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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON NUCLEAR WASTE (ACNW)

168th MEETING

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WEDNESDAY,

MARCH 22, 2006

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ROCKVILLE, MARYLAND

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The Advisory Committee met at 8:30 a.m. at Nuclear Regulatory Commission Headquarters, One White Flint North, 11555 Rockville Pike, Maryland, Dr. Michael T. Ryan, Chairman, presiding.

MEMBERS PRESENT:

MICHAEL T. RYAN,	Chairman
ALLEN G. CROFF,	Vice Chairman
JAMES H. CLARKE,	Member
WILLIAM J. HINZE,	Member
RUTH F. WEINER,	Member

ACNW STAFF PRESENT:

JOHN T. LARKINS, Executive Director, ACNW/ACRS Staff

MICHAEL LEE, ACNW Staff

DUANE SCHMIDT, Waste Management and Environmental Protection

ANDREW PERSINKO, Waste Management and Environmental Protection

CHRISTEPHER McKENNEY, Waste Management and Environmental Protection

DEREK WIDMAYER, Waste Management and Environmental Protection

DAN GILLEN, Waste Management and Environmental Protection

DAVID ESH, Waste Management and Environmental Protection

ROBERT JOHNSON, Waste Management and Environmental Protection

ANTONIO DIAS

ALSO PRESENT:

ERIC W. ABELQUIST, Oak Ridge Institute for Science/Education

ERIC L. DAROIS, Radiation Safety and Control Services, Inc.

TRACY IKENBERRY, Dade Moeller & Associates

DAVID C. KOCHER, SENES Oak Ridge, Inc.

THOMAS L. NAUMAN, Shaw Environmental and Infrastructure

C-O-N-T-E-N-T-S

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

8:32 a.m.

CHAIRMAN RYAN: We have a couple of preliminaries. This is not the ACNW's usual room so in this room if you are speaking into the microphone, please make sure it's pointed directly at you and close to you; otherwise, it won't help our recorder. If you have a nametag in front of you, I think we've got that organized, so you don't need to identify yourself every time you speak but if you don't have a nametag, please identify who you are and who you're with as you speak.

Let me go ahead and start the meeting. The meeting will come to order, please. This is the first day of the 168th meeting of the Advisory Committee on Nuclear Waste. My name is Michael Ryan, Chairman of the ACNW. The other members of the committee present are Vice Chair Allen Croff, Ruth Weiner, James Clarke and William Hinze. Today during the meeting, the committee will conduct the working group meeting on public comments to supplement on of NUREG-1757, NRC's Consolidated Decommissioning Guidance to implement NRC's License Termination Rule.

Mike Lee is the designated federal official for today's session. This meeting is being

conducted in accordance with the provisions of the Federal Advisory Committee Act. We have received no written comments or requests for time to make oral statements from members of the public regarding today's session. Should anyone wish to address the committee, please make your wishes known to one of the committee staff.

It is requested that speakers use one of the microphones, identify themselves and speak with sufficient clarity and volume so they can be really heard. It is also requested that if you have cell phones or pagers, kindly turn them off or place them in a mute mode. At this time, I'll turn over the meeting to Dr. Jim Clarke, Chairman for today's working group meeting on the License Termination Rule. Dr. Clarke.

MEMBER CLARKE: Thank you Mr. Chairman. I welcome all of you to this second working group meeting on proposed revisions to the Decommissioning Guidance. The ACNW appreciates the opportunities it has had for early and continued involvement in decommissioning guidance revisions process. In April 2005, the committee attended a staff workshop on the proposed guidance revisions and held its first working group meeting in June of 2005.

In that meeting we were assisted by a panel of invited experts, several of whom have been able to join us today and graciously agreed to participate. Also, in October of 2005, we held a working group meeting near the West Valley site on the decommissioning status and performance assessment work that is being done there. Two of the experts with us today participated in that meeting as well.

Today we will receive presentations from the NRC staff on the status of the proposed revisions and a summary of the comments that were received in preliminary plans to revise the guidance. As usual we have a full agenda, a busy day ahead of us. Nevertheless, the primary goal of this meeting is a good exchange of information and ideas. We've built time into the agenda for questions and discussion and we encourage interaction.

If I have to keep us on schedule, I will do my best to do that but please note that we have reserved time at the end of the day for a roundtable discussion. Now, it's my pleasure to introduce the panel. Eric Abelquist is Director of the Radiological Safety Assessment and Training Program at the Oakridge Institute for Science and Education, where he provides technical assistance in health physics including

independent verification of decommissioning sites for the NRC and the Department of Energy. He was a major contributor to the preparation of the Multi-Agency Radiation Survey and Site Investigation Manual, NARSSIM, and is author of a book, "Decommissioning and Health Physics, a manual for NARSSIM Users". Eric has graduate and under-graduate degrees in radiological science protection from the University of Lovell. He was also a member of our expert panel for the first working group meeting held in June. Eric, welcome back.

Dave Kocher is a Senior Research Scientist at SENES Oak Ridge and a consultant to the ACNW. Prior to joining SENES he was with Oak Ridge National Laboratory for 29 years. He has over 30 years of professional experience in environmental health physics and is a fellow of the Health Physics Society. A frequent author and lecturer on the topic of harmonizing NRC and EPA regulatory approaches to public health protection, he was the principal author of NCRP Report 146, "Approaches to Risk Management and Remediation of Radioactively Contaminated Sites".

Dr. Kocher has a PhD in physics from the University of Wisconsin and also served on our expert panel for the West Valley Site Working Group Meeting

held in October. Welcome back.

Tracy Idenberry has been an Associate and Senior Health Physicist with Dade Moeller & Associates since 1998. He is the ?Vice-char of the American National Standards Institute Accredited Committee N13 on Radiation Protection and serves as Associate Editor for the Health Physics Journal. Over 22 years of experience, including a wide range of activities in environmental and occupational health physics. Tracy graduated suma cum laude from McPherson College with a Bachelors in Biology and received a Masters from Colorado State University in Radiological Health Science. Tracey also served on our expert panel for the first working group. Welcome back, Tracey.

And Tom Nauman, Vice President of Shaw, Stone & Webster Nuclear Services and Northwest Regional Director. Tom has over 30 years of experience in nuclear engineering and project management, construction maintenance, outage management and decommissioning, including development of independent spent fuel installations and dry-cast storage systems. He began his career with Commonwealth Edison where he held progressively challenging positions in construction engineering and maintenance, culminating as the Dresden Unit 1 plant

manager in charge of all spent fuel management and decommissioning activities.

He has served as a member of the Nuclear Safety Oversight Board for the Three-Mile Island Unit 2 and Saxton Plant Decommissioning Projects for the past several years. Tom has a Bachelor's in Environmental Engineering from Southern Illinois University and is a graduate of the Northwestern University Kellogg School of Business Executive Program for Nuclear Business Leadership.

Tom served on both our first Expert Panel for proposed guidance revision and on our Expert Panel for the West Valley site decommissioning as well. Welcome back all of you. We appreciate very much your participation and advice. And now it's my pleasure to turn the meeting to Dan Gillen, who I believe will get us started.

MR. GILLEN: Thank you very much, Dr. Clarke. I'm very pleased to be here this morning. I'm Dan Gillen, I'm the Deputy Director of the Division of Waste Management and Environmental Protection of NMSS, and with me here is Andrew Persinko, who is my Section Chief in charge of Special Project Section in charge of this guidance that we're discussing today. I'm please to be here this morning

to continue the ongoing interaction with the ACNW working group on our revisions to the decommissioning guidance and NUREG-1757. The revisions deal with issues that we addressed in our look at the flexibility of the License Termination Rule and issued in a License Termination Rule Analysis. We've since that time, initiated interaction with the ACNW and as Dr. Clarke mentioned, we had a meeting. Well, we actually had two meetings last year. One was a working group that we had that you attended with the public and then subsequent to that, we had a specific meeting with you in which the staff presented all of the issues, good interaction review, received comments from you. We, since that time, published draft guidance out for public comment and we received public comments and that's what we're here today to discuss the public comments and where we're going from here.

The key issues that we're discussing this morning and this afternoon are realistic scenario, intentional mixing, removal of material after license termination, onsite disposal under 10 CFR 20-2002, engineer barriers and restricted use of institutional controls. The way we intend to conduct this, this morning, and into the afternoon is that each one of these issues a member of the staff will present

background on each issue, a summary of the public comments on the issue and the current staff considerations in addressing the comments.

I wanted to -- before I turn it over to Duane Schmidt, who will be giving a brief introduction before we go issue by issue, I wanted to mention the fact that as we move forward during this fiscal year, we have two key milestones that we're focused upon. The first of those is that by June of this year we will be issuing a Commission Paper to share the results of the public comments with the Commission as they directed us in the Staff Requirements Memo to SECY-0069.

Subsequent to that, we are strongly committed to finishing the final guidance by the end of the fiscal year in September of 2006, so with those two key milestones in mind, that's where our focus is on after this meeting today. Before I turn it over to Duane, Drew, is there anything you wanted to add?

MR. PERSINKO: I just wanted to just ask, I noticed on the agenda there's a letter-writing session for Friday at 11:00 o'clock at which time, I guess the Committee will compose the letter or discuss the letter to the Commission. We plan to attend that session. It's open, I see.

MEMBER CLARKE: Yeah, I think what we'll be doing Drew, is we'll be discussing the opportunity to write a letter, not the letter itself.

MR. PERSINKO: Okay.

MEMBER CLARKE: I suspect that we will want to write a letter but we do go through the process of deciding as a group if we want to do that. That will be all that will take place on Friday.

CHAIRMAN RYAN: Just to explain, you know, we might talk about major (inaudible) sorry, there we go. We'll talk about major points, things that might be included in a letter, so even though we might not be, you know, down to the fine editing of a draft, it would be very helpful if you were there to hear that discussion and offer your views as we continue the discussion. So --

MR. PERSINKO: Good, the sooner we get -- the more insight we can get into the letter, I think will be better.

CHAIRMAN RYAN: Right, okay. Thanks.

MEMBER CLARKE: No, we would very much appreciate if you would be there. I just wanted you to have the right expectations of what we're going to do. Okay. Dan?

MR. GILLEN: Yeah, I apologize that I

won't be able to stay here the entire day but I'm in the building so if anything -- if I'm needed, you know, one of my staff can come and get me. Any questions from me before I turn it over to Duane for our first presentation?

MEMBER CLARKE: I don't think so. If I could, Duane, let me take this opportunity to introduce the remaining member of our expert panel to you just briefly. Eric Darois has over 28 years of experience as a health physicist including various technical and management positions in nuclear power plants, decommissioning sites, environmental laboratories and with other users of radioactive materials.

He's the owner of Radiation Safety and Control Services in New Hampshire and provides consulting and training to a board range of clientele. Eric is presently supporting the Connecticut Yankee and Yankee Road Decommissioning Projects in the areas of LTP development, dose modeling and final status surveys. He holds a Masters of Science Degree in Radiologic Science and Protection from the University of Lovell and also served on our expert panel for the first working group meeting on Decommissioning Guidance Revisions. Eric Darois.

MR. DAROIS: Thank you.

MEMBER CLARKE: I believe our next presenter is Duane Schmidt.

MR. SCHMIDT: Yes, thanks, I'm Duane Schmidt, Senior Health Physicists in the Division of Waste Management, Environmental Protection Decommissioning Directorate. I'm one of the co-project managers for the development of this guidance in NUREG-1757 Supplement 1. I've got a few slides which might not be up yet by way of introduction, some of which really Dan has already touched on, so I'll try not to be too duplicative here.

Dan mentioned and I think, Jim, you might have mentioned the workshop and the previous ACNW working group meeting. The other stakeholder input that we had was through a state working group that worked with us in the development of the Draft Supplement 1. I guess I'm on Slide 2 if anyone is looking at the slides and some of these I'm going to skip. We got public comments from about 12, I believe, individuals, several state agencies, not too many licensees and a few individuals.

My last bullet is, you know, I really do want to say that we appreciate the comments that we got from the public. As you'll hear later, I think

some of these public comments have caused us to rethink at least in some ways, were we were going on some of these issues. And so I think it's been helpful.

On Slide 3, of course, the purpose of today's meeting is to obtain input from you all on the public comments and on our preliminary plans for addressing comments and moving forward with our guidance. We've already mentioned what the key issues are that we'll be talking about. On Slide 4, we're trying to focus in our discussions on what we think are the most substantive issues that were raised in the public comments. That may not be the same as what you all think, so, of course, you know, the discussions can go wherever the discussions go, but we had to start somewhere.

And of course, in finalizing the guidance, we are considering all of the comments, whether or not they get discussed today and, in fact, our plan at this point is to prepare an appendix or some type of document to document how we respond at least to each of the public comments. And just to mention again, that whatever we say today is our preliminary plans and we're getting input from you all. We're going to have additional considerations as we develop a

Commission Paper, so of course, our plans could change but this is the best we've got at this point.

Then on the fifth slide, Dan already mentioned the Commission Paper and actually we're shooting for May. I think June is the absolute, but we're shooting for May. So we are trying to get to the fairly quickly and that's part of why we care about getting as much input from you all today and as soon as possible, the earlier, definitely will help us out.

So that's really what I've got by way of introduction. If there are any background questions that are appropriate at this time.

MEMBER CLARKE: Okay, thank you, Duane. Let's start with the Committee, Dr. Ryan?

CHAIRMAN RYAN: If you had to characterize, you know, what were the major topics that you reviewed -- saw in the comments, what would they be, just to give us a preview of what the rest of the day might be like?

MR. SCHMIDT: Well, we actually tried to organize the agenda in sort of reverse order. So we're saving the best for last, I guess.

CHAIRMAN RYAN: Oh, I see.

MR. SCHMIDT: We certainly got the most

comments on restricted use and institutional controls. We got a lot of comments, some of them fairly substantial comments. I'm trying to think backwards without looking here. We've got a fair number of comments also on the use of engineered barriers. And then on onsite disposal, in some ways it wasn't as many comments but there was a lot of agreement on the comments on that issue and that's one where we are talking about changing where we were going.

The other three issues, part of the reason we lumped them together into one session is that we thought overall those three issues; intentional mixing, use of realistic scenarios, and removal of material after license termination, we didn't get a whole lot of comments and/or not a whole lot of substantive comments, although I think of those three there was more interest in intentional mixing and there's a couple interesting things there, I think.

CHAIRMAN RYAN: That's great, thanks.

MEMBER CLARKE: Any questions from the panel here? Tom? Eric? Tracey? Okay, thank you. Our next presenter is Chris McKenney and he's reasonably foreseeable land use scenarios.

MR. GILLEN: We may have to fill in, I don't know or skip ahead because he doesn't seem to be

here.

MEMBER CLARKE: Chris was planning to be here. We could do that.

MR. SCHMIDT: The plan is messed up. Well, the plan is a little bit scattered already to tell you the truth.

MEMBER CLARKE: Well, do you want to do that, Duane? Do you want to continue with intentional mixing?

MR. SCHMIDT: That would be fine and so on your slides, that would be Slide 10 and when I say the plan is a little scattered, Derek Widmayer was our lead for this issue of intentional mixing and he bailed out to come work -- to come work for you all, which is great for him and great for you all actually.

CHAIRMAN RYAN: Let me just add, Derek, welcome to the staff of the ACNW. We're thrilled to have you with us and we know you bring a wealth of experience to help us in our work, so welcome aboard.

MR. SCHMIDT: So I'm going to try and fill in. If we have to call on Derek for -- oh, okay, we have the slides up, so if we could go ahead a few slides to Slide 10 that starts with intentional mixing.

CHAIRMAN RYAN: Thank you, Tyron.

MR. SCHMIDT: If we have to call on Derek, we'll try not to do that but he might be able to help out. I'm not as up on it yet as Derek is certainly. So the next slide, Slide 11, just to summarize what was in the draft guidance on soil mixing, we had -- before the actual bullets, I'll note that one of the initial considerations that got us looking more seriously at soil mixing and into this guidance is that the License Termination Rule just provides the performance based dose criterion and the criterion is 25 millirems per year. It doesn't say anything about mixing good or bad. There's a lot of things it doesn't say anything about in terms of how you get to that dose criterion.

Importantly, I mention that because that relates to some of the comments that we got on this from the public and maybe relates to how we might be changing our thinking a little bit on this issue. So in the guidance we had developed a proposed new Section 15.13 in Volume 1 of 1757. In that guidance, we provided a discussion of essentially continuing the practice of using mixing to meet waste acceptance criteria for disposal facilities and actually one thing that I just learned a little bit more, we actually didn't have a good policy on using mixing for

waste acceptance criteria written down. That was something that had developed over years of a small number of licensee requests that we responded to. So this guidance, is, I guess, the first formal guidance on even meeting waste acceptance criteria with mixing. But the practices have been in place and licensees have used mixing for this purpose before.

And then our real focus, I guess, was on new guidance on the use of mixing of contaminated soils to meet the License Termination Rule criteria for limited circumstances on a case, by case basis. And the general criteria that we were proposing for the use of mixing was that mixing should be part of an overall approach to cleanup that would include ALARA. It shouldn't just be the only thing that's done at a site. And we proposed limitations on the use of clean soil and on not increasing the footprint of contaminated soils at a site.

The guidance also described information that should be included in a decommissioning plan or license termination plan. If we could go to the next slide, 12; for a summary of the public comments on mixing, we had comments from three state agencies, one licensee, a solid waste management industry group, and an industry consultant and on this issue, and perhaps

this was similar to the differing opinions from the ACNW working group at the last meeting, we had both support and opposition to mixing.

We had -- the State of New York questioned the need for some of the options and limitations in the guidance and they opposed some of the specific circumstances. They also had some more specific changes that they suggested. The State of New Jersey generally supported the use of intentional mixing for LTR compliance. They provided additional information on their policy and they do allow mixing in some circumstances within their regulations.

The State of Colorado opposed the use of intentional mixing and also provided several specific comments. And the solid waste management industry group supported the use of mixing to meet waste acceptance criteria but they opposed the use of clean materials for mixing for leaving material in place for license termination. And then the consultants suggested changes that would actually add more flexibility primarily to the guidance that we had already provided and this goes back to where I started. I think these comments were coming from the perspective that the existing rule doesn't say that you can or cannot use mixing. And I think these

comments were really suggesting that, hey, it's a performance criteria. It should be risk-informed, of course, but there's flexibility and the guidance should be more flexible.

The last bullet on this page is something that I think you all might want to talk a bit about. We had two comments, one sort of pro and one a little bit against about the use of mixing to change waste classification and the commentor in favor suggested that the waste classifications for low level waste, Part 61 that that should be allowed, the mixing should be allowed to reduce classification, for example, from Class B waste to Class A waste. And this is where I don't have a whole lot of expertise but a little bit of talking and looking, we didn't see obvious reasons why this is a non-starter but something that you all might want to talk about a little bit.

On the other hand, comments that we had from the State of Colorado supported our previous language that it would have prohibited changing classification and also asked for additional prohibitions on changing waste classifications for other types of waste. I guess I probably jumped ahead to the next slide on that one but -- if we could go ahead and move ahead to Slide 13 and talk a little bit

about what we've been thinking about.

Many of the comments, we think, don't require significant changes to the guidance, perhaps some clarifications. Some of the comments we will at this point, tend to disagree with and so our responses would explain why we disagree. I guess on the flexibility issue, we certainly understand that the LTR criteria is a dose criteria and that there are a number of different ways to get there. So I think at this point we're open to adding more flexibility to how mixing might be used to meet the LTR criteria.

