US Department of Health and Human Services
Centers for Disease Control
National Institute for Occupational Safety and Health
Advisory Board on Radiation and Worker Health
Argonne National Laboratory-East Work Group
Wednesday, June 27, 2018

The Work Group met telephonically at 10:30 a.m. Eastern Time, Bradley P. Clawson, Chair, presiding.

Members Present:

Bradley P. Clawson, Chair
Josie Beach, Member
Genevieve S. Roessler, Member
Loretta R. Valerio, Member

Also Present:

Ted Katz, Designated Federal Official
Bob Barton, SC&A
Elizabeth Brackett, ORAU Team
Ron Buchanan, SC&A
Stu Hinnefeld, DCAS
Lara Hughes, NIOSH
Vincent King, ORAU Team
Jenny Lin Naylor, HHS
Megan Lobaugh, NIOSH
John Stiver, SC&A

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(10:30 a.m.)

Welcome and Roll Call

Mr. Katz: Welcome, everyone, this is the Advisory Board on Radiation and Worker Health, the Argonne National Laboratory-East Work Group. And this meeting is largely about everyone getting sort of up to speed on where things stand and the works that are in progress.

The materials for today's meeting are posted on the NIOSH website under this program, scheduled meetings. You can go there. You can pull up the agenda, which is very simple. And also the main document that this is based on, which is SC&A's sort of update on where issues stand, as well as a document that has -- from the Board Review System, which has the back-and-forth between SC&A staff and NIOSH staff of various issues and where they stand. So people are welcome to go there and pull those up if they want to see the background to the discussions today.

(Roll call.)

Mr. Katz: So just to remind everyone to mute your phones, except when you are addressing the group. Press *6, if you don't have a mute button, to mute it and *6 to come back off mute.

And Brad, it's your meeting.

Chair Clawson: Thanks, Ted. I appreciate that. Like has been said, this is the first Work Group meeting for ANL-East. I'm kind of at a loss here. I guess, where do we -- on the agenda, I believe this is, SC&A has responded to NIOSH's response. So I'm just wondering who wants to go first.

Mr. Buchanan: Brad, this is Ron.

Chair Clawson: Yes, Ron.

Mr. Buchanan: Yes, what I would like to do is just refresh everybody to get everybody on the same

page. And then I find it most productive if NIOSH would just give a brief idea of what they want to do because a lot of this is they are going to revise the TBDs.

Chair Clawson: Okay.

Mr. Buchanan: And SC&A can't do much until they see those revisions.

Now, there are a couple of findings that we would like to say a few words about. So may I suggest that I give a brief rundown of where we're at, and then have NIOSH just read the finding and what they plan on doing, and I'll put in any comments at the end if we want to?

Now the question remains -- there's a few that we have recommended closing. There are some that have been resolved. So I don't know if the Work Group wants to address those today or wait until a future meeting when we have addressed more of them and close them all at the same time. So that's up to you, whatever you want to do on that.

Chair Clawson: Okay, I figure we'll just take them one at a time there.

If you want to go ahead, Ron, that will be fine.

Mr. Buchanan: Okay. Well first of all, I know that a lot of us have done other things since we've discussed this. So I just want to give you a brief rundown of where we are at on Argonne National Lab East because we haven't paid it a lot of attention in the past. We've had one conference call in March of 2017 and then we went to the tour there and the meeting in Chicago there in March, which was helpful.

As most of you know, Argonne National Lab East started out as a reactor research facility, a direct offshoot of the Chicago Pile at the University of Chicago. It became a national lab on July first of 1946. It did a lot of reactor research and it was in conjunction with Idaho National Lab.

And so they then diversified into other -- a lot of research. So I'll just give you a little bit of

background then of what we're looking at here. There was a lot of other researchers and they diversified into other areas now. And so this leaves us some legacy to work with.

They moved from the University of Chicago to the A Site and then to D Site, officially became a national lab in July of '46.

And so what we are looking at here is some findings that were issued in early -- in 2009 by SC&A. The TBDs were issued in 2006. That makes them about 12 years old and I think it's wise that NIOSH, as they have suggested, we want to update some of these because a lot of water has run under the bridge since 2006 when they were issued and a lot of items have been addressed and resolved in this program since then.

And in addition, SC&A initially issued their revision. They started about ten years ago, issued it in I think March of 2009, and I was not in on that initial review. And so both NIOSH and SC&A have had some changes since this was originally issued. And so I have taken this over in trying to address the findings and I think SC&A is also funding it. NIOSH has also had several people working on this. And so I think Megan, apparently, is leading it at this time.

And so what I would like to do is just to have NIOSH, whoever wants to represent them, just to read the finding and what they plan on doing on it. And then we can do any discussion that we want to on each finding.

There are 13 original findings and there were seven secondary findings on our original report in 2009. Now we do call those -- changed that to observations now. So we have 13 findings and seven observations.

And some of these, like I say, we have found that they have been resolved, and we'll indicate that there in the discussion. But most of them NIOSH is going to do an update to the TBDs, which they indicated would be released towards the end of this year. And of course after that's done, well we'll review those

and give our written evaluation of those changes and see if they resolved the findings or if there is more work that needs to be done on it.

So with that, I would like to turn it over to NIOSH and have them just briefly go through each one and what they plan on doing in the revised TBD or how they are going to address the issue.

Review Findings

Ms. Lobaugh: Thanks, Ron. This is Megan Lobaugh with NIOSH.

As you said, I am the new lead for Argonne National Lab East, so -- and I am the one who suggested having this meeting, again, just as an update and review, like Ron was saying.

Finding 1

So let's start with Finding 1. It may be easiest -- I'll read page numbers from the ANL-East Work Group BRS responses document that was posted online, if you want to follow along in that document.

So for Finding 1, this is on page 1 of that document, it's covering the potential missed dose from the lack of definition of radionuclide compositions and radionuclides not addressed in the Site Profile.

So this is specifically talking more about plutonium, uranium, and americium compositions. And our path, so far, has been to research the SRDB and review the Technical Basis Document with the information that is currently in there and provide -- what we have provided so far to SC&A is the process that the dose reconstructors used in approaching the dose reconstruction for claims coming in.

This also covers nontraditional accelerator-produced nuclides. I didn't mention that.

So our path forward on this is to update the internal dose Technical Basis Document to add more specific information as to the approach and assumptions that the dose reconstructors are making, specifically for uranium mixtures, which we typically assume

natural, unless the reports are giving us other information, plutonium mixtures, and the exotics. And those exotics are referring to the nontraditional accelerator-produced nuclides.

