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

+ + + + +

ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

+ + + + +

WORK GROUP ON WELDON SPRING

+ + + + +

THURSDAY
FEBRUARY 1, 2018

+ + + + +

The Work Group convened telephonically, at 2:00 p.m., Eastern Time, Richard Lemen, Chair, presiding.

PRESENT:

RICHARD LEMEN, Chair
R. WILLIAM FIELD, Member
PAUL L. ZIEMER, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
RON BUCHANAN, SC&A
DAVID HARRISON, ORAU Team
STU HINNEFELD, DCAS
MARK ROLFES, DCAS

Contents

Call to order, Welcome, and Roll Call..... 3
Overview/update of Weldon Spring Plant's..... 5
Site Profile review: 6 closed findings,..... 5
22 open findings, 9 observations, matrices,..... 5
and BRS..... 5
Update/discussion of open Finding #24..... 10
(awaiting EU PER)..... 10
Discussion of 21 open findings recommended..... 14
for closure (Findings 3 - 19, and Findings..... 14
25 - 28)..... 14
Discussion of nine observations that have..... 38
been resolved..... 38
Adjourn..... 52

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

2:00 p.m.

Call to order, Welcome, and Roll Call

MR. KATZ: Welcome, everyone, to the Advisory Board on Radiation and Worker Health. It's the Weldon Spring Work Group.

The agenda for today's meeting and the materials related to today's meeting are posted on the NIOSH website under this program, schedule of meetings, today's date. You can go there and pull up the agenda and all the materials that we'll be talking about. There's no presentations because there's no formal presentations being given, although there will be a lot of talk from the staff that have been doing the work on both sides of SC&A and DCAS.

I would just also ask, everyone, please, except for when you're addressing the group, keep your phones muted, because it will improve the quality of the sound for everybody. And you press *6 to mute your phone; *6 to take

your phone back off of mute, if you don't have a mute button.

Okay. So, we have a little bit of a change in the constitution of the Work Group. I should note that, too. Dr. Lemen is still our Chair, but we have Paul Ziemer, Dr. Ziemer, who will be joining the Work Group now. Bill Field actually joined it also sort of late in the process, but he's been with us for a couple of meetings. And Paul's with us now.

There are no conflicts of interest among the Board members. But, then, now I'll run through the staff, and please address conflict of interest as we do roll call. We have all three of the Board members.

(Roll call.)

And John Stiver sent me a note to say he wouldn't be doing this. So, I'm not sure there are any others from SC&A.

Okay. The last thing I will just note for everybody, Dr. Field, Bill has a commitment

for about 20 minutes, I think starting around 2:00 p.m. Eastern time.

MEMBER FIELD: That's right.

MR. KATZ: And so, he may be leaving us for a brief period if we haven't finished at that point.

Okay. That's the preliminaries. Dick, it's your meeting, and I think Ron is ready to start with his piece.

CHAIR LEMEN: Okay. I think, Ron, you're going to talk about six -- we have 22 open findings and nine observation matrices. And I guess you'll introduce your talk and throw in the rest that I didn't talk about now.

Overview/update of Weldon Spring Plant's Site Profile review: 6 closed findings, 22 open findings, 9 observations, matrices, and BRS

DR. BUCHANAN: Okay. Yes. I would like to give a little introduction before we get started because it's been a long time since this

Work Group has met formally, it's about six years. And so, I wanted to give you just a refresh your memory because I know it's been a while since you've probably looked over this material. So, I'll give a very brief introduction and, then, we'll go on to the particular findings.

Weldon Springs is a 220-acre site near St. Louis, Missouri, and it processed uranium compounds during the period 1957 to 1966. It was put in standby from 1967 to 1985 and had maintenance and monitoring only. Went into the remediation period 1985 to 2002, at which time all the radioactive material was shipped offsite and low-level waste was buried, some of it in concrete slurry at the main site, and had a large rock pile put over it. It looks like a big rock pyramid at this time. And, of course, they have onsite and offsite monitoring going on.

Now the initial TBDs were issued in 2005, TBD-1 through -6, Rev 0s. And those have

changed through the years. We've got all currently as Rev 1 all the way up to Rev 4, and the dates range from 2013 to September of 2017. So, you can see it's fairly recent editions on some of these TBDs.

Now SC&A was tasked and first evaluated the TBDs and issued a report at the end of February of 2009. In that report we had 28 findings and nine observations, which we're going to discuss some today.

Now, since then, there's been eight Work Group meetings in the period 2010 to 2012. And like I say, it's about six years since we convened formally.

Now this came about at the Advisory Board meeting the 27 of May in 2017. There was some discussion of Weldon Spring, some updating done, to the Board, and it was discussed and SC&A was tasked to review any of the current TBDs and revisions to see if they addressed the previous findings.