And on the last issue on waste classification, that's one that we're thinking about. In fact, as I already mentioned, that's one that we are most interested in, in you all's input on. I guess a couple other notes on that last one, waste classification, I already mentioned the previous guidance was based on individual letters. The limitation in our draft guidance about not changing waste classification, we think that was just, you know, a holdover from what had been our practice for many years and perhaps a result of the situation in 1985 where there was a lot more interest in reducing waste volumes.

The world is different now and maybe the

situation has changed. So it seems like I think we're open to reconsidering that.

CHAIRMAN RYAN: Just for everybody's benefit, the committee has written a White Paper on low level waste as you know, and it's related to this topic and I think you're really speaking to one of the points that will be taken up at a working group meeting in May, and that is that there is two things that really you think about when you think about risk from radioactive material in the setting. One is concentration but also as important is quantity. You know, I can give you a much greater than Class C source that is exempt from regulation because it's just a small amount and conversely on the other end when you talk about mixing of soils, you're talking about very dilute end. So the very dilute end and the concentrated end, things get difficult or challenging.

So I think the idea that you're thinking about how to deal with that is very, very helpful. The other part of thinking about disposed material, it's quantity in a disposal site, not the concentration that really sets the stage for a risk informed assessment. So if you go from A to B, B to A, C to B, whatever it might be, that to me, my own view of the world there is that, that's a convenience

for classification relative to packaging requirements, transportation requirements, health physics controls and things of that sort, either in the preparation aspect or in the getting it to the disposal site aspect but once it's disposed, then it really kind of reverts to the quantity being the risk unit of concern. And if somehow we could capture that transition in a smart way that recognizes those things, that would be helpful but that, again, will be coming up in a May working group particular to the low level waste White Paper that we've already provided to the Commission. So -- and I think we would, or at least I would at this point if other committee members would agree, that moving toward that smarter interpretation of those variables in a risk informed way from your standpoint and your guidance and having that, you know sort of match up, perhaps, with the risk informed approach would be a really great step forward, I think. I just wanted to throw that out for you to think about while we're moving along here.

MR. SCHMIDT: That's great and I'll acknowledge, you know, I haven't read where you're at on the White Paper. I don't even know if it's available, I guess.

CHAIRMAN RYAN: It's available.

MR. SCHMIDT: That's not my area, but we'll certainly --

CHAIRMAN RYAN: And more will be coming up in May, so you're really not behind the curve on that too much, so --

MR. SCHMIDT: Right, which is good. Thanks. I don't know how you all -- it looks like there's a question.

MEMBER CLARKE: Go ahead.

MR. KOCHER: I apologize because I've come into this game a little later than some of the others. I'm scratching my head about this mixing to meet waste acceptance criteria in a disposal facility. Could you go back to square 1 and tell me what the problem is that you're trying to fix? What kind of waste acceptance criteria can't you meet unless you mix stuff?

MR. SCHMIDT: I don't -- since I wasn't involved in developing this, I don't' have -- I think what might be helpful is a couple of examples, and I don't have those. Derek, do you know -- sorry to call on your right off but do you know some examples that might help answer that or do you, Chris?

CHAIRMAN RYAN: Chris, just for the recorder would you tell us your name and so forth?

MR. McKENNEY: Chris McKenney, NRC. Yeah, I was involved in the actual -- some development of the BTP and waste classification and mixing back in `92. And what it is, is a lot of it involves not necessarily materials that can be homogeneously mixed but materials that were wanting to be waste average that still retained their characteristics but just for -- in terms of the package were being averaged together and the classification then would change even though there were hotter pieces in there that could be Class C or greater than Class C and some pieces that could be Class B.

There was a concern that people would take Class A materials and mix them with Class C's and depending on the size of the -- the size of the canister, you could get almost all the way down to Class A on your average. Even though these are all pieces of metal and the metal isn't actually mixing at all. It's just there are pieces of metal and some of that metal could, in an intruder scenario, that that Class C material which still could be so raised and you would still have an intruder issue that would usually result for a Class C material and you would want that canister treated as it was Class C not Class A from an intruder standpoint.

And so there were a lot of those concerns and so what the mixing guidance here was, was that we were taking the `92 branch technical position and just staying with it, with the guidance that was in there and that in the future, for classification in low level waste and then we had public comments about maybe we should revisit that branch tech --

MR. KOCHER: I'm sorry, I don't get that. I still don't understand what the problem is you're trying to solve.

CHAIRMAN RYAN: Dave, let me help. Just take the PowerPoint example of radiated stainless steel that comes out of the core has a very wide range of induced radioactivity but it's all stainless steel. The practical result of what Chris explained was that at least in the Barnwell license case, the high and the low couldn't be different by a factor of 10, but they could be averaged according to the rules of averaging and in fact, there are experts that do that for utilities all the time.

So that's really what it was about. My own thought as you were talking and as Duane was talking, was that for soils and other materials that frankly could be mixed where metals can't, you get a different setting and I think revisiting that setting

on the fact you actually can mix, and come up with something that would sample then as a more homogenous mix, is the right way to think about that.

So I'm, I guess, just -- and I don't have the full measure of everything you've said in terms of reading about it and thinking about it, but trying to extend the metals rule --

MR. McKENNEY: Everything else, that's what we're saying. We're saying we're willing to relook at that.

CHAIRMAN RYAN: Okay, so I think that's a good thing to take soils and other materials that actually do mix in a different way.

MR. KOCHER: What waste acceptance criteria can't you meet unless you mix? I don't get it.

CHAIRMAN RYAN: Concentration limits.

MR. KOCHER: So what? You dispose of it as Class C waste and declare victory.

MR. McKENNEY: Oh, not, they're trying to dispose of the Class C waste in a Class A cell.

CHAIRMAN RYAN: Yeah, it's not a straightforward matter of just dispose of it as Class C waste because there's cost issues and, you know, lots of other issues and how you transport it and how

many casks are available to transport Class C versus Class A. I mean, there's a lot of practical issues that you try and optimize. You know, and these folks are expert at all that. They can tell you about it from now until the end of the day, but it's not a simple matter of saying, "Oh, well, we'll just" -- I mean, there are a very limited number of Class C transport units in the country. So you might wait a year to get on the schedule for one, whereas if it's B waste you can ship it this month. That's a practical reality that's very important to deal with. So there's lots of mundane, everyday, you know, work activities that are kind of independent from the ultimate classification of waste that factor in.

It's very much an optimization game, as I, you know, recall it. I'd welcome any other comment on it but it's a great question because it is at the root of you know, one element of the optimization. It, in essence, is independent of the disposal question.

MR. KOCHER: So it's not really a question of meeting waste acceptance criteria in the abstraction. It's more -- as you pose it, it's more an issue of management of waste in a timely and cost-efficient manner which is a different way of posing the question.

CHAIRMAN RYAN: Well, but with the requirement that you know, you go directly to jail and do not pass go if you don't meet the waste acceptance criteria, one of which is concentration. So it's not separate from the waste acceptance criteria requirement. It's integral with the waste acceptance criteria.

MR. GILLEN: And there are circumstances -- this is Dan Gillen. Dan Gillen. There are circumstances that, as Duane spoke of earlier, separate from the classification of waste but the mixing of bulk materials like soils where you can mix two levels that now you can dispose of in a non-low level waste disposal facility. Is that correct, Duane? That's what we talked about, some of our previous actions allowed mixing to reach lower levels of contamination, so now they can be accepted at places like Waste Control Specialists in Texas.

MR. KOCHER: I'm still just a little bit confused here. The examples, a number of the examples I'm hearing sound like low level waste disposal, not a license termination rule issue. Where is the intersection of these two? I mean, you were talking about, Mike, for example, stainless steel. Fine, but you were talking about disposing it like environ-well

(phonetic). Isn't that just a Part 61, acceptance or not and their license? What's it have to do with 1757?

CHAIRMAN RYAN: Well, I guess there are clear intersections between disposal and how you decommission a facility. You know, I guess my own view and correct me if I'm wrong, but until you understand what your disposal options are and what your range of materials are and how it matches up with disposal options, you really don't have a working decommissioning plan when you can't separate one from the other, so that's one aspect. But the idea of, you know, preparing materials for decommissioning clearly relate to where are they going to go. So if I'm allowed to mix, and maybe even go to something that's, you know, not to WCS or other outlets and are not classical, you know, ABC low level waste, that's one decommissioning strategy and if I can or can't do that, that switches, you know, what I can and can't do.

So they're not unrelated but maybe somebody else can help say it better than I can.

MR. NAUMAN: Let me jump in there, Dr. Ryan. It comes down to how clean is clean and how much material do you have to ship offsite. And as you

survey the materials, you're mixing in a way trying to homogenize the survey to release from a decommissioning project. And in that process, you come up with these variations of concentration that's acceptable to stay on site or go off site. And if you have materials on site that you're mixing in that process, you end up shipping less off site and leaving more on the site. So it does correlate to the License Termination Rule.

VICE CHAIRMAN CROFF: But if it's going offsite, you know, the criteria you've got to meet are the disposal site wherever else it is.

MR. NAUMAN: Exactly.

VICE CHAIRMAN CROFF: And so a lot of what's in the LTR doesn't make any difference. But coming back to the classification issue, if y9oure going to leave it on site, what do you care whether it's A or B or C?

MR. NAUMAN: Well, you can't leave it onsite.

MR. McKENNEY: No, no, the nexus between the classification system and the onsite issue is that it was trying for a more holistic method of mixing, rules for mixing and considerations of mixing for both onsite and for shipment offsite so that you don't have

-- if someone were shipping, were trying to mix for onsite, that wouldn't have different rules applied to it in the large extent than anything that was for classification because of the fact that you'd otherwise have some issues near the borders of each where you could have mixed it for onsite but now it's not even acceptable for offsite, if the rules were disjointed.

I mean, from a holistic standpoint to try to have a mixing -- mixing rules or bounds to be more appropriate along the realm of possibilities because somebody could mix on site and them make -- because of other decisions, all of a sudden make a decision to ship it all off. Now, it still has to somehow be appropriate to be accepted now and if that wasn't considered in the rules, in the first place, then you might have an issue.

And the thing was, this was to keep as much as possible in mind that we do have rules for shipping offsite. We weren't actually changing those to a large extent at all in the BTP but we did mention them and that's why the commentors mentioned them, brought them up again about the fact that maybe we should revisit those. And those wouldn't be revisited from the point of view of 1757 has to be reviewed but

from a position of low level waste, but it is a point of comment that was on 1757 and so we were bringing it up here.

MR. SCHMIDT: This is Duane Schmidt again. I think the only thing I was going to add, you know, to some extent I think you're right, whatever is left on site, you don't care what the classification is. I mean, they are related but I think part of is was just a practical decision that while we're focusing on LTR in NUREG-1757 we have this related guidance that we felt needed more exposure. And so I think part of it is a practical here's a way to get this guidance a little more formalized somewhere in our guidance system. I mean, we've done that for other issues as well that aren't exactly license termination but are related. I don't know if that helps but --

MR. DAROIS: I have a question in this regard. Chris, you mentioned you're going for a holistic approach which implies that there's going to be some changes or reinforcement of the branch technical position in regards to waste disposal and waste classification. Is there going to be a major change in the philosophy?

MR. McKENNEY: I don't think we're going to be making major changes. I mean, it's just more of

the fact that that is out there and there is some nexus between when waste offsite has to be considered so that we don't have a big disconnect between the methods and rules for mixing or the guidance for mixing.

MR. DAROIS: Okay.

MR. McKENNEY: I should say not rules.

MEMBER CLARKE: Duane, did you have any more on that topic? Bill, did you have a question?

MEMBER HINZE: Well, yes, I did and this goes back to the comment made by the State of Colorado and I have a sense that a couple of the other agencies brought this up as well. And that is the concern that intentional mixing may not really be -- may be inconsistent with other agency or state regulations. What -- can you expand on that a bit on how you're going to be treating that?

MR. SCHMIDT: I guess I'm not sure what to really say at this point. You know, we're really trying to work on guidance to implement our regulation and part of the issue, really goes back to that our regulation is different from, for example, EPA regulations. I'm not entirely sure what -- how we're going to respond to that and what we would do, if anything, but --

MEMBER HINZE: Well, have you considered -- have you in any way been involved with discussions with EPA or any of the other agencies on the intentional mixing issue?

MR. WIDMAYER: This is Derek Widmayer, currently with ACNW staff if I don't blow the answer to this question.

(Laughter)

MR. WIDMAYER: I think Dr. Hinze, we were basically following the direction that we got from the Commission to go ahead and include this flexibility in the guidance. And I think we would be responding to those state agencies acknowledging that we may be moving in a new direction but that's, you know, what we were advised to do. And I wanted to point out that we still were considering this to be just a limited applicability of this, you know, a case where it was the last resort. It was the only solution to actually terminating the license would be to mix and let it say on site.

MEMBER HINZE: How do you get that across to the user of the NUREG, that limitation?

MR. WIDMAYER: Well, I think we've tried to point that out a number of times up front and also in the guidance. But I think we did get some comments

indicating that -- and this is what Duane was alluding to before, that even that limitation isn't necessary. That the interpretation by this one commentor was, the Commission said to go ahead and utilize this approach and as long as you do performance based and risk informed, that you know, it will turn out to be, you know, very few opportunities to use it but it could still be something to use.

MEMBER CLARKE: Mike, you had a question?

CHAIRMAN RYAN: You know, I mean, when you hear about intentional mixing, I've heard, you know, just off-handed ad hoc comments that people are concerned that it's dilution of waste. That's really the root of it. And I think it goes back to what we talked about earlier that I mentioned and I'm soliciting your opinion, Derek. If you look at concentration, that's one component of a risk-informed view, but you've got to look at quantity, too, because it's quantity in a disposal setting or in a what's left behind setting, you know, material left on site that really gets you to think about risk in a better way from both points of view.

So I think if you -- and the challenge, I guess is that as you think about those two components and try and deal with both, that will help you, I

think, address the fact that it's really not dilution in the sense of making something go away. It is looking at two aspects of the risk. One is quantity and one is concentration, both of which inter-relate as we've talked about.

And, you know, the way I think about it is the extreme; zero volume and a pico-curie or a nano-curie, 100,000 cubic yards and a curie or something. You know, and you can begin to do those thought experiments that I think can help you explain what your view of the world is there that might be helpful at trying to talk about how to use it. So I urge you to think about concentration and quantity as the kind of key that unlocks that door a little bit. Any thoughts? Does that make sense? Is that on the right track?

MR. SCHMIDT: I think that -- this is Duane Schmidt. I think that makes sense, Mike. When you started out, I was almost going to disagree but recognizing that, you know, it depends on the rate of nuclides you have and therefore, the pathways that are important, there certainly are cases where concentration may be most important, you know, for example, material left on the site that's a gamma emitter, that may not end up being a ground water

issue.

And as you say, there certainly are cases where the other would be true, that the quantity is what's most important.

CHAIRMAN RYAN: And fair enough. I mean, I -- yeah, fair enough. I mean, that's a good point.

MR. SCHMIDT: But we do recognize that and that is that's a complication of when can this be allowed and if it gets back to doing a good solid dose assessment, performance assessment.

MR. WIDMAYER: Dr. Ryan, I think one of the things that we discovered when we were doing the Commission paper is that there certainly is a negativity associated with dilution mixing something to, particularly in the EPA space, you mix something to avoid treatment. That's clearly not allowed, and in this case, we're trying to make the point that that isn't what's happening. We're still going to be applying all of the criteria for safe disposal. We're just suggesting that, you know, there's a different, more risk informed approach that could be use -- maybe utilize space at a different disposal facility or whatever the trade-offs are. Nothing is being avoided.

CHAIRMAN RYAN: It makes a lot of sense.

I just think it's a matter of how you treat these variables and explain them so people recognize you're really not intending to take something out of a legitimate treatment or, you know, disposal pathway but you're really recognizing two aspects of the risk you're charged with managing and it's quantity and concentration. I think we'd encourage that.

MEMBER CLARKE: Okay, let's take, if we have, a couple more questions and I'm feeling a need to move to the next topic. Any of the panel, do you have additional questions? Ruth? No? Okay, thank you, Duane. Chris McKenney has joined us and the next topic is reasonably foreseeable land use scenarios. If you could take us to Slide 6.

MR. McKENNEY: One of the topics in the LPR was the issue of expanding the flexibility we have and what sort of land uses and scenarios that people should be using for the -- or can use for the License Termination Rule. So for the scenarios which we entitled Reasonably Foreseeable Land Use, we discussed this in June, I think it was June last year with you guys, and had discussed this at RD Commissioning meeting out there and overall concepts which are on Slide 7, please, the -- we had the -- we basically modified or expanded some of the current sections of

NUREG-1757 Volume 2. Mostly it was a modification of tone in the guidance from alternate scenarios being the exception to site specific scenarios being a valid area of flexibility.

In other words, what is the -- what is the most likely uses of the land in the near future? We had 1,000 years of analysis time period and the way the guidance was written, it seemed like you had to assume that you had to base your compliance on any scenario that could occur over 1,000 years rather than taking a more reasonable view and it was tending to be then, being forced to go to, you know, farming situations and what are potential urban environments and everything else if you go with the view of anything in 1,000 years and so the Commission decided that we should look at what is based on a more reasonable set of land uses for a site, but back that up with some analysis of unlikely scenarios so that we know the robustness of what the range of doses would be on a site and making the decision whether a site is reasonable to be released for unrestricted use.

We had five organizations that gave us public comments, three states and two private organizations. We had some of the comments were supportive of the policy. We had no comments that

said this was absolutely the wrong way to go. We had a few comments were on editorial changes or slight confusions, such as -- this is Slide 8, yeah, I'm sorry -- that there were -- in revising the guidance, without changing in essence the policy as set forth by the Commission.

Slide 9, please. A couple of commentors confused the time frame of analysis for the time frame we were discussing for scenario development. They thought we were shortening the analysis time all of a sudden to 100 years in this from 1,000 years on the rural. Obviously, those sections of the guidance need to be buffed up to try to make sure that people in the future don't get confused, similarly.

And the one other commentor which was the solid waste organization, commented that they viewed that we should be putting deed restrictions or other devices on any site that used reasonable -- that used reasonably foreseeable land use scenarios as a compliance measure. We're going to be responding to that comment. It was discussed in 69. However, it's the robustness of the analysis with the unrestricted -- with the unlikely scenarios being analyzed and other measures -- and the decision to release the site that we don't need to have the deed restrictions.

First of all, deed restrictions is counter to unrestricted release in the first place. That we'll be responding to the comment but not actually changing the policy or approach. And that's it.

MEMBER CLARKE: Okay, Chris, thank you. Eric, would you like to start?

MR. DAROIS: I'll only mention that I think this would be certainly a useful tool looking retrospectively at where we've been in some of these decommissioning projects but just a little bit of a footnote is -- and we seem to get a little bit hung up on complying with EPA side of the house in these site restrictions, site releases. And we only wish that they might see the world in a similar way. So that's all I've got to say.

MEMBER CLARKE: Tom?

MR. NAUMAN: No comment at this time.

MEMBER CLARKE: Eric?

MR. ABELQUIST: I think the only comment I would have at this point is in order to establish a level of robustness, as you stated Chris, other scenarios would be looked at. Is it staff's intent to provide additional guidance on just how much robustness is going to be expected once a licensee looks at what is the reasonable scenario over 100 year

time frame and then they look further and see, okay, other scenarios need to be developed.

And I think the view is going to be it's additional work that really isn't going to address the initial development of DCGLs. It's sort of performed just so that the staff has additional assurance that a robust analysis was performed. And so I think there's going to be this drive to really keep the other scenarios that are looked at to a minimum. And so I think the comment I have is, can you provide better pounding guidance on just how much robustness the staff is looking for?

MR. McKENNEY: I mean, yeah, it all depends first of all that a number of alternative scenarios can always be not actually analyzed in quantitative fashion but qualitative because you can discuss how it's different from the base scenarios that you were doing, how are the pathways potentially effected.