And in our discussions in the BRS with SC&A, it seems like we have both agreed that, you know, the next step is reviewing our revised Technical Basis Document in this approach. But Ron, if you have anything additional to add, please feel free now.

Mr. Buchanan: No, I agree with that. We concur with that approach.

Ms. Lobaugh: Okay. So I guess, would we like -- if there's any discussion from the Work Group, should we go through that finding by finding as well?

Chair Clawson: That would be fine. You know, Ron, what you said earlier, we're not going to be able to close any of this until we actually see the changes, correct?

Mr. Buchanan: Right, except for a few that we've already addressed here, and mainly the medical, which has been -- we started using OTIB-6 on these others. We won't be able to close any of those until we see the revised TBD, have a chance to evaluate it, and send out a written evaluation.

Chair Clawson: Okay, I just -- I appreciate that. Thanks.

Okay, we'll go ahead and we'll just go finding by finding.

Finding 2

Ms. Lobaugh: Okay. So we'll move on to Finding 2, which is on page 3 of the BRS discussion document.

This finding refers to a potential missed dose from the use of gross alpha counting for bioassay for the time period from 1946 to 1972.

NIOSH's path forward on this is to update the internal dose Technical Basis Document to add more specific information as to the approach and assumptions the

dose reconstructors are making for gross alpha bioassay results. And in our discussion with SC&A, SC&A pointed out that we should review some of the other program methodologies, specifically the Lawrence Berkeley National Lab document that was recently reviewed, the White Paper that NIOSH wrote that SC&A gave us responses or review on.

So using that or, you know, reviewing program methodologies that we currently have for gross alpha and previous comments that we've received on those.

So updating the internal dose Technical Basis Document with more specific information about how we are accounting for the fact that these are gross counts.

So Ron, if you have any additional comments or questions.

Mr. Buchanan: No, we agree with their approach. We just, as Megan said that, we caution the use of gross counting. It has problems in assigning specific radionuclide intake because of difference in efficiency and what the counters were calibrated to might be different than the 70 possible radionuclides that might be out there.

So yes, I'm glad that NIOSH is considering that paper and we agree with that path forward.

Finding 3

Ms. Lobaugh: Okay. So the next finding, Finding 3 starts on page 5 of the BRS Discussion Document or BRS responses document. And this finding has to do with the assumption in the Argonne National Lab East Technical Basis Document that the default pathway was inhalation for assigning internal doses.

So the purpose of this was that we should be considering ingestion along with inhalation. NIOSH's response was that we do that in the process of the dose reconstruction and that inhalation is the default intake mode for the NIOSH project.

So through our discussion with SC&A we have agreed

that this finding -- that we have come to a conclusion on this finding and that we suggest that the Work Group close this finding.

Mr. Buchanan: Yes, this is Ron Buchanan. And remember, this Evaluation Report was started in 2008, before some of the OTIBs came out and such. And so we find that in their dose reconstruction that ingestion is considered along with inhalation, when it is appropriate. And so we recommend that this finding be closed.

Member Beach: And, this Josie. The language is updated as well so that it's very clear that both of those are being considered now?

Ms. Lobaugh: Yes, so we are in the process of updating the Technical Basis Document. And so in that update, we will be sure that the language is clear that we are considering both ingestion and inhalation, when appropriate.

Member Beach: Okay, great. Thank you.

Member Roessler: Megan, this is Gen.

Ms. Lobaugh: Yes.

Member Roessler: On that item, I remember reading somewhere more details on how NIOSH handles the ingestion along with the inhalation. Can you give me the reference on that so I can look back at that? Was that in the current -- or not the current but the old TBD?

Ms. Lobaugh: So are you talking in general for --

Member Roessler: Yes.

Ms. Lobaugh: Okay.

Member Roessler: Yes, I think there was a discussion by NIOSH about how, in general, ingestion is handled when you have the inhalation pathway being the primary one but I can't remember where I read it.

Ms. Lobaugh: Yes. So this is -- you may be referring to the DCAS TIB-9 or OCAS TIB-9, which talks about how we apply ingestion intakes when we assume that

the -- when we determine the inhalation intake via air sampling results.

Member Roessler: Yes, that sounds like it. I'll look back at that one --

Ms. Lobaugh: Yes.

Member Roessler: -- and I'll try to get refreshed on it. That sounds good. Thank you.

Ms. Lobaugh: Yes, so DCAS TIB-10 -- or DCAS TIB-9.

Member Roessler: Nine, okay, thanks.

Ms. Lobaugh: You're welcome.

Mr. King: Megan?

Ms. Lobaugh: Yes.

Mr. King: This is Vincent King --

Ms. Lobaugh: Great.

Mr. King: -- also OTIB-60, the internal dosimetry OTIB, discusses this.

Ms. Lobaugh: Great. Thank you.

Chair Clawson: Hey Ron, this is Brad. Have we already done -- because of what's going on at some other sites and stuff like that, have we already done a data adequacy and completeness review of ANL-East?

Mr. Buchanan: I'd have to go back. Megan, do you recall if that was done and when?

Ms. Lobaugh: No, I don't -- sorry.

Chair Clawson: I'm sorry. I haven't seen anything and that's why I asked the question. And just because what's -- you know, especially one of these where we've done very -- I just want to make sure that we don't miss that portion of it because -- the completeness and adequacy on the data.

So I don't know who would take that on. It would

probably be you, Ron. But I just wanted to make sure. I hadn't seen anything on that. And if we have, I'd like to, I guess, be pointed in the right direction for it.

Ms. Lobaugh: This is Megan. Since I'm new, I'm still not sure of all of the things but for data completeness and adequacy, what I'm familiar with is the review of data use in coworker models.

Chair Clawson: Right.

Ms. Lobaugh: And Argonne doesn't currently have a coworker model and, as of now, we're not recommending a coworker model. So I don't believe that this has been done for Argonne.

Chair Clawson: Okay --

Ms. Hughes: This is Lara. Yes, I agree with Megan. I'm not aware that anything has been done. There was an SC&A review of the TBD and what we're dealing with right now is still the fallout from that, the -- addressing the issues from that review that was done initially in 2009.

Chair Clawson: Okay, I appreciate that. And that is something that was got into in some of these other sites, that one of the things is that that should be being looked at along with this. So if you'd keep that in mind, Ron, I would appreciate that.

Possibly, Bob Barton, that may fall into your realm there but that being said, I understand what we're saying on this one and I just wanted to bring that up before we got too much further onto that.

I'll turn it back over to you guys.

Mr. Hinnefeld: This is Stu, if I could just offer one thing.

Chair Clawson: Okay.

Mr. Hinnefeld: Data completeness work is done when we are trying to determine whether our coworker model data set is complete enough. And so in the absence of a coworker approach, I don't know that

there is a call for it.

