Centers for Disease Control
National Institute for Occupational Safety and Health
Advisory Board on Radiation and Worker Health
Work Group on Lawrence Berkeley National Laboratory
Monday, November 25, 2019

The Work Group convened telephonically at 3:00 p.m., Eastern Time, Paul L. Ziemer, Chair, presiding.

Present:

Paul L. Ziemer, Chair
Bradley P. Clawson, Member
David B. Richardson, Member

Also Present:

Ted Katz, Designated Federal Official
Bob Barton, SC&A
Ron Buchanan, SC&A
Zaida Burgos, NIOSH
Joe Fitzgerald, SC&A
Megan Lobaugh, NIOSH
Jenny Naylor, HHS
Lavon Rutherford, DCAS
Mutty Sharfi, ORAU
Stephen Spanos, ORAU
Tim Taulbee, NIOSH

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Proceedings

(3:00 p.m.)

Roll Call/Welcome

Mr. Katz: So, welcome everyone. This is the Advisory Board on Radiation and Worker Health. It's the Lawrence Berkeley National Laboratory Work Group. And it has three members. It's chaired by Dr. Ziemer who's on the line. And Brad Clawson who is a member. And we're waiting for David Richardson.

And let's go on, well let me just -- other preliminaries. There aren't a lot of materials posted for this meeting. The agenda for this meeting is posted on the NIOSH website. And SC&A which is the contractor to the Board, did a review in 2018 I think, of the Site Profile issues. And that is posted.

There haven't been any recent papers from NIOSH posted yet, but those are in the works. And they will get posted. They won't get posted for this meeting, but they will be posted subsequently when they can, or if.

And what else do I have, that's really about it. So for roll call, we're speaking about a site, so conflict of interest and issues. And Board Members on the Work Group, by definition don't have a conflict, or they wouldn't be on the Work Group. So we don't have to address that, but please for the rest of the staff as we go through roll call, speak to conflict of interest. And we can get started with the NIOSH ORAU team.

(Roll Call)

Mr. Katz: David are you with us yet, David Richardson?

Member Richardson: Hello, this is David.

Mr. Katz: David, great. Glad you could join us, thanks.

Okay, and we haven't started yet. So we're ready to go now. Paul, it's your meeting.

Opening Remarks, by Paul Ziemer, WG Chair

Chair Ziemer: Okay, thank you very much, appreciate everybody being here on the line today. You should have at least three items before you. One is the agenda itself.

The second one is a transmission that Megan Lobaugh sent, I think to all the Work Group Members, and probably to others. Dated I believe the 18th of November which included several summary statements that'll be helpful for you in organizing things.

One was an update on the NIOSH October 2019 update. There was an August 19th update. And a section on, let's see, internal dose methodology, just a number of bullet points that Megan sent out. And I'll refer to some of those as we go along.

And then the actual input that is in the master database dealing with Lawrence Berkeley, and particularly the internal dose reconstruction issues that we'll be dealing with today or at least discussing today. And that is Findings 1 and 2, and three observations.

Discussion of any closed findings/observations, by Paul Ziemer, WG Chair

Chair Ziemer: So the first actual item on the agenda is discussion (as needed) of any closed findings, observations. I'll just remind you that on the Site Profile, of which I think originally there were 13 Findings, finding -- and most of those carried across to the various revisions. So I think the numbering

remains largely the same.

We had closed Findings 3, and 9. I'm going to ask Megan to help me if I miss anything here. And I think on Finding 10, which dealt largely with data from pre-1961, that basically was taken care of by the special, the SEC.

So although there were some uncertainty issues that are general and I think are handled by other findings anyway, so in essence I have marked Item 10, or Issue 10 as being closed as well.

And the point here in the agenda was, are there any questions on any of these at the moment, by the Work Group or even any of the staff, NIOSH or SC&A?

Are we good on that then? I'm taking the silence to mean that we're good on that.

Member Clawson: Paul, this is Brad. I'm good at this time.

Chair Ziemer: Yes, good, okay. Unless there's any questions or additional comments, we'll move right on to Item 3, which is an overview of the DCAS work that's underway. And I think Megan, you can lead us through this. Give us an overview.

And I wanted to point out, on these, we have I think 17 pages of output from the database which presents all of the comments going back to, let's see, NIOSH responses going back to October 2018. And then Megan has provided us with the April 5th comments. That was our last Work Group meeting.

And then an update, dated October 2019, which is a current update of where they are. And Megan, I don't think you necessarily have to go through all the details on October 2018, but just to make sure that we have it in the record, maybe give us the April 5th update.

So, I mean we have that before us, but I think to get it in the minutes would be useful. And then your current October update on each of these items and anything that's occurred since you sent this out. Would that we a workable way to do it?

Dr. Lobaugh: Sure I can do that.

Chair Ziemer: And also at each point, I think we'll take these one at a time. At each point, Joe or any of the SC&A colleagues, if you have any additional input or comments on each of these items although you don't have any written things at this point, because it's maybe too early for that.

But I know that you've seen the comments. And I think if you have any reactions to it, we'd be pleased to hear those as well. So Megan why don't you go ahead and proceed?

Presentation Summary of LBNL Site Profile Findings and Observations, by Megan Lobaugh, DCAS

Dr. Lobaugh: Okay. So on Friday I shared a presentation. So I think that presentation will be the best way to kind of walk through. Because I walked through the Site Profile issues that are in progress. And then talk a little bit about the current work that we're doing to answer those Site Profile issues, as well as work that we're doing in support of answering the White Paper issues.

So I emailed that on Friday. If you're on Skype, I've also shared my screen so please let me know if you have issues seeing the presentation on Skype. And I'll try and say when I change to a different slide. So if you're following along on your own, you'll be able to follow that.

So, I'm going to start with an overview. So what I'm going to talk about, just kind of what I just said. A

summary of the LBNL Site Profile issues. And then we'll talk specifically about the issues that are still considered in progress. They're the ones that we're still working on.

And then I'll talk about the overview of what we're currently doing to answer the Site Profile issues as well as the White Paper issues. And then I'll talk even more specifically on our responses to the White Paper issues.

So I'm going to, you know, probably interchange White Paper internal dose methodology. When I say that what I mean is the White Paper we put out in the fall of 2017 in support of determining doses from, internal doses using the gross alpha, beta, and gamma bioassay and air sampling for LBNL.

Chair Ziemer: Let me interrupt Megan just a moment also. Are you comfortable with us after each of the items, to stop and have input?

Dr. Lobaugh: Yes, that would be great.

Chair Ziemer: Then after each of the findings and observations --

Dr. Lobaugh: Yes.

Chair Ziemer: -- then, yes. And incidentally I'll add one other thing here. These finding numbers are specific to the White Paper. And I don't believe they correlate at all with the finding numbers in the Site Profile.

Dr. Lobaugh: Yes, exactly. So we'll have different numbers for the Site Profile versus the White Paper.

Chair Ziemer: Right, right, so it's the White Paper that we're looking at today. Okay. Proceed.

Dr. Lobaugh: So actually I'm going to start with the

Site Profile. Unless you would like me to skip over those altogether.

Chair Ziemer: Oh, no. No that's fine. Yes, because you have it. It's all right. I appreciate the slides you sent too. Yes, do those. And then we'll go back on the others. Thanks.

Dr. Lobaugh: Yes, so right now I am on, I'm going to Slide 3. So just talking in general about the Site Profile issues. There were 13 findings and eight observations. As Dr. Ziemer said, three of these findings are closed. It was Finding -- need to pull up the BRS -- Finding 3, Finding 9 and Finding 10 were closed.

And then we have two findings that are considered addressed in finding. What addressed in finding means it's a BRS status. And what that means is that the issue itself is being covered by another issue.

So when we have this addressed in finding status, we put an entry in the BRS that discusses how these other issues are covering the current issue. So when I get to that, I'll point that out in the presentation. How these two addressed in findings are being addressed in other findings, fall out of addressed in finding.

And then we had eight issues that are considered in progress. And then for the observations, we have three addressed in findings and five in progress. So that's just kind of an overview of the numbers and what we're talking about in terms of issues for the site, for the Site Profile itself.