Also we do discuss how you can use bounding analysis, you're unlikely -- you know, as soon as you've got possibly an assurance that you've covered most of the pathways and other things that it's really difficult in a generic sense to say exactly how much robustness you'll need because it all

depends on how far a specific case goes or how much extra analysis goes. We've had some sites who have done it and then they've, you know, done, you know, suburban resident or something like that on the side to show what sort of doses those would be if that occurred at the site when they were going for industrial.

That's -- that was part of their analysis and they just showed it -- they just did the analysis, ran the basic runs and supplied it. From the company's point of view, it can be considered as those are questions that were going to be raised by the public anyway would be, you're going with this land use, what is the doses going to be if this was to be used as something else? So somebody should, you know, sort of forward thinking of what could be happening, but or to answer questions.

We'll look at trying to get more guidance on that but that can always be strengthened, but it's sort of difficult when you start how much of a tune of if then are you going to write to say what is the bounding scenario you must use or how much is it to be used.

MR. ABELQUIST: Thanks.

MEMBER CLARKE: Tracy?

MR. IKENBERRY: I don't have any more.

MEMBER CLARKE: David?

MR. KOCHER: This strikes me as a really thorny problem. I gather that you have a default set of soil guidelines that people can use without question. These are the ones that you publish in the Federal Register. But I guess I wonder two things. In making a decision about terminating a license and releasing a site, how would these other analyses to test robustness be factored into a decision? I mean, that's just something to ponder. I don't expect a clear answer to that right now.

And I also wonder how this relates to ALARA considerations because if you base -- for example, if you base some idea of ALARA in terms of how much is reasonable to remove from a site and ship to a low-level waste facility, say, if you do an expected scenario and you conclude that your doses are less than a millirem per year, say, in that scenario, you would way it's not worth spending 10 cents to move any material offsite. But if your resident farmer scenario indicates 100 millirem, what then, how do you make a decision in a realm like this?

Maybe you want to lay out some kind of hierarchy for how to do this or you certainly want to

have public buy-in to any scenario, any future scenario you come up with which is not nearly as restrictive of some others that are plausible. I'm going to think about this some more, but this strikes me as not a very easy issue to deal with.

MR. McKENNEY: The first part -- actually, we'll go backwards on this. The thing you raised about public buy-ins, that is part of the guidance about you should be working with stakeholders on what is the reasonable land uses for the site you're discussing, site, it's not just the licensee. It should be showing that they have some public buy-in with the various stakeholders on what's possible choice -- that they've discussed it with what possible choices are there and what -- and their justification for their land uses.

Secondly, for ALARA, if we go back to actual ALARA, is that you should not be using bounding scenarios as your basis for making any ALARA determinations. You should be using the expected case. That that is -- that otherwise you'd make faulty ALARA considerations, faulty cost benefit analysis. I mean, basis for ALARA is cost benefit, the theory and cost benefit analysis to always use best estimates for all your terms, not to use bounding

for any one of them, which is one of the problems with actually using -- in the past, with using a lot of resident farmer or other scenarios has lent it the other way for cost benefit analysis.

So, I mean, there is consideration. I mean, we are doing the -- we do want to see the licensees are reaching out to see what are the possibilities and it's not just an in-house think tank of what can my land be used for and that, yes, there is some difficulties on what is -- if the dose -- at the DCGL, remember, we're talking about decision making by the agency on whether to go forward with a DP is if the site was contaminated wholly at the DCGL, what would be doses or unlikely scenario. Now, I mean, that's -- and where that falls in comparison to 25, but, you know, in real side is that no site is actually contaminated at the DCGL the people request, so the actual doses even in the unlikely scenario is much lower.

CHAIRMAN RYAN: Chris, it seems that without really getting to a probability kind of thought, you're really sort of inching your way toward it. How likely is something to be -- you know, how likely is the, you know, extreme scenario, the low probability or higher dose scenario to be and I think

built in, as you've pointed out on DCGLs and other thinking, you're sort of hedging the bet on it which is fine. I mean, I'm not suggesting you should start cranking up the PRA codes to do all this, but Dave, to think about your question, I think you've got to think about the fact that bounding cases mask risk. They don't tell you anything about risk.

And without having some insights from the average case to the nominal case on what realism is, that's to me where it starts which I think is what the guidance is aiming at. So you've got to be careful, and I agree with Chris' comments, that ALARA just isn't -- doesn't make any sense. ALARA is a comparison of two or more things not an absolute. Lots to talk about, but I mean, it's an interesting dimension. Thanks.

MEMBER CLARKE: Dave, any other questions? No, I was going to go around this way. I just wanted to make sure Dave was finished. Bill? Ruth?

MEMBER WEINER: I'd like to follow up on some of the comments that were made. One of the things we heard at the workshop that we went to was that if you can meet the backyard farmer, that's what the licensee is going to use because it's simpler, it's cheaper and that's what they're going to do.

What are the optics, do you think of somebody saying, "Okay, all of these sites met the bounding case, but we can't meet the bounding case, so we're going to use a realistic scenario". I know that the guidance says you work with the stakeholders but it seems to me that that is a dichotomy that you're going to have to face. As long as people can meet -- as long as there are sites that can meet the backyard farmer's scenario, that's going to be the hallmark of what you do and related to that question is how often do you think or how many sites do you think -- what's the sort of your guess of the frequency in which a realistic scenario would have -- that is not bounding, would have to be used because those are the only circumstances that I can tell under which it would be used.

MR. McKENNEY: There's a little bit more consideration but generally that's true. However, it's similar to the fact that we have screening criteria out there and the same licensees who are doing site-specific analysis are -- would be in the same boat as well. Everybody else meets the screening criteria, then why don't you?

The flexibility in the dose standards leads to the fact that different sites get different concentrations. That's just the way it is. The

method of analysis may be different at different sites. That's the difference between a dose system and a concentration based standard.

The State of California has had to deal with that quite a bit because that is the basis for most arguments against the -- in the State of California under their licensing issues. There's been arguments about this site is used, this may be used -- we haven't seen that as much in ours about people saying well, this site did it this way with this code and they got a value of this, you should do the same because you have the same radio nuclides. We haven't seen that as much and we haven't seen it pulled in as saying, well, you know, Site XYZ or at least we haven't seen it coming into us.

I have no idea what the licensees have seen from their own, you know, their local public and their local -- if they have boards or whatever, but we haven't seen too much of that that has been serious opposition with the argument being based on the fact that another place, another site was approved with a different number and that they -- and this one is getting away with everything by having a number 10 times. We have not seen many arguments along that line.

MEMBER WEINER: How do you handle them when you do see them?

MR. McKENNEY: Let me explain again that with a performance based standard, there are a number of factors that go into it, including what is the scenarios and what is -- not only that, I mean, there's other factors that go into it with Kd chemicals, the site, the mixture of the radio nuclides, possibly the site, depending on the way they're doing analysis, which sources are contaminated at the site, which ICRP factors they're using, all those sort of things can lead to different DCGLs for the same radio nulcides, so we just try to describe that to them and try to make them understand that it's -- the risk is being -- the risk is trying to be or dose is trying to be held below 25 millirem but you don't -- but that can lead to different concentrations in different situations.

MEMBER WEINER: Thank you, that's helpful.

MR. GILLEN: Dan Gillen. I just wanted to mention in response to Ruth about you seem to indicate that well, there's not very many of these that would come in and not use just a bounding resident farmer. We actually have, I don't know maybe Chris can give site specific examples, but I'm pretty sure that you

know, we've had a number of cites already come to us and use the more reasonable scenarios, SE Holdings, MD&R, Kiske, we did that one ourselves. Those are examples that come to my mind, anyway.

MEMBER WEINER: Thank you, that was actually my question so you have used this --

MR. McKENNEY: Well, we've been using this on a case-by-case basis before we even made it guidance, pretty much, we had, which is sort of the basis which -- which is discussed in SECY-0369 about some of the ones that we had already sort of went this way because of case specific issues that allowed us to be in a position to go in this approach. And so this was more of a making this the formal policy rather than the case by case policy.

MR. SCHMIDT: This is Duane Schmidt. You might guess and correct me, Chris, you know at headquarters, we deal with the more complicated sites and it could be out of the ones we deal with, you know, roughly half, I don't know, somewhat of a guess, but a good portion of those complicated sites end up using, you know, scenarios different than bounding ones. So we would be talking about a few 10s of sites that we deal with.

CHAIRMAN RYAN: You know, I guess let me

add a view that I think when you think about the NRC doing this, it's fairly straightforward because there's always access to all the folks that are involved either at a region or at headquarters, but when you notch it down to the sites that will be decommissioned through an agreement say, you know, having the robustness and guidance, and the clarity of direction across the guidance to use realistic scenarios and how that ought to be done as opposed to, you know, some single reference scenario which, you know, I think, frankly, can mask risk as opposed to elucidate risk is real important that it's in the guidance. You know, and you look at the things that you mentioned, Chris, of KD's and other geo-hydrologic types of questions, the backyard farmer scenario, just doesn't hold up, I think, across that spectrum of potential sites.

So having flexibility in the guidance and actually have the guidance say, you know, how you develop your own scenarios, which of course, it does and can be strengthened in that regard is pretty much the right way to go. But, you know, I want to just add the dimension, it's not just the NRC that will be using this guidance. It's the broad spectrum of agreement state licensees across the country and in a

wide variety of settings.

MR. McKENNEY: That is correct; however, for -- from the point of the agreement states, at our agreement state meetings, they tend to have much -- they have a lot less of the complicated large earth. Generally, our sites are more complex, tend to be larger contaminated sites and luckily they tend to be in proportion which is more like the regions and that most of our sites are simple, but yes, they could -- I mean, that's also for the guidance, it allows them to go forward on a site specific basis.

CHAIRMAN RYAN: Yeah, I think, you know, whether the site is complex or relatively simple, having that guidance flow to them in a clear and -- you know, and detailed fashion gives them, you know, a lot of support that, frankly, a lot of them can't afford to develop internally on their own merits, so it's good that it does address the spectrum, which is just what we're talking about. That's great.

MEMBER CLARKE: Dr. Larkins, did you have a question? Are there any questions from the staff? We do have one more topic before we're scheduled for a break and that is removal of material after license termination. We have Tom Youngblood presenting that.

MR. SCHMIDT: Actually, that was John

Buckley and I. Tom is on the next --

MEMBER CLARKE: I'm sorry, he's on the next one.

MR. SCHMIDT: So this is, we're there. And I believe this is an issue that we did not talk to you about in the June meeting. Hopefully, it's not too new but this was in the draft guidance and the real issue that we were trying to get at here was sort of distinguishing criteria that may be used by licensees to release material from an operating site or from a decommissioning site, release materials from that site versus criteria that might be used for materials that may remain on the site and in particular for materials remaining on a site at license termination that cold then be removed after license termination.

And you know, for removal of solid materials during operations, we've got REG Guide 1.86 for surface contaminating materials. For volumetrically contaminated materials we've been sort of consolidating around a criterion that's acceptable of a few millirem per year when licensees apply under NCRF 20.2002. So that's the one hand of releases of materials during operations.

At license termination, materials that may

be left on site are subject to the License Termination Rule and so there can be some inconsistency because there are certain types of materials that could fit into either category, materials that could be released before termination or could remain on site and later be recycles or something else to move off-site.

One example that I think of is a metal building that might be on a site. You know, that's a -- a structure like that would be relatively easy for a licensee to disassemble, decontaminate as necessary, scan and release it during operations or during the decommissioning process, but they might also choose to leave that structure on site to develop DCGLs for that structure scan it appropriate but that building could remain on site at license termination and then after the license is terminated, you don't know what the next owner of that property might do. So that material could actually still end up being removed from the site being recycles as scrap metal or reused somewhere else.

So there is in some sense an inconsistency and that's what we were trying to clarify, I guess, with this guidance. There was little bit more in the slide there but since we hadn't talked about this one. Public comments on -- moving to the next slide, public

comments on this issue, we didn't really get a whole lot. We had a couple of -- a small number of comments, a couple requesting some clarification of the approaches that we described. There was one commentor that wanted concentration values instead of a few millirem criterion. And there was, I guess some confusion about what does criterion would apply to materials that are left onsite at license termination where they could be removed after termination and the doses had to address, say an offsite use scenario.

And our path forward, we don't think that there are any significant substantial changes that we need to make to the guidance. We're going to look at the comments and see if there's some things that we can clarify to eliminate the future confusion.

I guess that's really all I wanted to say on this issue. We didn't get a whole lot of interest. It was a little bit surprising but we really didn't in terms of public comments. So I'll give it back you all.

MEMBER CLARKE: Thank you. Bill, do you have any questions?

MEMBER HINZE: No, I'll pass.

MEMBER CLARKE: Bill?

CHAIRMAN RYAN: No, thanks.

VICE CHAIRMAN CROFF: One question; if you used the reg guide in 2002 before license termination, why not just use them after license termination as opposed to creating new language in the 1757?

MR. SCHMIDT: The Reg Guide 1.86?

VICE CHAIRMAN CROFF: Right.

MR. SCHMIDT: I guess the difficulty is that -- well, I guess in most cases if a licensee proposed doing that, that would probably be acceptable, but the license termination rule says that those criterion for unrestricted use is 25 plus ALARA, that can give you different numbers than are in the reg guide. So licensees certainly have flexibility and some licensees have chosen to develop their own DCJLs for buildings especially. Does that -- is there more question, I'm not quite sure I answered your --

VICE CHAIRMAN CROFF: Well, I'm not sure it did either. You've got --

CHAIRMAN RYAN: Maybe I can help you. What's the difference between a 2002 determination and a License Termination Rule determination for the same pile of material?

MR. SCHMIDT: The 2002 determination would be if it would be probably for the pile of material to be released from the site prior to actual license

termination.

CHAIRMAN RYAN: Well, what's the criteria difference? I mean, is it the same does number and all that -- I mean, that's what I think, Allen is trying to get at. Why are they different?

VICE CHAIRMAN CROFF: Right, why have two different things?

MR. SCHMIDT: That's a good question. That's where we have ended up. I mean, we've -- it's been sort of a slow evolution in our thinking but I guess we've sort of been there for several years. On 20.2002 for operating facilities, the doses in general should be a few millirem for materials that are leaving the site. The regulation itself does not require that but what we had been saying and what we've put into the -- through some other guidance, said that if licensees requested 2002s for offsite disposal at doses of a few millirem per year, that would be acceptable.

So we sort of evolved to that over really a couple decades almost. You know, if push came to shove and a licensee said, "I want to send material offsite at 25 millirem per year", the regulation could allow that. We don't totally like that, we would prefer lower doses for materials that are being sent

offsite.

CHAIRMAN RYAN: When you say "sent offsite", sent offsite for what, disposal or reuse or only reuse or --

MR. SCHMIDT: Yes, but the majority of the requests we get, I think, are for disposal in, for example, municipal landfills, sometimes hazardous wasteland landfills. There are the occasional other situations. I mean, there's a request in place now that's sort of an after the fact something that wasn't -- that I guess, the licensee wasn't totally aware of where concrete that was slightly contaminated was moved offsite and now is, I believe, at a commercial establishment just serving as a barrier, I guess.

Most of them really end up as disposal in landfills but there are a few other cases that come up and it could be -- under 20.2002, a licensee could request any use. I guess another -- one of the other examples that was a recent proposal that was approved was use of I think it was filter cake, I'm not sure of the exact material at a Cabot site in Pennsylvania, low concentrations of, I believe it was uranium, but they wanted to use -- the material fit into use in making cement, and so they planned to send the material to a cement production plant, I guess, and

that was approved. So that's not exactly disposal, that's reuse. That one is pretty low concentrations after the cement was produced.

CHAIRMAN RYAN: Do you think it makes sense to try and address the differences between 20-2002 and the LTR in this guidance? It would sure help people sort out where they are.

MR. SCHMIDT: Can you -- in what way would it --

CHAIRMAN RYAN: Well, I mean, 2002, it's not just the fact that we're talking about material before or after the License Termination Rule. That's just the timing, but there's very different criteria in thinking on the two.

MR. SCHMIDT: Right.

CHAIRMAN RYAN: And I think it's important to tell people in the license termination game why 2002 either can be used or can't be used or should be used or shouldn't be used in one setting or another and maybe some of the case by case work you've done already would help you document that at least a little. And I recognize this is very much a work in progress because you're doing these things actively and currently, but it is a good question to say why is 2002 different than LTR?

MR. SCHMIDT: Right, and I think that's a good suggestion. I know we've got a little bit on that in the guidance, but I think that's a good suggestion that might be something to beef up there.

CHAIRMAN RYAN: You know, folks at this table, I think, have wrestled with it some already but, again, new entrants and again, I'm thinking of the folks that are walking into termination questions for the first time. They're going to hit the wall of confusion there if they don't have some kind of detailed guidance laid out. So that might be a way to help clarify for folks what the differences are and why they're there and how each one is used and so forth.

MR. SCHMIDT: Right, I think that's a good suggestion.

CHAIRMAN RYAN: Okay, thanks.

MEMBER CLARKE: Ruth? Let's go the other way, Dave Kocher?

MR. KOCHER: Hypothetically, I suspect the only way that you might really run into trouble here and this is, I suppose, not likely to happen, suppose some piece of contaminated equipment or part of a building, if left in place, could meet the License Termination Rule criterion but by some means or other,

if it were then after the license was terminated, the owner of that property sold this to somebody else and he used it for some purpose, not disposal that led to a dose higher than the License Termination Rule criterion, that could be a problem. I don't suppose it's likely to happen but it may call for some thought about what kinds of things would be permitted to remain on site even if -- even if the License Termination Rule criteria were met, I don't know. You probably just have to give some thought to this hypothetical situation to see if it's at all plausible. I don't know.

I mean, sculptors do funny things with stuff, you know.

MR. SCHMIDT: With found objects. That's a good point and I think we have addressed that at least somewhat in the guidance. The options that we presented push licensees towards removing before license termination, materials that are easily removed. So there's a push there, at least, in the guidance and we also have a discussion in cases where you know, a licensee knows that -- and maybe there's a key word there, knows that a material that is going to be left on site at license termination could be removed and used for something else, that should be

considered. You know, potential offsite uses should be considered and we have said a little bit about that in the guidance.

You know, you can't -- and maybe that's part of what you're thinking. You can't always tell how somebody is going to reuse materials.

MR. KOCHER: And it's not your job to think of every eventuality, either, I don't believe, but it's just something worth hearing.

MR. SCHMIDT: Right, right, but, yeah, I think -- I mean that's part of what's difficult and I think that's part of what causes you know, confusion with people looking at this, people look at it and say, "Well, gee, this could get taken offsite afterwards", are you really addressing that?

I guess I feel like we've got something in the guidance and we are trying to take that into account. I don't know if we've had good examples yet come out of this.

MR. KOCHER: On this issue of consistency between offsite disposal, those criteria under 2002 and then the License Termination Rule criterion, if as you say, the idea here is that disposal in a sanitary landfill is a desired end point for some of this stuff rather than a licensed low level waste facility, I

don't see that you want the criteria to be the same.

I think the criteria should be low at a landfill because there's other stuff there. It's not a hazardous waste site.

MR. SCHMIDT: Right, that's a good point. And I think that's -- you know, that relates when we were working on a clearance rule, I don't know if I'm allowed to say that word, but that was part of the consideration that went into, you know, looking at lower dose criteria for clearance, for releases during operations, that you've got lots of different releases over time and people may be exposed to multiple materials, I mean, a similar type of concept, I think.

MEMBER CLARKE: Tracy?