I mean, certainly, if SC&A finds something to do or finds some reason to go to investigate something, I'm sure they will investigate it. But that specific issue, I don't believe is in play at the moment.

Chair Clawson: Well, and I understand what you're saying. If you remember what we got into in Savannah River, we went through this and then the coworker model came --

Mr. Hinnefeld: But they are coworker models. There are coworker models in play at Savannah River and we've gone through many of their sites, like you said, where they were using coworker models. But until such time as we find coworker model is warranted in Argonne, then it wouldn't come up.

Chair Clawson: Okay, point taken but if coworker model does come up, one of our first things we need to do is look into that so that -- we'll just discuss that down the road, then.

Mr. Hinnefeld: That's absolutely true, if a coworker comes up then that absolutely will be high on the list.

Chair Clawson: Okay, because it seems like sometimes we kind of put the cart before the horse and I just want to make sure that we don't go too far into it.

And if it does come up, you are correct; we'll go ahead and go on to that.

So, Megan and Ron, I'll let you continue on.

Mr. Buchanan: Okay, thanks, Brad. Yes, that's a good point.

Finding 4

Ms. Lobaugh: Great. Thank you.

So moving on to Finding 4, which is on page 6 of the BRS response document, this finding has to do with the fact that there is insufficient information on the calculation of the minimum detectable concentrations and uncertainties in the bioassay methodology.

So NIOSH's response and path forward on this is to update the internal dose Technical Basis Document with additional more specific information regarding the minimum detectable concentration.

In reviewing the SRDB documents that we found, there is some information that we can update the current MDCs using that information from the SRDBs. And you know we're currently still reviewing that but in the new -- in the update to the TBDs, we will be sure to have more specific information regarding the calculation of the MDCs.

Ron, if you have anything else?

Mr. Buchanan: No, that sounds like a good approach. We'll review that when it becomes available.

Finding 5

Ms. Lobaugh: Okay. So the next finding is Finding 5, which is on page 7 of the BRS response document. This has to do with the lack of guidance for estimation of missed dose for unmonitored workers. So this is specifically for internal dose, internal missed dose for unmonitored workers.

So NIOSH's path forward will be to update the internal dose Technical Basis Document to specifically direct dose reconstructors to use environmental intakes when we come upon a claim that the worker was unmonitored.

So in our discussions with SC&A in the Board Review System, we recently provided additional references that were requested for supporting the statement that all workers in radiologically controlled areas were monitored. So the approach for unmonitored workers comes about because we're assuming that all workers that were in radiologically controlled areas were monitored.

So if there is an unmonitored worker, assignment of the environmental intake would make sense because if they were in a radiologically controlled area, they would have been monitored.

So Ron, if you have any additional questions or

comments.

Mr. Buchanan: Yes, the reference that is provided on the Site Research Database, SC&A went through those. At this time, we did not -- could not find any evidence that people weren't monitored when they were in radiological areas. And so -- and it appears that the contractor, subcontractor issues we've had at some of the other sites did not come into play here, especially in the early days.

And so at this point, we will see how this is worded in the TBD but, at this point, we find that this has been fairly well addressed and agree with this approach.

Finding 6

Ms. Lobaugh: Great. If there is no other discussion on Finding 5, we can move on to Finding 6, which is on page 8 of the Board Response System -- Board Review System response document.

This finding is a finding that deals with occupational medical exposures. So the finding was failure to adequately define and assess occupational medical exposures in the pre-1988 years, and potentially misses special employment exams.

So OTIB-6, which covers occupational medical x-rays, was released in 2011. So that was after the initial review of the SC&A -- the initial SC&A review of the Argonne East Site Profile. So we have agreed, both NIOSH and SC&A, that in our update to the Argonne East Technical Basis Document covering occupational x-rays, that we will include the current OTIB-6 guidance, which provides more information on default assumptions for x-ray frequency and doses that would be assigned from those x-rays.

So this is one of the findings that we've agreed, you know, basically is in abeyance until we update that document again.

Mr. Buchanan: Yes, this is Ron and we agree that we will look at that and make sure it covers the bases when it's revised.

Chair Clawson: Sounds good, I agree. This is Brad.

Finding 7

Ms. Lobaugh: Okay, if there's no additional discussion, we can move on to Finding 7.

Finding 7, again, has to do with occupational medical x-rays. And this finding covers the lack of techniques and protocols for medical examinations prior to 1988, increases the uncertainty of the dose conversion factors listed in the Argonne East occupational medical x-ray Technical Basis Document.

Again, this was -- the SC&A review, was prior to the release of OTIB-6. So in our discussions with SC&A, NIOSH and SC&A have agreed that, once the occupational x-ray Technical Basis Document is updated to reflect the current guidance of OTIB-6, likely this finding will be closed.

And Ron, if you have anything --

Mr. Buchanan: Yes, this is Ron. We agree that if they incorporate the recommendations in OTIB-6, the latest revision, this should address this finding and we will check this out for sure when that's done.

Member Beach: So this is Josie again. The wording on these seems to be not quite correct on number 3 and number 7. It says that SC&A agrees with NIOSH, however, they still have to review those documents -- is that correct, Ron -- before they are actually closed out?

Mr. Buchanan: Yes, that is really correct. As I was going through these, I noticed it in several places. We agree that this is the solution, so therefore we recommended closing it but, in actuality, we probably should check that that has been done like we did on all the others.

Member Beach: Okay.

Mr. Buchanan: So that's really true, we should have worded that we will -- we find it resolved but will check it out for sure when the TBD is issued and make an official written comment on that.

Mr. Katz: Right. This is Ted.

So these are -- I think Megan correctly just used the term, these are really actually in abeyance.

Mr. Buchanan: Yes.

Mr. Katz: Because the solutions are well-known, well-trodden everywhere else in the other sites. It's not like we don't know what's going to be done here, but --

Member Beach: Perfect.

(Simultaneous speaking.)

Member Beach: -- so just change the wording held in abeyance.

Mr. Katz: Yes, exactly.

Member Beach: Thank you.

Finding 8

Ms. Lobaugh: Yes, thank you for that clarification. So, if there are no additional comments on that, we can move to Finding 8, which is on page 10 of the BRS responses document.

Finding 8 again has to do with the occupational medical x-ray dose. And this one is specific to the frequencies and types of x-ray exposures were uncertain. Again, our path forward would be updating the Argonne East Technical Basis Document that covers medical occupational medical x-rays to include the OTIB-6 guidance, which provides default assumptions that we make for the project or the program across the board.