So, through the summer and fall of 2017, SC&A reviewed the current TBDs and provided responses and an updated matrix on the BRS. Now there were some emails sent out on some of the findings, No. 4 for recycled uranium and Finding 25 for geometry factor, to the Work Group last summer.

And that brings it up to the current status. In November of 2017, SC&A brought things up-to-date and put them on the BRS. And so, on the BRS you'll find 28 findings. On the first finding is an attachment which gives the current matrices for the findings. And also, there's nine observations. On the first observation is attached the matrices for the observations.

Now I put those in in order. Unfortunately, the BRS has scrambled the numerical order of them somewhat, so they're not exactly in order when you look at the BRS, but they were put in there right.

And some of them are closed. Six

findings were previously closed. That was No. 1, 2, 20, 21, 22, and 23, had been previously been closed by the Work Group. There's one finding, No. 24, which is addressed as enriched uranium, which created a PER, and we'll get an update from NIOSH on that today.

And then, there's 21 findings, number three through 19 and number 25 through 28, which SC&A has evaluated the revisions in the TBD and all correspondence with NIOSH or the Work Group, and we will recommend those for closure.

Now there's nine observations which have been resolved and recommended. Those are to be closed or whatever we need to do with that. I find that they've been resolved, and those appear on the BRS also.

So, with that, that concludes my introductions. Are there any questions at this time before we go on to number two.

(No response.)

Update/discussion of open Finding #24

(awaiting EU PER)

Okay. I hear no questions. So, item number two on our agenda today is an update and discussion of open finding number 24. Now I don't know if you are on Skype. I have it up on Skype and presenting the matrices, if anybody wants to refer to that. Does anybody have that on or can they see it, to make sure I'm hooked up?

MR. HINNEFELD: I can see it, Ron.

DR. BUCHANAN: Oh, okay. Thank you.

Okay. So, we see on that number 24 is enriched uranium not sufficiently addressed. This was back in our 2010 finding, and we found that enriched uranium was mentioned, however, we felt that the 1-percent enrichment was -- we questioned whether that was the maximum Weldon Spring had received.

Since that time, we have received documents on the Site Research Database which do show that and do state that Weldon Spring did not

receive anything greater than one percent enriched uranium from 1957 to 1966. So, we agree with that, and we have no further issue with that.

Now TBD-5, Revision 3 of 2017, increased the one percent enriched uranium specific activity from 0.783 picocuries per microgram to 0.973 picocuries per microgram. So, this would increase the dose assigned to those previous claims that had been processed with the older value. And so, therefore, a PER was required.

And our last information was October 4th of 2017. We got an email from NIOSH saying that that would be issued. And so, at this time I'll let NIOSH update us on where that's at.

MR. ROLFES: Thank you, Ron.

I checked to see, I looked back to see. NIOSH/DCAS submitted the PER to ORAU on November 13th of last year, 2017, and ORAU has completed a list of the affected claims as of yesterday for DCAS review and approval. I don't

know if it's been transmitted to us yet or not, but that PER documentation is scheduled to be reviewed and completed and, then, submitted to the Department of Labor by the end of May of this year.

DR. BUCHANAN: Okay. Thank you, Mark.

As far as SC&A is concerned, the PER was not part of our initial finding. So, I just want to keep track of it on this. However, I don't know if the Work Group -- we consider the issue closed, the data in the research database, but I don't know if the PER is a separate issue which we'll follow separately or how the Work Group wants to -- if they want to close that or leave it open.

MR. KATZ: So, Ron, this is Ted.

So, I mean, it is a separate issue. And your recommendation to close the finding is really what the Work Group needs to hear. And then, I guess if we're going to take these one-by-one, we might as well take this first, but I

think, then, we just put it to the Work Group, does it concur with your recommendation? If so, we can close that and go on to the next finding.

CHAIR LEMEN: I guess we ask the Work Group, do you concur? Can we close it?

MEMBER ZIEMER: This is Ziemer.

I believe they've resolved the issue as far as the use of the 1 percent -- or use of the concentration value. So, I'm in favor of closing the finding itself.

CHAIR LEMEN: Okay. Bill?

MEMBER FIELD: Yes, this is Bill. I agree.

CHAIR LEMEN: And I agree.

MR. KATZ: And so it's closed. And just for a process question, after this meeting Ron will, then, update all the findings to relate to whatever the final decisions are in terms of closure and non-closure of the findings.

CHAIR LEMEN: Okay.

MR. KATZ: Let's move on.

CHAIR LEMEN: So, it's closed.

MR. KATZ: Yes.

DR. BUCHANAN: Okay.

CHAIR LEMEN: Next?

Discussion of 21 open findings recommended for closure (Findings 3 - 19, and Findings 25 - 28)

DR. BUCHANAN: Okay. Yes, like Ted said, after the meeting I'll update it on the BRS for permanent record.

