you've got good ventilation. And the

two things are not necessarily related.

MR. ALLEN: But I think from the -- the worker interviews you talked to, I don't think there was any hint that there was good ventilation at Mallinckrodt, that they collected -- collected all the dust very well.

DR. NETON: Can't -- can't have it both ways. But I think -- what I'm hearing you, Arjun -- I'm having trouble grasping this -- is that you seem to be contending that the 50th percentile, the average worker assigned intakes, would not sufficiently bound an unmonitored worker who was an administrative -- in administrative area on a full-time basis. Is that what you're suggesting?

DR. MAKHIJANI: Well, since we're talking about Missouri, this is a Show-Me State issue. Right? So I'm not suggesting that -- that this is the case. I'm saying if -- it's not a priori given that what -- I think that -- that -- that it's important to run some numbers, and I -- I did some numbers and I was surprised, and I'm not ready to share them because maybe I was wrongly surprised. Right? So I mean it's important to put those numbers on the record,

and I just -- and I -- so maybe I'm not quite right, but I do think that -- that assuming that coworker data inside the plant covers an outside accident exposure where you've got lots of radium, thorium, so on -- I'm not sure. You may well be right and I'm -- I'm not saying that -- I think some little bit of work needs to be done here, and I don't know exactly --

MR. GRIFFON: I think -- I think that this can be an off-line discussion --

DR. NETON: Yeah.

MR. GRIFFON: -- but I think that we -- I mean the issue of the environmental samples came up in our prior discussions, so I think you should address it head-on and -- and make the case --

DR. NETON: Right.

MR. GRIFFON: -- for why this is more -- I tend to agree with you.

DR. NETON: Right.

MR. GRIFFON: I know Arjun has some questions.

DR. NETON: Right.

MR. GRIFFON: But I think -- maybe not quantitatively but at least qualitatively make a -- make the case.

DR. NETON: We -- we can do that.

MR. GRIFFON: Direct-- directly, instead of saying, you know --

MS. BLOOM: Well, I think the case is made from the environmental numbers at the DOE sites where we do have monitoring and we do have some DOE sites where we had information in the early years, and you don't have anywhere near the intake rates that you're assuming for workers inside buildings as you do outside buildings.

DR. NETON: Well, and I also think that Janet Westbrook indicated in our last call there -- there are a few, albeit small, number of environmental samples taken in areas where security guards may have been stationed and what-not, and we can look at those.

MS. BLOOM: (Off microphone) We call them outdoor (unintelligible) samples.

DR. NETON: Now that would -- those are going to be small and -- and maybe only cover a few day periods, but it would certainly indicate that constant emissions were not well above that of the average plant that we're assigning. I mean we're talking intakes of hundreds of picocuries per day by workers in the plants, and it would be difficult for me to imagine

those values to get higher than that outside the plant on a -- on a constant basis. But -- but you're absolutely right. I mean, you know, Arjun's a show-me type guy today and I think we need to -- we need to do our homework and demonstrate that.

MR. GRIFFON: And -- and -- yeah, and I would also -- I mean I think to the extent you can use Mallinckrodt-specific data, it would -- it would be better, right, 'cause we've gone down that path before, too, but...

UNIDENTIFIED: (Off microphone) (Unintelligible)

MR. GRIFFON: Yeah. Okay, is there anything else on number five?

DR. NETON: I think there are a couple other -- additional points here. The issue was raised about the SLAPS workers and -- and we've investigated that to some extent, and I think I covered this briefly on our last call. The SLAPS workers were not permanently assigned there, so we would -- we propose to use the plant data for SLAPS workers, although we do -- are doing some -- some (unintelligible) last-minute refinements on that. Cindy has some