MR. IKENBERRY: I just had a question regarding the use of the few millirem criteria that you're using. Has that been -- is that based on or couched in terms of ALARA? Is that where that's come from in reducing from the 25 millirem or -- I mean, that would seen reasonable to me that if it were done that way, but I'm just curious about that.

MR. SCHMIDT: I'm not positive where it exactly comes from. I think part of it comes from the thought that people might be exposed to multiple releases, multiple batches of materials. I'm not sure

if ALARA worked into that or not. I guess I'm not sure. I'd have to go back and look at some of the documents.

CHAIRMAN RYAN: Duane, couldn't you speculate, too, that that -- and it's qualitative, which I think is an interesting point. It's a few millirem. It's not one or two or 2.76 or any specific number, but it is consistent with the range of values you see for disposition of solid materials worldwide. You know, it's not inconsistent with that. If you look at EU Safety Directive 6, or you know, any of the other international guidance, it's kind of in that range. So I think there's some consistency there, Tracy from that standpoint which is helpful and it's not inconsistent with the materials that were developed on clearance here but, you know, are not just on hold at the Commission's direction citing the higher priorities, but recognizing as they did in their own comments in the quality of the work, so there's a consistency from that standpoint, at least that's my thought. What do you think, does that seem reasonable?

MR. SCHMIDT: Yes, I would agree with that, although one thing to mention, I guess, you mentioned that it's qualitative. Related to the next

topic on onsite disposal where we've got the same criterion show up, we were actually proposing making it quantitative and putting a number 5 on that few millirem. So if you all have thoughts on that, we can talk about that now or later but --

MR. IKENBERRY: Yeah, that was kind of my question because what is 8 not a few millirem and three is a few millirem? I was kind of going that way and I wondered, you know, the potential for trouble in that.

MR. SCHMIDT: You know, all I can give you is my personal view from when I was a kid, you know, a couple is two, a few is about three, four or five and several and, you know, that's not written down.

(Laughter)

MR. SCHMIDT: And I think that's why when we were thinking about -- and it really came from Tom Youngblood, who was thinking about the onsite disposal issue, we have difficulty with that because, you know, if it's one millirem, it's clear, I think and probably two or three is clear, but some people think a few is five and some people think a few is less than 10, which isn't a huge difference but, yeah.

CHAIRMAN RYAN: I guess when you consider the uncertainties in some of those things, they're all

just a little --

MEMBER WEINER: And aren't you going to have to say five plus or minus what?

MR. SCHMIDT: Or five times or divided by three.

MEMBER CLARKE: Okay, Eric?

MR. ABELQUIST: I think the biggest gap potentially with this guidance is when it's applied at power reaction decommissioning sites and if I'm not mistaken, currently if the licensee looks at the materials that cannot be left, the equipment, that means that prior to license termination, the equipment is going to have to be removed from the site and the current guidance lacking a disposition of solid materials rulemaking, is the nothing detectible.

Basically the criteria states how hard you look and as long as there's nothing detectible, it will be leaving the site. And that's the potentially, I think the biggest gap between materials that could be released with the license termination rule versus the materials that have to leave before the license is terminated. So that's just a reflection that this guidance continues to highlight the difference between the materials licensees and the power reactor licensees, not much that you can do there but it just

-- it further highlights that there is this continuing difference, if you're going to have to revert back to the case by case of how material ultimately is released. So that's just an observation.

MR. SCHMIDT: And a good one. I think reactor licensees could, at least, apply you know, to release materials at a few millirem as opposed to undetectable. My understanding is that usually for surface contaminated material, they have not done so. But your point is, it does highlight that issue.

MEMBER CLARKE: Tom?

MR. NAUMAN: To expand upon that a little bit, we're getting from -- and my experience is based mostly in the power reactor segment. You're crossing over from a qualitative to an emotional issue and public perception and shareholder value. You know, Exelon or TVA or Entergy, the large corporations that are in this business, they can't afford to have an issue with their local public associated with trying to take advantage of a few millirem. So they end up eating the cost and not fighting the battle, although it's a substantial cost to them and I think clear guidance would be helpful.

And you know, if they can go to their constituents and say they're just following the

regulations, then it becomes less of an emotional issue. But right now, they have to default to no detectible for materials leaving the site.

CHAIRMAN RYAN: Tom, just so I'm understanding your point, would you like to see a numerical criteria?

MR. NAUMAN: That's a tough question. You know, a few is -- there's room for interpretation and working with the regulators, but I think they need to probably apply Reg Guide 1.86 type criteria to the materials. Yeah, a numerical probably would be easier to defend from an emotional perspective.

CHAIRMAN RYAN: Well, 1.86 suffers a bit from my way of thinking, because it's surface contamination based. It's not risk based.

MR. NAUMAN: Yeah.

CHAIRMAN RYAN: So how do we get from A to B? I know I'm asking the hard questions but I think it's helpful for the staff to, you know, kind of explore that with us today and hear the views of, you know, what might work, because I agree with you, it's a tough problem. I mean, a few, five, 10, seven, you know, whatever number you home in on, does it help, do you think, the folks that you've mentioned, the utility folks, to have a number?

MR. NAUMAN: I think it does. I think no detectible is obviously a tough number to meet.

CHAIRMAN RYAN: That's a never ending chase.

MR. NAUMAN: Yeah, exactly.

CHAIRMAN RYAN: And well below any risk threshold of importance when you get down to, you know, current detection capabilities.

MR. NAUMAN: Yeah, so if you could establish a number, there would an advantage down the road, but again, it would be an uphill battle in a public forum, I believe.

And maybe to steal Eric's thunder here a little bit, taking a specific case, the concrete blocks at Connecticut Yankee, they presented a few millirem -- they fit into this few millirem criteria and I know for a fact that they spent over $10 million going back and retrieving these materials that had left the site because they hadn't left the site as non-detectible, they had left the site within the guise of the procedures in place at the time they left the site. But those materials would align with this release criteria here and it became such an emotional issue that the utility had to go get them and bring them back and how do we prevent that from happening,

you know, in the guidance here and maybe setting a number might be the key.

That's all I have.

MR. SCHMIDT: I don't think I really have any response. I mean, that's a good point and obviously a difficult issue.

MR. NAUMAN: Yeah, I just wanted to point it out for your consideration more than anything.

MR. SCHMIDT: Thanks.

MR. DAROIS: I just had a comment that kind of in regards to the real license termination issue here on leaving material behind. And it just appears that we're setting up the potential for licensees to experience the slippery slope a little bit and this is what I mean. If we go into a license termination situation and I'm thinking of a larger utility or a large facility at least, where they choose to leave building standing onsite and survey against the DCJLs. I can certainly see where we're going to need to now look at other dose criteria for other uses of that material after license termination.

And it just begs the question how much, how extensive, you know, I've got a combination of metal buildings and concrete buildings and do we need to look at different kinds of landfills that this

material might eventually end up being in? What's the criteria? It could be a fairly substantial project to consider all of that. And I'm not saying it's wrong, but I'm just pointing out the fact that this could be a substantial effort. Is it one building you're going to leave, is it two? Do we have to consider all of them? You know, so just be aware that this could be a little bit of a slope, a slippery slope in what we're requiring the licensees to eventually evaluate.

MR. SCHMIDT: That's a good point. Chris may want to say something, too, but you know, one thing that comes to mind is that it seems like in a lot of cases some type of building occupancy scenario might be a bounding, you know, exposure scenario.

MR. DAROIS: Well, it might unless the materials go to groundwater in a landfill scenario.

MR. SCHMIDT: Right, so maybe it's -- so maybe in a lot of cases, it's a case of trying to determine if there's something unusual about the contaminants or the material that would --

CHAIRMAN RYAN: Eric, your question got me to think about the FUSRAP sites. I mean, those are interesting industrial facilities, some small, some very large where these exact questions have sort of cropped up over a few cycles through each one. You

know, I was involved in the `70s on some of the first surveys east of the Mississippi and you know, as time went on the surveys were improved and engineering plans and decommissioning occurred, and of course, those materials have been removed. Has anybody mined that experience to see if there's any instruction there for the things we're thinking and talking about now? I know that's a huge mouthful to offer you to think about but it just seems that there might be some analogies there or some experiences that might be useful.

MR. SCHMIDT: Not that I'm aware of, have we mined that information. I mean, that's a good suggestion.

CHAIRMAN RYAN: Because I mean, some of those, of course, they're all in the 50-year old range and it would be interesting even to see if, you know, what you're looking at for scenarios of assessment how those have evolved and that could give you actually some powerful support views perhaps or have you adjust it so it is supported, your views are supported. Just a thought.

MR. SCHMIDT: Right. No, that's a good point.

MEMBER CLARKE: Any other questions for

Duane or Chris for that matter? We're a little ahead of schedule, but let's stick with the agenda and take a break and come back at 10:45.

(A brief recess was taken at 10:20 a.m.)

(On the record at 10:47 a.m.)

MEMBER CLARKE: Chris McKenney, I understand you'd like to make some comments.

MR. McKENNEY: Yeah, just a couple things I forgot to mention on the realistic scenarios issues about the level of guidance versus level of detail in the guidance is that there's other avenues; that the staff really does approach it also on the fact that while we have the generic guidance in the rule -- sorry, in the NUREG, that -- and there's the flexibility in the rule, we do encourage licensees and we have done this very actively in the past of having many meetings with them on discussing before they give us a license amendment or an ABTP or a -- I'm sorry, not -- a license termination plan or a decommissioning plan to discuss just what their plans are and what scenarios they should be analyzing for their situation so that we have covered the possible scenarios they need to do and what unlikely scenarios they may need to explore and how they may need to discuss them in the license termination plan or DP so that we get that

supporting coverage before we start down that path and so that they can ask us how much work, basically they need to -- they may need to so as part of their process.

And also that just remember that the guidance is guidance and licensees can go with alternative approaches anyway.

MEMBER CLARKE: Thank you. Duane, I understand you'll be our next presenter, Onsite Disposal of Radioactive Materials.

MR. SCHMIDT: But I do get to go away after awhile.

MEMBER CLARKE: Not if we can help it.

MR. SCHMIDT: Well, I'm going to stay around. Yeah, Tom Youngblood had to leave for this issue but he's on travel this week, so I'm filling in for him. This one I'm a little bit more up on so hopefully I won't have too much trouble with the questions here.

So on onsite disposal to -- let's see, we're on -- we're there. In the guidance we propose a new Section 15.12 that would be added to Volume 1. The main point of the proposed guidance was to discuss three options really related to dose criteria. The first was what we've called the current approach that

I eluded to before of a few -- of doses not exceeding a few millirem per year. The second approach was allowing doses up to 100 millirem per year but with a requirement that additional financial assurance be provided. And the third option was an in-between up to 25 millirem per year for mainly short lived radio nuclides where the possibility of creating a legacy site was minimal.

The first two of those options were proposed by staff and agreed to by the Commission. The third was one that was proposed by the Commission in the SRM in response to our SECY paper. And just a note, which really relates to the comments that we received, we talked about this issue at the workshop in April of last year. One of the questions that we asked at that time was, did people feel like there was a need for additional flexibility in criteria for onsite disposals. And we got at least some limited support for additional flexibility that might be afforded by options 2 and 3. I guess the real reason to mention that is giving away the comments that we didn't hear that in the public comments.

Onto the next slide, I'll talk a little bit about the comments that we did receive. We received comments from four state governments, a

couple of public interest groups and a private citizen. And some of the state agencies were generally opposed to onsite disposal. And in fact, one of them opposed all onsite disposals. There were differing levels of opposition, I guess. One state, New York in particular, posed onsite disposals that would later have to be remediated.

A number of commentors, including some of the states were opposed to implementing these options for onsite disposal by way of guidance and were really suggesting that rulemaking was needed. One of the -- and finally, one of the public interest groups observed that in particular in Option 2, the higher dose level with financial assurance, that in a way financial assurance was the main way that we were trying to prevent the creation of legacy sites for the future. And the commentor suggested that that one method might not be sufficient to preclude legacy sites. Just because you have money doesn't mean that money will be available, doesn't mean that things will eventually get cleaned up.

And to the next slide, our staff considerations, this is a case where we did agree in at least general terms with many of the comments that we received, especially related to this option to the

higher dose with financial assurance. We think there's some validity to the comment that onsite disposals are in conflict with preventing future legacy sites. The comment about financial assurance, that that requirement may not be sufficient to insure that materials get cleaned up in the future and at least to some extent we agree with the intent of the -- or with the thoughts that rulemaking should be done. I think partly we got, of the people who commented on this issue, many of them, a good portion of them said the same thing.

And I guess an additional consideration that we factored into all this is the last bullet here, trying to balance two objectives, the one of preventing future legacy sites and one of providing flexibility under the regulations. And here's where maybe we're thinking that that balance should tip a little bit differently towards preventing legacy sites. So onto the next slide, our current --

CHAIRMAN RYAN: Duane, just to comment --

MR. SCHMIDT: Yeah, I'm sorry.

CHAIRMAN RYAN: -- or question here. We've heard before a little bit on preventing legacy sites and doesn't that really get way back up stream into operations and inspections, you know, during a

site life as opposed to close to the end?

MR. SCHMIDT: It does and onsite disposals also can occur at any point in the facility's life also. And so yeah.

CHAIRMAN RYAN: I mean, there was talk of, you know, folks have financial assurance requirements and how those might actually be measured as a function of that have at least some measure of risk or some view of risk for decommissioning.

MR. SCHMIDT: Right, and we are -- we do have a separate rulemaking effort that will be addressing some changes to financial assurance and I don't know if we have detailed questions, I wouldn't be able to answer those.

CHAIRMAN RYAN: No, that's fine, I'm just trying to create for everybody here that there is a linkage between the rulemaking for operational aspects of financial assurance and these decommissioning concepts where legacy sites is really the key phrase. Is that fair enough?

MR. SCHMIDT: Certainly.

CHAIRMAN RYAN: Okay.

MR. SCHMIDT: That's a good point.

CHAIRMAN RYAN: Thanks.

MR. DAROIS: Let me add to that a little

confusion. When we do this analysis for operating -- an operating site, and we apply, say a 20 millirem criteria, recognize that we haven't yet determined what the site use condition is going to be yet for that analysis. I mean, I've certainly run into this situation before where there's been a prior onsite disposal permitted but the pathway analysis was direct exposure and it was occupational exposure, perhaps. Now we go into decommissioning and that disposal doesn't meet the 25 millirem say resident farmer criteria or whatever the LTP end use would be. So there's -- just because we're doing it doesn't mean it can stay.

And that's an important distinction because you don't even get into determining what the scenario is going to be until you sit down with the stakeholders in the decommissioning process and negotiate that as we heard from Chris earlier. So, the two may be very different.

MR. SCHMIDT: Right.

MR. NAUMAN: And a little clarification on my part, too, just to ask you a question, Eric; is it truly disposal or is it permitted storage until license termination time? You know, what's --

MR. SCHMIDT: Maybe.

MR. NAUMAN: What's the difference?

MR. SCHMIDT: I guess that's my point.

MR. NAUMAN: Yeah, what's the difference? You're not going to release the site until you analyze the end state and that's not until you go into decommissioning.

MR. SCHMIDT: Right.

MR. NAUMAN: So that permitted storage or disposal cell is just there until such time as you make that next phase jump.

MR. SCHMIDT: Yeah.

CHAIRMAN RYAN: It seems to me that it would be helpful if the LTR guidance could actually recognize what these two folks are bringing from their own experience. If there is a transition point where the rules could and legitimately change to the License Termination Rule versus a determination by whatever means during the operating life of the facility and they're not necessarily carefully aligned because they're different purposes.

No, and in the discussion that we've had at other briefings on preventing legacy sites as an operating issue it's, you know, are there more spills, less spills, are there solids, no liquids, you know those kind of criteria help you set the stage for

well, is this going to be, you know, something down the road or not? You know, are sewer treatment -- sewer outlets isolated from radioactive material areas, you know, all those usual operational things. So that's kind of a different set of issues and all good.

I just think that the handoff between one and the other, even though that guidance is under development, too, that it might be helpful to at least recognize that there are perhaps slightly different issues even though they're aimed at the same goal of not having you know, real problematic legacy sites.

MR. SCHMIDT: And actually, I need to go -- I don't know if we moved forward. I need to go back a slide because I forgot an important point. The other thing that we've done in thinking about this, is reviewed our data base of 20.2002, or recent 20.2002 disposals and there's a very small number over the past -- we looked at -- well, it's not even this century but since January 2000, there's a handful that were for onsite disposal. My real quick look at those with not seeing all the detailed information, indicates that most, if not all of those have very low concentrations of radio nuclides involved and would probably have very low doses that would be within a

few millirem.

Part of -- I mean, the real point of that is that our thinking is also changing to be more that we're not sure we see a need or a desire and I hope we'll get some input here, especially from the reactor guys here. We're not sure we're seeing need for onsite disposals where doses might exceed a few millirem per year, and that's the better lead to the next slide is our current thinking is to back off on Options 2 and 3 from our draft guidance to just present Option 1, continuing the few millirem policy, but to also note that of course, licensees can propose other options. They always can but we would note that.

That would be a change from what we sent to the Commission and what the Commission asked us to do. So that would be part of our discussion in the Commission Paper. But that's our current thinking on this issue at the time and welcome discussion on that.

MEMBER CLARKE: Okay, Ruth, would you like to start?

MEMBER WEINER: This is somewhat the same question I had before. If you simply go with Option 1 and you say a few millirem not to exceed five, there is so much uncertainty in that determination. Are you

going to put uncertainty in the guidance, some limit? What if somebody does a model and says, "Well, it's going to be six"? I mean, I think that's a question that you have to face.

MR. SCHMIDT: I think if -- well, and this one is harder because if we do put the number five in the guidance, that really is only guidance. There's -- the limit is certainly not five, the limit in the regulations. Yes, we will have to face that. That might be easier to say, yes, six is pretty close to five when the uncertainty is four. You know, but it is a little bit different than the LTR where we have a limit that is -- I mean, we certainly acknowledge there's a great bit of uncertainty especially in many of these numbers.

MEMBER WEINER: The other question that I have is for something -- for a situation like this where you're going to allow onsite disposal of very low activity stuff, what do you consider background? Where is your background point?

MR. SCHMIDT: I guess I would -- I'm not sure if this will answer the question. I mean, I would consider background to be -- yeah, I guess I don't know what you're getting at.

MEMBER WEINER: Maybe I can be a little

clearer. When you say, okay, we're going to allow onsite disposal of this material and terminate the license, this is part of the LTR. And you say that the dose delivered by this particular material is not going to exceed whatever, how do you compare this to the rest of the site, nearby areas that are not on site? I mean, you're talking about very low activity and really an almost so what situation.

How -- maybe my question is, how do you present that to yourselves and to the public? This is a little bit of activity, but if you go 10 miles down the road you're going to measure a higher dose anyway.

MR. SCHMIDT: I guess I'm not sure what exactly to -- I mean, that is an issue certainly with public perception. I mean, we're aware that that's a difficult sometimes and especially certain sites it's maybe more of a difficulty where there's more variability in either concentrations in soils or whatever. I'm not -- I guess I'm not sure what else to really say. We recognize that that definitely is an issue of -- especially of public concern sometimes.

MEMBER WEINER: That's really all I was looking for, that you recognize that there will be people who say, "Oh, my goodness, you can't do that", and there will be other people who will say --

MR. SCHMIDT: Right.

MEMBER WEINER: -- it's not a big deal.

MR. SCHMIDT: Right, thank you. I appreciate that. Allen?

VICE CHAIRMAN CROFF: I'd like to come back to the point that Eric raised a little bit earlier. If you go forward under Option 1, will there be some language that will prevent the disposal from becoming a legacy problem during decommissioning? Is there such language attached to 2002 now?