So, right now, we have quite a few of these to cover. What I suggest I do is read the title, give a little description, if I need to, and how it was resolved, and then, SC&A's recommendation, if that's okay with the Work Group.

And so, if look at now Finding 1 and 2 has previously been closed, so we don't need to discuss that. And that's marked "closed" on the BRS.

Now that brings us to our first open

finding, which is finding number three, which is individual exposures versus average exposures. And this came about because that Weldon Spring processed mainly natural uranium; over 97 percent of its material was. However, there was some enriched uranium, some recycled uranium that was also processed, certain projects, and this could create exposure for certain workers. And that was a basis of the finding.

Now what we have found since that time is that the potential exposure to other radionuclides of concern besides the uranium has been addressed in other findings, such as number four, number 14, and number 24, and such as we just looked at for enriched uranium. And therefore, we find that the issue has been addressed and we would recommend closure.

CHAIR LEMEN: This is Dick. It's kind of slow because I have to go on mute and, then, come off.

Bill, first to you. Do you agree with

closure on this one?

MEMBER FIELD: Yes. Yes, it looks reasonable.

CHAIR LEMEN: And Paul?

MEMBER ZIEMER: Yes, I agree on this one as well.

CHAIR LEMEN: And I do. So, we close this one.

MR. KATZ: And, Dick, you know you can stay off mute because the three Board members aren't going to cause a lot of audio problems here.

CHAIR LEMEN: Well, I might pose a lot of noise.

(Laughter.)

MR. KATZ: Okay. Go on, Ron.

DR. BUCHANAN: Okay. That brings us to issue number four, and that was recycled uranium. We felt that it was mentioned in the TBDs, but not sufficiently addressed. And we find out, since items have developed since then,

that the TBD has been revised several times, and has included the recycled uranium and their associated radionuclides and the intakes, assignments. Okay with that.

Yes, we did have little problems getting all the dates straight so that they corresponded in all TBDs. The correct wording was to start in 1961 and from then on, and some of them said "after 1961". But, then, the recent editions of the TBDs state 1961 and are consistent. And so, we recommend that this issue be closed.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Yes, I agree. That was kind of a minor one, but that's taking care of it.

CHAIR LEMEN: Bill?

MEMBER FIELD: Sounds good.

CHAIR LEMEN: And I'll agree. So, it's closed.

DR. BUCHANAN: Oh, okay. That brings

us, let's move on to the next one. Another closed one.

Issue number five is accident and incident documentation not sufficiently addressed in the TBDs. Now this, of course, is back about 10 years ago. We have discussed those at many sites since then. We did discuss them at the 9/13/21 (sic) Weldon Spring Work Group meeting. NIOSH did provide some dose reconstruction information/clarification. SC&A did agree with this issue. It was resolved on page 136 of the transcript. And so, we recommend closure on this finding.

CHAIR LEMEN: Bill?

MEMBER FIELD: So, this one goes back a while. Yes, I think it's fine.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Yes, I agree, close.

CHAIR LEMEN: I'll agree. So, it's closed.

DR. BUCHANAN: Okay. Now findings

number six, seven, eight, and nine are all kind of related to the same issue. And that's the TBD-3, and that's X-ray frequency and exams, the type and frequency of what exams, lumbar spines, that sort of thing, how you convert that to dose.

And initially, TBD-3 did not clarify this, we felt. However, TBD-3 has been revised, and this was discussed at the 1/25/2011 Work Group meeting on page 250 to 258, and NIOSH clarified some stuff in that meeting and, also, made it clear that the OTIB-79 and OTIB-6 and the latest revision of TBD-3, and to they provide clarification of the frequency and the type of X-rays taken and the dose conversion, and different parts of the body. And so, we feel that six, seven, eight, and nine have been addressed, changed in TBD, and recommend closure of those four findings.

CHAIR LEMEN: So, right now, we're voting on the four findings, six, seven, eight, and nine, is that correct?

DR. BUCHANAN: Correct. They're all resolved by the same TBD-3 changes.

CHAIR LEMEN: Okay. Paul?

MEMBER ZIEMER: Yes, those are all the X-ray exposures. Now these were all just the regular worker X-rays, annual X-rays, were they not?

DR. BUCHANAN: Correct.

MEMBER ZIEMER: Yes. Yes, I'm in favor of closing that. That has easily been taken care of.

CHAIR LEMEN: And Bill?

MEMBER FIELD: You bet. It looks like that TBD was updated. It helped a lot.

CHAIR LEMEN: I agree also. So, those four are closed.

DR. BUCHANAN: Okay. Now that brings us to number -- now that was TBD-3. These go kind of by TBD, so we're on TBD-4 now, number 10. And this is another one where four of them are all addressed by the same resolution, changes in

TBD-4, 10, 11, 12, and 13.

Ten was lack of atmospheric monitoring data for the operational period, using Weldon Spring data. That's since been rectified.