data on some SLAPS -- air concentration data?
MS. BLOOM: That's only the radon, we have --
DR. NETON: The radon issue.
MS. BLOOM: -- no air concentrations, though.
DR. NETON: But again, we believe that the SLAPS, being a storage facility and the material was already drummed -- at least for the radium material, the K-65 material -- it appears to us, and we'll do a better job documenting this -- that these SLAPS workers spent a bulk of their time at the plant. This was not a full-time, assigned position. They -- they moved over there, took care of some -- whatever activities they needed to, as far as drumming and -- and maintenance --
MS. BLOOM: They were actually restricted from being there more than a couple hours a week. Certainly by -- I can't remember the exact date when that happened, it was around '49 and '50, where they were --
DR. NETON: Right, so --
MS. BLOOM: -- '48 to '50 where they were changing the requirements, so...
DR. NETON: We -- we will have a little better detail on the SLAPS workers 'cause they don't

necessarily fit into this unmonitored, secretarial/maintenance type -- type workers.

MS. BLOOM: For the -- for the intakes, those workers are monitored. I mean we -- you have monitoring data. They -- they're included in that population of coworkers.

DR. NETON: That is true.

MR. GRIFFON: All right. Anything else on number five?

(No responses)

You want to do another presentation of the cases? No, I was just kidding.

DR. NETON: I'm ready if you are.

MR. GRIFFON: How about some new cases? No... Okay, I was just going to try to summarize a couple of things that -- that are going to happen in the next week or so as far as follow-up items, and here what I had and maybe we can just flesh out the final -- I think there's only actually a few issues that we really need to -- to hone in on.

One was the issue that we just discussed, the environ-- you know, the justification for the -- for not using the environmental data for those that were outside the plant.

The second one that I had is an outline of the approach -- or I guess a -- the argument that the radon breath data will actually bound the radon exposures, as well. It'll be a bounding factor, the argument that Dave made earlier. The third item, which I think is the most critical item -- in my eyes, anyway -- is the -- the thorium question as Jim has been describing it and the -- the approach that you're going to use to bound I guess the thorium, actinium and protactinium, but -- and whether those -- whether those ratios --

DR. NETON: Right.

MR. GRIFFON: -- have to be adjusted or how -- yeah, so...

And I don't know, I might have missed -- are there other issues on the table?

DR. WADE: You might put one -- and this goes back to Denise's issue as to the policy question as to an SEC process versus a site profile process. That's an issue that really NIOSH has to take up, and then the Board will have to take up, but I think that's a major issue for us to address leaving this meeting.

MR. GRIFFON: I agree, yeah, yeah.

MS. BROCK: (Off microphone) (Unintelligible)
DR. WADE: We'll discuss it leading up to the August meeting and then at the August meeting NIOSH will have to either present the supplement to the SEC report or not, and then the Board will have to deliberate based upon what NIOSH presents, as well as this working group reporting now. So I think that's the process we'll follow.
MR. GRIFFON: All right. Arjun.
DR. MAKHIJANI: Mark, was there anything to be done on the missing radon breath data?
MR. GRIFFON: Oh, I did -- yes, thank you. I -- I would like -- and I don't know if this is possible, but I still have that issue of the 25 to 30 percent either not analyzed or lost datapoints. And it -- it goes to the reliability of the breath radon data and -- and I don't know if there's any documentation in the HASL literature that might give us a good reason why -- why those samples were, you know, quote/unquote, lost or -- and I -- and I agree, it might be a lost in processing kind of thing.
DR. NETON: Yeah, we'll certainly look -- look into that. I think -- now you're saying that

these were indicated as missing or lost on the HASL analysis sheets?

MR. GRIFFON: Uh-huh, yes.

DR. NETON: Okay. There's a few things we could -- I could think of to try to do to give you some comfort. I think, you know, looking at possibly the -- if we -- if we could find the job categories of the workers and -- which were lost and to -- to get a feel that those are no different than the ones where we have samples for -- you know, that kind of thing --

MR. GRIFFON: Right, right, right.

DR. NETON: -- that there was no selective --

MR. GRIFFON: That's --

DR. NETON: -- censoring of the information, that sort of thing (unintelligible) --

MR. GRIFFON: And I should say I did a preliminary look at this and it -- there don't -- there don't appear to be any trends --

DR. NETON: Right.