MR. SCHMIDT: There's no language attached to the regulation 2002 itself now. What we're proposing which we had said in the draft and we may want to expand, what we're proposing is that licensees should consider doses for the existing situation and also somehow doses for future use. And from what Eric mentioned, you know, that's not something that was necessarily done in the past. That's what we're proposing so that people should think about this few -- the thought is really that the few millirem would be a fraction of the 25 for future use, and therefore, there shouldn't be a need, you know, to remediate.

So that's our intent is to put words or to add even more words, I guess in our guidance. We do -- you know, this guidance is for decommissioning,

this is an operational issue so we do have the difficulty of figuring out how to get this guidance attached to some operational guidance and that's something we'll work on but --

VICE CHAIRMAN CROFF: And there's no guidance with 2002 that requires looking at decommissioning.

MR. SCHMIDT: To my knowledge there's not at this time.

MR. DAROIS: There isn't -- well, for the reactor licensees, there's 5075(g), although there's no requirement in 5075(g) to do a dose evaluation, it's just to inventory what you have and know where it is, et cetera, keep a file on that.

VICE CHAIRMAN CROFF: It seems if future legacies are going to be avoided, somehow that needs to come of front.

MR. SCHMIDT: Right.

VICE CHAIRMAN CROFF: Thanks.

CHAIRMAN RYAN: I'll take a difference, on the background question that's one you just -- you know, I mean, it's in addition to background. You don't regulate background. And it's -- you know, at these small numbers, it is a fraction of background and buried well within the range of normal variability

of background. So I think that really puts a focus on the question for the background.

To get back to the ideas that Chris mentioned earlier about what the licensee can and should do or has the option to do, to come in with alternatives and things of that sort, it seems to me that any time a licensee hears that or reads that, that's very helpful, you know, that they have the chance to offer alternate scenarios or alternate calculations or you know, some view of the world that's different than the reference case or the base case or whatever else it might be, that's really helpful.

And anywhere where you can -- particularly on these issues where there are variability, you know, or connections to other regulations, talking about what the licensee has the option to do or to think about is really helpful, I think. So I would look for any opportunity to enhance that and you're probably saying it two or three times extra probably isn't a bad thing, you know, just to re-emphasize that point. And I think the other part of it is the pre-planning conferencing that can occur is probably a major advantage for licensees to come in and hear for their case, you know, for their facts and figures, what

initial assessment might be or an initial view might be to help them get on track. And that, I think, is different than other regulations in other agencies.

You know, all agencies have open doors, but, you know, this is the chance to really come in and learn from the technical experts that have been working on this for years at lots of sites as you guys have, and I think emphasizing that is a key thing. So that's just kind of a summary point or two from this morning.

MEMBER CLARKE: Thanks. Bill.

MEMBER HINZE: I think we're all agreed that we would like to eliminate or certainly minimize legacy sites and in view of your possibility of moving to the few millirem policy as the one option, I wondering what the thinking was with regard to the third option that you had, that you have now up to 25 millirems for mainly short-lived nuclides. How did you see this minimizing legacy sites and in view of that, how -- isn't it logical to keep this as an option?

MR. SCHMIDT: It could be logical. I guess part of the -- part of the question that we were trying to answer in developing guidance for that third option is what really do you consider short-lived and

how do you insure that short-lived really is short-lived relative to how long the licensee will truly remain in operations. I mean, that's what's -- you know, if short-live could be cobalt-60 if you've got a licensee that's going to stay around long enough for cobalt-60 to decay but you don't always know that.

I guess, you know, and this -- I don't have a lead so this year is my personal view that that option could kind of be left in or could be taken out or could fit in as part of a few millirem. You know, you might be able to -- or we might be able to say, "Well, if the doses that you calculate today are 25 millirem but there's a lot of assurances that that would be a few millirem by the time that license termination really is likely to happen, you sort of end up in Option 1. I don't know if that -- I mean, I guess to me that option could kind of go either way but there is a little bit if difficulty in how long is short-lived versus how do you assure licensees stay in operation.

MEMBER HINZE: When I look at your proposed revisions to guidance, the third bullet under the first bullet is "consider other requests on a case by case basis". I really wondered if that wasn't really incorporating option -- your Option 3. You

know, and if it is, wouldn't it be better to state it so that we have some specifics here in the rule making?

MR. SCHMIDT: Or in the guidance. I --

MEMBER HINZE: Or in the guidance.

MR. SCHMIDT: I would agree with that. If we really think that that's a good option, then we should outline it. And that wasn't necessarily the intent of the bullet on allowing other ones.

MEMBER HINZE: Then why should we eliminate -- why should you eliminate this option in the guidance?

MR. SCHMIDT: Maybe we shouldn't and I guess you're suggesting that perhaps we shouldn't.

MEMBER HINZE: Well, I'm trying to get at what -- you know, why should it be eliminated?

MR. SCHMIDT: I don't have a great answer to that, I guess. If we were -- if we were trying to focus or consolidate around getting to a point of a few millirem, you know, a fraction of 25, in my view, if we kept it in, I would might want to change it so that it's clear that the end result is a few millirem, and maybe that -- and that probably is worth -- you know, I guess thinking about it right now, it probably is worth saying, "Hey, that's one way of getting

there". If you've got short-lived, you've got more flexibility because of that, really.

MEMBER HINZE: Your problem there is what is short-lived and --

MR. SCHMIDT: Yeah.

MEMBER HINZE: -- and if you made that a little more specific, you would end up with an option that would be very reasonable, I believe and very viable.

MR. SCHMIDT: Yeah.

CHAIRMAN RYAN: If I may, Bill, you could take the time line idea that you just mentioned and offer discussion of that point. You know, for example, if you're doing an onsite disposal today, because you want to manage the material today, you know, have the licensee suggest, "Well, we're really looking at license termination in 25 years". Let's pick a number just for the sake of the discussion, or 20 years. And so we'll be looking for your forward looking assessment of what that will -- profile will be, whether it's radioactive decay or you know, whatever the other issues are, and you could actually at least in principle, approve that kind of action but have some, you know, future, "Well, we'll inspect it at 20 years out or you'll have to readdress that to

verify things are as predicted in your decommissioning plan and sort of tie it together", but, you know, use the fact that you've got a clock built in there more explicitly. That's a possibility.

MEMBER HINZE: Right, right.

CHAIRMAN RYAN: Thank you, Bill.

MEMBER HINZE: And I really would exclude the out there with financial -- with additional financial assurance because you want the financial assurance to be there and that's what you're saying, too, it's this finite time period. The way you have it written now is for being a short-lived nuclides without and I would suggest just with additional financial assurance.

CHAIRMAN RYAN: I wouldn't say additional. It's whatever financial assurances are appropriate for that facility at that time. You know, it's not with or without higher or lower, it's what is the appropriate financial assurance for the activity.

MEMBER HINZE: Right, right. But take without additional out because that eliminates that possibility.

CHAIRMAN RYAN: Yeah, I would take out "without additional" and say "with financial assurances", period.

MEMBER HINZE: Right, right.

VICE CHAIRMAN CROFF: Can I follow-up on some of this? Has anybody looked at how useful this might be, in other words, who might want to use this? It seems like you're talking about ways that decay to I'll call it innocuous levels fairly quickly. I mean, I'm having a hard time seeing a dominate half-life being greater than five years. It seems to me maybe cobalt-60 is almost at the limit of what you could do and even that might be pushing it. You might be talking about, you know, somebody being active for 50 years, which is, you know, a ripe old business. You know, maybe power reactors might fit into that but I think a lot of material licensees may not.

So how much practical application would there by on this? Has there been any consideration or survey or --

MR. SCHMIDT: There's been at least some consideration but not a detailed survey really that I could point to. I think that's a good point and a lot of the licensees that have, you know, some of the research types of licensees that have very short-live materials would --

CHAIRMAN RYAN: Accelerators would, you know, probably be a big group that could consider it

as well as some medical, nuclear medicine and some other applications in those areas.

VICE CHAIRMAN CROFF: Basically, you're talking about the decay in place option in 2002. I mean, that's what this dissolves into.

MR. SCHMIDT: Right, that's kind of what I was going to say, that if it was very short, you wouldn't go to the trouble of burying it or considering onsite disposal, right.

Yeah, so --

MEMBER CLARKE: Duane, it strikes me in listening to this interchange that -- and maybe you have this in the guidance, but legacy site is one of those terms that could mean very different things to very different people. Is a legacy site, for example, one that cannot be released and it requires a survey and monitoring and institutional controls and all of these measures to protect the public for some period of time? Is a legacy site a site where something has been left behind? And it strikes me that a lot of these onsite disposals doesn't necessarily mean that you've generated a legacy site. So I wonder if there's merit to that clarification if it's needed.

MR. SCHMIDT: I would agree with what you said and that clarification might be helpful on that,

yeah, because just because it was left behind, right, doesn't mean there's a problem. The problem is what is --

MEMBER CLARKE: Well, that's an understandable interpretation of that term, if you don't have a -- you know, a definition that we're all working with.

MR. SCHMIDT: Right.

MEMBER CLARKE: Okay, Dave?

MR. KOCHER: Okay, again, I have to back up and start with a really naive question. We're talking about onsite disposals during normal operations of a licensed facility and we're not really talking about -- does this include onsite disposals of waste produced during decontamination and decommissioning?

MR. SCHMIDT: It could although usually waste produced during decommissioning would be addressed as part of the license termination plan or decommissioning plan.

MR. KOCHER: Do you require that it be sent offsite?

MR. SCHMIDT: No, not necessarily. Not necessarily.

MR. KOCHER: It strikes me to where almost

everything your agency does is a balancing act between A, B and C and various competing interests. Obviously, you want to avoid a situation where you have to go in and dig up old burials. You want to avoid any perception of end runs around Part 61, I think. And although you can argue that, okay, if I put waste in the ground and it's only a few millirem, an argument for why it shouldn't be a whole lot higher than that might be that a responsible operator of a site will produce as low a footprint of contamination as reasonable and when you build an onsite disposal facility, you are deliberately increasing your footprint.

And so there should be some kind of -- it's not a good idea to do that more than -- it just doesn't look good. Do you see my point?

MR. SCHMIDT: Yeah, I do.

MR. KOCHER: So I could -- I was thinking about West Valley and the issue of what scenario should you assume in deciding what is an acceptable onsite disposal. If I remember right, at West Valley, the low level waste site from operations there was on the back 40 so to speak. It was down the hill. It wasn't on the site. Well, a resident farmer on the site where the reprocessing was done is a no -- it's

not going to happen that down on that waste site, why not? There's a creek right there, irrigation readily available, great site. It's already been cleared. So you may -- this may be an arena where you want to perhaps encourage a little forward thinking by your operators in terms of future site conditions when they are doing deliberate onsite disposals.

I mean, this -- it strikes me as this should be a fairly restrictive operation within reason. You certainly want to encourage it but you don't want to let it be an excuse for avoiding Part 61 and other things.

MR. SCHMIDT: Right. I think that's a good point. I think that fits with a lot of what we're thinking about and where we're going on some other related issues. You know, at this point, we have not chosen to revisit the actual regulation and maybe that's part of the difficulty of trying to fit some guidance that's not totally, you know, agreeing with the regulation but I think that -- I think it makes sense what you said and I think that does fit with our overall thinking.

MEMBER CLARKE: Chris, did you want to --

MR. McKENNEY: Yeah, I just want to say that currently in 1757 Volume 2, we do have some of

that forward looking sort of statements in the guidance on partial site release whereas we tell them we have -- we suggest the licensee to forecasting if they're going to release a piece of land today, and they're going to continue operating for quite awhile, that they should look at how that releasing that piece of land may impact the future release of the entire site and probably that will be similar in at least tone or scope to -- it might be for what we're going to possibly do for the onsite disposal.

MR. IKENBERRY: I guess when I look at these options, some words came to mind that I read in the draft guidance and that was the risk informed graded approach and that seems to be an application of that where you expect most of the applications to be a few millirem and then you have the graded applications higher and I also read some words about last resort where that may be the application for the 100 millirem application taking into account you know, where the potential environmental or human health impacts may be higher to remove the material and to leave it on site.

So that seems to fall directly in line and seems to be a good process for applying to this. I did have one question about that. Do you have any

scenarios in mind where that last resort of the 100 millirem might be applied? Have there been any cases or -- I would expect those to be rare of course, and you mentioned power reactors. I guess that's where I would expect them as well.

MR. SCHMIDT: I don't have any in mind and I'm not -- is there anybody else in the room that does, jump in, but I don't believe we've thought of any specific examples where that really would be necessary.

MR. IKENBERRY: It seems like that would be the thinking behind the second option is that it was in those very rare cases where the impacts of removal would be worse than the impacts of leaving them onsite.

MR. SCHMIDT: Right.

MEMBER CLARKE: Eric?

MR. ABELQUIST: I'm thinking back in the old days of decommissioning when we had the concentration based limits, that typically a site would clean up to the concentration base limit and in those areas where they couldn't achieve the concentration base limit, there might be an onsite disposal. FUSRAP sites come to mind, certainly some of the older SDMP sites. So when I looked at this

guidance, I had a real hard time connecting a few millirem with the fact that the license termination rule is 25 in the context of if it's okay to have 25 plus ALARA, what is a few millirem really going to buy someone? I'm looking at it the other way, is that you're going to clean up to the 25 millirem and in those areas where you just cannot achieve that, that would be the formal burials or it would be an onsite disposal cell, and by definition and my thinking, it's greater than 25 millirem, otherwise you don't have it. I don't see the connection between a few millirem and the general prevailing dose criterion of 25 plus ALARA. I just don't see the connection where it's going to be providing any value, especially for uranium and thorium sites when you're already at two or three pico-curies per gram and then if you're going to go to a few millirem, the two and three being equated to about 25 millirem, now you're down to .6 pico-curies per gram. I don't think anyone wants to call that an onsite disposal area. I mean, it's very similar to background and almost -- you cannot measure it any different from background.

So I'm just having trouble with the whole Option 1 here, what that really provides.

MR. SCHMIDT: I think what it mostly

provides is flexibility during operations rather than at the point of decommissioning. And, you know, I don't have -- I don't have examples in mind of the ones that have been approved. I'm trying to think if I can remember a couple of the recent ones. Eric or Tom might actually know that but the -- I guess the examples that have come up where licensees have proposed and we've approved have been operational, you know, where reactors are currently operating, where materials -- the one I think of is a little bit different than what you normally think of that was actually -- and I'm not sure absolutely that it was onsite, it could have been on or offsite, where a licensee disposed of waste in deep wells, a deep well injection. That's a different kind of -- but you know, I wish I could think of the reactor examples right now, but I think it's more you know, a way to dispose of waste that hopefully -- at least forward thinking that hopefully won't impact decommissioning but is a way for the licensee to deal with the material at the time during operations.

I mean, at decommissioning, you're certainly right. You don't get anything from that.

MR. NAUMAN: Okay, from a power reactor, Eric mentioned earlier that you dispose on site, you

store on site, it's almost interchangeable words, you know, because when you go to license termination, then you have to take those storage or disposal locations into account for your overall site determination. So it's literally storing on site and not disposing on site.

And disposing probably is a -- is a trip point for the public in general because they think you're going to leave it there forever, and it's not the case. You're just approving -- even if you're burying it, they're approving a storage location until such time as you terminate your license. And I think operating reactors have the record keeping so that you don't miss those areas and you clean them up at the end if you have to. But if you're storing in less than 25 millirem, then obviously, as long as it's not a huge volume, it will probably be factored into your overall and not have to be remediated going forward in the future. And there's no reason to go to a few if 25 is your limit.

You know, you could go right up to 25 in most cases. So the Option 1 of going to a few doesn't really apply to the power reactors very well. But following on David's discussion on West Valley, it trips some thoughts in my mind. I'm more concerned

with operational decision making on a year-to-year basis. If I have a limited budget, why ship material offsite to be disposed of if I can just store it? And of course, you're increasing your volume and probably your footprint for storage, but if there's no regulatory requirement that I can't, why not store it until license termination? The only problem with that is, if you're not adjusting your estimates for ultimate decommissioning, you may not have the financial assurance in place to insure that you can -- you know, you can dispose of that material some time in the future.

And if you're a small company, there is a greater risk that you won't -- you'll go out of business, you won't have the financial capability to deal with this ongoing O&M expense that they should be dealing with.

CHAIRMAN RYAN: Tom, just for my own clarification, if I may, aren't utilities in the mode now of trying to reduce their onsite inventories for the very reason you say they want to reduce their financial assurance cost, which is now an important part of their overall management program? So --

MR. NAUMAN: You know, the pendulum swung, Mike, several different times in our career.

CHAIRMAN RYAN: Where are we now?

MR. NAUMAN: Right now, they're not storing much material on --

CHAIRMAN RYAN: So there is the financial incentive to get whatever they have that can be disposed to be disposed ASAP?

MR. NAUMAN: Yeah, it's their ongoing -- and I think there may even be accounting issues associated with the new regulations.

CHAIRMAN RYAN: Right, yeah, it's the new financial model for utilities.

MR. NAUMAN: Yeah.

CHAIRMAN RYAN: I understand that because in the old days, if it was the same for everybody, you know, it's just a cost of doing business and it's in the rate base.

MR. NAUMAN: Right.

CHAIRMAN RYAN: But those days are gone.

MR. NAUMAN: In `94 when Barnwell was going to close, everybody built interim storage facilities, store their waste so they could keep operating. They at least had a means to control their waste until such time as they had a disposal option again.

CHAIRMAN RYAN: Right, but for the non-

power reactors, I think if I'm not mistaken, correct me if I'm wrong, Duane, but you know, you can't go very far into accumulating a large inventory of material without it having an impact on your decommissioning cost and your financial assurance requirements for the larger material licensees.

There is a negative to accumulating material even for the non-reactor side of the house, I would think.

MR. DAROIS: You know, certainly for the reactor side of the house, I think this is really applicable to soils. I mean, you're not going to take a bunch of piping and put it in the ground these days. I mean, I think it's happened historically but I don't think that's the case. There are all kinds of state regs that kick in on solid waste disposal sites that just make this kind of a silly thing to do. So it's soils.

MR. NAUMAN: Yeah, and okay, you don't generate a lot of contaminated soils in the power business. You would have some fines and some other things that you want to store, but you just don't have that big a generation, so this isn't that big a deal for the power reactors. The Option 1, just a few millirem, I don't think it's necessary. And my other

general philosophy or view of this, since we're focusing in on operations other than financial assurance and decommissioning estimate, I don't see how this applies at all to license termination. You know, because it rolls back into the operational phase and should be regulated there.

MR. SCHMIDT: That makes sense. Can I ask you to just clarify when you say you don't think for reactors you need Option 1, you think you don't need -- what exactly do you mean by that? I thought I heard earlier that -- and maybe I heard wrong, that you were proposing that 25 millirems should be okay.

MR. NAUMAN: Yeah, if you're going to have these options at all tied to operations, you shouldn't have the few millirem. You should set it at 25 and like Eric was saying, really the idea is to store materials that are at 40 and count on decay to get it down to 25 by the license termination time. So going with the minimal rates, it doesn't add any value.

CHAIRMAN RYAN: But you're being specific to the operational phase when you make that comment.

MR. NAUMAN: Absolutely.

CHAIRMAN RYAN: I mean, that's the clarification, I think.

MR. NAUMAN: Yeah.

CHAIRMAN RYAN: You're talking about, you know, storing materials during operation before the actual LTR process begins.

MR. SCHMIDT: Right, and that really is what we're most interested in.

CHAIRMAN RYAN: Right, right.