Insufficient data for unmonitored workers' internal environmental doses. Lack of validation for maximum environmental dose, and lack of sufficient effluent data prior to 1967 during the operational period.

Now those came about in that a lot of the information in the original TBDs used some data from Fernald for what we felt wasn't good situations to determine the exposure. However, TBD-4, Rev 1 of 5/17/2013, had data by assigning environmental intakes with accompanying text for the DR, and they had quite a bit of information and added Weldon Spring's data, didn't rely as much on Fernald data. And so, we see that on the summary of additions there's quite a few on page two of Rev 1 of TBD-4, and that these additions resolve the environmental intake issues that we

had in TBD-4 for finding 10, 11, 12, and 13. And so, we recommend the closure of those four findings.

CHAIR LEMEN: So, we're talking 11, 12, 13?

DR. BUCHANAN: Ten, 11, 12, and 13, the four findings on environmental.

CHAIR LEMEN: Okay. Okay. On the environmental?

DR. BUCHANAN: Mm-hmm.

CHAIR LEMEN: So, Bill, what is your opinion?

MEMBER FIELD: Yes, I agree.

CHAIR LEMEN: And Paul?

MEMBER ZIEMER: Yes, and I just have one question on these. Does this include those lookup tables that the dose reconstructors use then?

DR. BUCHANAN: Yes, they would include data that's now contained in the TBD that's to be used for environmental intake for people that

weren't monitored.

MEMBER ZIEMER: Yes. Well, I'm assuming, Ron, in your review of this that you took a close look at the tables. I mean, I glanced through them, but you took a good look at the tables themselves, right?

DR. BUCHANAN: Yes. Each revision that came out we did a test, reviewed it to see that it satisfied --

MEMBER ZIEMER: Yes.

DR. BUCHANAN: -- didn't pose any new problems and satisfied the old problem.

MEMBER ZIEMER: Yes. Yes. Okay, yes, I favor closing them then.

CHAIR LEMEN: Okay. I do, too. So, that leads us, Ron, I guess, to start on 14, right?

DR. BUCHANAN: Right. Correct. Okay. So, we start on 14. And 14 is that we were concerned about the ratio of some of the uranium/thorium/radium ratio here in TBD-4,

whether it covered all the workers and such. And we find that Revision 1 of TBD-4 of 5/17/13 added tables and data on pages 19 through 22 to resolve these issues. And again, we have went through that and found that they did resolve it. So, we recommend closure.

CHAIR LEMEN: For 14?

DR. BUCHANAN: On number 14.

CHAIR LEMEN: All right. Paul?

MEMBER ZIEMER: Yes, agreed.

CHAIR LEMEN: Bill?

MEMBER FIELD: Yes.

CHAIR LEMEN: And I agree.

So, let's go to 15.

DR. BUCHANAN: Okay. Fifteen was the natural thorium was not always negligible. And so, we just said that it should be addressed also. And we're seeing that revision to TBD-4, Rev 1 of 2013, on page 10, has information that corrects this issue. And so, we recommend closure on number 15.

CHAIR LEMEN: Okay. Bill?

MEMBER FIELD: Yes.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Yes.

CHAIR LEMEN: And I say yes.

So, let's go to 16.

DR. BUCHANAN: Okay. Number 16, use of external environmental dose from Fernald estimated data. In essence, the earlier TBDs relied quite a bit on Fernald. And so, we brought this issue up. And TBD-4, Rev 1 of 2013, Section 4.3, uses Weldon Spring's data instead of Fernald data. And so, we reviewed that, felt that that covered it sufficiently, and that it had been resolved, and recommend closure on finding number 16.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Yes, I'm in agreement with their finding here.

CHAIR LEMEN: Bill?

MEMBER FIELD: In agreement.

It seems like a lot of these were completed a while back. I was just wondering, if we had had a meeting sooner, we could have closed a lot of these before, couldn't we?

DR. BUCHANAN: Yes, that's correct.

MEMBER FIELD: Okay.

CHAIR LEMEN: So, I agree.

So, let's move on to 17.

DR. BUCHANAN: Okay. Number 17, episodic releases, and this has a time variance to it. Can you do a chronic exposure compared to acute releases, that sort of thing? This has been discussed several times and at other sites. And we discussed it at the 2011 Work Group meeting, and NIOSH supplied clarification of the information and NIOSH testing. They agreed with this issue along with the incidents were resolved on page 136 of the transcript. And therefore, we recommend closure.

CHAIR LEMEN: Okay. Bill?

MEMBER FIELD: Yes, that looks fine.

MEMBER ZIEMER: Yes, Ron, could you just remind me? I actually didn't look at page 136 of the transcript. What does that say there?

DR. BUCHANAN: I don't --

MEMBER ZIEMER: Or maybe you don't need to quote it, but that's the Work Group transcript, I believe?