I want to also mention that the BRS is up to date with all the information from the April 5th Work Group meeting. As we discuss, you know, action items, they're in there. And I'll go through those in this little step through.

The reason why I wanted to do this quickly, like step through these in progress Site Profile issues is so that you're familiar when I get to the discussions of our data capture that we're currently working on, and the interviews that we did. How those correlate to the issues.

Slide 4 is Finding 1. Finding 1 on the Site Profile is inadequate documentation of historical operations and sources of radiological exposures. So how I have each of these slides set up is the title, is the finding title. The first bullet is typically just general information about what the finding is on.

So in this case, facility information. And then if there are related issues, so if there are other findings or issues that are addressed by this finding, I put them under related issue.

So for this case here, for Finding 1, the Observation 5, lack of information on isotopes facilities and handling methods. The specific information about additional facility information on that observation, is going to be covered by Finding 1.

And then the action items that are currently on the table is for NIOSH to update the Site Profile with additional information that has been captured since the last revision.

That's my quick overview. If anyone has any comments or questions on Finding 1?

Chair Ziemer: Do either of the Work Group Members, either us three, or SC&A? Okay, proceed then.

Dr. Lobaugh: Okay. Next Slide 5 is on Finding 2. And this is titled insufficient information for internal dose reconstruction especially during the early years. So the first bullet is that general information, it's covering internal dose. We have two related issues.

So Finding 4, bioassay data completeness and adequacy of -- have not been verified. In Finding 11, inadequacy of bioassay analysis presentation. So these two findings gave been marked addressed in Finding 2.

The action items at this time are for NIOSH, for us to respond to the SC&A February 2014 memo with specific references to where we have provided this information in the past, as well as how the recent internal dose methodology would affect answers to the questions put forward in the memo.

So, I have a sub-bullet there saying, interviews and data captures. So this is one of the things we're targeting in the interviews and data capture that I'll talk more specifically about later.

So if anyone has any questions or comments on Finding 2?

Chair Ziemer: Let me just remind the group about these before. And we had already identified the fact that Findings 4 and 11 are related, and would basically be covered by resolution of this one.

But we would continue to carry the other two findings in the database so that we don't lose track of that relationship. So they will still be carried, but I think we're expecting resolution on Finding 2 to take care of 4 and 11 as well.

Any other comments? If not, let's proceed.

Dr. Lobaugh: Okay, so Slide 6 is covering Finding 5. So Finding 5 is insufficient justification for selection of IREP energy range fractions for photo exposures, or photon, I should say photon exposures.

This is covering external dose. And again we have a related issue. And that would be Observation 8. And Observation 8 has a few different things that it was

targeting. So the specific part of Observation 8 on the overuse of generalizations and assumptions is that the IREP photon energy fractions that were discussed in Observation 8 will be covered by Finding 5.

So one thing I want to point out here is that when I put parentheses at the end of this related issue. That means that issue, that related issue that addressed in finding issue is being covered by several different findings. If that makes sense.

So here there were several things discussed in Observation 8. The specific one that's going to be covered by Finding 5 is IREP photon energy fractions.

Then the action item for this finding are for NIOSH to update Table 6-5 for all years and all major accelerator operations. Again this is one of the things that we're targeting with our current data capture and interview efforts. Again I'll speak about that more specifically later.

So any questions on Finding 5?

Chair Ziemer: Apparently not, and all of the, and the previous thing, will also occur in this case. It's an observation that presumably will be taken care of by resolution of this finding. Okay, proceed.

Dr. Lobaugh: Okay. The next is Slide 7 and that is covering Finding 6 insufficiency of neutron dosimetry treatment. So again, this is covering external dose.

Our related issue again is Observation 8 the overuse of generalizations and assumptions. But the specific part of Observation 8 would be the neutron to gamma dose ratios that are discussed in the observation will be covered by Finding 6.

The action items that we have are NIOSH to revise the external dose discussion. To direct the uses on neutron photon ratio. And determine if NTA

correction factors, meaning energy response, angular dependence, and fading correction factors are required. Clarify low-energy NTA correction factor discussion. And clarify the uncertainties listed in Table 6-11.

Again, this is one of the focuses of our data capture and interviews. Any questions on Finding 6?

Member Clawson: This is Brad, no.

Chair Ziemer: Okay. Again, the same comments that I made on the previous slide would apply here. The observation would be handled with the resolution of Finding 6.

Okay, thank you, let's proceed.

Dr. Lobaugh: Great. The next slide covers Finding 7. And this is the failure to justify the shallow dose to deep dose assumption. Again, we're talking about external dose. And we have three related issues here. Observation 5 which discusses the lack of information on isotopes facilities and handling methods.

The specific area of Observation 5 to be covered would be additional information on specific, specific to shallow and extremity doses. Then we have Observation 6 which is extremity dosimetry needs revisiting.

And Observation 8 again, that overuse of generalizations and assumptions. The discussion in there is specific to shallow to deep dose ratios.

So I'm going to go on to the next slide because that's where the action items are. So our action items for this are for NIOSH to review NOCTS claim data to determine if it supports the shallow to deep dose ratios and extremity dose ratios.

NIOSH to compile list of pure beta emitters in use.

NIOSH also to research whether there is area monitoring available for pure beta emitters in use.

NIOSH to determine if unmonitored approach is needed for pure beta emitters. And NIOSH to review the extremity dose ratio and provide specific response to SC&A's comment on three versus five times assumption.

Again, we're targeting our data capture and interviews to help answer this question. So any questions on Finding 7?

Chair Ziemer: Okay, a lot of work on this one to do. But this again will if resolved, will also take care of several, well 5, 6 and 8 Observations. SC&A any questions, Board Work Group Members, questions?

I hear none, let's proceed.

Dr. Lobaugh: Okay. So the next slide covers Finding 8 which is the uncertainty in beta-gamma dosimeter response to radiation types and energies.

So again focusing on external dose. Our action items, what I'll say here is there is no bullet for related issues because we have no related issues that are being addressed by this finding.

So the action items are NIOSH to update the external dose discussion in the Site Profile, with specific direction regarding not using electroscope data after 1948. Because there is film and other dosimetry data available.

And also for NIOSH to review Attachment A of the Site Profile and provide a summary of what is included to address the specific information requested in the SC&A review.

So that's it for Finding 8, if there's any questions?

Chair Ziemer: No questions? Okay, continue.

Dr. Lobaugh: Great. So the next slide covers Finding 12. Finding 12 is failure to provide sufficient guidance for unmonitored workers. This was specific to internal dose. And again, there's no specifically related issues that are going to be covered by Finding 12.

So the action items are for NIOSH to respond to the SC&A, February 2014 memo with specific references to where we have provided information in the past, as well as how the recent internal dose methodology would affect the answers to the questions put forward in that memo.

So again, this is one of our areas that we're targeting with the data capture and interviews. Are there any questions on Finding 12?

Chair Ziemer: And let me insert here, not on Finding 12 per se, but just to alert folks that remember finding, the previous slide was Finding 8. Finding 9 had been closed. Finding 10 was closed.

Finding 11 I think we had decided was also covered by Finding 2 and 4. So that would be the reason it wouldn't appear here. Does that coincide with what you have, Megan?

Dr. Lobaugh: Yes, that's correct. So Finding 11 will be covered in Finding 2.

Chair Ziemer: In case anybody wondered where it was, yes. Okay, I think we're good. Okay, let's go ahead.

Dr. Lobaugh: Great. So the next slide covers Finding 13 which would be inadequate coverage of occupational environmental dose. So here the focus is the environment dose that we're assigning.

And the action items would be for NIOSH to add

information on the Site Profile about the cobalt-60 accelerator. Flush out accelerator background. So environmental exposures. And change guidance for radionuclide assignments for internal dose from beta contributors.

Any questions on Finding 13?

Chair Ziemer: Apparently not, okay. Now Observations.

Dr. Lobaugh: Yes, so now we'll go into observations. So Observation 1 is the Site Profile does not address LBNL staff assigned to the Nevada test site, or the significance of its employees working at other DOE/AWE sites.

So this one we actually discussed at the April 5th, 2019 Work Group meeting. And at that time we explained that the LBNL Site Profile would not have information about assigning dose from exposures at other sites.