MR. DAROIS: Well, that time you did steal my thunder, but I have more. No, I agree with Tom. My first question as I started looking at this a little bit more was why this decommissioning guidance, we've got to account for all this anyways. What's it doing in here because this is really an operational issue. More on that is what is disposal? Let's define that and distinguish that from storage. I've done several evaluations where a plant or a facility wants to dredge their discharge canal and store that dredge material onsite. They call it storage and I said, "Okay, I'll do the evaluation", so we did, but is that disposal or storage?

And I think that's a key point but not may more key than where does this belong because I really think it's an operation issue more than anything. But the other thing is, what about spills, what about underground leaks that create contaminated soils? Is that storage, disposal, how does the fit? I mean,

5075(g) says we've got to keep track of that, but when do we get kicked into this? So that's the kind of a question, I think, needs to be answered. If we stay with this, then I think you need to define dose to who. 10 CFR Subpart E says average member of the critical group is what we calculate the dose to. So is it -- I mean, it needs to be addressed, I think, as to who are we calculating these doses to.

You know, I agree also, if we keep this, on the comments regarding the few millirem, the basis of the few millirem, I think in the Brench technical position is as Chris pointed out, the contribution offsite from multiple sources and if we're doing an onsite disposal the rad protection program kicks in and you know, you've got to measure doses and account for doses onsite, so I don't know what a few millirem does for us. So that's pretty much it.

And this isn't lost, by the way, on when you get into materials licensees. I mentioned earlier that 50.75(g) kind of hooks the operational thing into -- operational plants into tracking spills and call it onsite disposals, I suppose but I believe there's a section in Part 30 that mirrors 50.75(g) for material licensees. That's all I've got.

MR. SCHMIDT: Thanks. I don't know if I

need to try to answer any of those or not.

MR. DAROIS: They're just comments.

MR. SCHMIDT: I guess we have -- and we certainly appreciate the question, concern about where does this guidance really go. Tom Youngblood has certainly brought that up before and I guess maybe we're still struggling with that based on the fact that you've got a comment. I think that's something we need to think some more about.

MR. DAROIS: I mean, an operational plant is not going to even know this document exists.

MR. SCHMIDT: Right, right.

CHAIRMAN RYAN: Duane, I'm hearing kind of a theme there that there ought to be a brighter line between the guidance relative to license termination and guidance relative to operational management of materials. And whether you talk about it in this document or not, you really ought to somehow discuss you know, when you expect somebody to be in one arena or another. Maybe that's really the key here is that you've got to brighten up the when did I step from being an operating facility to be a facility that's now in the decommissioning phase.

Am I summarizing that from the --

MR. DAROIS: Yeah, I just don't think in

the decommissioning phase you're disposing of material. You're passing the LTR criteria.

CHAIRMAN RYAN: Right, and that's why I didn't say disposing of anything. I mean, you're actually going from being under operational rules to being under license termination rules and that -- everybody needs to know when you cross that line and then what applies on one side versus the other.

MR. SCHMIDT: I think there's a couple of good points in there. One is to make sure the guidance is in the right place and the other is if it stays, make it clear that line, as you say.

CHAIRMAN RYAN: Yeah, and it's a handoff. I mean, it's two bits of guidance that deal with it, then, you know, the guidance on the lefthand ought to say, "Well, now you're on the right hand", and vice versa. You know, it ought to be clear on both sides of the handoff.

MR. NAUMAN: What is disposal, too. I mean, do we want to call this waste disposal? It just invokes a lot of other regulatory requirements outside of NRC, too.

CHAIRMAN RYAN: Sure.

MEMBER HINZE: It can go from storage to disposal.

THE REPORTER: I didn't catch that.

MEMBER HINZE: Sorry. It can go from storage to disposal.

MR. DAROIS: It sure could.

MEMBER HINZE: It may be storage while you're operational but disposal when --

MR. DAROIS: Then you leave it there.

MEMBER HINZE: Yeah.

MR. KOCHER: I would agree with the idea about making some careful definitions about disposal and storage. My naive view of this is that disposal has two central attributes. One, it's something you do deliberately. So you're leaking underground pipe is not disposal.

The second essential attribute of disposal in my opinion, is no intent to retrieve. So I'm personally uncomfortable with the idea of putting solid waste in a trench, covering it up with dirt and saying, "Well, I'm going to come dig it up later". On this issue of where the guidance goes, I can sort of see where you were coming from here, is you're looking at trying to tell the operator how to foreclose a future problem is basically why you did it this way, I'm guessing. But it's a good point that they're making.

MR. SCHMIDT: Right, thanks.

MEMBER WEINER: But you know, David, you've raised a really interesting point. A leaky underground pipe is certainly not deliberate disposal but the soil that becomes contaminated, what do you then call that?

MR. KOCHER: That's not a 2002 problem. That's a cleanup -- that's a License Termination Rule problem.

MR. SCHMIDT: I know I'm not the reactor guy, but that's my understanding, too.

MEMBER CLARKE: Actually, under other regulations that is disposal, not NRC but EPA.

MR. KOCHER: We're talking about a logical set of regulations here.

MEMBER CLARKE: I understand, for what it's worth, David. Any other questions? Staff, questions? Okay, let's adjourn for lunch and we're scheduled to be back at 1:30.

(Whereupon at 11:45 a.m. a luncheon recess was taken until 1:26 p.m.)

MEMBER CLARKE: On the record. Our next speaker is David Esh and his topic is engineered barriers. Welcome.

MR. ESH: Thank you. Nice to see all of

you again.

CHAIRMAN RYAN: Your microphone.

MR. ESH: How is that? Is it on now?

CHAIRMAN RYAN: Yes. David, if you would introduce your name and affiliation for the reporter, that would be great.

MR. ESH: Sure. I'm David Esh. I'm in the Division of Waste Management and Environmental Protection. I work in the Performance Assessment section and I had a number of contributors on this effort. The Johnson Brothers, they aren't really brothers, but it's easier to refer to them that way, Robert L. Johnson and Ted Johnson who's a retired annuitant, I think, is his official title. He's our expert on erosion control issues and then also Jacob Phillip and Tom Nicholson from the Office of Research contributed to this.

Today I hope to just give you a summary of the comments that we got and an idea of where we're going. Any sort of feedback or input that you have is appreciated.

MEMBER CLARKE: Excuse me, David. I don't think your slides are up yet.

CHAIRMAN RYAN: (Inaudible.)

MR. ESH: Would you like me to wait or

fill in with random information?

MEMBER CLARKE: No, if you could get to Slide 22, I think that's where we are.

CHAIRMAN RYAN: No, we'll go ahead. I think everybody at the table has your slides in hard copy.

MR. ESH: Everybody has hard copy.

CHAIRMAN RYAN: It's hard for the folks in the audience. I think there are some extra copies on the table over there. So go ahead.

MR. ESH: I really don't know how much you'd be missing without the slides either. We had two state governments, Colorado and New Jersey, and three other groups provide primary comments on the engineered barrier, part of the guidance.

The main areas of concern that we had were the summaries of experience for various barrier types were not up-to-date. The summary of the UMTRA experience was not accurate or at least didn't accurately describe some of the relevant experience and the only area of real disagreement was that a couple of the groups said engineered barriers should not be used at all at unrestricted release.

We received comments on a variety of other lesser topics on the guidance and we appreciate all

the comments. We looked at it as an opportunity for improvement. I'll walk through some of the main ones here that we got and where we think we're going to head to address them.

On Slide 24 for those of you with the hard copy, on the issue of the use of engineered barriers at unrestricted release sites, we feel like the guidance was pretty clear that it's not preferred approach to try to use an engineered barrier at an unrestricted release site, but it's also not protected by regulation. So in the event that somebody wanted to attempt to do that, we felt we had to at least mention it and discuss it in the guidance what that meant and might entail.

What we envision is that somebody attempting to an engineered barrier at an unrestricted release site would be much more challenging than a restricted release site because you don't have monitoring and maintenance that you can rely on to justify the performance of the barrier. You basically have to demonstrate the passive performance credit that you could get for a barrier considering the expected degradation modes and the different type of stressors that that barrier may experience, so disruptive processes and even reasonably expected to

occur human disruptive processes.

So it gets a lot more challenging to do that for an unrestricted release site, but the regulation doesn't prohibit somebody from attempting to do that. I thought the guidance was pretty clear on this already, but we'll look at it and maybe emphasize it a little more strongly if we think we need to.

Now in terms of the other main areas that will take a little more work, we had in the guidance -- Let me step back a second. Our initial thought was that in the guidance we would provide a summary of barrier types, kind of a summary of their expected performance based on observations and experience and what somebody could maybe expect for a barrier type. So that somebody using the guidance and they come in and they say, "I want to use a cementitious barrier for my problem" how long if people attempted to use that type of barrier for, what's the range of experience, how have they performed or not performed, we thought that would be useful in the guidance.

That type of information is challenging to develop. I'll put it lightly that we have an attempt in there. We think we can do much better, but ultimately we're still going to wrestle with this

question of what's the appropriate amount of detail to put in guidance like this and where is it somebody else's responsibility to generate that sort of information. So I'm always kind of optimistic. I would like to do more than what I think we should.

But in this case, I have to face reality and this is just a real challenge that I'm not sure how well we're going to be able to do. We're certainly going to do better than our initial draft of the guidance, but ultimately there's this resource question.

Our individuals from Research are already involved in some activities along those lines with the National Academy of Science and they have a relationship with Craig Benson at the University of Wisconsin who has done a lot of work in the ACAP. I don't remember what the acronym stands for now, Alternative Cap Assessment Program, I believe. Basically, they've looked at covers, at landfills and those types of sites and instrumented them and did detailed analysis. He might have spoken to your Committee in the past I think. Maybe the experts didn't hear him though. He basically instrumented these caps and then did detailed analysis of the information that they got from instrumenting the caps

and learned a lot of valuable information about how these caps work and how they might not work.

That information, I think, they want to take it to the next step which is exhume and dissect some of these caps or portions of them and look at how the barriers may or may not have worked, what layers failed, why did they fail, how did they change, how did the properties of them change and develop that sort of information that you would need if you're going to go on the path of trying to justify long-term performance of that type of barrier.

So they have a relationship with him and then also are very familiar with Jody Waugh, I believe it is, who was the main individual at DOE, I don't know if it's in charge is the right words, but in charge of the cap performance area for uranium mill tailings and they hope to get some information from him and see what sort of summary DOE may have developed from that program that would be useful and could be summarized in the guidance.

So that area, I think, any feedback that you have about what you think is the appropriate level of detail to provide in this type of guidance it would be helped. Ultimately, I think we could put in, we could do a lot, but we might not be able to do a lot

in this version of the guidance on this time frame. It might be a future revision that we bring in some new information that would be more helpful.

In the area of the UMTRA experience what we had attempted to do in the initial guidance and we may not have done it as well as we could have is to discuss that experience and basically say that our interpretation of it is that that program has demonstrated that you can make a barrier for long-term stability of a cap. It hasn't necessarily -- We weren't trying to come at it from an infiltration control perspective but from a stability perspective, an erosion control perspective.

Those types of caps after some initial hiccups in the program, they are generally not needed, monitoring and maintenance, in order to be stable. DOE has performed monitoring and maintenance of them removing vegetation. That type of activity has been the primary thing, but our erosion control specialist's perspective and my own and I believe Robert Johnson's is that from a stability that sort of activity hasn't been needed. So it is at least a few decades of experience of trying to make an erosion control cap, primarily for more arid sites, so not necessarily for some of the humid sites that we may

experience in decommissioning which has a different set of challenges. But we hope to --

MEMBER HINZE: Excuse me. But that has been without any active control, without any active control, for example, in the vegetation and so forth.

MR. ESH: Well, that's the issue that they have done active control of the vegetation, but I think maybe it's speculative but it's kind of our opinion that the vegetation control has even been desired in some instances. Like if you have a evapotranspiration cap, you like to have plants growing there and the plants can also contribute to stability and not instability. But from the stability standpoint, the presence of some of these plants and vegetative species would not greatly impair the ability of that cap to act from the long-term stability perspective. It may influence something like infiltration and that's what I think the confusion was in the guidance. We were talking about -- The example that we put in there was from that experience for erosion control, not for all the reasons why you're using those type of caps which is infiltration, erosion control and even radon release, control radon emissions from those materials.

So we think we have that one under control

pretty well and we'll do a better job summarizing the experience. We thought about seeing if DOE has done a summary of that experience in bringing that information forward, too. We thought that would be useful to the users of this guidance, a more detailed summary of that experience.

And then moving on to Slide 25 -

CHAIRMAN RYAN: I asked this question earlier today, but excuse me. How about the fuse wrap sites?

MR. ESH: Yes, I think we are open to any sort of experience that we think can be summarized and beneficial in the guidance. I can't speak to that today.

CHAIRMAN RYAN: No, I know you can't, but I think if we could maybe and I'll be happy to make some contacts and try myself. But that gets at two issues. One is it's more like the license facilities rather than just the soils part and two, it's east of the Mississippi where there are more water issues and so forth. So there may just be some interesting history of stuff that has been idle for 30 or 40 years just to learn.

MR. ESH: Yes, we envision that this area of the guidance is only going to be used by a limited

number of sites. So that's partly what we've struggled with in terms of the level of information to provide and if it's only going to be used by a few sites, how much should we just provide in the guidance as providing the right direction without doing a lot of effort to provide all the details if the details are the responsibility of the people that want to go that route and implement the guidance in that direction.

CHAIRMAN RYAN: Yes, and a real good bibliography or maybe even an annotated bibliography would be here's ten documents on this topic and that topic and just getting folks steered in the right direction would be a great start.

MR. ESH: Yes, and I think that's what we thought as a great start to have.

CHAIRMAN RYAN: Yes.

MR. ESH: Even that can be a little bit of a challenge in today's world. Yes, information is very accessible to us, but it's also almost too accessible. You get 198,000 hits on web search. So what are you going to do with that? How do you find the good ones or the right ones that are going to provide the best information because we didn't want to just provide references and say, "Okay. Here's our

guidance. Here's the issue. Now go off and read these 30 reports and try to make heads or tails of it."

We wanted to try to pull the information from those reports and make heads and tails of it in the guidance, but then it would be more useful to somebody. If they want additional information on a topic that is beyond the level of detail that we would in guidance, they can go read that report, but not just take the short approach and say, "Go read all these reports and you decide what you want to do it." We don't see that as very efficient or maybe the right thing to do.

MEMBER HINZE: Excuse me. But in some cases, it's still evolving too. Our information is still evolving.

MR. ESH: Yes.

MEMBER HINZE: And putting it into guidance seems to make a benchmark and we want people to move on from that.

MR. ESH: We also -- I think there is certainly a great deal of uncertainty in some of these things and there are some pretty broad ranges of opinions on some of the subjects. So you may have one group that says, "You can't use a geosynthetic for

more than ten years because of this problem" and then another group says, "Well, of course, you can. You can use it for 700 years." So where is the real answer? What do you need to do to decide whether it is more ten or it is more 700?

The basic research and analysis, the type of work that I think Craig Benson is doing with the cats is a great example. It's not just paper study. It's digging things up and analyzing them. That's really what you need to do. Only that's going to give you information on a few decade time scale, but that's probably a much better predictor than not having that information at all. So it's generally the approach that we take to this things.

We did have a mention in the guidance when we talk about, because you are going to end up extrapolating barrier performance, and we talked about multiple lines of evidence to support the performance of the barriers. One of those lines of evidence that we mentioned is natural analogs and some groups asked or the State of New Jersey asked if we could provide some examples of analogs. So we intend to do that in the guidance, but we don't intend to provide a full summary of natural analog's SFI to each barrier. That would be a very large task. While useful, interesting

and valuable, I don't think it's something that we can do in the scope of this guidance.

We didn't or rather I would say we shortchanged evapotranspiration covers maybe in the guidance and also geosynthetics. We plan to talk about those in a little more detail as to specific barrier types in the revision.

Then there was an interesting question about or a comment about the differences between 10 CFR Part 20 and Part 40. Basically, the issue was if you're in decommissioning and you have a decommissioning site with material similar to material that you have a Part 40 license under decommissioning, the comment was decommissioning allows you more lax standards or requirements than what's required under Part 40. If this material is basically the same, why is that? Why, if I'm under Part 40, are you burdening me with all these more difficult and expensive requirements than if I was under Part 20?

Understand that these are different regulations and written differently and different materials and we think in the application of the regulations that if you have a Part 20 licensee with material that's similar to Part 40, you're going to end up in the long run with similar types of

requirements that would be required under a Part 40 license. So you'll have to justify cap performance and those sorts of things that are similar to the requirements that are under Part 40.

The question wasn't specifically about engineered barriers. It was this higher-level policy type question about materials and regulations, but it applied to engineered barriers because they're used for both of those types of materials or they would probably be used. We plan to discuss that a little bit, but I don't know if that would result in any significant revision to the guidance.

Those are the main areas. There were some other minor, lesser, smaller areas that we're commenting. There was about the time of compliance basically for Part 20. Why is it only 1,000 years if you have material that persists much longer? I call that minor not because it's an easy question to answer, but because it's outside the scope of this engineered barrier activity and I think it was adequately addressed in the statement of considerations for Part 20 as opinion of the staff. But it's an interesting question. How long do you need to demonstrate the performance of these systems if the hazard persists for a very long time?

And that's pretty much a summary of the main comments. I'm open to discussion and detail of any things you'd like to cover.

MEMBER CLARKE: David, let me get started a little bit and if you're looking for additional references, and I agree with you that I think your best source of additional references are people you've already mention. Craig Benson and Jody Waugh knows as much about this as anyone I know. You would want to focus those on demonstration projects, actually field work and, as you say, the cap program is actually getting into it now and looking at some of the barriers after they've been in place for some time.

But the DOE experience, they have test plots at Sandia, Hill Air Force Base and of course the Hanford barrier which that design was based on a natural analog, namely asphalt. And Jody has an excellent analog for Burrell which is the mill tailing site that's probably had the worst experience from a biointrusion standpoint. Fortunately, it only had four curies and the risk assessment showed it actually increased evapotranspirations.

MR. ESH: These near-surface barriers are in my opinion a much larger challenge than the subsurface barriers or the deep subsurface barriers

because of all the surface processes that you have going on, potential biological impacts and they are challenging problems and I think you can analyze them to some degree, but then ultimately you have to look at what data do you have to support it, to support the modeling activity.

That's what we had hoped to try to summarize this experience because we believe it would be a little cumbersome for any one group to try to do that themselves to justify their performance. So if we could get people headed in the right direction, then we thought we'd be doing a service to them. But we also don't want to provide an inaccurate or incomplete summary of that information because then that wouldn't be of any value to them at all.

I think we wanted to summarize the experience. There's also been -- The problem is that we're dealing with not only caps but other types of barriers, slurry walls, cementitious barriers, geomembranes. This is a broad scope. So it's all types of barriers and that makes the problem more challenging than even it was just a cap experience.

MEMBER CLARKE: You know it's ironic. With as much interest as there is in this area, that there is no one source or few sources to get actual

performance information. The superfund sites have been putting in barriers ever since the early `80s and those same sites even before superfund were putting in slurry walls and covers and all of that.

So the problem as you articulated is that the length of service is much less than they expected period of performance. But there has to be some good information out there.

MR. ESH: And one of the biggest challenges I think with the experience has been you have some people who have used some of these barriers and put them in, but what they're usually do is monitor for extreme failure type condition. But they aren't monitoring for actual NCQ performance to see whether they can confirm that it's performing like they conceptualized and modeled it.

So there's this gap of information in between the two states that there's not a lot of it out there. You have to really search to find it.

MEMBER CLARKE: Right. Well, at this point, let me interject a plug that we are working up in a follow-up working group a modeling and monitoring interface that we hope can shed some light on this as well. Let me stop and let's go to Eric.

MR. DAROIS: I don't have any comments on

this.