DR. BUCHANAN: Right, and that was, if I recall right, that was when we were questioning the bioassay data that would represent the releases. And at that time NIOSH discussed how they would use the bioassay data or coworker data or environmental data to assign dose. And at that time, as far as I recall, we agreed that that would cover the incidents that workers might be exposed to.

MEMBER ZIEMER: Yes. Okay.

DR. BUCHANAN: I can go back and read that page to you exactly. I don't have it --

MEMBER ZIEMER: No, that's fine. Okay. Yes, I'm okay on that.

CHAIR LEMEN: And I am.

So, let's go to 18.

DR. BUCHANAN: Okay. Number 18 is incomplete assessment of uranium decay products. Okay. We felt that some of the decay products weren't covered sufficiently in the TBD-5. Now we're moving on to the next TBD-5 for finding 18. And TBD-5, Rev 2 of 2013, Section 5.2.2 provides data that includes this information and intakes, and that we find this has been resolved. So, we recommend closure.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Yes, I was good on this one.

CHAIR LEMEN: Bill?

MEMBER FIELD: Yes.

CHAIR LEMEN: And I am.

So, let's go to 19.

DR. BUCHANAN: Okay. Nineteen, a little bit of background on this. It's incomplete radon exposures. Initially, NIOSH

refusing an environmental exposure for TBD-5, and we questioned that. And so, they went into an indoor exposure model, if I recall correctly. It's been a while. And where they didn't have any ventilation, it was probably overly conservative. And they put maximum material processed in the inside room, did a modeling of radon intake. And we found that this modeling was acceptable. And it was discussed at the 6/7/2012 meeting, on transcript page 69.

At that time the Work Group discussed it and said they would take it to the Board, the Advisory Board's next meeting. I wasn't in on that Board meeting, but, since that meeting, the Board apparently questioned the .5 equivalent factor. And NIOSH has since increased it to .7 in the revised TBD to increase the equilibrium factor.

And I've talked to other people at SC&A about this, and they say this is quite conservative. And so, SC&A finds that it's

conservative and recommends closing. We sent an email to the Work Group of 12/6/2017 that this response was agreeable, and we entered it on the BRS. So, that's where that stands at this point.

If the Work Group feels comfortable with, I guess, the Advisory Board's recommendation of .7, then we can recommend closing it.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Well, I have one question on this one. Maybe Ted can remind us. Did the Board itself recommend that change or was it simply discussed and, then -- the change from .5 to .7?

MR. KATZ: Yes, Paul, I believe this was raised with that specific change discussed, raised at the Board meeting, and the Board said we'll check.

MEMBER ZIEMER: So, there wasn't a formal Board action on it? It simply was raised in that discussion?

MR. KATZ: Yes.

MEMBER ZIEMER: And then, after that, NIOSH went back and actually raised it. And then, it's gone to SC&A and they agree with that? Is that the process on this one?

MR. KATZ: Yes, correct.

MEMBER ZIEMER: Okay. Yes, it's very good. I'm good, I'm good then, mm-hmm.

CHAIR LEMEN: Bill.

MEMBER FIELD: Yes, I recall this and I remember having problems and raising some concerns about the .5, but I think the .7 is claimant-favorable, but realistic. So, I agree.

CHAIR LEMEN: Good. I agree also.

So, let's go to No. 20.

DR. BUCHANAN: I had one question on that for NIOSH. Did that create a PER?

MR. HINNEFELD: Ron, this is Stu.

The PER that's in process that Mark was talking about incorporates all the changes that have been addressed here to the extent they

would change the calculation of radiation dose. So, yes, it will be included in that PER that's getting close.

DR. BUCHANAN: Okay. Thank you very much.

Okay. So, that brings us to, okay, now on numbers 20, 21, 22, and 23, have previously been closed by the Board. So, we don't need to discuss those. Those are in green.

CHAIR LEMEN: I believe so, and we still have an open finding on 24?

DR. BUCHANAN: Okay. Now 24, no, that was enriched uranium we discussed just a little bit ago.

CHAIR LEMEN: So, that's closed.

DR. BUCHANAN: And so, that will be closed on the BRS when I update it.

That brings us to 25. Okay. So, finding 25 was shallow and extremity doses not sufficiently characterized. And this was concerning, of course, low-energy radiation to

the skin and such. And so, we find that, yes, we're on TBD-6 now. So, TBD-6, Revision 1 of 2/6/2013, added Section 6.3.11. On page 30, they discuss geometry factors and references DCAS 0013.

Now SC&A had a little trouble finding the right reference and evaluating it. We found that it does address the issue sufficiently. We sent an email out on June 13th of 2017 to the Work Group that it had been resolved and recommend closure.

CHAIR LEMEN: Bill, do you agree with that?

MEMBER FIELD: Yes. I did go back and read all the correspondence. So, I think this sounds reasonable.