One area that we have discussed with SC&A was the potential to extend the dose, the potential dose for considering PFGs. So in the current Technical Basis Document, it was assumed that PFGs were really only -- the doses from -- the potential for dose from PFGs was really only valid through 1956. And we have reviewed and are going to continue to review but will likely extend that to 1958.

If Vince has any other comments on that, Vince King, he's been working on this.

Mr. King: Yes, that's all right. That's correct. And this is just for the default information for the TBD, remember, to be applied when there are no x-ray records for a claimant. And I don't think I've ever seen a claim come in that didn't have x-ray records. So this is just sort of the default to use in case it's not in place. But it's almost a moot point because the records, x-ray records are very good from ANL-East.

Finding 9

Ms. Lobaugh: Yes, thank you for that clarification.

If there is no other discussion, we can move on to Finding 9. Finding 9 is on page 11 of that BRS response document.

Finding 9 covers external dose and this is specifically about uncertainties and undocumented aspects of the film dosimetry at Argonne East.

So our path forward on this is to update the external dose Technical Basis Document by incorporating a simple table which gives the Argonne East dosimeter parameters and, through our update, continuing to research and see if we can refine and be more specific on those dosimeter parameters and when we're applying them.

Ron, if you have any additional --

Mr. Buchanan: Yes. I don't want to go into all the details but I would encourage you to look back at SC&A's pretty elaborate reason for this finding in their 2009 report on what their concern was and try to address those in the revised TBD as much as possible. Some of them go into quite the detail on the film covering, and packaging, and that sort of thing. And so those are important points which I don't want to go into all those details. It was pretty lengthy.

But I just would like to remind you that that would be an area that you might want to look at to see our

areas of concern with the dosimetry.

And so other than that, I agree with the path forward.

Ms. Lobaugh: Great. We will definitely review the initial review and make sure we address any specific areas that were brought up in that review.

Finding 10

If there is no additional discussion on Finding 9, we'll move on to Finding 10. Finding 10 starts on page 12 of the BRS response document.

Finding 10 covers neutron dosimetry and the fact that it may be inadequately addressed. So as a little background for Argonne East, pre-1953 there is no neutron monitoring. Pre-1960 there was -- so after 1953 but before 1960 there was neutron monitoring but the neutron dosimeters were only read if the photon dose was over 100 millirem. So in that early time frame, pre-1960, we don't have many measures of neutron dose.

Our -- NIOSH's suggested approach would be to the update the external dose Technical Basis Document and review the potential for a neutron/photon ratio for the Argonne East site.

Now the fact that we don't have much data pre-1960 is leading us to suggest that we look at surrogate sites for neutron/photon ratios. So we are currently in discussion with ORAU at this time to figure out the best path forward on surrogates, but just in our discussions so far, we have talked about looking at Hanford and X-10 as potential surrogates, given the time frame and the type of reactors that were in use at Argonne.

This finding will require likely an additional data capture and more effort to review what we find and determine -- provide justification for an adequacy of using those surrogate sites. So this is one of the findings that will take us a little more effort as far as time and data captures, likely.

So Ron, if you have any questions or points.

Mr. Buchanan: Yes. Unfortunately you know we have had to do this at other sites, use N/P values, and generally we find that it becomes claimant-favorable compared to any doses that you can find recorded. So we are okay with this path forward. We'll have to see what the justification is and what sites they use and see if it is applicable to Argonne during these periods.

So, we're okay with this path forward.

Chair Clawson: Megan, this is Brad. And you'll make sure that SC&A is involved with that data capture?

Ms. Lobaugh: Yes, we will keep SC&A informed. Yes.

Chair Clawson: Thank you.

Finding 11

Ms. Lobaugh: Sorry, I was taking notes.

So if we have no additional discussion on Finding 10, we can move on to Finding 11. Finding 11 starts on page 13 of the BRS response document.

Finding 11, again, has to do with external dose. And this is specifically quantification of external exposures to unmonitored workers outdoors was inadequately justified for the time frame before 1972.

NIOSH's path forward is to update the external Technical Basis Document to use the ORAU team PROC-60, ambient doses for unmonitored workers. So doing a quick comparison of what is currently assigned for ambient dose compared to the PROC-60 numbers, PROC-60 would be more claimant-favorable and so that is the suggested approach at this time.

Mr. Buchanan: Yes, this is Ron again. We'll have to see how that comes out when it is put in the TBD. And so, we can't comment further than that at this point.

Finding 12

Ms. Lobaugh: Okay. If there is no additional

discussion on Finding 11, we can move on to Finding 12. Finding 12 starts on page 14 of the BRS response document.

Finding 12 has to do with internal dose and this is specific for outdoor inhalation exposures associated with waste disposal operations at Site A and particulates released during accidents.

In our discussion with SC&A we found that waste disposal operations at Site A were conducted from 1943 through 1949 and all buried waste was removed to a different site, Site D, in 1949. So since the Site A operations were all conducted during the time prior to 1954, which was already reviewed by SC&A and said to be adequate, we considered -- both NIOSH and SC&A considered this an agreed-upon path forward or you know, agreed that this finding could potentially be closed.

Ron, if you have any additional discussion on this.

Mr. Buchanan: Yes, this is Ron. And yes, this was mainly getting the dates straight and what site had waste at what time. And so reviewing the Site Research Database for those dates, and then NIOSH's input on the dates, and then the visit to the -- in late last March and actually seeing the sites and where things were done, we find that this would be satisfactorily addressed. And so this is one that I don't think involves a TBD change. And so we would recommend that this be closed.

Ms. Lobaugh: Great. So if there is no additional discussion on Finding 12, we can move on to Finding 13.

Mr. Katz: Well before you move on, I think the Work Group needs to decide whether they want to do something now about this or whether they need more information to be able to act on this closure.

Chair Clawson: To tell you truth, Ted, I'm sitting here looking at everything that we've got outstanding on this. Part of my question is on this waste disposal, have we -- has it been accurately depicted of what they -- do we really know what they had there or is

the documentation even that good?

So I know Ron has been involved with this, so this is one of my questions that I wanted to ask. I know that you said that you feel that we can close it but I want to look at the bigger picture on this one, to tell you the truth.

Mr. Katz: So Ron, can you maybe address Brad's questions? Because there needs to be some clarity about whether there is more information to give Brad or it's clearly -- it's not that clear what you discussed for Brad, and maybe the other Work Group Members, too.

Mr. Buchanan: Okay. Yes, I would have to go back -- it would probably be best if I just write down the situation and what we found took place and then send that to you for consideration, rather than try to bring it all -- I don't recall it all at the moment. I'd have to sit down and go back through the notes and some of the documents and such to put it all together.