MR. NAUMAN: My only comment is the applicability to decommissioning as a whole. It doesn't seem to, except for institutional controls, have any, I don't know of any instances where engineered caps are being used especially in the reactor world.

MR. ESH: I think the problem we're seeing is that as the low-hanging fruit sites get picked off, the other ones are starting to run into situations where you will have a distinct challenge especially from a financial standpoint to clean some of those up to unrestricted release conditions. So the prime example I would use is West Valley. West Valley is going to use, right now at least they plan to use caps, slurry walls, a bunch of different barrier types at that site. Robert could probably comment on a couple other sites like shield alloy. They plan to use erosion control cover.

MR. NAUMAN: West Valley is a good example. We were up there last fall. It's definitely a long-term situation there that's going to have to have solid controls.

MR. ROBERT JOHNSON: This is Robert Johnson and as you'll hear when I talked about

restricted use, that these two sort of go hand-in-hand and certainly West Valley will be the most extensive use. But Shieldalloy, I know their planned restricted use site also will need an erosion cover at least and a shield covered with ripwrap or whatever type of design we end up with there. Then we have one other unrestricted site that is composing a ripwrap erosion cover. So Dave is right. There are very few sites, but some of these are really important sites that we're trying to deal with.

MR. NAUMAN: Thank you.

MEMBER CLARKE: Eric.

MR. ABELQUIST: I don't have any comment.

MEMBER CLARKE: And Dave.

MR. KOCHER: Going back to square one for me since I'm kind of new to this issue, we're basically talking about barriers to infiltration or erosion and that's about it or are you getting into entombment of facilities, things like that?

MR. ESH: Yes, I think there has been fairly extensive evaluation of the use of cementitious materials for entombment applications, but our emphasis and this initial version of the guidance was on barriers for typical decommissioning sites that may have a surface or subsurface source that somebody

wants to control infiltration, water pathway, associated releases or erosion surface type release pathways and in some cases also to try to limit contact.

If you do a restricted release, you have to evaluate people being on the site and doing activities. You may be able to use one of these barriers a limitation of contact with the material, an intrusion type scenario. So those are the primary applications I believe.

MR. KOCHER: Has there been any useful information come out of the NRC research program on caps for low-level waste disposal facilities?

MR. ESH: Useful information, that's a good question. I think there has been a number of contractor reports on the subject but not necessarily focused on demonstrating their performance. So the reports are more focused on who do you analyze them, what sort of information do you get. Basically in NUREG 1573, the NUREG on performance assessment for low-level waste facilities, there's an appendix to that or a series of appendices that have references to a lot of reports and there's a whole section of reports on caps and engineered cap performance, those sorts of things. They're all related to low-level

waste facilities, but we don't have a lot of low-level waste facilities out there operating with caps that they could generate observations from is part of the problem. So you're generally sent in other directions to get experienced information.

MR. KOCHER: My understanding of the low-level waste business is basically, and this is a problem you all face, you have a fighting chance of taking credit for these things as long as you're maintaining. But once you stop maintaining them, it's very, very hard to take much credit especially for a surface feature. The underground barriers, I'm not that familiar. But it's just very, very hard to go out in time and say, "Yes, I'm not going to watch them, but they're going to work."

MR. ESH: Yes, and that's I think the general perspective. We try to take a total system perspective when we're looking at these. So we want to look at all the potential -- Or the guidance wants to direct the licensee or the party that's trying to use the guidance to consider all these disruptive processes so that we don't have them using a cap and they say, "We designed the cap. That's the way it works. It works that way forever." "No, there's more to it than that."

Yes, it might work that way when you have monitoring and maintenance, but you also, for restricted release, you have to analyze it assuming you lose your monitoring and maintenance. Then how does it work? You have a different dose cap that you apply for that analyses, but you still have to do that analyses considering that it doesn't work in the pristine design conditions and it degrades over time.

So I think the guidance is kind of told to educate people as well as to provide information. Somebody that wants to use a barrier for restricted release, what do you have to do to do that? And it's also even to educate our staff so that we don't have a reviewer that's looking at site and they're using an engineered barrier and they say they have a barrier and I assume it works. Nothing ever happens to it. Whereas another reviewer makes a different decision regarding the barrier. So it would help us get some interior consistency in our reviews as well as improving the information that we may get from the licensee that wants to use a barrier.

MR. KOCHER: And if I got the gist of your earliest remarks about this is really you are kind of discouraging engineered barriers in a way. In other words, there really is a substantial burden of proof

on the licensee to demonstrate to you that these things will work and that these may be hurdles that can't be crossed.

MR. ESH: I think I wouldn't say discouraged. I'm actually a proponent of them. I feel that man has solved a lot of problems and applying engineered barriers to these types of waste sites is not outside of the realm of accomplishments that they've done in other areas, that they've accomplished in other areas necessarily. But it all comes down to a matter of dollars and if you can remove the material for cheaper than you can build and justify a barrier, you're going to remove the material. If it's prohibitively expensive to remove the material, you're going to look at alternatives to try to put in barriers and handle the problem that way.

I don't think people should always default to removing the material if there is a smart alternative to using a barrier especially in situations where your contaminant may be short-lived and you would spend a lot of money to exhume a bunch of material and remove it and place it somewhere else when it's going to decay. If you can put in a barrier for enough time that's going isolate it during that

decay period, that's probably your smartest alternative for everybody.

I think we would probably discourage people from using them for unrestricted release sites just because it can get so complicated and therefore also expensive. But for restricted release sites, we recognize there are going to be opportunities where people are going to have to use almost.

MR. KOCHER: One quick question and then I'll shut up. I wasn't really clear about this comparison between Part 20 and Part 40 Appendix A. When you say that Part 20 is more lax, are you talking in terms of prescriptive requirements for how certain parts of the system function because the dose criterion on Part 20 is more restrictive than the mill tailings.

MR. ESH: Yes, it should have been more specific and that was the comments of the thing. The comments of the thing was basically that there's more prescriptive requirements that are there for more burdensome for how to --

MR. KOCHER: -- a mill tailing pile.

MR. ESH: -- for what you have to do under Part 40 than what you have to do under Part 20. Part 20 allows you more flexibility. It doesn't put in the

defined requirements that you have in 40, like 40 has something about that you have to demonstrate the cap performance for 200 years or 300 years or something like that where Part 20 doesn't say anything about the defined period that you have to have a cap.

MR. KOCHER: Just get you a dose and then say okay.

MR. ESH: That's what the issue was. Yes.

MR. KOCHER: Okay. Thanks.

MR. ESH: Yes.

MEMBER CLARKE: Bill.

MEMBER HINZE: In response to David Kocher's remarks, it was my understanding that there was extensive research conducted out at Greenbelt, Department of Agriculture. I see Tom Mickleson shaking his head yes. And I would think that much of this would be very applicable to this. Is that not right? Has that been brought into this at all?

MR. ESH: No, I think that is right. I don't know if Tom wants to talk about it explicitly, but there were a variety of studies that were done out there on basically caps to limit infiltration and basically to look at different types of designs to limit infiltration for, I think, low-level waste facility applications.

MEMBER HINZE: I think there was also some --

MR. ESH: They had covers with like juniper on them and different things like that that data was developed from.

MEMBER HINZE: Right.

MR. ESH: So the problem with any of these applications is you always get into the issue of the relevance of the other information to your application.

MEMBER HINZE: Site specific.

MR. ESH: Yes. Like the site specific things can drive the whole problem and you can say "I'm going to use the cementitious barrier. I want to immobilize things from a chemical standpoint. I'm going to put in a low permeability concrete. It's going to modify the poorer solution pH to control the solubility of plutonium for a thousand years" and I referenced the Merra Copa site in Jordan that say there's natural minerals there that are cement-like minerals that have been there a long time and the pH has been maintained at that condition.

I can tell somebody all that information and they say, "Well fine. What does that have to do with this site?" And that's always the way it works

is they want a site-specific demonstration that if you're going to do an extrapolation and you're dealing with long periods of time you're never going to have that.

You're just have to try to develop enough confidence and the way our regulations are set up is that it does not allow you to have an over-reliance on a barrier because you have to analyze the situation without monitoring and maintenance. If the barrier doesn't perform as designed, what are the dose impacts. So there is a threshold to protecting public health and safety that helps address this uncertainty and extrapolating performance.

MEMBER HINZE: In the spirit of providing guidance and also keeping that guidance up-to-date, have you or your colleagues considered the possibility of referencing that website that could be kept up-to-date with at least the pertinent reports and journal articles, etc., the work of Benson and so forth? We see this more and more in the literature. I haven't seen it in NRC literature, but use of websites is tremendously useful in keeping things up-to-date and also minimizing. If we're talking about type specific, then a person could go in and get the kind of information they're looking for without you having

to say this is the last word.

MR. ESH: Yes, I think that's a great idea. We can certainly explore it. We're open to it I should say.

MEMBER HINZE: That's great.

MR. ESH: I'm always -- I was recently dealing on a different problem with cementitious waste forms and I ended up at the Nyrex website in the United Kingdom and they have done a lot of studies on cementitious waste forms that were really relevant to the problem I was working on and I could request the reports for free. They arrived in my office on CD five days after I requested them, whereas, I requested something from downstairs and it took five weeks. There's good information sources out there. If we could be a good information source, I would be open to it.

MEMBER HINZE: The problem is to keep a website up-to-date and all, but the investment could really be rather minor once it is prepared.

MR. ESH: Yes, I agree.

MEMBER CLARKE: Picking up on that, you mentioned the mill tailing sites. They do have annual inspections as you know and I think all of those inspections are on the Grand Junction website. The

kind of summary you're looking for, I'm not sure whether that's been provided or not. But all the raw data is there.

MR. ESH: When Ted before Ted Johnson retired, he reviewed or I should say evaluated those inspection reports and we thought about that in this guidance. He said, "I've been out of NRC not reviewing those reports for a little while now, but I could go back and look at all the ones that have come in and also think about trying to do a summary of them" and we've thought about doing that if we can't get the information that's already been done like that by Jody Waugh or somebody else with that program.

We imagine they probably have already done that and we can just benefit from that instead of doing it ourselves. But if it doesn't exist, then we thought maybe we would do it ourselves.

MEMBER CLARKE: Well, they do issue an annual report.

MR. ESH: Yes, but I think the issue is summarizing the reports for all the different sites and relevant observations and that sort of thing. I don't know if the summary report has the level of technical detail that we would be looking for to try to distill the information out of.

MEMBER CLARKE: I suspect not. Mike.

CHAIRMAN RYAN: David, as always, thanks for a thought-provoking presentation. I'm thinking about covers and barriers and I took a couple of your comments to heart. One is how do you know you've designed it for the purpose you needed to actually achieve. That's a great question. A lot of folks design for a compliance point not a dose point. So if a concentration meets some value at some location, I'm okay. But that may or may not meet the ultimate dose requirement of a termination rule or some other applicable rule. So thinking about that up front I think is a helpful thing.

The second is with that in mind the Committee's been kind of wrestling with this modeling and monitoring question which is what I'm thinking about and we all monitor for compliance at some derived value like a concentration in groundwater or something. And we typically have for a disposal situation some kind of a modeling exercise that has gone on and I guess it's my experience that often those are roads that never intersect. I think what we're trying to think about is how can we combine those two activities in a way where we could build confidence over time.

In other words, could we get to a position where, and using all the information that you have out there and it will be in the guidance and it will be referred to on, say, covers, that you could offer a design but then come up with some view where you could commit to monitoring it in an appropriate way to build confidence over time. So if you have, for example, a higher requirement, say, institutional controls and I'm picking wild numbers out of the air now, but, say, year zero to ten or zero to 15, you have some monitoring activity that's agreed to as being instructive regarding performance. You get a thumbs-up at year 15.

Then you can make at that time a decision what's the appropriate view of the world for year 15 to 30 or 15 to 50 or something like that and we're working with Tom Nicholson and other folks on his staff and Jake and others to try and think of how we could structure a working group session to pose that question and think about it and come up some hopefully useful ideas on how that work.

But tell me how you think about this kind of general idea. Would that sort of scheme enhance the kind of guidance you're putting forth?

MR. ESH: I think we support the approach

of trying to develop performance indicators to monitor a system rather than monitoring for release of contamination or as a precursor to release of contamination. The challenge with that with respect to a lot of these, maybe these engineered barrier applications, is the uncertainty gets larger with your extrapolation time basically. So you design an engineered system.

There's probably a high degree of confidence that it's going to work close to as designed considering you go through all the right steps to get there, but it's going to perform close to as designed in the very near term, years, tens of years. So you start getting out tens, hundreds, of years, a thousand years. That's when the likelihood increases that maybe it's not going to perform as designed, but yet your monitoring is very local temporally. You start your monitoring after you put your facility in, but that's exactly the time where you would expect to see nothing.

CHAIRMAN RYAN: Yes. But it could even other indicators. That's the radionuclide tracking part.

MR. ESH: That's what I mean. What would be a reliable performance indicator that could

indicate you might have a higher likelihood of having a problem with your system down the line.

CHAIRMAN RYAN: Fair question. I'll give you a couple of examples that maybe we can kick around. For example, if I'm designing a cap and I have high confidence in my waste form and I build it right, I would not expect any subsidence. What happens if I start seeing subsidence? Well, that's an indicator of some kind of problem.

MR. ESH: Yes. Sure.

CHAIRMAN RYAN: So I think it's the non-radiological indicators, maybe engineering related or maybe even runoff measurement related. I'm expecting infiltration to be some small fracture of rainfall. Well, if I actually measure runoff, then I should be able to do a water balance that says the infiltration is around where I think it ought to be.

What if it's 10 times higher than you thought it was going to be? Then that is a direct indicator, again not radiological tracking for compliance, but that says something is wrong. I think this is related to some of the issues that Tom is working on at the site over in Maryland to do these very heavily instrumented sites and get at that. That's where I think it's not just about measuring the

radionuclide. It's about measuring the engineering aspects and the system aspects, if you will, of how that's behaving.

MR. ESH: We agree completely with that.

CHAIRMAN RYAN: So we're trying to wrestle --

MR. ESH: -- moisture content under a cap instead of radionuclide concentrations 500 meters down gradient from the facility.

CHAIRMAN RYAN: Exactly. And simple questions like if you have an impermeable sump system in a disposal cell how many square feet does it have to have to intersect a half of percent of the water that could infiltrate. You find out you need a lot of area to do that. So those kind of basic things, I think if we could come up with some ideas along those lines together, that might give folks better insight as to what will work and where their leading indicators might be.

MR. ESH: And I think the indicators are not just how the system is performing, but also the indicators should be developed to support or refute your conceptual models or your modeling of the facility. If you can develop information that's consistent with your modeling, then you have a higher

degree of confidence that your projection of your modeling is more accurate.

CHAIRMAN RYAN: I couldn't agree more.

MR. ESH: If you are off from your initial condition, the likelihood that you're going to be right longer on, I think, decreases.

CHAIRMAN RYAN: I always use the example to students about just don't take a sample for radiological monitoring. Measure the water level too. You can find an awful lot by just simply understanding the temporal behavior of the water table or other basic things that are pretty cheap to get once you have the wells installed.

MR. ESH: Sure.

CHAIRMAN RYAN: And again, I think our modeling and monitoring working group meeting is going to be designed and maybe explore these and come up with I won't say the top ten list, but key areas where there's a lot of fruitful opportunity to do both for very little additional effort and cost once you have one of them up and running. Thank you.

MEMBER CLARKE: Allen.

VICE CHAIRMAN CROFF: Yes. Dave, I'd like to get a little bit better understanding of the assumptions that are used in assessing the performance

of caps in a performance assessment, things like how long is the cap assumed to remain effective. Can you elaborate on the kind of assumptions that are used?

MR. ESH: Yes. I think that's part of the purpose of the guidance is to get people moving in the path of not assuming, but trying to demonstrate what projections of performance instead of assumptions of performance.

What I mean by that is the process we have outlined is you go through a design analysis/support/evaluation/monitoring process to try to develop how you believe that cap will perform. You don't say I'm going to assume that I can design a cap that's going to last 200 years. You have to demonstrate that you can make a cap that will last 200 years or whatever period of time you need it to perform for.

So I don't know if the issue is one of what assumptions are made in the cap performance. I think what's typically done, what had been done, in the past is you develop a design for a cap. You do a computer model of it that has some projection of performance. If it helps you achieve your goal, you put that cap in. That's it. Then you're basically done. You do some monitoring downstream and see what

has been released.

I think the approach that we're kind of pushing for and driving at is you don't assume idealized performance. You analyze the potential degradation mechanisms and processes that can occur for that cap. You incorporate those into your design and you evaluate those impacts in your performance.

A cap does not have to stay in an idealized state in order to meet your performance objectives. You can have some partial failure or in some cases total failure if it occurs, how it occurs and at the right time. But you can have partial failures of your system that still allow you to meet your performance objectives.

So I think the way people look at an engineered system is it's either working or it's not. But the reality is in most cases it's working very well at the beginning but maybe not in an idealized state and then at some point in time, it's still working but not it's not failed completely either. There is this continuum of performance that you have for the system.

I'm not sure if I answered your question directly, but I think the old approach might be that you idealize something and assume that the new

approach is you go through all these steps in the process. But you don't call it an assumption anymore. You might have to make some assumptions in the analysis process, but it's really more at least a semi-quantitative demonstration instead of an assumption.

VICE CHAIRMAN CROFF: That's not quite getting to where I was headed. Assume that somebody comes in or has come in historically and they've said we would like to use a cap and they give you an analysis of its performance or give you an assumption whichever. Is it permitted to assume basically that maintenance goes on for an extremely long time and therefore nothing ever gets out? Where do you draw the line here?

MR. ESH: In a restricted release analysis, you analyze the situation where you have monitoring and maintenance occurring and how your system will behave with that monitoring and maintenance occurring.

VICE CHAIRMAN CROFF: Forever?

MR. ESH: For the time period that you need and the second analyses that you perform as you assume, you lose your control and you have no monitoring and maintenance. How does that system

behave?

VICE CHAIRMAN CROFF: Okay. You lose your control at what time?

MR. ESH: At time zero.

VICE CHAIRMAN CROFF: Okay, and in the first one, let's say you have a site, maybe a FUSRAP site or something with very long-lived radionuclides, and you put one of these caps on it. But at some point, does the assuming maintenance and that it continues to perform in the base case if you will get a little bit --

MR. ESH: Well, I think you can have a monitoring and maintenance situation that the maintenance can range the whole way to replacement. So you feel you can only design a cap for whatever functionality you need that's going to behave for 30 years and in the decommissioning process for restricted release, you have to have financial assurance for the monitoring and maintenance part that you have. So you have to establish a fund of appropriate funds to provide for that monitoring and maintenance that you expect you're going to need.

So the issue of lose of control is supposed to be handled in that second set of analyses that you have and also lack of monitoring and

maintenance. The ability to provide for monitoring and maintenance when you have control is supported the financial assurance that you get from the funds that you have to provide to do that activity or those activities.

VICE CHAIRMAN CROFF: Okay, and in the second analysis, the one where you assume failure from get-go, what kind of a dose limit or criteria or whatever you want to call it is used there to say "Gee, that's too much" or not?

MR. ESH: The first level is 100 millirem and then you can if that's going to be exceeded justify that you can go to 500 millirem and you can justify it if it's going to be prohibitively expensive basically to meet the 100. You can go to 500 millirem.

VICE CHAIRMAN CROFF: Okay, but if it's over 500 you have to do something anyway?

MR. ESH: Robert.

MR. ROBERT JOHNSON: Robert Johnson. Under the LTR, any licensee would be bound to the dose caps that David referred to, the 100 or 500 millirem. However, for the West Valley site, you're probably aware of the West Valley policy statement. The Commission did kind of outline circumstances if the

500 millirem cap would be exceeded.