CHAIR LEMEN: And Paul?

MEMBER ZIEMER: Yes, I agree on this one.

CHAIR LEMEN: So now, we have 26.

DR. BUCHANAN: Okay. Badging policy

not consistent on the TBDs was finding 26, originally. And we were concerned about whether the documentation of the badging was complete or not and whether the dose reconstructor would be aware of badging or not to assign missed or coworker dose or environmental dose. So, this gives the environmental dose that's less than coworker or missed dose.

And then, November 9th of 2011, NIOSH responded to the Site Profile and SEC issues, was explained in detail on page 17 of that response. And it was followed up by a revision in TBD-6, Section 6.3.7 of Rev 1 of 2013.

And we have reviewed that and felt that it does clear it up to where the dose reconstructor has better clarification on when to assign what. And so, we recommend closure on that issue.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Yes, I agree.

CHAIR LEMEN: Bill?

MEMBER FIELD: This is when I went back and looked at the revision because I had questions about this, and I think it's much better now. So, I think that's fine.

CHAIR LEMEN: And I agree.

Twenty-seven?

DR. BUCHANAN: Okay. So, it moves on to finding 27, lack of sufficient coworker data development for external dose. We felt that there was some area of question on how the coworker data was developed. And so, that's what this finding was about.

We see that TBD-6, Rev 1 of 2013, revised table 6-7 and added 6-8 to resolve this issue, and felt that there was sufficient information for the dose reconstructor to do coworker dose assignment as per TBD-6. And so, we recommend closure of this issue.

CHAIR LEMEN: Bill?

MEMBER FIELD: Yes, agree.

CHAIR LEMEN: Paul

MEMBER ZIEMER: Yes, I agree.

CHAIR LEMEN: And I agree.

So, that brings us 28. Twenty-eight is the last one now that we're talking about?

DR. BUCHANAN: Correct, this is the last finding, number 28. This is for TBD-6, lack of documentation and detail for neutron doses. Okay. So, it's the regular old neutron issue at uranium processing plants.

And so, what they did was select some information from Fernald, again, to come up with an N over P value of .1. Again, we objected to using Fernald data. And so, we had some discussion on this in that 2011 Work Group meeting, transcript page 95 through 134.

And what we did, SC&A went back. We evaluated some other sites that had similar processing and found that, although we didn't exactly agree with the method, we did find that the results were conservative and using an N over P of .1 was okay.

And so, we sent an email out 9/2011 that the issue had been resolved and could be closed. So, we recommend closure on it.

CHAIR LEMEN: Bill?

MEMBER FIELD: So, other sites were looked at other than Fernald? That's what you're saying, right?

DR. BUCHANAN: Yes, uh-hum.

MEMBER FIELD: Okay. I think I'm fine.

CHAIR LEMEN: Paul?

MEMBER ZIEMER: Yes, I'm good on this one.

CHAIR LEMEN: And I'm good on this one.

So, that brings us to closure on all 28 that were open, is that correct?

DR. BUCHANAN: That's correct.

CHAIR LEMEN: And we agreed to close all 28?

DR. BUCHANAN: Yes.

CHAIR LEMEN: So, as far as the agenda is concerned, we have gone through the first, second, and third points, I believe, Ted, is that correct?

MR. KATZ: Well, I'm not looking at the agenda, but all we have left are the observations.

CHAIR LEMEN: The nine observations.

MR. KATZ: Yes, correct.

CHAIR LEMEN: Who is to lead that discussion?

MR. KATZ: Ron. Ron.

CHAIR LEMEN: Ron?

DR. BUCHANAN: Oh, yes, I'll be the lead on it.

CHAIR LEMEN: All right.

Discussion of nine observations that have been resolved

DR. BUCHANAN: Okay. Let me open that up here.

So now, if you keep looking at the

screen, you will see Weldon Spring Site Profile Observation Matrix, and it's January of 2018. And I've updated some of this. This is on the BRS, field observation number one, and you will see it attached.

Okay. Now, back when we were doing these, we did not number them sequentially. We actually have nine. We did it by TBD. And so, I'll clarify that as we go through.

The first observation we have general, and it covers several of the TBDs. It's lack of coverage of all site activities. Some of the material is printed offsite, some stuff done to it and brought back. And we were concerned about exposure offsite. But, since that time, there's been some policies made and such, and we understand that exposures occurring offsite are not covered. You have to be on the site, the covered site itself. Therefore, this observation has been resolved. And I don't know if you want to close off observations or just say they've

been resolved.

CHAIR LEMEN: I think just say they've been resolved.

DR. BUCHANAN: Okay.

CHAIR LEMEN: Unless the other two, unless Bill or Paul disagree with that.