So we could do that and then --

Chair Clawson: Ron, part of my thing was, was in the early years and when we were first starting into this there were some questions of what the waste really was and what the characterization was of it. And I was kind of going back to -- you know a lot of water has gone under the bridge since then and I just want to make sure that we've adequately addressed what was there and what we have found over the last little while to justify that. That's my main thing, Ron.

Mr. Buchanan: I understand.

Mr. Katz: So does that sound fine, Brad, if Ron writes up a summary memo on this issue, it seems like, and you can run that by Megan, too, and then the Work Group could consider this a little more fully.

Chair Clawson: Right because I hate to make a decision on this because I'm still, I guess in the earlier -- in the earlier years there were some questions on it and I want to find out what brought us to the level of confidence that we have.

So that's fine with me if Ron would do that. I would appreciate it.

Mr. Katz: Okay, Ron. And Ron, that could just be a memo, a summary memo. And again, if you would run that by Megan, too, you can copy me and the Work Group Members when you do that. Then Megan has a chance to weigh in on the summary, and then the Work Group will know more about this issue.

Mr. Buchanan: Yes, that would be fine.

Mr. Katz: Thank you.

Ms. Lobaugh: Great.

Member Valerio: So this is Loretta. I have a question on the same issue. Can you hear me?

Mr. Katz: Yes.

Member Valerio: Okay. So according to the TBD and what Megan is stating that Site A was -- the disposal operations at Site A were conducted between 1943 and 1949. And that was removed, the buried waste was removed to Site D in 1949.

The next statement is, consequently all waste disposal operations at Site A were conducted during the period prior to 1954.

So I guess in my mind between 1949, when the buried waste was removed, and 1954, was -- even though the waste was removed, was there any decontamination and decommissioning activities that took place at Site A?

Ms. Lobaugh: This is Megan. I, again like Ron, don't remember the specifics for this one. So we will make sure we address that, I guess, in the memo if that's okay with you, Loretta.

Member Valerio: That's fine with me.

Ms. Hughes: This is Lara. I believe I looked into that to some extent but I do not remember at this time. So I will be -- I'll make sure any information I have, if I haven't given it to Megan yet, that I do so.

Mr. Katz: That sounds good.

Member Valerio: Okay, thank you.

Mr. Katz: Go ahead, Megan.

Finding 13

Ms. Lobaugh: Okay, great.

So Finding 13, this starts on page 15 of the BRS document. Finding 13 is associated with occupational exposures at Site A and Plot M not being considered.

What we found in our discussion and review was that the specific time frame being talked about and the sites being talked about would actually be covered under the Met Lab and that the Met Lab methodology and SEC would cover this finding.

So again, this is a similar one to Finding 12, where we and SC&A have agreed that this finding could be closed because it actually applies to a different site.

Mr. Buchanan: The background on this was we, originally way back in 2009, questioned how Site A would be divided up, and Site D, and Plot M as far as covering them. And so what we were concerned with was if Argonne D Site started July 1st of '46, what happened to Site A and Plot M before that. And we understand that that is covered under the Met Lab SEC. And so we find that that has been clarified.

Mr. Katz: Thanks, Ron. And I think this really falls under the category of -- the way we classify things today, this is more really an observation than a finding.

Mr. Buchanan: Yes, today it would be.

Mr. Katz: So you know we probably should record it that way for the BRS.

Member Beach: I just have a quick question for either Megan or Ron. Is it clear, the worker -- the employees that worked between Site A and Plot M, is it fairly clear the distinction between those now with this?

Ms. Lobaugh: This is Megan. In Lara's response, I don't want to speak for Lara but in Lara's response from March 8th of 2017, she said that there doesn't seem to be an issue assigning claims to the respective site by DOL based on the review that NIOSH has done.

So Lara, maybe you can speak a little bit more about that, if you remember.

Ms. Hughes: Yes. To address this, back when I looked at it, what I did I pulled up the claims, a selection of claims that we have for both of these sites and just looked at what is the basis that DOL goes on. And it seems like, that they seemed to do a pretty good job in binning it. Also, what you have to keep in mind is this is a continuation. So it starts out at the Met Lab. So there's a date cutoff, there's a pretty clear date cutoff between when the Met Lab ended and ANL-East started. It was -- there wasn't really a cutoff. It was like they changed sites, and that's when DOL or DOE, when they do the site designation, do the cutoff. So anything that would be before, what's the date, June 30, 1946, would fall under Met Lab and the rest would be ANL-East.

Member Beach: Okay.

Ms. Hughes: So there is an overlap.

Member Beach: Okay, thank you.

Chair Clawson: So this is Brad. So, thanks, Josie, for that question because I was trying to remember this distinction between these two labs. But the employees that were working for Met Lab then became part of Argonne East. There was no change, just a change in the name, correct?

Mr. Katz: Well there was a change in the place, Brad, it's a different facility.

Chair Clawson: Okay.

Mr. Katz: So their employment would be -- if they worked at both places that would be captured in the records.

Chair Clawson: Okay. Met Lab was the earlier years, correct, and then they --

Mr. Katz: Yes.

Chair Clawson: Okay. There's been a lot of water flow since we've worked on this and I'm just trying to get the flow of this because I remember this was a big discussion.

And I thought, and correct me if I'm wrong, but a lot of the people went from Met Lab, I thought, on over to Argonne, just right from there. Is that correct, Lara?

Ms. Hughes: Yes, if they continued their employment, it is my understanding their employer was the University of Chicago that ran the initial site, what's now considered Met Lab, and what happened is that the site expanded. They were adding more reactors and larger reactors. And the understanding was that it was not a good idea to have them in the middle of the city. So they found a site that was more removed and where they could expand.

So it was really the same -- it's not the same site for our purpose but it is a consecutive site. So it is very much likely that the workers moved on if they continued their employment with the University of Chicago and it's also that -- I think we have a lot of claims where they have employment at both sites. Or we may not because Met Lab has been an SEC for a long time, but I'm not sure.

Chair Clawson: Right and the distinction between the two is because we have two different SECs. So it could be the same people, basically, on both sides that did this Site A and Plot M waste cleanup, basically. I'm just wondering.

We'll address this, and --

Mr. Katz: Brad, for this one I think the Work Group can -- this is an observation but it is very clean cut and resolved, I think. This is one that the Work Group can close this observation, right?

Chair Clawson: Yes, I'm still -- I'm trying to get my

hands around it. But yes, I remember the distinction between Met Lab and Argonne East. And so I'm not seeing -- Ron, what is your feeling on this?