MR. GRIFFON: -- but that might be something to look at, are --

DR. NETON: I think that's what we would look at --

MR. GRIFFON: -- are there trends by job titles

(unintelligible) --

DR. NETON: -- 'cause really --

MR. GRIFFON: -- something like that --

DR. NETON: -- really then what we have is more of a truncated dataset, not many as numbers, but -- but what we have are -- we would -- we could demonstrate possibly that they are not that different than the distribution of the ones that were missing, you know.

MR. GRIFFON: Right.

DR. NETON: But let's say if we came up with some -- some job category that was just selectively gone, we may -- it may cause --

MR. GRIFFON: Exactly, or --

DR. NETON: -- cause reason for concern.

MR. GRIFFON: Right. And I didn't see that, but I -- yeah, I would ask for a little follow-up on that.

DR. NETON: We'll do a follow-up on that.

MR. GRIFFON: Okay. I think -- anybody have anything else that I missed that we --

DR. NETON: No, that's enough.

MR. GRIFFON: -- we agreed to do? Denise has something else.

MS. BROCK: I just wanted to maybe ask a couple

of questions, if I could, and perhaps read something from the document that NIOSH had came up with, I think it was like the '75 -- yes -- notes and summary, a visit by Mont Mason -- or I mean Mason, August, 1975. And I don't know if this actually is relevant, but I -- I found it interesting. It was page 13 and it says number two, I quote, (reading) Exposure to radon in the work space air. There are fragmentary measurements of air radon beginning about 1946 and continuing through about 1955. I view them as having little if any use as a measure of the magnitude of individual exposure. These data can be used to show that certain jobs or job categories did entail possible exposure to radon within a (unintelligible) range. Any interpretation beyond that would be erroneous, in my opinion. I've done nothing to date to organize air radon date for the purpose of entering it into the exposure history as a job stress. Note, these have been taped for future reference. In general the air concentrations did not exceed the range of 0.1 to 0.1 times ten to minus ten Curies per liter of air. Although a few spots

were chronically in the 1.0 to 10.0 range from 1946 to 1949, occasionally single samples exceeded 100 times ten minus ten Curie per liter.

I really don't know what that means, I just thought it was interesting and I don't know if that has to do with the surrounding air -- I'm assuming that's what that means. Oh, I'm learning, that's great.

And the other thing I wanted to ask is in reference to the cases that have already been dosed and denied because, if I understand correctly, the methodology of dose reconstruction, if I'm understanding correctly, has changed now, I would assume that the dose reconstructions that have been denied will now be pulled back in for redose. Is that correct?

DR. NETON: If these approaches are adopted, that is true. Dave Allen has some words of wisdom.

MR. ALLEN: Before you commit to something there.

DR. NETON: Okay.

MR. ALLEN: We've said all along that the TBDs are living documents and there's been minor

changes to other TBDs, and our standard approach has been to write a -- an evaluation report. Essentially we're committed to evaluate, which I think is what you want, the previously done ones. But we're not necessarily committed to opening it back up. The last thing we want to do is to take somebody who's been denied, tell them we're going to redo their dose reconstruction, then deny them again. So --

MS. BROCK: Absolutely. I just want to make sure that the opportunity is there for that to be -- if this is adopted, that that -- that that would possibly be looked at again. I mean --

DR. NETON: That's --

MS. BROCK: -- I never --

MR. ALLEN: Again --

MS. BROCK: -- want to give anybody false hope, but if there's been a mistake and -- not even a mistake, but if there's another methodology that would allow them to come at a higher POC, absolutely I would like for that --

DR. NETON: Right.