So the Site Profile would be specific to LBNL exposures only. During the dose reconstruction process however, when an EE has been identified as visiting or working at other sites, the records would be requested from those other sites.

And then we would use the Site Profiles or dose reconstruction methodologies we have for the other sites, would be used to actually assess dose from those records.

So here what I have down for an action item is really asking for a Work Group or SC&A response as to whether additional information is needed to respond to this observation. Or if there's specific requests for something that you guys would like to see in the Site Profile to kind of address this?

So I'm not expecting any answer right now, but this

is the one item that is not, I guess, on NIOSH's plate. You can see everything else is kind of on our plate.

So if there are any questions on that or discussion?

Chair Ziemer: Right and I was checking my notes and I don't have any notes that we'd actually taken any action on that one way or the other before. Did, SC&A had you commented on this before?

Mr. Fitzgerald: Paul, this is Joe. Yes, this was a fairly vintage comment that we've made at a lot of the sites. You know, on the earliest Site Profile reviews. And I think we've grown to be more comfortable with the approach that NIOSH has taken site by site.

Certainly, initially that was a big question we had at most of the sites. How one would address these extramural exposures? But I don't think that's an issue any longer.

So this may just, you know, be a very old comment that was made some years ago that I would say we're, you know, we're pretty -- we're okay with the answer now.

Dr. Buchanan: Yes, this is Ron Buchanan SC&A, that's true. We see that in reviewing the dose reconstructions that other sites are queried, so I don't feel that we have any further issue with this.

Chair Ziemer: All right, and let me ask the Work Group Members, I think we're certainly clear on this. My question is one of process.

Do we need anything, or I'll ask Ted this too, do we need anything written from SC&A on this site? Or are the minutes of this meeting sufficient to simply close this?

Mr. Katz: The minutes are fine. This is not a technical matter. And you can just close it.

Chair Ziemer: Yes, we don't a formal written response.

Mr. Katz: No.

Chair Ziemer: As far as I'm concerned. Yes, Work Group Members are you comfortable with closing this on that basis?

Member Richardson: Yes.

Member Clawson: This is Brad.

Chair Ziemer: Yes, Dave and both, okay. Then I'll take it by consent that we will close Observation 1. Thank you. Next.

Dr. Lobaugh: Okay. So next slide covers Observation 2 which is more information is needed for internal dose assignment for short-lived radionuclides. So this again is focusing on internal dose.

And I just wanted to remind everyone that the NIOSH White Paper that we're going to discuss, that internal dose methodology as I refer to it. The White Paper itself was called "Method to Assess Internal Dose Using Gross Alpha, Beta, and Gamma Bioassay and Air Sampling at the Lawrence Berkeley National Laboratory".

This paper provides a method for assigning internal dose from short-lived radionuclides. So while that paper was written to address several issues regarding internal dose, again that paper would cover this observation as well.

So the action items would be for NIOSH and the Work Group, SC&A to continue to work to resolve the issues on the methodology.

So any questions on Observation 2?

Chair Ziemer: On this one the work is continuing. And again I'll ask Ted, I think just for record keeping, we simply keep this as ongoing, do we not?

Mr. Katz: I'm not sure --

Chair Ziemer: We don't close it.

Mr. Katz: I'm not sure what value it has, because it's just a general matter that's being dealt with specifically with specific findings now.

Chair Ziemer: Well, remind me. We're putting the observations in the BRS, are we?

(Simultaneous speaking.)

Mr. Katz: Yes --

Dr. Lobaugh: Yes, I'm entering them in the BRS.

Chair Ziemer: Okay, so I suppose there's two options then. We can close it because we're doing it. Or we can close it after it's done. Yes.

Mr. Katz: I just think it's redundant in a sense. You do whatever you prefer. I think it's redundant but if you want to hold it open that's fine, whichever.

Chair Ziemer: Well, if we close it, we can say why we're closing, since the work is underway or?

Mr. Katz: Sure.

Chair Ziemer: And then we don't have to deal with it every time.

Mr. Katz: Right, that's why I like closing it.

Chair Ziemer: Other Work Group Members you want to weigh in on that? I think it will, if the BRS indicates the reason we're closing it is because it is being taken care of. What do you think, Brad, David, both of you?

Member Clawson: What was that? This is Brad, what was the question again?

Chair Ziemer: Since this is being done and it's covered in one of the issues, and this is just an observation since it's being taken care of. I think both Ted and SC&A are comfortable with closing this observation because it's being handled already.

Member Clawson: Yes, I'm good with it, thank you.

Chair Ziemer: Thanks. David?

Member Richardson: That sounds reasonable, yes.

Chair Ziemer: Yes, okay I take it by consent that we'll close this one. Thank you.

Dr. Lobaugh: Great. So the next slide is Observation 3 which is a lack of discussion of radiological incidents. The action items here are for NIOSH to identify and research major radiological incidents at LBNL. Then revise Site Profile to incorporate a summary of these incidents.

Any questions on Observation 3?

Chair Ziemer: Now on this one it seems to me, this hasn't shown up in the most recent rev has it? The summary of the incidents?

Dr. Lobaugh: No, this is something that still needs to be incorporated.

Chair Ziemer: Yes, so it seems to me that we keep this open then.

Mr. Katz: Right, it stays in progress, in progress.

Chair Ziemer: In progress, right.

Mr. Katz: Yes.

Chair Ziemer: Any questions? This is a matter of, it's simply a matter of identifying these, that's what's to be done.

Dr. Lobaugh: Yes.

Chair Ziemer: Is that correct?

Dr. Lobaugh: Yes.

Chair Ziemer: So really there is no technical issue beyond identification then.

Dr. Lobaugh: Yes, as far as I understand it, it would just be us identifying and incorporating that information into the Site Profile.

Chair Ziemer: Joe, was that your understanding? Does that satisfy SC&A technically?

Mr. Fitzgerald: I believe so. I don't know, Bob and Ron what do you think too?

Mr. Barton: This is Bob Barton. I guess my only comment would be then part of the response was when we identify these major radiological incidents, what it says in here that, it appears that those records appear in the claimant monitoring files that are available to dose reconstruction.

So in so far as when we sort of gather information on these incidents, that we can identify who among them are in the claimant population. And then just get a better sense that yes, all these incidents are now documented in the Site Profile.

And to what extent follow-up, radiological monitoring, and things like that are being correctly included. Because those will sometimes have relevance to an individual's dose reconstruction.

Chair Ziemer: Yes, and I think that probably was the

basis of the original point. And as long as we continue this, you will have a chance to see the final product. And could comment on it at that time if it somehow seemed insufficient or otherwise inadequate.

So I don't think there's any action needed other than we're going to continue it, or keep it open. Is that okay with everybody? Any objection to that?

Member Clawson: This is Brad. I'm good with that.

Chair Ziemer: Okay, good. Let's continue then Observation 4.

Dr. Lobaugh: Okay. So Observation 4 is the need to provide information on metallurgical lab. And this I put in parentheses (dosimetry services). So specific to the fact that met lab provided dosimetry services for LBNL during that time period, early on in the history of the site.

So again, this is focusing on external dose. And then the action items would be that NIOSH will perform additional research for information on the met lab dosimetry services and include any additional information in the Site Profile.

So again, just like with the previous one, this is something that would remain in progress. We'd provide additional information as we find it. Just a reminder of what Observation 4 is covering and what action items have to be taken.

So any questions on that?

Chair Ziemer: And that has yet to be done so I think that would have to continue as well. Is this the first time we've had this as an action item, this particular statement? Or was that, did that --

Dr. Lobaugh: We discussed this, yes we discussed this in the April 5th Work Group Meeting, so that's

where the action item came from.

Chair Ziemer: Yes, but that was just verbal. Now it's in the, I guess it's in the BR --

Dr. Lobaugh: In the BRS.

Chair Ziemer: Right, yes.

Dr. Lobaugh: Yes, exactly.

Chair Ziemer: Any further comment on that from SC&A? Would that meet the needs of the observation if that's carried out?

Mr. Fitzgerald: Yes, I believe so.

Chair Ziemer: Okay, then we continue that.

Dr. Lobaugh: Okay. Next is Observation 7. Observation 5 and 6, let me scroll down, just so I'm not speaking out of turn, are addressed in other findings and we discussed them earlier.