Mr. Buchanan: I felt that it is more of a concern we had way back in 2009. But we feel that there is a clear-cut boundary there and I don't see that there's a problem at this time. We just wanted to make sure the Met Lab wasn't -- the people that worked at Site A weren't left out. If they were just doing the University of Chicago and Argonne, what about Site A? That was kind of split down the middle. We just wanted to make sure that they were included on one side or the other. And I see that they are. And so I don't have an issue with it.

Chair Clawson: Well, and I remember going through this. My cobwebs are knocking out and I remember what you were saying about being able to be on either side of it.

I really don't see a problem with it. I think that -- but other Work Group Members can chime in, I don't see a problem on it because now, after talking with Ron, I remember the issue was, of the split there.

But if I remember right, the people basically, if they continued their employment, it went right into the Argonne East.

So what do the other Work Group Members feel?

Member Beach: Yes, I'm fine with closing it, Brad. This is Josie.

Member Roessler: This is Gen. I'm fine with closing it but, as we go through this, I'm hoping somebody is doing some good recordkeeping on it, on all of this.

Chair Clawson: Right. I know that I remember reading, and I believe we covered this last time, of the separation between Met Lab and us, there was -- I believe there was quite a write-up on that, the distinction. And the biggest part of this is Met Lab had an SEC earlier. Argonne is now coming into it but we just wanted to make sure that either side of this was adequately covered.

So I don't see a problem with closing this one. Hello?

Member Valerio: This is Loretta. Brad, I agree.

Chair Clawson: Okay.

Mr. Katz: Okay, Megan, so you can close it. And I think, again, you can close it as an observation I think.

Ms. Lobaugh: Okay. So, I will work to get that closed and documented in the BRS System that it's considered an observation.

Chair Clawson: And Megan, just I remember this was -- and Lara you can probably help with this, but there was a fairly good write-up on this that would help justify in this. I know that we've dealt with this and I'm just trying to remember all the ins and outs. But if I remember right, there was a good write-up of it that could be referenced, too.

Ms. Lobaugh: Okay. Is that an SC&A document?

Chair Clawson: I believe it was actually you guys that told us of this separation and how it was. I thought it was something that Lara had put together.

Ms. Hughes: Yes, I do seem to remember -- Megan, I'll get with you and make sure you get it. I'm not sure. Yes, I haven't looked at it in a while and I would have to look through my document.

I seem to remember doing some research on it, but it was really -- we kind of put it as a non-issue because we didn't see that Site A is not falling through the cracks. It's just covered under Met Lab and I think it's discussed in the TBD as well.

Or it might be discussed in the Met Lab ER. I'm not sure.

Chair Clawson: Okay, appreciate it.

Observations for Secondary Issues

Ms. Lobaugh: Great. If there's no other discussion on that finding, then -- well, observation now -- we can move on to the rest of the observations for

secondary issues.

So they start on -- let me find the page -- they start on page 16 of the BRS response document.

Secondary Issue 1

And Secondary Issue 1 covers potential missed dose from skin and clothing contamination. This issue has to do with assigning dose from skin and clothing contamination, external dose. So the path forward for this is to update the external dose TBD with current OTIB-17 guidance. And this was agreed on with SC&A in our discussions.

So Ron, if you have any additional information to add.

Mr. Buchanan: Yes. And this, of course, has been quite a bit of discussion on skin and clothes since 2008 and 2006 when the TBD was written. And so we feel that this has probably been resolved. We just need to see it in the TBD. And we'll review that and give a written evaluation of it. So, we agree with the path forward.

Mr. Katz: Okay, so that would be a recommendation for putting it in abeyance.

Ms. Lobaugh: Yes, correct.

Mr. Katz: Is that good with Brad and the rest of the Work Group?

Chair Clawson: Yes, that's fine with me.

Member Beach: Yes.

Member Valerio: That's fine with me.

Mr. Katz: Okay, Megan.

Secondary Issue 2

Ms. Lobaugh: Okay, moving on to Secondary Issue 2, starting on page 17. This has to do with radiation exposures from other medical equipment other than typical x-ray machines.

What was found in reviews and interviews with

workers was that there were no other medical equipment, radiation-generating devices used in the medical facility or for medical reasons. So this, again, would be one of the issues that we would suggest closing at this time.

So Ron, if you want to add anything.

Mr. Buchanan: Yes. Of course this was kind of early on in the game and we didn't know if there was any therapeutic or other type of machinery there at Argonne National Labs. And so during the interviews and reviewing the Site Profile -- I mean the SRDB documents, we found that there's no indication. Of course we have found in the program, in general, that there wasn't that sort of therapeutical and such there at the medical facilities at the National Labs.

And so we recommend that this has been resolved and is not an issue at this point.

And so we recommend that -- this was a secondary finding in our original report which, in today's language, is an observation. We recommend closure.

Chair Clawson: This is Brad. I have no problem with closing this one. Other Work Group Members?

Member Beach: This is Josie. I don't have a problem closing this one either.

Member Roessler: And this Gen, I don't either.

Member Valerio: This is Loretta. I don't have any problems either.

Chair Clawson: Okay, it sounds like it's closed, then.

Mr. Buchanan: Okay, so Megan will you close that on the BRS?

Secondary Issue 3

Ms. Lobaugh: Yes.

Okay, so moving on to Secondary Issue 3, which is on page 18, this has to do with uncertainties for medical x-ray dose. And again our path forward for this one is update the medical -- the occupational

medical x-ray Technical Basis Document to include OTIB-6 guidance.

And again, we would recommend placing either this in abeyance or waiting for the TBD updates, depending on what SC&A wants to do or the Work Group.

Mr. Buchanan: Yes, thank you. This would be held in abeyance just like we did on the others instead of closing.

Chair Clawson: This is Brad. I agree with that, Ron.

Member Roessler: I do, too.

Member Beach: I also agree with that.

Member Valerio: I agree. This is Loretta.

Ms. Lobaugh: Great. So Secondary Finding 3 -- or Secondary Issue 3 would be in abeyance.

Secondary Issue 4

Moving on to Secondary Finding 4 or Secondary Issue 4, this has to do with internal dose to workers from radon exposures and not being considered.

So NIOSH's current stance is that there is no record that indicates any worker monitoring for radon was routinely performed and that there were no major sources of enhanced radon that would cause an exposure.

So our suggestion is to update the internal TBD, internal dose TBD with additional justification for why we don't assign radon dose. And if in our update to the internal TBD we find any additional information that would suggest assigning radon dose, we would incorporate that at that time. But currently we would just suggest to add additional justification for why no radon dose is assigned.

Member Roessler: Okay, this is Gen. So you interpreted SC&A's concern as being radon dose, I assume, here. And then when you address that, it appears you are going to look at whether there were quantities of uranium or radium and by showing that

there were not, then you would answer this question.