MEMBER ZIEMER: Yes, well, I would I guess I would ask Ted. I don't think we actually take formal actions on observations, do we? If just SC&A and NIOSH agree that they've been resolved, does the Work Group actually take actions?

MR. KATZ: Well, I mean, the Work Group usually runs through them to make sure that there's nothing that seems wrong.

MEMBER ZIEMER: Yes, yes. As long as we don't have any questions on them or something. I mean, we don't officially close them, do we?

MR. KATZ: Well, some Work Groups do; some don't.

MEMBER ZIEMER: Oh, really?

MR. KATZ: You can do whatever you want. You can say the results, as long as you pass through them all and are okay with how they were addressed for good.

CHAIR LEMEN: I propose that he says the result. Unless anybody wants to change that, that's fine.

MR. KATZ: No, that's fine.

CHAIR LEMEN: Okay. Number two?

DR. BUCHANAN: The second observation has to do with TBD-3, and it was the medical TBD. There was not a typo; it looked like something in the equation, and NIOSH has removed that equation from TBD-1, Revision 1 in TBD-1, and Revision 1 as of 2013. So, it no longer applies. So, we consider that resolved.

CHAIR LEMEN: Yes. Everybody agree?

MEMBER FIELD: Yes.

MEMBER ZIEMER: Yes, that's good. Not an issue anymore.

CHAIR LEMEN: Okay. Now observation

three.

DR. BUCHANAN: Okay. The third observation has to do with TBD-4, and that's application of environmental dose. And this kind of goes back to one of the findings. There's a couple of them that are when do you assign environmental dose and when do you assign coworker or missed dose. Again, the rewording in TBD-4, Revision 1 of 2013, Section 4.1.1, provides correct wording. So, they don't feel that there's -- we feel that it's clarified for the dose reconstructor and it's been resolved.

CHAIR LEMEN: Everybody agree with that?

MEMBER ZIEMER: Yes. It was just a wording issue, wasn't it?

DR. BUCHANAN: Correct. Correct.

MEMBER ZIEMER: Yes, yes.

CHAIR LEMEN: Bill?

MEMBER FIELD: The clarification is good.

CHAIR LEMEN: Bill, you said you agree?

MEMBER FIELD: Yes. I say the clarification looks good, yes.

CHAIR LEMEN: Okay. Observation four?

DR. BUCHANAN: Okay. Observation four was TBD-4 again. And this was the special uranium curie. And this comes about because uranium gives off several daughter products. And so, they multiply the curie by 2.024 to arrive at the total activity. And the wording was somewhat confusing, we thought, in TBD-4. It's fairly straightforward in TBD-5.

And we discussed this some with NIOSH and went back and analyzed the way it was worded again, and we agree that technically it's correct. And so, we don't have a further issue with it and feel it's been resolved.

CHAIR LEMEN: Bill?

MEMBER FIELD: Yes, it looks resolved.

MEMBER ZIEMER: Yes, yes, that's fine.

CHAIR LEMEN: Okay. It's resolved.

Five?

DR. BUCHANAN: Okay. The fifth observation was correction to the text on TBD-4. And this was simply typos, 10 to the fifth power, and "working levels of" instead of "or", uranium, radon, I mean. And TBD-4, Rev 1 of 2013, corrected this, the typos, in the past. And so, it's been resolved.

CHAIR LEMEN: Paul, okay?

MEMBER ZIEMER: Again, it's just more like an error thing. That's fine.

MEMBER FIELD: Yes.

CHAIR LEMEN: And you're okay, Bill?

MEMBER FIELD: Yes. It makes quite a difference, though, doesn't it? Yes.

CHAIR LEMEN: Yes.

MEMBER FIELD: Yes, yes, that's fine.

CHAIR LEMEN: Okay. Resolved.

Number six?

DR. BUCHANAN: Okay. Number six is

TBD-5, and that's thorium. And we felt that it wasn't real clear on what the years that should be used by the dose reconstructor. And we find that thorium exposures have been addressed in more detail in Site Profile findings such as number 14. So that this has been resolved.

CHAIR LEMEN: So, do we know what years that thorium has been used?

DR. BUCHANAN: Yes, it does specify when they used thorium and how much, and that sort of thing, in the --

CHAIR LEMEN: And we're pretty certain? And they're pretty confident that this information is correct?

DR. BUCHANAN: Well, it relates back to number 14, which we had clarified the use of it in the revised TBD-4 in pages 19 to 22.

CHAIR LEMEN: Okay. Paul, do you agree with this?

MEMBER ZIEMER: Yes, I do.

CHAIR LEMEN: Bill?

MEMBER FIELD: Yes.

CHAIR LEMEN: Okay. Go to observation seven.

DR. BUCHANAN: Okay. Number seven is TBD-5 again. And some of these were just observations that clearly didn't affect dose reconstruction. "A" was the location of a paragraph. It would have been more appropriate on a different page, but that doesn't really impact dose reconstruction.