Chair Ziemer: Right.

Dr. Lobaugh: As far as what findings are addressed in. So Observation 7 is the lack of sufficient information for external dose evaluation. So again, specific to external dose assignment. And the action items are for NIOSH to improve the discussion in the post-1947 external dosimetry program, including historical dosimeter information.

I didn't mark it here, but this again is one of the areas that we're focusing on in our current data capture. So any questions on that observation?

Chair Ziemer: And this is important mainly to have a complete record because I -- well I guess there could be some pre-'61 people who don't have the specified cancers for whom this could also be important, so this would still be appropriate.

And SC&A that was still adequate for your observation?

Member Richardson: As far as the description there isn't much we can say at this point.

Chair Ziemer: No, no I wasn't asking you to evaluate.

Member Richardson: Right.

Chair Ziemer: A big space omitted in dealing with this. That was presumed upon I think.

I just wondered if you had any additional comments. Okay. I think we're good on seven. Now current work underway.

Overview of current DCAS work underway, by Megan Lobaugh, DCAS

Dr. Lobaugh: Yes, so right now I'm going to get into Agenda Item 3. So all of that overview of the in progress Site Profile issues were just hopefully to give you a reminder of what issues we're talking about for the site. So that when I bring up what we're doing currently, how it fits in. You kind of have a quick idea of what those issues cover.

So in general I want to say that we're performing research basically at this point. And we're trying to formulate some responses to several of the Site Profile issues and the White Paper, internal dose methodology issues. So that's kind of the summary of where we're at is research stage.

So I wanted to give a quick timeline. So on Slide 19, if you're following along on your own is a timeline of what we've done so far. So on June 11th, 2019 we sent our initial data request to LBNL.

I'll talk next, on the next two slides specifically what we requested and how it fits with the findings. But

we made that initial request in June. And then we followed up in July with the request for interviews.

So part of our data requests were several questions that we had specific to questions from, you know, the issues that we're following up on. So we thought that the best approach would be to try and interview somebody about these specific questions.

So in August, we were actually able to start reaching out to potential interviewees. On September 3rd, we actually were able to do our first interview. And that interviewee provided several additional names. So we sent out four additional requests for interviews.

And we actually, unfortunately have not been able to interview anyone else, aside from the second interviewee that we interviewed on September 6th. So we got two interviews out of our first, that August 15th reach for interviewees. We got two interviews out of that.

We reached out to several additional people from names that we were given during the first interview. Unfortunately, like I said, nothing panned out of those so far.

There is still potential that someone could get back to us, but we're a few months removed at this point. So what we've done then is come back and been in touch with the site. And kind of reformulated that initial data request we made.

So the data request we made has specific questions in it and specific, you know, things that we're looking at. But was a bit more general. So the interviews kind of helped us target a little bit better what we're looking for.

On November 15th, so not that long ago, we actually received some selected, what I'll call numbered

documents, or technical documents that LBNL has actually put out there. So and we reviewed a few more lists of those selected documents to try and request additional technical documents that they have. That are actually published, or you know, numbered documents.

And then right now, January 13th there's, January 13th of 2020, there's an onsite data capture tentatively scheduled.

Go on to the next slide where I talk more specifically about what the data request was asking for. And this first slide is specific to Site Profile issues. So we asked for information on the whole-body counter, peak surges in calibration. This is going to help us with Findings 2, 4, and 11.

We also asked about neutron and other radiation energy spectra from cyclotrons and accelerators. This is going to help us with a lot of our external dose findings, so Findings 1, 5, 6, and 8.

And then extremity dosimetry, which is going to help us with Findings 7, Observations 5, 6, and 8. And neutron exposures measured by NTA film which will help us with Finding 6 and Finding 8.

And we asked, our fifth point was about shallow and beta dose which will help with Finding 7, and again, Observations 5, 6, and 8.

So those are the five things that were kind of very specific to the Site Profile issues. And these are basically the key words in everything that we geared for that data capture that's coming up.

So before I move onto the next section, are there any questions on the Site Profile issues and the data capture?

Chair Ziemer: Not a question, but it looks like a lot of

work to be done. Who will be going on the data capture activities with you?

Dr. Lobaugh: So, ORAU team will be doing the data capture. And I wanted to put this out for the Work Group. So if there is, you know, interest or the Work Group felt a need for SC&A to attend, they could get in touch with me. And we can, I can help set that up.

Chair Ziemer: Now SC&A I think you may want to discuss internally and determine whether you want to accompany NIOSH on that data capture.

Mr. Fitzgerald: Yes, we just need to know, you know, timeframe. And, you know, make sure to weigh that against whatever else is going on.

Chair Ziemer: Yes.

Mr. Fitzgerald: I think we'd be interested otherwise.

Chair Ziemer: Yes, Joe can you or one of the others, Bob Barton or Buchanan work with Megan on this? See if you can coordinate something.

Mr. Fitzgerald: Ron, are you available?

(Simultaneous speaking.)

Dr. Buchanan: Yes I'd have to see. We'll just need the schedule.

Mr. Fitzgerald: We'll work it out.

Chair Ziemer: Yes, just it out, just work it out, you know.

Dr. Buchanan: Yes.

Chair Ziemer: Okay, good. Any other questions on that?

Member Clawson: This is just Brad, I'm just looking

at what kind of timeframe are we looking at on this?

Chair Ziemer: Well, you're tentatively scheduled to go out in January. Is that a multi-day trip?

Dr. Lobaugh: Yes, that would be at least one week.

Chair Ziemer: Yes.

Dr. Lobaugh: And then just depending on how much information there is to capture it may end up, you know, extending beyond one week. But right now it's scheduled for one week.

Chair Ziemer: All right. And I assume that some of this at least is classified, would it not be?

Dr. Lobaugh: As far as I know --

Chair Ziemer: Or do you know at this point?

Dr. Lobaugh: As far as I know at this point, I don't believe there is classified information.

Chair Ziemer: Oh, okay.

Dr. Lobaugh: On data capture, yes.

Chair Ziemer: Yes, okay that makes it a little more flexible then for you.

Dr. Lobaugh: Yes.

Chair Ziemer: Yes, okay. Let's go ahead then.

Summary/discussion of current responses to SC&A review of internal dose methods, by Megan Lobaugh, DCAS

Dr. Lobaugh: Okay. So the next slide covers the information that we requested for the data capture that's specific to the internal dose methodology issues.

So as a reminder here, I put a little note that the internal dose methodology was written in response to the Site Profile Findings 2, 4, 11, and 12, and then Observation 2. So we kind of discussed that a little bit when we were going through everything.

But just as a reminder that's how this White Paper came about was responding to issues on the Site Profile.

So there were three areas that we were targeting in our data requests. And the first was gross alpha, gross beta, gross gamma bioassay in-house detector systems. So this would help us in response to Finding 2 which we'll discuss in the next section. More specific on what Finding 2 is.

The same thing, we were requesting information on the breathing zone alpha and beta, gamma in-house detectors systems. Again in response to Finding 2 on the White Paper.

And the last thing that we are asking about was air sampling policies and procedures. We asked for photographs of air sampling set up in, you know, in the work areas. And asked specifically for more information about breathings and samples.

And so this would in response to Finding 1, which again I'll discuss more in detail next section. But Finding 1 I'll remind you is more about representativeness of the air sampling results themselves.

Whereas Finding 2 was about the in-house detectors systems and what kind of measurements we get off of those systems and how they can be interpreted.

So any questions on that?

Chair Ziemer: Well that's a good transition into your next section then. And I think we can go ahead and

proceed.

Dr. Lobaugh: Okay, great. So the next section is our current responses to the actual issues on the White Paper, "Method to Assess Internal Dose Using Gross Alpha, Beta, and Gamma Bioassay and Air Sampling at the Lawrence Berkeley National Lab."

So this is Agenda Item 4. So the next few slides that we go through after this summary of issues is our responses. And I'm going to try and -- if I don't say it, and you have a question about it, please ask -- I'm going to try and emphasize what we have already responded in our previous responses and what's new. And I'll try and point that out when we get there.