Is that where you're going on this?

Ms. Lobaugh: Yes, correct.

Member Roessler: Okay. Okay, thanks.

Mr. Buchanan: This is Ron. And of all the issues that we have here, this is one that we kind of take exception with. And even though it started out an observation -- I mean as a secondary issue and changed to an observation, we have looked at this and feel that there are still some unanswered questions here. And it might turn out to be nothing or it might turn out to be a major issue because if we look at the TBD-2, pages 25, 26, and 27, we see that there is a fairly significant amount of radon-222 and radon-220 released from the stacks in the 80s in the findings. And so that came from some place.

And so at this point, we're not sure if this is vented directly from inside of hot cells, if this was a potential exposure to the workers inside the building, I guess Building 220 -- or 200 area series of buildings, was the one that reported most of this radon and radium usage.

And then in TBD-4, page 19, there is some calculations for 100-curie radium, 220 source to the environment. And so we felt that this has been addressed more from an environmental point of view, rather than a worker point of view. It's been addressed from a TBD-4 point of view, rather than a TBD-5 point of view.

And so we had asked in our last reply if they had looked to see if there is any radon measurements, or bioassays, or any sort of that sort of thing in the files. And they said of the 95 claims, there was a number for radon in decay products but no indication that radium or radon was monitored for it.

And so at this point, we're still not completely satisfied that there was no potential for radon exposure to workers inside of buildings, especially around 200 -- Building 200 and such, where there was a significant amount of radon out the stack.

And so at this point, we're not really satisfied with the path forward, unless there is some really good justification like workers weren't present, it was all in the hot cells going out the stack, and that there was no exposure potential inside the buildings.

Member Roessler: Okay, Ron, that was very clear. So I think we know where we need to go on that.

Chair Clawson: I agree. I think we need to dig a little bit deeper on this one, Ron, and we'll go from there.

Ms. Lobaugh: Okay.

Mr. Katz: Can I just ask a question here for clarity about who is digging where?

Megan, is this issue that Ron has raised, is this one that you guys are going to be exploring as you develop the TBD? Are you doing something that is more data-related to this or what have you?

Ms. Lobaugh: We can. The plan was as we update the internal dosimetry Technical Basis Document that information that we review within that, if it shows us that there is a source, then we would bring that forward to SC&A and discuss it. But there wasn't a targeted approach for that, but we can definitely do that.

Mr. Katz: Okay. Well, you've heard the concerns. So you know where the review will be coming from what you have to address.

Ms. Loaugh: Yes.

Mr. Katz: Okay, thanks. So then I don't think there's an action for SC&A on this right now except to see what is finally produced on this in terms of the support material for whatever method is recommended.

Ms. Lobaugh: Yes.

Mr. Katz: Thanks.

Ms. Lobaugh: So one thing I would like to ask at least is, would the process forward then for us be,

present this before we write it up in the TBD? Would that be the ideal situation, present it to SC&A before we include it in the updated TBD?

Mr. Buchanan: I think that would be more efficient -- put it in the TBD and then have to go through it again. Because we would like -- you know we're not saying red flags. We're just saying we're not sure where the workers were in relationship inside the building to a TBD-5 issue rather than a TBD-4 issue. So I think it would be most efficient if you would provide us with your direction and what you find out before you actually do all the work of putting it in the TBD.

Mr. Katz: So Megan, that would just be like a memo or a White Paper with references to the support for what you find, what you end up finding.

Ms. Lobaugh: Okay, great.

Mr. Katz: Thanks.

Secondary Issue 5

Ms. Lobaugh: Okay, so looking at Secondary Issue 5, which starts on page 21 of the BRS response documents, this is lack of treatment provided to the monitoring of contractors, transferees, and visitors.

So in our review of the SRDB documents and interviews with workers, we did not find any evidence of contractors, visitors, or transferees not being monitored. So our suggested path forward would be to update the external Technical Basis Document to include clarity or specify that contractors, transferees, and visitors were monitored.

This was especially brought up due to the fact that there was use of roving dosimeters. So especially in that discussion, mentioning that there is no evidence of a lack of monitoring for contractors, transferees, and visitors.

Ron, if you have anything.

Mr. Buchanan: Yes, NIOSH -- since we had brought this up in 2009, and I've got involved in this

discussion, NIOSH has provided a number of interview records and Site Research Database documents. And I went over those and, having worked with the Savannah River Site, I was looking for things that would indicate a problem with people not being badged, especially temporary or part-time. And looking at those documents, and the variety of dates on them, and the facilities, I did not find evidence of subcontractors and visitors being monitored different than the full-time employees and, therefore, we don't have an issue with it. And we will agree with that in the TBD changes and give our evaluation at that time.

So we can remove that. It's in abeyance. Remove that closure and put it in abeyance.

Secondary Issue 6

Ms. Lobaugh: Okay. If there is no additional discussion on the Secondary Issue 5, we can move on to Secondary Issue 6, which is on page 22 of the BRS response document.

Secondary Issue 6 has to do with the human radiation experiments that were conducted at ANL-East and the fact that they were not adequately addressed within the TBD.

So the discussion with SC&A has revealed that the exposures, these exposures, these human radiation experiments that occurred at ANL-East would be covered EEOICPA exposures or covered program exposures but how we approach them is at the claim level.

So there is some discussion of these human radiation experiments in the TBD. So our path forward would be to provide explicit direction to the dose reconstructors within the TBD to include the human radiation experiments dose, if there is evidence in the claim.

So currently, like I said, we approach these on an individual level when there is information within the claim documentation that shows this person would have been a participant in human radiation

experiments.

So Ron, if you have any additional discussion.

Mr. Buchanan: Yes, the original question on this was, we wanted to make sure or we wanted to clarify, rather, the human experiments would be included under The Act. And we found out they would be. And then make sure that they are included in the dose reconstruction if they were subject to it.

Now, I realize there is a number of caveats here that some of the facilities were not under The Act and that sort of thing so it has to be separated out. I did go back to the SRDB references and looked at some of the human experiments, write-ups, and such, and see some of the details. And I agree that this could be separated out. It doesn't seem to be an issue but we would like to see this explicitly described in the TBD. And so we'll review that when it is released.

And there's no further issue with that at this time.

Member Roessler: This is Gen. I have a question on this. I'm trying to see how do you identify, while these human radiation experiments involved a variety of people and I can see that it would include workers, how do you identify it, or how do you find out if a particular worker was involved in the experiments? I'm totally unaware of how that was handled.

Ms. Lobaugh: Vince can correct me if I'm wrong but I believe there is information within the claim documentation we received and then within the references that we have in the SRDB that talks about the experiments that were done.