"B" was -- let's see, tables. Okay, yes, a reference to tables and documents, and they corrected this on page 13 of Rev 2 of 2013 at TBD-5. It gives the correct references and tables.

And "C" is the second paragraph using the assumption of MAC hours. And this has been resolved because TBD-5, Rev 2 of 2013, page 40, gives us a different methodology. So, therefore, the observation is no longer applicable.

CHAIR LEMEN: All right. Paul?

MEMBER ZIEMER: Yes, good on all of these.

CHAIR LEMEN: And Bill?

MEMBER FIELD: Yes.

CHAIR LEMEN: All right. Let's go to eight.

DR. BUCHANAN: Okay. It is TBD-6 now, and we look at TBD -- it was the table 6.6 and used question marks for the gamma symbol, and that's been corrected in Rev 1. Table 6-5 uses the correct symbol. So, we find that resolved.

And "B" is Table 6-6, page 15, under the report column, they refer to a number of figures. However, it describes different contents in the figures, and we thought it would be more instructive to refer to them each individually. But it doesn't really impact dose reconstruction. And so, we feel that that's been resolved and recommend that those both have been resolved.

CHAIR LEMEN: Okay. You, Bill and

Paul, agree with this?

MEMBER ZIEMER: Yes. It is really editing.

CHAIR LEMEN: And lastly, nine.

DR. BUCHANAN: Okay. Nine is TBD-6, missing data in TBD-6. And this was that there were some tables, 6-2 and 6-14, that had some blanks in them for some of the entries, and we felt that it would be useful to have those filled in. However, these can be filled in. It doesn't really impact dose reconstruction because this information is contained elsewhere and in workbooks, et cetera, and the LOD values are used in the dose reconstruction for these periods. And so, it would not impact the dose reconstruction per se. So --

CHAIR LEMEN: Okay. I'm sorry.

DR. BUCHANAN: Yes, I feel these have been resolved.

MEMBER FIELD: It looks resolved.

MEMBER ZIEMER: Yes, it looks good.

Okay.

CHAIR LEMEN: I guess that's all the observations. Is there something else that's not on the agenda that needs to be discussed?

MR. KATZ: Yes. This is Ted.

So, I mean, you've gotten through everything, which is great and it's very efficient, which means the Board is done with this Site Profile review and you can report out on the Site Profile review at the April Board meeting.

CHAIR LEMEN: All right.

MR. KATZ: So, SC&A, Ron, normally, what we would have is SC&A would draft a presentation of the Site Profile review, giving a little of the history and how each finding was resolved. There are a lot of findings here, so I would encourage sort of lumping and summarizing to some extent. But, actually, they can do that. And then, normally, the Chair would, then, present that, Dick, to the Board for the Board's

discussion and closure.

CHAIR LEMEN: Okay.

MR. KATZ: So, if that sounds okay, then --

MEMBER ZIEMER: One question. Is this for the phone call meeting or the face-to-face meeting?

MR. KATZ: For the face-to-face normally. I mean, normally, we try not to do too much substantive matters if we don't need to at the teleconference --

MEMBER ZIEMER: Right, right.

MR. KATZ: -- and particularly this teleconference, I think.

MEMBER ZIEMER: Right.

MR. KATZ: We want to do just process matters because we don't have a Chair.

MEMBER ZIEMER: Right.

MR. KATZ: Yes.

CHAIR LEMEN: All right. So, we've given Bill eight minutes, it looks like.

(Laughter.)

MEMBER FIELD: More than happy.

CHAIR LEMEN: And so, I guess we can, unless there's something, can adjourn the meeting.

DR. BUCHANAN: I had one question. Ted, so, then, I'll go and put these responses and close them on the BRS. And then, do you want me to provide a brief summary of the finding and resolution to the Chair, so he can present it orally to the Board in April?

MR. KATZ: Yes, yes. And John Stiver is very familiar with what we do in presenting Site Profile reviews to the Board, to the full Board. So, you can check with him or just get examples from him of how we've done it for other Site Profile reviews.

And just the last matter to mention before we adjourn is that you had some talk about this PER that's in the works. When that PER gets issued, we'll assign that -- normally, the Board

does for most PERs assign that to SC&A to review the PER. And the Work Group would just look at how that gets resolved, but that will be down the road.

Okay? Does that sound good?

MEMBER ZIEMER: It sounds good.

MEMBER FIELD: Yes, it sounds good.

CHAIR LEMEN: That's fine.

We will adjourn unless there's some objection.

MR. KATZ: No. Thank you, everybody. Thank you, everybody.

MEMBER ZIEMER: Okay. Thank you.

MEMBER FIELD: Okay. Thank you very much.

Adjourn

CHAIR LEMEN: Thank everybody. Bye-bye.

(Whereupon, the above-entitled matter went off the record at 2:51 p.m.)