But right now, I'll just do a quick summary of the issues on this White Paper methodology. There are two findings and three observations. So now we'll go onto Slide 24.

So Slide 24 covers Finding 1 which is air samples may not represent concentrations breathed by workers. So what we had already, we had already provided a written response in the BRS about why we believed the air samples that we're using in this methodology do represent concentrations that would have been breathed by workers.

So the current response is what I have here on the slide, which is that we performed two interviews. And I gave the SRDB reference, IDBs for those interviews. And sent a data capture request to the site regarding finding more additional information about the air-sampling program, policies and procedures that would help us better respond to Finding 1.

So any questions on that? Right now again, like I said, we're kind of in the research phase. And we're trying to capture additional data to support our previous responses. And support the response to this

issue. So any questions on Finding 1?

Chair Ziemer: And Work Group Members on this particular item the summary is on your BRS document, the 17 page document. It's on Page 5 which summarizes the April 5th meeting response. And then the current response that's basically on this slide, October response.

And again, this is basically simply describes what's going on. It doesn't answer the question, the resolution of the issue, but what is being done to be able to respond to the issue.

And I think, Joe, when I emailed you I just indicated that you hadn't input on these particular items. If you had particular suggestions or reactions, please feel free to comment.

Mr. Fitzgerald: No, I went --

Chair Ziemer: You looked then?

Mr. Fitzgerald: Yes, I went through the interview notes, just the first two. And I think, you know, I think this is probably moving in the right direction. It's hard to know because it's just two out of 12.

Chair Ziemer: Yes.

Mr. Fitzgerald: Thirteen total interviews, but I think this kind of information is the right information.

Chair Ziemer: Yes, very good. And Work Group Members if you have any additional comments or suggestions on any of these, please speak up as well. Let's go ahead then.

Oh, go ahead.

Mr. Barton: If you're looking for information about policies and procedures, I know a lot of the

discussions back in April centered around whether simply having a policy or procedure really answers the question. And the real question is were those policies and procedures really implemented correctly?

And the whole issue is obviously whether these air sampling data that we have really represents either a breathing zone, such as the lapel or something even more claimant favorable such as, you know, an air sampler between the worker and the actual source that they're working with. Such as on a hood or something like that.

So in so far as it's possible, you know, trying to figure out where these air samplers physically were beyond just the room they were stationed in. I think it's really where we want to be, to sort of answer this question. Now whether that data is out there, I don't know.

Chair Ziemer: Yes, well I think it's a good point. It's basically the overarching question we have on many of these things. Do the practices actually follow the procedures? So to the extent that we can match or effectively not match those up, I think those are important.

Mr. Fitzgerald: Yes, I think -- this is Joe again. I think the interview questions I was reading seem to indicate that that was kind of the, part of what was being sought was more specific facility information that these individuals might be aware of that would answer the question of how were these samplers positioned?

And what was the practical experience in the past? I don't if there's going to be a good answer to those questions. But that was the line of inquiry which I think is the only way you're going to get to it.

I mean I don't know how else you would find where

this information may reside.

Chair Ziemer: Well, right. And what you're really looking for is something that pops out that says this doesn't match at all what they're supposed to be doing. So in so far as it looks to be in, it looks to be consistent with policies. That gives you some degree of assurance at least to the extinct possible, a match.

Sometimes you can find things that are very obviously out of kilter. But it's a limited group that you can interview and you know, it's always, it's not an absolute certainty that you get a -- it's like a review in the sports game. You know, you do your best to confirm or not confirm what's really happened.

Mr. Fitzgerald: Yes, I think if you get a diversity of interviewees, if you talk to the HPs, but also talk to maybe some of the old time HP techs.

Chair Ziemer: Yes.

Mr. Fitzgerald: The techs may actually get --

Chair Ziemer: People out in the field, yes.

Mr. Fitzgerald: Yes, may be a better source. Just they're the ones that would be maybe doing the monitoring, going out and checking the air samplers. They would have a better idea I think than maybe even the HPs.

Chair Ziemer: Right, good point. Okay, any other comments? Okay let's go ahead.

Dr. Lobaugh: This is Megan. I wanted to also put a little plug for the tour that we're going to do at LBNL before the Board meeting. I've tried to target or request some areas where we could see, hopefully, some of the air sampling that's currently in use there. So if you're signed up for the tour currently, the

Board Members, I know you guys are, you'll get to hopefully see some of this firsthand.

Chair Ziemer: Very good, very good. Appreciate that. Okay, let's go to Finding 2.

Dr. Lobaugh: Okay. So Finding 2 is that the technical issues and uncertainties with gross counting data conversion to concentration/intake for use in dose reconstruction.

So just as a quick reminder, this is focusing on the fact that there can be, with these gross counting techniques, what we typically do, we being HP world, typically do, is calibrate its vector with maybe one radionuclide or, you know, a few radionuclides, maybe three radionuclides, in a calibration standard for -- when we make the measurements of an air sample data.

So we have typically kind of a limited scope in converting those counts that you get from a measurement to activity of a radionuclide. So that was kind of basically the main, one of the main concerns of Finding 2 was using a gross counting technique that's not radionuclide-specific and assigning dose to another radionuclide using those results.

So this finding kind of deals with energy and efficiency calibrations, or efficiency changes with energy, more the technical aspects of counting that could be affecting that assignment of dose in the end. So we provided just a quick written response back in October of 2018, that basically we'll look into this and account for it if we can.

Our current response is really, again, just about the research that we've done, the same interviews where we're targeting specific information to help in responding to this finding and the data requests for

more specific information on these in-house detector systems.

So we targeted that data capture to ask for calibrations, to ask for systems, detector system specs if we can get those, so that we can look at how this could potentially affect our conversion of counts to activity and then that activity is used to assign dose.

So again, kind of our quick response for October of this year is that we're working on it and this is part of our data capture request. So any questions on that?

Chair Ziemer: Maybe not a question so much as a comment. In the BRS for both of these first two observations or first two findings, your response is identical, not on the slides, but in the BRS, and I'm wondering if it would be helpful to add an additional phrase or two in each of these that you show on the slides.

Like in this one, specific information on the in-house detector systems, on the other one, regarding additional air sampling program policies and procedures. Do you see what I'm looking at in the BRS document itself?

Dr. Lobaugh: Yes.

Chair Ziemer: On page 5 and page 6, those responses are both identical. Maybe you can add some specificity to each of them by adding just an initial phrase or so, as you've done in --

Dr. Lobaugh: I can definitely do that.

Chair Ziemer: I think it would be helpful.

Dr. Lobaugh: Okay. Yes. Dr. Buchanan: Yes, I had a question. This is Ron with SC&A. Megan, are you

planning on finding a binding -- if you do find calibration efficiencies and such, are you looking to find a binding radionuclide or are you looking to do specific radionuclides as a function of facility and period, you know, year?

Dr. Lobaugh: So how the methodology actually currently works is, it reviews all radionuclides for the site in general. So I mean, until we kind of see what kind of additional information we receive on the detector systems, I'm going to just kind of talk generally, I guess.

And so how I imagine, if we do find this information, we would kind of bin those radionuclides into different energy bands and determine, based on their emissions, right, so the radionuclide emissions, into energy bands and then determine if in that energy band there would be a significant difference based on, you know, the detector system, how it's measuring that energy band, if that makes sense.

Because how the methodology is set up is that we're actually reviewing all radionuclides that are on site to assign dose from the highest radionuclide to the person, so we're not really breaking it down into facility-specific, we're doing a review of any potential radionuclide on site.

Dr. Buchanan: Okay. Thank you.

Dr. Lobaugh: You're welcome.

Chair Ziemer: Okay, any other questions or comments? Let's go ahead with Observation 1.

Dr. Lobaugh: Okay. The observations are where you're going to actually see a bit more work was done aside from just research. So Observation 1 is specific to some potentially missed radionuclides. So there were lists of several radionuclides that either weren't

included in the methodology and were in the Site Profiles. And, you know, the question kind of was, why is that?

What you'll see here is that I have some blue writing and some red writing. And the blue writing is our past responses, the red writing is our current response. The red type is our current response. So I'll just go through everything together.