But Vince, could maybe you speak a little bit more?

Mr. King: Yes, there was an SRDB document, I can't remember it right off, but in fact SC&A was the one that pointed out, where there is a compilation of human radiation experiments. And the only ones I saw in there appeared to be University of Chicago, like a cancer treatment, and it was separate from the University of Chicago, and Met Lab, and all of that. It was the hospital. It was a different facility and

there didn't seem to be any employees from ANL-East that were in that compilation.

And other than that, I'm not sure how you would identify who was involved in radiation experiments, other than just documentation with the claimant file.

Ms. Brackett: This is Elizabeth Brackett. I just joined the call, sorry. I'm with the ORAU Team.

Actually there was a claimant that had identified in his record that he had been involved in some experimentation. And we were able to match him with one of the entries in that documentation, the DOE Human Experimentation Volume, where it gave the specific details of how much the administration was.

So there was very specific detail in his claim file that came over to us.

Mr. King: And that's what I would expect. It would come in with the claim file.

Member Roessler: So it would be the claim file, it would have to appear in the claim file first and then you would cross-check it with the documentation that you feel is pretty complete on the human radiation experiments.

Ms. Brackett: Yes, there was a big effort by DOE to go back and track down all of the human experimentation that went on. And as Vince said, there's not much listed that actually occurred at ANL-East but I think that that would be the case.

Member Roessler: Okay. I think this is going to be a question that may come up from other Board Members, too, so I think we need to make sure that the way you address it is pretty straightforward.

Ms. Lobaugh: Okay.

Chair Clawson: I agree with you, Gen. This is Brad.

Mr. Katz: Okay, then, Megan. So I think that is in abeyance.

Ms. Lobaugh: Yes. Great. So the last secondary issue to talk about is Secondary Issue 7, which starts on the last page, page 23 of the BRS response document. And this has to do with incidents and accidents and our discussion of incidents and accidents in the TBD.

So the discussion we had with SC&A is that there is a section on incidents and accidents within the document for significant incidents and accidents that had happened. And we have reviewed some additional SRDB documents and claims that tell us that early on the -- early in this time period, the documentation is there to tell us when somebody was involved in an incident.

So within the dosimetry results or other documentation that we have for a claim or in the SRDB database, we will know when somebody was involved in an incident. Typically, we will know when that happens.

And then the later time period, if it is a major incident, there would be tracking by DOE and we should receive that information from DOE if there is a significant exposure or a major incident that that person was involved in.

So in our discussion we basically provided that this is handled, again, on an individual claim basis based on the documentation that comes with the claim and SRDB searches that are done based on the claimant's information.

And so our final discussion was that we recommend closing this issue or recommend putting it in abeyance until the TBD is updated with more specific information about how the claims are handled.

Mr. Buchanan: Yes, this is Ron. We looked at the Site Research Database documents they referred us to because SC&A did their own search for incidents that might lead to unmonitored exposures. And considering the badging policy and bioassay program overall, and the incidents that we could find, we did

not find that there was a further issue on this observation.

Ms. Lobaugh: So at this time, I guess our recommendation is to place it in abeyance.

Chair Clawson: Yes, that would be best. I think there is a little more to this that will come out. But I would suggest we put it in abeyance right now. This is Brad.

Member Roessler: I agree.

Member Valerio: I agree, Brad. This is Loretta.

Member Beach: And I'm in agreement also, thanks.

Ms. Lobaugh: Okay. So that was all of the findings and secondary issues for the ANL-East Site Profile.

So I don't know -- should we do a quick review? Would that be helpful if I go through a review and say basically for each finding what -- I mean quickly, whether it's in abeyance or whether -- what the path forward is for NIOSH?

Member Roessler: I don't think I need that. I took notes.

Ms. Lobaugh: Okay.

Chair Clawson: I think we're pretty good on that.

Ms. Lobaugh: Okay.

Chair Clawson: You know a lot of this is going to come down to the TBD and a lot of these will be taken care of with that.

We've got a couple that are out there that we need a little more information on but I'm pretty good with the path forward.

Mr. Katz: Yes, I think, Megan, as long as we update the BRS from this meeting, we'll be good.

Ms. Lobaugh: Okay, I will do that.

Member Roessler: Brad, may I make a comment? Brad?

Chair Clawson: Yes, go ahead.

Member Roessler: Okay. This is Gen. I just wanted to second what Brad said, there's been a lot of water flow since we worked on this before and I really appreciate Ron's brief update on everything. It got us right back to the pertinent things, and the systematic way that Megan and Ron proceeded here, it really helped I think to explain everything to us.

Chair Clawson: And having Lara here with us, too. I know this is kind of hard, one person starting into it and coming in the middle. And we appreciate Lara's input, too.

Ms. Lobaugh: Yes, definitely.

Mr. Katz: Yes, and welcome, Megan, to the Work Group -- the Work Group world.

Ms. Lobaugh: Thank you.

Mr. Katz: Okay, Brad, are we ready to adjourn, then?

Chair Clawson: Yes, we are. I guess one of my things is and, Megan, I know this can be kind of a little bit hard, but what type of a time frame are we looking for to get some of the -- especially like the TBD and stuff, what do you think we're looking at for a time frame?

Ms. Lobaugh: Yes, so as scheduled right now, we're looking at the end of this year, beginning of 2019. But I will throw a caveat out there that with the fact that we've been discussing doing additional data captures for the neutron/photon ratio information, the external dose TBD might be a little bit longer than that.

But currently, as scheduled, we're talking basically beginning of 2019. But I will update the Work Group as, you know, if we see those dates changing at all.

Adjourn

Chair Clawson: Okay, I appreciate that. I don't really see scheduling another Work Group meeting until we have a little bit more information and are ready to do

some more work.

So that being said, if there's nothing more to say, I'd say let's adjourn.

Mr. Buchanan: I had one question for Megan. Did you plan on releasing the TBDs as you get them revised or are you going to release them all at once?

Ms. Lobaugh: I think typically we do it as they are revised but they're all going to be pretty close to each other, given our current time line, like within a month or so, I would say, of each other.

Mr. Buchanan: Okay. It helps us if you release them when you get them done. That way we can spread it out a little more to work on them.

Ms. Lobaugh: Okay, great.

Chair Clawson: Good point, Ron.

Well thank you, everybody. I appreciate it.

Does anybody want to say that we're adjourned and second it?

Member Beach: It sounds like you just did.

Chair Clawson: Sounds good. Thank you, everybody. I appreciate your time today.

(Whereupon, the above-entitled matter went off the record at 11:59 a.m.)