MS. BROCK: -- to --

MR. ALLEN: Yeah, and it very --
MS. BROCK: -- to happen.
MR. ALLEN: Our standard approach is to re-evaluate when there's a change, but not necessarily to open it up or even tell the claimant about it.
MS. BROCK: Oh, okay.
MR. ALLEN: Like you say, we don't --
MS. BROCK: Right.
MR. ALLEN: -- want to do the false hope thing.
MS. BROCK: Okay. And another thing I'd like to ask, I have -- and I think we've maybe discussed this before. I have obviously certain claimants -- workers, that are in very poor condition and I would hope that possibly those could be expedited, as well. I'm assuming that NIOSH is moving quite expeditiously on a lot of these, so I'm hoping that maybe if -- if you know or somebody from ORAU would know that maybe somebody's not doing real well, that they would be gracious enough to maybe, if they could, push those ahead.
DR. NETON: Well, our standard approach here is to do dose reconstructions for the oldest claims in our possession first. I mean those

are -- it's a first in, first out type of approach. Right now we're working on the backlog of the first 5,000 cases, so any lower numbered cases would be given priority at this time. That's -- that's our approach.

MS. BROCK: Okay. And I -- I know I had one more. For some reason, I wrote a note and I -- I can't find it.

MR. GRIFFON: I think the -- to speak to your first question, I think Dave's analysis might address some of that concern over the radon data because it sounds like you're not (unintelligible) -- you may not end up assigning radon doses. Right?

DR. NETON: Right, but I think what -- what Mont -- the Mont Mason reference that Denise was referring -- to which she was referring is really the radon in air concentration data.

MR. GRIFFON: Right, that's --

DR. NETON: Oh, I see what you're saying is the radon breath would bound -- possibly bound those exposures. I think what Mont Mason was talking there is the ability to give individually-assigned radon doses would be unlikely, and it's -- that's -- that's why you

see us adopting the 95th percentile approach. And in his little statement there he even acknowledges that we -- one can put maximum values on these things, but you'll -- it is very difficult to go and assign Worker A X radon exposure, but we do know what the distribution was and we would assign the upper end of it, lacking any specific information.

MR. GRIFFON: (Off microphone) But it may all be moot (unintelligible).

DR. NETON: And Dave's technique may actually end up --

MR. ALLEN: (Off microphone) For systemic (unintelligible) --

DR. NETON: For systemic organs. In fact, as we've indicated previously, the lung cancer cases that we've analyzed --

MR. GRIFFON: Right, that's --

DR. NETON: -- to date have been over 50 percent by Department of Labor, so adding additional radon doses is not really critical.

MS. BROCK: And I have one more statement to -- oh, I'm sorry, Arjun. One more statement about the unmonitored workers. I just know from my experience with some of the workers that I

speak with, or maybe even some of the spouses of these workers, that sometimes the job title does not always match the job description. For example, I had a gentleman that was called a -- an -- like an office boy or mail clerk, and part of his job description or part of what he did was to actually take open containers -- now I don't know if that was liquid or sol-- I don't have any idea, but he would transport this waste back and forth from downtown to maybe -- I think SLAPS and just back and forth. I don't know that this person was monitored. The case has been denied. The gentleman had a glioblastoma. I haven't got a chance to look completely at the dose reconstruction myself. I don't know if his actual records were used, if they were -- if there were actual dose records or if that was coworker data. But as you read through that -- and again, it puts a spouse at a disadvantage, too, because they're just not really sure what all that job entailed.

Another thing that I would like to talk about is a particular claimant that has recently been denied. She was a secretary, had a double

masectomy (sic), worked downtown St. Louis and also at Weldon Spring and she actually was within the plant. Now I don't know which plant it was, whether it was Destrehan or Weldon Spring, but she was actually in the plant area. Through the phone interview there was discussion about of course the dust being all over the paperwork and the desk and the floor, stockings coming off her legs -- which I'm assuming maybe have been acid -- but I'm wondering if in fact that's all taken into consideration. And I wonder if someone like that, if they're within that facility and there's -- in the dose reconstruction report it actually states that she had exposure to thorium and radon, and even though that case has been denied, I -- I wonder if that would possibly change the numbers on that.

DR. NETON: That's difficult to tell. I mean we can't envision, you know, what the -- what the do-- without looking at the dose reconstruction there's no way that we could really make a judgment --

MS. BROCK: Got it right here. You want to see it?