So one of the -- well, this is a set of radionuclides, it would be the radioiodines, and the question was, why aren't they included? And they were not included because at LBNL they were measured on separate charcoal samples, so it wouldn't have been a very efficient method to capture some of the radioiodines on normal air filters. So they actually made separate measurements specific to radioiodines.

That's why they're not included in the method, because the samples that we're using on this method wouldn't have been the samples that the site would have used to measure radioiodines in the first place.

For the next one, it's erbium-165, this wasn't included because it's below the short half-life cutoff. We have a cutoff at the lower end of the half-lives that we aren't assigning dose from those short half-life radionuclides, so that's how that one was excluded.

Erbium-169 was mistakenly left out, so it will be included in the final DR methodology. And those three responses right there, we had already previously provided.

Erbium-237, this was an interesting one because we -- from what we could tell, it doesn't exist as an isotope. What we found was that this was likely a typo in SC&A's review, and that we think their intent was fermium-257. What we found is that fermium-

257 is listed in the LBNL Site Profile, and it wasn't included in our methodology.

So what we propose now is that fermium-257 will be added to the final DR methodology implementation. So maybe before I go on to the next slide I'll ask if there's any questions on that, those responses there.

Chair Ziemer: Well it seems to me that this may resolve the original observation. Let me ask the SC&A folks to respond.

Mr. Barton: Well this is Bob. I don't know if Ron had something to say about it, I mean it certainly does seem to directly get to the point. I did have one question, and it was about the erbium isotope that was below the half-life cutoff. That cutoff is simply there because it's no longer a radiologically significant, or never was a radiologically significant isotope, or what is the half-life cutoff for?

And then the second question was, and I believe it's written in here, are methods going to be developed for iodine, obviously separate from this gross beta gamma counting methods for bioassay and air samples? Is there going to be a separate model for workers who don't have individual radioiodine monitoring results?

Dr. Lobaugh: So I'm going to answer the second one first, for the radioiodines I actually cannot speak off the top of my head as to whether we're going to be developing something for unmonitored workers. If the workers have bioassay, which is most likely the case if they're working with iodine, they would have some sort of bioassay monitoring just given the volatility of that, that we would be assigning dose specific to the bioassay samples.

But as far as the unmonitored worker, I'm not going to be able to answer that right now, that's something

I can get back to you on.

For the short half-life cutoff, I wanted to actually pull up the methodology quickly so that I can answer without screwing this up. Off the top of my head I would say that there's likely not actual dose conversion factors for those short half-life radionuclides, just because of just like you said, dosimetrically there wouldn't be -- they'd be too short to have any effect, right, to actually cause dose within the body.

But I'm going to pull up the methodology and look and see if I can speak more specifically about that. One second. Or Stephen, I don't know if you can speak quickly on that one while I'm trying to open it.

Mr. Spanos: If you can bear with me for a moment, I just need to double-check something. This is Stephen Spanos, ORAU team. I seem to recall what we did in the methodology was, we took the group of, we call them the real shorter-lived radionuclides below a certain half-life.

And what we did was, and one of the things we did in the methodology was we decay-corrected the samples because typically the air samples were allowed to decay for 48 to 72 hours, typically. So we back, you know, we decay-corrected the samples.

And what we determined was some of the real shorter-lived half-lifes stopped around, I can't recall the cutoff, it's in the DR method, but when you decay-corrected them and came up with external doses based on submersion in a radioactive cloud, you'd get huge external doses.

So these could not be present in the workplace without setting off some other indicators, and that's just not necessarily -- wasn't the case at Berkeley. That's why we dropped out a whole mess of them

below a certain half-life cutoff.

Mr. Barton: I see. Thank you.

Chair Ziemer: So maybe in the final response that sort of information could be added.

Dr. Lobaugh: Yeah. We can definitely do that. So I'm putting back up the slides, for anyone that's on Skype, it probably went away. Was somebody else going to speak?

Mr. Katz: I wasn't, but someone else seemed like they were going to start. But if they're not then just, my question, I guess, was Observation 1, is there anything left to do or can this be closed?

Dr. Lobaugh: There's actually one more slide on Observation 1 to cover.

Mr. Katz: Oh, okay. Sorry.

Dr. Lobaugh: That's okay. So I'll go on to that right now, before, hopefully -- it looks like I'm sharing, so if you're on Skype and can't see, please let me know.

So Observation 1, there were two more radionuclides that were mentioned in the SC&A issue, and the next one was rhodium-102. This was, again, our response we already previously provided that will be added to the final DR methodology implementation. So it just happened to be left off.

The last one is scandium-93. What we found is that this is actually a typo, potentially a typo carried over from the site environmental report. So from the LBNL environmental release reports that we used for determining the lists of radionuclides for the site to use in this methodology.

During the interviews we actually asked if they had any -- if these interviewees had any additional

contacts who maybe worked in the environmental area at LBNL, and we actually did receive some names. So we're continuing to investigate this and we'll get back to you, but we were at least able, I want to reiterate, to find out that this was reported in the site environmental report.

So as of now it does stand, but we need to figure out, because scandium-93 is not a radionuclide that we know about. So, that doesn't mean that LBNL didn't have it, given that they were creating things, but it doesn't look likely and we do believe it's a typo, so it's a matter of trying to figure out what isotope was meant instead.

So that would sum up, that would finalize Observation 1 right now, if there's any questions.

Mr. Barton: I would also point out that I'm not sure if I'm entirely comfortable closing it just because of the radioiodine issue. I know it's no longer really under the purview of this White Paper, but if it's not going to be addressed as far as the unmonitored worker, then I think we need to have some assurance that anyone who was actually handling that material was sufficiently monitored, those records are available, and thus we don't need an unmonitored coworker model. So I guess that's the only part that still gives me pause.

Dr. Lobaugh: Okay, since I'm not hearing anything else, I'll go on to Observation 2.

Chair Ziemer: Sorry, I was talking and I was on mute all the time. So there's really three parts here. One is to clarify, and it could be done in words, that the iodine was handled separately, and what and why, the issue of clarification of the scandium, after that interview is done, to clarify that.

And then the third thing was on the half-life issue, if

we can clarify exactly what the cutoff is. So my suggestion is to just leave this observation open and we can get those questions all clarified. Let's see what the other Work Group Members want to do. SC&A, would you be comfortable if we just left that open and let these clarifications occur?

Mr. Fitzgerald: Yeah, I believe so.

Dr. Buchanan: This is Ron. I agree with Bob. The information on iodine needs to be a more definite, what's going to be done there. But other than that, I agree with everything.

Chair Ziemer: Okay, Work Group, are you okay just leaving this open until we get clarity on these?

Member Clawson: This is Brad. I'm good with it.

Chair Ziemer: Okay. David, okay?

Member Richardson: Yes.

Chair Ziemer: Okay. Let's go ahead. Observation 2? On Observation 2 and 3, we had identical responses in the Board, on the BRS, I think. But go ahead.

Dr. Lobaugh: Yeah. So, Observation 2 is on slide 28 if you're following along on the presentation on your own. Observation 2 is that the bioassays and claimant DOE files may not be indicative of exposure potential, so Observations 2 and 3 are very similar in the sense that they're focusing on the records that we received from DOE, and Observation 2 has this exposure potential discussion, and Observation 3 is really just about the records themselves, as far as my understanding of the SC&A issue.

So Observation 2 and 3 are going to look very similar, because we did 1:1 basically approach to try and answer these questions.

I'll remind you that at the April 5 Work Group meeting we discussed that we had made a mass re-request of LBNL to send us all -- the entire medical file for any claim that we received prior to 2010.

In 2010 we actually started receiving the entire medical file as part of the DAR response that is done in support of Part E claims that are made under the program, so not specific to Part B, but we started receiving that entire medical file as part of that DOL package. So we were receiving -- that started in 2010.

Prior to 2010, we were only receiving X-ray information from the medical file. So that's why, when we did this mass re-request to look at the files, we only focused on prior to 2010. Because prior to 2010 we were not receiving that entire medical file.

The whole reason this came up initially was for X-ray information but what we also found in the process was that some bioassay information is saved in the medical file. And it seems to be especially at that early time period of the site, there would be bioassay data in the medical file.

So that's kind of a little bit of a recap. So we made a mass re-request of data from DOE for those claims prior to 2010. Then what I list here in red at the bottom is the information about that mass re-request. We asked for 168 claims. As they came back we reviewed those medical files, or lack of medical files, and kind of made a disposition here.

We found that there were 53 claims of 168 that had no medical records. So LBNL responded to us that these 53 claims had no medical records. One claim we accidentally submitted that actually had a PoC over 50 percent. So those 54 claims needed no more review from us.

So there were 114 claims still left for us to look at. 109 of those claims had no new bioassay information. That means that there were five claims left that provided new bioassay information in the mass re-request.

Of those five claims, three of them had new bioassay information from DOE, but we, NIOSH, had that information via other documents.

So DOE does their review of their records, sends their response back to us, but we also search the SRDB and other -- basically the SRDB, so data-capture documents, to see if we find any information about the claimants. And that's probably how we have this information for these three claims where we actually already have the information.

And then there were two claims that had new bioassay information to us. So two out of the 168 claims really had additional information in the medical file that we did not have access to previously.

Since this observation, Observation 2, was specific to the use of bioassay results being present as an indicator for exposure potential and then application of the internal dose methodology, I ended up reviewing these five claims to determine if the methodology would have been applied the same, or different, before and after the data we received in the mass re-request. And I really used a strict interpretation of the presence of bioassay data. So, that's what we're going to talk about next.

So on slide 29 is that review that I did of the bioassay data that we received, or the claim data that we had.

So here's a table. On the lefthand side is the number of claims. The next column is bioassay results available at the time of the dose reconstruction. So I had to pick some point in time previously, because

sometimes when we receive these claims, we get returns several times when there's additional cancers or other reasons why DOL sends the claim back to us for additional dose reconstruction. So I chose the time of the last dose reconstruction as the time that I was comparing to.

And then the next column is the new bioassay results available after the mass re-request. So did we have new information about bioassay results after this mass re-request we did.

And then the last column is that analysis I did. Was there an effect, or a potential effect, on the application of the internal dose methodology?

So the first row is two claims. There were no bioassay results available at the time of the DR, but there were bioassay results after the mass re-request. So because of that, there was enough potential effect on the application internal dose methodology if we take that strict interpretation of no bioassay results, it's not applied. So it wouldn't have been applied before, it would have been applied after the mass re-request. So there would have been an effect.

The second row is two claims that had bioassay results available at the time of the dosage reconstruction. There were new bioassay results after the mass re-request. So again, potential effect on applications of internal dose methodology was yes, because the new bioassay results could have either extended the time that the internal dose methodology would have been applied, or could have had some other effect, some potential effect on it.

The last row there is one claim that had bioassay results at the DR. There was no new information provided in the mass re-request, or new bioassay results. I think there was new information as far as maybe the bioassay card versus the summary of the

results, but there was no new actual results. And so the potential effect again would be no.

So what we see from this is there are really four claims that could have been affected by us not receiving that medical file. So I'm going to go on to the next slide.

One thing I want to note before I give my conclusion was that while, even SC&A pointed this out, we had this kind of more strict interpretation in the application of the internal dose methodology saying, if the bioassay results are there that means there's exposure potential, apply the methodology.

But in our example methodology that we showed in there, we actually didn't stick with that and we applied the unmonitored approach even though the person did not have bioassay results for a certain period.

So, what I want to point out is that there's the bioassay approach that uses the bioassay results to assign the dose and then there's the unmonitored approach that uses air sampling results. And that unmonitored approach doesn't necessarily rely on the existence of bioassay data, as we demonstrated in our example of dose reconstructions within the methodology, and was pointed out by SC&A.

So while I used a strict approach here, that's not necessarily how a dose deconstructionist is going to do it. And our previous response, we actually provided saying that we are going to update the methodology to be more in line with what we actually do, which is not just review bioassay results at -- for exposure potential, but we also review job titles, we review the CATI, we review other claim information that tells us whether there was potential for exposure or not before we make that determination that would potentially apply this methodology.

So, in conclusion, we had four of the 168 claims that could have potentially been affected by not receiving all the bioassay information. That was approximately 2.4 percent of the claims that could have been affected by not having all the bioassay information, using that strict interpretation that bioassay had to be present.

So that's my quick summary of Observation 2, if anyone has any questions.

Mr. Barton: This is Bob. And I was the one who did the original claim and comparison that kind of brought this issue to light. I did have a couple of questions. It sounds like the more complete records that we're receiving for these claims are actually maybe not coming from DOE, but they're actually in the medical files coming from the Department of Labor? Did I understand that correctly?

Dr. Lobaugh: Yeah, I believe so. The medical files are provided by the Department of Labor in that initial claim information.

Mr. Barton: And so where we were finding bioassay records that had been missing from the original DOE submission, those are pretty much all contained in these medical files.

The other question was, I note a large portion of the records we request had no medical files.

Dr. Lobaugh: Yes.

Mr. Barton: That's -- can you expand on that a little bit more? I mean, wouldn't that just be a standard yearly physical or something like that, that would apply to workers who were monitored? Or how would that work?

Dr. Lobaugh: No. So actually, most of those people that did not have medical record files were visitors.

So we did a re-request, it didn't matter if they were actual employees of LBNL or not. If they had down even one day of visiting LBNL we requested their information as well. So most of those are actual visitors. They didn't actually work at LBNL.

Mr. Barton: Okay.

Chair Ziemer: Do we now get all the medical records? In other words, is this just something that occurred in the past that has now been corrected?

Dr. Lobaugh: Yeah, we actually have been receiving the entire medical file since 2010.

Chair Ziemer: So it was just a correction of the earlier files, but I'm sort of trying to get at, it's not an issue going forward anymore?

Dr. Lobaugh: We don't think so, no.

Chair Ziemer: And it's been corrected for the past?

Dr. Lobaugh: Yes. Exactly. So in 2010 we started receiving that entire medical file, and it just happens that what SC&A reviewed all happened to be claims prior to 2010. In the past we had tried to do this mass re-request at that time in 2010 when we recognized the issue with not receiving all the X-ray information, but there was a lot of resistance from the site. This time we were actually successful in working with them to get this done.

Chair Ziemer: Well the reason I asked that question, I'm asking whether we can now close this observation. It's been taken care of by these actions that you took to determine whether it was a problem. Is that correct?

Dr. Lobaugh: I would say that we feel that it could be closed. I know that SC&A had mentioned in the April 5 Work Group meeting, they suggested that they

could review the data that we received in the mass re-request, so I'm not sure if maybe they can speak more about what they were intending to do with that.

Chair Ziemer: Well, I guess I'm asking SC&A as well. Are we ready to close this, or is there additional information needed?

Mr. Barton: Well, if I may offer up one not very onerous solution it would be simply, I can go back and, a dozen or couple dozen claims that I had identified with records missing, and just go and verify that all those bioassay are now correctly there.

One other aspect of this that was important, and that was really more for Observation 3, how complete are these records? We're really having this discussion because we don't necessarily think that the bioassay records alone are going to be adequate. That's why we have the air sampling approach.

Chair Ziemer: Yes.

Mr. Barton: So in Observation 3, that would be a quick, I can just go back and look at these, I think there were maybe 15 or so claims, and see all right, look, here's the medical file, all those bioassay results I identified as being missing, they're all there, no problem.

(Simultaneous speaking.)

Chair Ziemer: I would be satisfied to have SC&A go ahead and quickly make that review. Ted, we wouldn't have to --

Mr. Katz: No, we don't have to -- but I just wanted clarification from Megan. Did Megan, did you folks already do that, already go through these?

Dr. Lobaugh: We went through the claims that we requested. We went through the 168 claims

themselves. We did not do a crosswalk with the ones that SC&A specifically requested.

Mr. Katz: No, but my question is, are the ones that SC&A, the 15, are they a subset of the ones you went through?

Dr. Lobaugh: Yes. They would be a subset.

Mr. Katz: Oh. So Paul, my suggestion about this is, I mean we don't normally -- if NIOSH has already done that and these are the numbers, there's no reason for SC&A to confirm that NIOSH did proper accounting.

Chair Ziemer: Okay. So you had SC&A's list of 15? Or did you?