DR. NETON: Not -- not during this meeting, but maybe after this meeting we can sit down --

MS. BROCK: Okay.

DR. NETON: -- and look at it.

MR. GRIFFON: Okay. All right, Arjun.

DR. MAKHIJANI: Just a brief follow-up on what Denise just said -- or a little bit earlier. There are a few measurements of like ten to the minus eight picocuries per liter. Are they -- are they in your distribution, all of -- and how do you deal with that and to -- ten to the minus eight seems -- it jogged my memory 'cause I'd seen those numbers and I'd forgotten about them.

MS. BLOOM: We do --

DR. MAKHIJANI: That's a pretty huge radon concentration.

MS. BLOOM: It is a huge radon concentration. Those were usually measured either at SLAPS or in the scale house or in the ore house. Some of it's associated with opening drums. There was also a drying oven, I think -- a drying furnace, I believe, that sometimes had high values. For Mallinckrodt they don't actually have -- I didn't see very man-- I think one --

one boxcar measurement, but I know from looking at other sites that those can be very high, the radon concentrations can be very high in the boxcars when they're first opened up.

DR. MAURO: Along those lines, one of the interesting things I've run across with I work with these statistics, sometimes the average actually is higher than the 95th percentile when you're -- I've seen distri--

UNIDENTIFIED: (Off microphone) (Unintelligible)

DR. MAURO: Yeah, when -- no, and the only reason it's triggered is because -- see, we're talking about numbers on the order of 100 picocuries per liter, maybe 1,000. Now ten to the minus eighth is 100,000 or -- 10,000 picocuries per liter. Right? So where -- what we're talking about is --

MS. BLOOM: (Off microphone) 1,000 (unintelligible).

DR. MAURO: Well, it's ten to the minus 12?

MS. BLOOM: (Unintelligible) Oh, no, I'm sorry, ten to the minus eight --

DR. MAURO: 10,000.

MS. BLOOM: I'm sorry, I haven't seen them that

high. I've seen 2,000.

DR. MAURO: 'Cause I've seen ten to the minus eight in one of --

MS. BLOOM: Yeah.

DR. MAURO: -- your reports. Now it might have been just one reading. I just rai-- triggered because I've seen the situation arise. When you have a distribution and you have a couple of really big outliers, even individual values, that -- what that does is it drives the average all the way off the scale, and it's higher than your 95th percentile.

DR. NETON: Right.

DR. MAURO: I'm not quite sure, what do you do with that?

DR. NETON: Well, and one needs to look at those huge, huge values and determine whether they're relevant for -- for continuous exposure scenarios or not. I mean that -- that's -- I think we have to apply some reasonableness here to those values. And if they are, if there was positions like that, then you're right, but the likelihood of anyone being in a furnace -- drying over for 2,000 hours -- who knows.

DR. MAKHIJANI: Yeah, but this -- this is the

kind -- you know, rail cars, opening drums, there would be episodic exposures, but frequent for the people who were doing that job, presumably. I mean I don't know, because if they were that high, then -- and radon breath is only being taken once every six or eight months -- sorry -- then -- then this whole systemic radon thing -- you wouldn't catch that.

MS. BLOOM: They -- there -- I misspoke, I -- I did the math wrong in my head. The highest results I've seen are 2,000 picocuries per liter, and that's looking at 1949 forward, which is the period we're talking about. The other part is that if you're having radon concentrations that high, the gamma exposure rates are huge, and so these workers were restricted from being in those areas for any length of time because they were concerned about going over tolerance levels. So there -- they were -- the occupancy factors need to play into that, as well.

DR. NETON: And we also need to look -- you just jogged my memory, this ten to the minus eight may be pre-1949 data. I don't know.

MR. GRIFFON: (Off microphone) Denise, you have (unintelligible)?