Dr. Lobaugh: We received that. In the issue itself there were the list of claims that they found that were not in agreement, right?

Chair Ziemer: Okay.

Dr. Lobaugh: But what we did was more general than that, even. We just said, we know we had an issue prior to 2010, so we know we started receiving the entire medical file in 2010, so we made a larger request then.

Chair Ziemer: Yeah. But it included the 15, that's what we're asking.

Mr. Barton: Right, that's what Megan's saying.

Dr. Lobaugh: Yeah.

Chair Ziemer: Okay. I got you. Okay.

Dr. Buchanan: Just for clarification, it was 13.

(Simultaneous speaking.)

Mr. Barton: If NIOSH has gone through that list, and the dates and the type of bioassay, and we can say that all those are being provided now, then I agree. I don't think there's any reason to reinvent the wheel and go check it again.

Chair Ziemer: Then if that's the case, I would say we're ready to close it.

Mr. Barton: Right. And I think that's more directly appropriate to Observation 3. What I was going to say about Observation 2, our concern there was originally the White Paper message, as Megan indicated, sort of said that you could only be applied an occupational dose if you had a bioassay already and it was during a certain time frame, I think it was within a year, then you were considered to be occupationally exposed.

As she indicated, even in the examples in that White Paper, that's not really the case. There was hypothetical worker who was only monitored for partial employment, but they still got occupational throughout.

So again, the only thing really open from Observation 2 would be what guidance is actually going to appear in the TBD to instruct the dose constructor about when a worker really should be considered occupationally exposed. It doesn't sound like bioassays can be the only marker anymore.

But what other criteria? Is it going to be very general, as in any evidence that they might have entered a radiological area? Is it going to be more specific than that? I'm not sure if the specific language has been developed yet. And then again, how are we going to apply this to unmonitored or partially monitored workers?

Chair Ziemer: So in your mind that was the

underlying question in Observation 2, that that information by itself may not be indicative of exposure potential? Is that the underlying question?

Mr. Barton: You're right. If a method was going to require for someone to be assigned occupational internal dose, there was going to be a requirement of bioassay, that's why we went in. And then found out that well, you're not always getting all the bioassay, so is that an appropriate criteria by itself?

And as Megan was explaining, no, that's really not it. As written, it's really taking a full snapshot of the claim file, which would include statements made by the claimant, the claimant's survivors, or even just their job title. So I mean, I'm certainly satisfied with that approach but I haven't seen that actual language about what a dose reconstructor's going to be instructed to do for individual cases.

Chair Ziemer: So this goes a little bit beyond just the medical record, the exposure that shows up in the medical record itself. You're talking about some other parameters, then.

Mr. Barton: Yeah. This is, how are we going to take these methods involving air samples or bioassay, how are they going to be applied to individual workers. Prior, it seemed like they were going to have to have a bioassay sample already to be considered an occupational worker, and that's really not the case anymore. There's more information that can be used. I'm just curious to see what the actual guidance will be for the dose reconstructor beyond what was originally a required bioassay.

Dr. Lobaugh: So what I'm hearing is, you want to see the specific language that we're going to include in the revision for when this is applied? Okay.

Chair Ziemer: Which goes beyond, I'm understanding

this observation a little differently that I thought it was written to start with. I see what you're asking. You're asking it remain open until you see sort of the final criteria statement?

Mr. Katz: That's right, Paul. It makes sense, because the tissue as bioassay don't -- may not be sufficient, and Megan has acknowledged they're not necessarily significant as a measure, so it still relates to what was -- where they started with Observation 2.

Chair Ziemer: Okay.

Mr. Katz: So, in progress for Observation 2. Or even in abeyance until they see the, whatever, but either way.

Chair Ziemer: Yes, I guess it's more in abeyance until they see the final wording of it.

Mr. Katz: Yeah. And you can close Observation 3 if the other Work Group Members are comfortable with that.

Chair Ziemer: Let's take care of 2 first. I want to hear from the two Work Group Members, and I assume, SC&A, you'd be satisfied with 2 being in abeyance until we see the final wording, is that correct?

Mr. Barton: Yes. This is Bob. That's what I would suggest doing with Observation 2, and then if you all are comfortable with Observation 3, then I'm comfortable with closing that one as well. Closing 3, leaving 2 in abeyance.

Chair Ziemer: Let's do 2 first. Brad and David, are you comfortable with keeping 2 in abeyance, based on these discussions?

Member Clawson: Yeah, this is Brad, I'm good.

Member Richardson: Yes.

Chair Ziemer: Okay, and then what about closing 3? I certainly am in favor of that. Ron, David?

Member Richardson: Okay, yeah.

Member Clawson: Fine.

Chair Ziemer: Okay, we have concurrence on that, 2 in abeyance and 3 closed. Okay, good. Megan, I think we're at the end, aren't we?

Dr. Lobaugh: Yes, that was it.

Action items and plans for December Board meeting presentation, by Paul Ziemer, WG Chair

Chair Ziemer: Thank you. I appreciate your presentation and. all the work you did on preparing this. That brings us to the action item for 5, which is presentation at the Board meeting. I'm thinking, let me think out loud here, that a lot of what you presented to us today, Megan, could be used in the Board. And maybe a little more detail is needed on some of these, but I think basically you've captured a good overview of what needs to be done. I think you've pretty well, you've given a good summary of the actual findings from the Site Profile, it gives a good summary of what we're working on.

When I say a little less detail in some of these, particularly on the current work stuff starting with the overview of the current work, it may be that where we get into the detail on these findings and observations, well, they're pretty brief still, so -- there's quite a few slides here, but I think there's two questions I have. One is do we need an overview of the site? I'm going to ask Ted that.

Mr. Katz: I don't --(Simultaneous speaking.)

Mr. Katz: I mean I think it's helpful to have an overview of the review. I don't know how much needs

to, I mean I think a little bit of narrative about the site, since this is a site that the whole Board really hasn't heard about in a very long time, and it's hard --

(Simultaneous speaking.)

Chair Ziemer: What do they do, and so on.

Mr. Katz: I think that would be helpful.

Chair Ziemer: Can we get a summary slide, Megan, of just overview of the site?

Dr. Lobaugh: Yes. I can put that together.

Chair Ziemer: And then maybe we can split this in two. Have an overview of the site, I would give a brief summary of what the Work Group, you know, when we met, who's on it, kind of a quick overview of -- well, let's see. I don't want to repeat all this. I'm trying to minimize my workload here.

I thought originally I was going to give an overview of the findings, but I think you've done such a great job here on the findings that I would just let you proceed with that.

Mr. Katz: Paul, I think it's fine. You could just introduce the session, but she has done a really nice, fairly comprehensive job, and I think it would be fine if you want to let her just run with it. I think that's okay.

Chair Ziemer: Maybe I'll just kick it off and introduce the Work Group and when we met, and then have Megan introduce the site and go through the findings. How does that sound?

Mr. Katz: Sounds good to me. And Megan, you can update it to the extent that some things were put to bed. You can update it on those for the meeting, too.

Dr. Lobaugh: Okay. Great.

Chair Ziemer: Are you good with that, Megan?

Dr. Lobaugh: Yes, that's fine with me.

Chair Ziemer: Okay. That's why we're paying you the big bucks, right?

Dr. Lobaugh: Yeah, exactly.

Mr. Katz: I just wanted to thank Megan. I just think you did an extraordinarily good job with this mapping, and I think it's a really nice example for both teams, NIOSH and SC&A going forward with other sites where we have the same issue of we have a lot of things that, at this point in process, need this kind of mapping. I think you did a great job. It's a good model. Really helpful.

Chair Ziemer: Okay, we'll proceed on that basis. Megan, we put the burden on you, you do whatever revisions you feel are appropriate on these slides. I wouldn't think it would be very much, just update a little bit here and there, and add some introductory things and we'll be in great shape. And I'll prepare a few introductory slides about the Work Group. Ted, that sound okay to you?

Mr. Katz: That sounds super. I think that's great.

Adjourn

Chair Ziemer: Okay. Let me ask if there's any other comments or questions or anything for the good of the order? If not, we will stand adjourned. We'll see you all soon. Thank you, everybody.

(Whereupon the above-entitled matter went off the record at 5:33 p.m.)