MS. BROCK: Yes, I do. As far as the workers being restricted, that may have been what should have happened, but when I talk to the workers, that's not exactly what happened. There were many times when these workers were basically put in these positions and had to finish what they were doing, no matter how long it took. And by the own admission of the AEC or the AE standards, I think sometimes we're talking about 15 rem to the lung, and that's different than the radon exposure, but they were actually letting these people get way beyond that, way beyond that before they'd ever even pull them out, but some of them were 600 to 1,000 rem to the lung. So I don't necessarily believe that, just because they should have been restricted, they necessarily were.

MS. BLOOM: And I certainly agree with that, but I think we're looking at the -- the total program to see what was going on there, and we are looking at external doses, as well. And I think for the most part, if they -- and I've

read a lot of correspondence for Mallinckrodt on that that indicates that, you know, they might have worked -- if they were only supposed to work two hours, maybe they did work four hours to finish the job. But on the other hand, when we're going to apply this data, we're going to do that in a -- you know, in a claimant-favorable way.

MS. BROCK: (Off microphone) (Unintelligible)

MR. GRIFFON: Go ahead, that's --

MS. BROCK: I promise this is my last one. I want to know if -- because this -- and this is a policy question. If in fact, due to all of the -- the new things that have arisen, will the Board and NIOSH be able to come -- come to a conclusion whether or not this set of workers in this second part of this SEC will be able to be dose reconstructed? Will you know that by the next Board meeting, or does this -- is this going to require additional research? I mean -- and as far as the policy question, I know Dr. Wade said that it will be discussed whether or not this can even be adopted. Will I be informed prior to the meeting as far as the issue of whether it's adopted, and then by the

next Board meeting I guess I'm asking if in fact there will be a decision made.

DR. WADE: Well, you asked the hard questions. Certainly you'll be informed if NIOSH is going to submit a supplement to the SEC evaluation report. You would be informed of that. And as a courtesy, if we're not, we will call and tell you that. God knows, Denise, if this issue will be resolved at the next meeting. I think it is all of our hope, and I think everyone in this room is working as hard as they can to bring this to closure. I don't think there's a member of the Board that doesn't feel the pain of the claimants as this process goes on and they're weighing that pain against the desire to do a complete job.

I think it is all of our expectation -- hope -- that this issue will be resolved. Again, none of us can say that for sure until it's actually done and sent on.

MS. BROCK: I would just like to tell everybody thank you again for including me and thank you for all of your hard work. I know it's -- it's -- it is very hard for everybody involved and I appreciate it.

DR. WADE: Thank you.

MR. GRIFFON: And we've got two weeks. No... Arjun?

DR. MAKHIJANI: That's what I was going to say, we've got -- I've got what, today's August 4th. I've got 12 days. Right? So really I've got ten because two days before I have to send it to Nancy and -- and three days before I have to send it to John, so I've got nine days. And -- and so these four issues that we've got --

MR. GRIFFON: Right.

DR. MAKHIJANI: -- I think obviously have to have a much closer -- I mean just for my own sanity, I'd like -- I'd like some -- some idea of, you know, by when we're going to have some cutoff date that I can start writing about that it won't require -- I don't know what the process is of coming to closure on those four points, and whether there are going to be any dates or -- because for me to really do justice to sending you a report --

MR. GRIFFON: Right.

DR. MAKHIJANI: -- by the 16th, I -- I've got to have the information much earlier.

DR. WADE: And let's talk through that.

MR. GRIFFON: Yeah.

DR. WADE: I mean that -- I want us to talk a little bit about that, so let me paint a broad picture, Arjun, of this and then we can maybe start to get more specific on some of the issues that remain.

I think that what's going to happen starting now is that you can expect to see from NIOSH certain augmentation or documentation on selected issues. We'll go back and talk about what those are and maybe we can talk about dates.

Then you're going to see a process of dialogue between SC&A and NIOSH. And this working group has asked that we encourage a free discussion between the two parties. We'll try and let the working group know of those discussions. We'll certainly let the petitioner know, but we'll in no way limit the ability of those two groups to work together to bring this to closure as quickly as possible.

Then we'll be seeing an SC&A report to the Board on the 16th of August.

Then the Board will meet on the 24th and 20-- excuse me, the 25th and 26th. Either in

subcommittee or in the full Board meeting the issue of the Mallinckrodt site profile will be discussed and the review of that site profile. Then in a full Board action the Board will take up the issue of the Mallinckrodt SEC petition. And as we said earlier, hopefully we'll bring that to closure.

So those are how things will -- will play out in the long term. Let's try and deal with Arjun's issue of timing on a -- on a case-by-case, and let me start with the issue of -- of radon breath bounding radon exposures. And Dave, that's your issue. Let me put you on the spot. When might these fine people have something to -- to discuss with you?

MR. ALLEN: I'm --

UNIDENTIFIED: (Off microphone) (Unintelligible)

MR. ALLEN: Yeah, thanks. I'm thinking early -- well, I'm thinking next week, that it might be -- the more I've thought about it, the might -- the best bet might be for me to simply document a few calculations and then I guess send it to John Mauro and if I -- if I feel I can get it documented well enough to put it to

bed, and I think I can, then next week at some point.

UNIDENTIFIED: (Off microphone) The 11th? (Unintelligible) the end of next week?

MR. ALLEN: The earlier, the better.

DR. NETON: Early next week, he's saying.

MR. ALLEN: Early next week.

MR. GRIFFON: How about the 9th? That's Tuesday. Close of business on the 9th? I mean everything's tight here, so...

MR. ALLEN: Yeah, I'll commit to that. I'll commit to something by then.

DR. WADE: Okay, do the most that you can do. And I think there's been a good intellectual agreement reached here. I think this is a matter of sort of documentation, give and take and discussion, so let's move on to the next one.

And we sort of categorized this as the thorium or the ratios kind of issue.

MR. GRIFFON: Right.

DR. WADE: Jim, how do you want to proceed with that?

DR. NETON: Well, SC&A colleagues are going to have -- or ORAU colleagues are going to provide

some support here on this. I don't want to speak for their schedules, but I don't see anything forthcoming until maybe the middle of next week. Is that reasonable?

MS. BLOOM: I would say at least the middle of next week, and it may be toward the end of next week.

DR. NETON: That doesn't give you a lot of time --

MS. BLOOM: I'm happy to --

DR. NETON: We'll do what we can do.

MS. BLOOM: I can give you preliminary information, but I know you're going to beat me up on that, so...

UNIDENTIFIED: (Off microphone) (Unintelligible)

MR. GRIFFON: I'm -- I'm hoping also there will be some phone calls prior to like a -- a report, so...

DR. NETON: Well, that's what I'd --

MR. GRIFFON: Yeah.

DR. NETON: -- like. I think I'd --

MR. GRIFFON: Yeah.

DR. NETON: -- like to engage in some dialogue earlier in the week --

MR. GRIFFON: Right.
DR. NETON: -- as -- as we develop our positions, rather than throw something over the bow and then get it back. I think we can sort of get some tentative feelers out as to where we're heading and see if that's going to -- I think some of these dose calculations -- my -- my sense is some of these calculations we've shown have helped maybe alleviate some of --
MR. GRIFFON: And --
DR. NETON: -- the concern, and --
MR. GRIFFON: And I'd also -- I mean I'd also maybe recommend that -- that Arjun, you can be drafting a tentative report while they're -- you know, while you're doing these phone calls, and -- and -- only to say that, you know, as you iron out issues, then -- then NIOSH knows where you're coming from, too, so you can have these phone calls --
DR. NETON: I think a report that says we agree would be very easy to write and very quick -- very -- very quick to produce. I mean I can't see that to be a very difficult position, but...
DR. MAKHIJANI: I'd -- I'd be very happy, but I

don't sign blank checks, so...

MR. GRIFFON: Again -- so you said the 10th on the -- that issue?

DR. WADE: Could -- could -- well, let's say a call -- let's imagine a call on this issue before the 10th.

DR. MAKHIJANI: Yes, Dr. Wade, that's what I was about to suggest is if -- if Cindy could let me know what the approach is maybe on Monday as you're writing it or something, I'm -- I'm not going anywhere from Washington between now and the 15th, by the time -- by which I imagine I will be done with this, and so that I can be looking -- 'cause I really like Mark's suggestion is that if I can be kind of writing a re-- drafting a report, and then all my colleagues -- see, I have to tell my colleagues what I'm doing and they have to sign off on it, to do some calculations or something, so that would be very useful. And then of course I understand that you could change your mind -- put different data or whatever.

MS. BLOOM: At the last minute. I -- I don't intend to do that. I do see the beginning of

approa-- an approach. I do have more data on the airport cake, and that's really my first place to look. I have been working these issues night and day for the last 14 days, and I have some personal issues that I have to deal with, so that's my concern about meeting your deadline. It's certainly not my goal to impact your dates, but there's just -- I'll do -- do it as fast as I can. I'll let you know my thoughts on it. They -- but actually having the actual numbers, I think the approach that we've taken so far is going to be similar to what I propose, but we will have adjusted numbers in there based on better data.

DR. WADE: So a contact early next week.

MS. BLOOM: Yeah.

DR. WADE: With the only promise being complete -- complete and candid disclosure, and then hopefully a follow-up of information later that week, but we'll see how that first phone call goes.

MS. BLOOM: Correct.

DR. WADE: Okay.

MS. BLOOM: Thank you.

DR. WADE: Thank you. What about the lost data

issue, Mark? The lost data issue?

DR. NETON: I think -- I think this is something we can address fairly quickly. I would say early next week we can have something out. That's a different set of philosophies --

MR. GRIFFON: August -- August 9th too (unintelligible) --

DR. NETON: August 9th I think is fine. You know, we -- we're not -- we're not creating any new models here. We're just sort of reviewing --

MR. GRIFFON: Just --

DR. NETON: -- and sort of evaluating.

MR. GRIFFON: Just for the record, it's not lost data necessarily, it's just what was recorded in (unintelligible) --

DR. NETON: Yeah, missing -- missing -- missing or lost, yeah. I think we can have some -- some position or some document on that.

DR. WADE: Okay. And then what I categorize as the environmental issue?

DR. NETON: Yeah, that, on the surface, does not seem to be a real tough problem, but we're -- we're going to need to -- to -- you know, there's always surprises when we look at these

things, but seems like everything is gravitating towards the 9th, but can we have till the 10th on that, just in case we -- we need an extra day to -- to coordinate the effort (unintelligible).

Okay. Well, that -- that's -- that'll be interesting. And that gives Arjun an entire week to generate a report.

MR. GRIFFON: That says we agree. Right?

DR. NETON: That says we agree.

MR. GRIFFON: All right. Lew, did you have any other closing remarks?

DR. WADE: Only just to thank everyone for their -- their effort, and particularly to thank Denise for her willingness to travel here and to tolerate our processes. Please understand that -- that we understand how important this is to -- to real people who have given their lives and their health to these things, but those real people deserve quality effort on our part and that's what we're trying to give you.

MS. BROCK: (Off microphone) (Unintelligible)

MR. GRIFFON: And I'd like to thank everyone around the table, too. I know -- and -- and

back at the offices. I know a lot of effort was put into this analysis and I think we're getting there, so we're really close. And I think with that -- are we adjourned? We're adjourned.

(Whereupon, the meeting was adjourned.)

C E R T I F I C A T E OF COURT REPORTER

STATE OF GEORGIA

COUNTY OF FULTON

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I transcribed the above and foregoing from the day of Aug. 4, 2005; and it is a true and accurate transcript of the testimony captioned herein.

I further certify that I am neither kin nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 23rd day of August, 2005.

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STEVEN RAY GREEN, CCR

CERTIFIED MERIT COURT REPORTER

CERTIFICATE NUMBER: A-2102