What in that case would need to be done to demonstrate like Dave was saying that further removal or clean-up would be prohibitively expensive or that they had cleaned up to the maximum extent possible. But they still have to make the case that what they're proposing to do would maintain safety and would make protection. So that's the only time that permission has looked at a possibility of exceeding the 500 millirem cap. Otherwise, all other licensees under the LTR are expected to demonstrate compliance with those caps.

VICE CHAIRMAN CROFF: Okay. Thanks.

MR. ROBERT JOHNSON: And I'll be getting into this topic when I talk to you next.

VICE CHAIRMAN CROFF: Okay.

MR. ROBERT JOHNSON: Or maybe less now. I don't know.

MEMBER CLARKE: Go ahead, Ruth.

MEMBER WEINER: Dave, you touched on something that might be a good thing to look at which was when you said that for the shorter half-life radionuclides, perhaps engineered barriers, would be a reasonable solution. Do you want to expand on that at all? I was thinking something like cobalt-60 or

even strontium and cesium. You have a lifetime that you can reasonable project an engineered barrier to perform.

MR. ESH: Yes, those are some of the primary examples that I was thinking of especially, say, cobalt-60, many other short-lived radionuclides. I think there are some sites that have, because of the operations that have occurred at those sites, they may have certain kind of narrow sources of a specific isotope or isotopes that would fall into that class and some other sites like a West Valley that's not really the case. There may be pieces of the problem that that approach would be a good approach for, but generally it has a whole set of both short and long lived radionuclides that they have to deal with.

But in many cases though, the high specific activity, short-lived nuclides can cause more of a challenge certainly in the near term because of their high specific activity and if they also have an associated high dose conversion factor.

MEMBER WEINER: Yes.

MR. ESH: So you may be able to apply an engineered solution to that part of the problem that solves the short-lived component and then the long-lived risks are manageable and appropriate. That is

a situation that occurs too. It's not only limited to a specific source of just short-lived. It may be that the short-lived risk is large. You're long-lived risk is low. Therefore, you need an engineered solution just to deal with the short-lived portion of it.

MEMBER WEINER: So you're looking in a complex site that has a number of radionuclides that this might be applicable for part of this.

MR. ESH: Yes.

MEMBER WEINER: For some nuclides not others.

MR. ESH: Yes.

MEMBER WEINER: Are you thinking of reflecting that thought in the guidance because you say you plan to ensure that engineered barriers are not favored in the guidance and that's sort of a vague statement. Are you going to expand on that in this direction or in other directions.

MR. ESH: Yes. I think what we wanted to try to do was not -- We have to be fair to the uncertainty in the information and the variability and the opinions regarding that information for different barrier types. So we felt like if we have a strong opinion about a particular barrier, when we're talking about favoring barriers, it was emphasizing one

barrier type over another type.

So we didn't want to say people should be using geomembranes and you shouldn't use slurry walls. If we can outline the problems associated with each and, say, maybe indicate some advantages and disadvantages and ranges of performance, etc., then people can choose what they think is best for their problem and demonstrate it justifiably. So I think that we don't want to favor a particular type, but if we feel like we have a fairly strong basis based on experience, observation, etc., and we're accurately summarizing experience, people might not like that experience, but it is what it is.

The problem is like I'll talk about cements for example. If you have a poor quality assurance program with cements, you can get some actual performance that differs substantially from the your design performance. So that's an example of if you just summarize that experience of how a cement may have worked without putting the appropriate context of why didn't it work, it might be unfair to cements in general to say "Look. Cements have been used at this site and the experience was awful. Therefore, cements don't work." We just have to be cautious that we're even and we're neutral on the information and that we

accurately describe it.

MEMBER WEINER: Yes, that's a good point. I also wondered if you had looked at some of the analogs on the Department of Energy sites and we have the Sandia Mixed Waste Landfill as good example of an engineered barrier that is only expected, is only required, to last for maybe 40 or 50 years and some of these sites might give you analogs that you can document and then point to and they cover a variety of topographic and geographic environments.

MR. ESH: Yes, we think that -- We're open to any sources of information. The difficulty is getting it, receiving it, evaluating it and synthesizing it.

MEMBER WEINER: Yes.

MR. ESH: It's a challenge. We realize there's lots of information out there, but this process of getting it all and getting it into a form that's useful in the guidance is a difficult problem. We think in this version of the guidance that we'll do the best we can and provide some summary with a good set of links to other sources, but that ultimately if we want to go the next step, that's a bigger longer project that maybe that would be reflected in a future edition to the guidance.

MEMBER WEINER: Thank you.

MEMBER CLARKE: Any other questions? Mike.

MR. LEE: Dave, you made reference earlier to NUREG 1573, the Low-Level Waste Performance Assessment. There's a reference in there by the National Academy on engineered barriers. I think it was a 1990 study. You may want to go look at those participants to see if there is any more recent work because they do in that, if you may recall, they do in that report address bituminous materials as well as geosynthetics. So that might be a good starting point to see if those principal investigators have done any more recent work.

MR. ESH: Sure.

MR. LEE: And the other thing is one thing that we didn't get into in that report which I thought might have been useful is looking at analog sites. I believe it's in the Mississippi River valley there are some mounds, these Native American mounds, that have been around for hundreds if not thousands of years and I'm sure there have been some work to evaluate their performance. I'm not sure what the mounds are for or what's under them, but that might a good starting point to look at some analog sites particularly in

humid areas.

MR. ESH: That was one of the examples that we already thought of pursuing or at least Ted Johnson, our excellent contractor said he was so interested in it that he basically said on his own time and money he might go look at them and evaluate them, etc., just because that's the type of person he is. I think that type of activity, whether it's done by us or done by somebody else, it's very valuable.

I have a variety of reports on natural analogs. I have the Department of Energy's work on high-level waste. I think that area is a valuable area of research. You still run into this fundamental limitation of basically why people believe that analog applies to your site.

MR. LEE: I'd asked Ted how close those sites are to golf courses. I know Ted's pretty busy in that department.

MR. ESH: He claimed it was not to go golfing. It would only be to evaluate those mounds.

MR. NAUMAN: Work, work, work.

CHAIRMAN RYAN: Back to that kind of combination view of engineered and maybe even some natural components of barriers for the short and the long haul, that's a fruitful area I think. You'll

find sites. I know Arnold for example, has both. There's a polyethylene membrane and of course there's always challenges about how long have they been around, how long will they work and all of that. That's fine.

But if you combine that with some of these geomembranes that include Bentonite clay and other kinds of barriers it's a belt and suspenders approach perhaps, but incrementally it's not that expensive and it's a confidence builder. So there's a component, I think, thinking about engineered barriers as well as the natural materials and seeing if there's any synergies between the two.

MR. ESH: Two problems that I've found when I've been working on this is that first whenever people are making observations of their system, if their observations are favorable, they usually quit making observations. And the second thing is if they observe something and it's bad, they don't like to talk about it. They'll only talk about how they resolved it. They don't want to give the details of why it failed or what the issues of failure were. So those pieces of information are things that would be useful, but they're hard to come by.

CHAIRMAN RYAN: Sure. But to make the

point though, don't you think that if you do have some suspicion that one kind of a barrier or another may or may not work. In other words, cement may be good in some settings or for some radionuclides and for others, it doesn't matter much?

MR. ESH: Yes.

CHAIRMAN RYAN: For tritium, cement is the same as clay in terms of permeability. Basically, it's within a given range. But for ionic species, it's great stuff. Basolonic materials lock up all sorts of radionuclides, but again, I think you have to think of it as a system and not just components of a system. You have to integrate it and say what's the whole picture. So natural materials and engineered barriers offer you some advantages and in combination might actually do a better job than each alone.

MR. ESH: Ideally, if you can provide some guidelines certainly of things you might want to try to avoid, that would probably be very helpful in the guidance like you don't want to put a clay layer close to the land surface generally at any site is what Craig Benson found. Even in Georgia, they had a drought period and that thick clay layer cracked and became more permeable than the native soil basically.

CHAIRMAN RYAN: Sure.

MR. ESH: Just rules of thumb like that, I think, would be useful to have.

CHAIRMAN RYAN: Sure.

MR. ESH: It's just a real challenge of getting this information, synthesizing it and getting into the form of this guidance. We think it could be very useful to a lot of people, but it might be something that we pursue over a longer period of time and that might have more tendrils that affect other work than just this area of decommissioning, the incidental waste area that I work in where you deal with the impact and projection of barrier performance a lot and then eventually in any low-level waste facility application. So this information could benefit all those areas.

CHAIRMAN RYAN: Clearly, yes. Again, that's why we've kind of carved out the modeling and monitoring working group as a separate activity because it does transcend across all of these areas.

MEMBER CLARKE: Any other questions? David, personally I have to say that I really like the direction in which this is moving. You've alluded to the fact that in the early days of engineered barriers there was a lot of anecdotal science, "don't do that, it doesn't work." Well, maybe it didn't work there.

Maybe it will work here.

And we went from prescriptive designs and groundwater monitoring to "Oh, my God, what do we do now," so putting the barrier and I'd like to think of it as even a larger system than Dr. Ryan. I think of it as the engineered barrier together with the institutional controls that may be needed together with the monitoring of both of those as the system which is just the way I like to look at it.

The other is that I think in the past a lot of engineered barrier decisions were made by comparing the cost of the barrier to the cost of removal. The actual cost of selecting contaminant isolation is not just the cost of the barrier. It's everything you have to do to monitor and maintain not only the barrier but the institutional controls. So I throw that out as just a helpful way at least for me to look at that. Thank you very much.

MR. ESH: Thank you.

MEMBER CLARKE: Our next presentation is Robert Johnson talking about the other part of this system, Institutional Controls/Restricted Release Provisions. Robert.

MR. ROBERT JOHNSON: Good afternoon. I am Robert Johnson, a Senior Project Manager in the

Division of Waste Management and Environmental Protection. I've worked on this issue and briefed you back in June on this issue and one of the things we'll talk about today is restricted use and institutional controls and a long-term control license that is one of the parts of our guidance. It's the last resort of the last resort and that's why I'm last on the agenda today in the briefing period because they finally moved me to the end instead of the beginning as I briefed you in June.

If we look at the first slide on the summary and just recap very briefly what was our draft guidance about for this issue. I had a number of components. One component was a risk-informed graded approach to applying institutional controls and we identified and defined what high-risk sites, low-risk sites and then a range of different types of institutional controls. I'll just comment that this is kind of important because probably the sites that we're working with today like Shieldalloy or West Valley or other sites, they're really high-risk sites and the fact that we're using a long-term or thinking about a long-term control license today shouldn't give people the impression that that's the only type of institutional control that the staff thinks will work.

We do have this graded approach and it was presented and developed a little bit more in the guidance so that you could stand back and look at all the possibilities there and realize that we were trying to match, the attempt in the guidance was to match, the appropriate institutional controls for the risk at a particular site. So keep in mind that even though we're looking at a long-term control license today, there may be other sites that could just use conventional institutional controls if they're a low-risk site.

But if they're a high-risk site, they're going to need durable controls that's required by the LRT and if they can't arrange long-term controls, then a license may be one of the options that we think about. So it's good to start off with just keep in mind there is that graded approach out there and it could be used in the future even though we're kind of working a couple examples that only pertain to one end of the graded approach.

As you know, the guidance also identified two new institutional control options involving NRC and this is where the last resort comes in. Part of the problem that the guidance was trying to deal with is that some licensees were not able to come up or

arrange appropriate institutional controls and so the Commission directed the staff to look at other ways that we could provide those institutional controls.

So we came up with two, the long-term control possession only license and then the legal agreement and restrictive covenant (LA/RC) and we maybe didn't say it enough in the guidance, but these are last resort. They aren't just available for anybody to use and it's not a free pass for getting through decommissioning.

They literally are if the licensee can demonstrate that they tried to establish controls and they weren't able to make arrangements for the controls like with the state or they were not able to arrange an independent third party that's required by the LTR. They have to demonstrate that and then if that's satisfactory, then there may be consideration for the use of the long-term control license. So I want everyone to keep that in your mind. It's the last resort of the last resort because restricted use is the last resort for decommissioning.

Our guidance also had some revisions to guidance on advice from affected parties and then we included a new section on the total system what Dr. Clarke was just referring to. It's not just

engineered barriers. It's institutional controls. It's monitoring and maintenance. It's financial assurance and particularly the dose caps acting as a safety net and really the sustaining protection in my view over the long term is its reliance on this system and that's what the Commission and the LTR did explain in the Statement of Considerations. But we tried to put that into our guidance as well. It's in an appendix but it's there to give an answer to this how are you going to sustain protection question that we often get asked.

And then lastly, there was some guidance on a risk-informed approach for long-term monitoring of a site, of a cap, of the restricted use site.

If we go to the next slide please, Public Comments. A summary of public comments, of course, I guess we ended up with the largest number of commentors, the largest number of comments. There was a broad range of topics that I'll get to in a minute and a lot of detailed questions. The comments though, all of them, from all the commentors showed a lot of insight and that they put in a lot of effort thinking through this issue.

In some cases, it was from parties who are looking at having one of these supplied to their

state. So they had an interest in really looking at it very carefully and not leaving any stone unturned the way I feel. But in reality, they're asking very good questions. That helps us make sure we're not missing something. Even though today, I'll be kind of going over what I think are the major ones out of the whole set of ones that we looked at, as Duane pointed out earlier, our guidance will address all the comments. So I won't talk about them all today, but just the ones that I thought were more significant.

We got comments on the LTR again for instance. They couldn't help themselves ask questions or comment on it and, of course, our guidance is implementing the LTR. So we're not going to be addressing suggested changes to the LTR.

We got comments as we already touched upon but I'll mention a little bit about. The LTR is different than Part 40, Appendix A or Part 61. So they were worrying about differences the NRC regulations.

Going to comments on the guidance itself, most of the comments were on the long-term control license. There were a few on the legal agreement restrictive covenant and a few on the advice from the affected parties. But there were no comments on the

risk-informed approach or the total system approach or the long-term monitoring. That's just an overview.

If we go to the next slide please, first what I want to talk about is the comment on duration of institutional controls and indefinite durability. I have to put this one first because I think it comes quite often is institutional controls typically can fail. We have lots of experiences. How can we expect them to last forever? How can we expect to use the commentor's term "to have indefinite durability"?

That's a really good question. It's hard to answer, but I thought maybe the Commission's words would be better than mine. So I would start with a quote and I just felt like I had to put the quote in the slide. I had to read it. So I will because that's sort of a foundation to me seriously of some of the thinking that we have on a difficult issue.

The quote comes from the Statement of Considerations of the License Termination Rule. It's sort of like the fine print. You have to go hunt for it in the record. So putting it out here might be useful to remember that the quote going "Requiring absolute proof that such controls would endure over long periods of time would be difficult and Commission does not intend to require this of licensees. Rather

institutional controls would be established by the licensee with the objective of lasting 1,000 years to be consistent with the time frame used for calculations."

They go on to say, "Although the Commission believes that failure of active and passive institutional controls with the appropriate provisions in place will be rare. It recognizes that it's not possible to preclude failure of controls. Therefore, in the proposed rule, the Commission included a requirement that remediation be conducted so that there would be a maximum value, a cap, on the TEDE from residual radioactivity if the controls were no longer effective in limiting the possible scenarios and pathways of exposure."

I think that just gives probably the most realistic, practical view on a difficult issue about how do you think about performance of controls with total system in the future and it leads to the point that obviously the LTR has set up two different cases to analyze and two sets of criteria that licensees need to comply with and they need to clean up to. The first, of course, it's with institutional controls in effect and then the second one, it's with institutional controls not in effect.

To answer your question earlier which is a good one, I guess I view this, it's my personal view, as these two are sort of bounding cases and they give you, you just assume that controls are in effective and you analyze that and you assume the monitoring and maintenance goes on. And you can do that because you're also analyzing the next one where you're assuming that they're not going to be in effect.

So reality is probably somewhere in between. Right? And there could be just forever arguments about how long will institutional controls last, how will they fail, when will they fail, how much will they fail, all kinds of questions. And I kind of think the elegance of this approach is that it puts a bound on those and gives clean-up levels for both of them and then it requires, it's the only regulation that we have that requires analysis of the failure and what happens if the controls are not in effective. What will happen to your system? So I think there is some merit in this approach and it's a very useful regulation.

CHAIRMAN RYAN: It's interesting to think about it, Robert, in the sense of our discussion on half-life and if I back out my thinking here it says

anything with a 100 year half-life or so will tend to perform with the barriers working and anything with a longer half-life will tend to be in that mode where you're kind of assuming that things are going to work past that. It gets me to thinking about what radionuclides and what wastes are in each of those two bins.

MR. ROBERT JOHNSON: In each of those two bins.

CHAIRMAN RYAN: It's an interesting exercise to think about it. Source materials obviously have a longer term and there's a lot of stuff under 100 year half-life that would be kind of on the inside of it. I don't have a good answer, but it's just an interesting way to think about it based on your reading and discussion of the requirement.

MR. ROBERT JOHNSON: And the sites that we're dealing with mostly now are the uranium and thorium sites. So from a restricted use standpoint, we don't have any sites with the short-term radionuclides.

CHAIRMAN RYAN: Right.

MR. ROBERT JOHNSON: All of ours are uranium and thorium sites.

CHAIRMAN RYAN: Makes sense based on the

ideas put forth. Interesting to think about it that way though.

MR. ROBERT JOHNSON: The commentors also point out, Part 61, is you only take credit or you shouldn't rely on institutional controls after 100 years. So what's the difference here and I think they are similar and from what I've been told, and there are experts in low-level waste sitting around the table and I'm not one, but the reason for the hundred years was to provide time for Class A and Class B waste to decay to acceptable levels. So it was designed in that regulation for a particular purpose.

I would say that in the LTR it was designed for a different purpose so that it would applicable to maybe many different types of facilities. But I think conceptually it gets at the same problem. It's just another way of doing it, but people typically bring this 100 year institutional control time period up as well the Agency believes that the institutional controls can only be relied upon for 100 years. That's within Part 61 and I think it's just a different regulatory approach that we're using in the LTR and it's still is very protective because it assumes failure at day one for the other analysis and for the dose cap criteria compliance.

I think our plan is to just try to enhance some discussions up front in the overview to address this particular issue and if we could go to the next slide please. The first one I talk about here is consistent analysis of institutional controls and engineered barriers.

One comment suggested that when we analyze for institutional controls not in place, we should analyze for engineered barriers not in place and we've already touched upon that in Dave's discussion, but we don't plan on making any changes to the guidance here because we feel that the Commission clarified this in the West Valley policy statement where they discussed that engineered barriers were not determined to be institutional controls. They were separate. To us that's important in the analysis for controls not in place.

As Dave pointed out, under that circumstance, then the licensee would analyze how the engineered barriers that are used at that site how they would degrade without monitoring and maintenance. In some cases, like one site that we're looking at in New Jersey, it looks like erosion is the principal activity and the erosion control cover would the principal engineered barrier to protect the shielding

of the slag.

So you can, we feel, we have confidence that we have used a process to design erosion covers to last a long time under the UMTRCA Program. So that would be one example where that engineered barrier could be relied upon to last a long time and if it's designed to our guidance, degradation may not be a factor in the analysis. Other engineered barriers, it might be very different. So you just would analyze the particular barrier and incorporate that analysis of degradation in your analysis.

The next one, perceived inconsistencies and we touched upon that also in Dave's discussion. There were comments that the LTR or our guidance in 1757 and the approaches in Part 40 Appendix A in low-level waste were different. They set up a double standard for reclamation and disposal and that under Part 40, those requirements were more stringent than in the guidance.

Examples, I guess, as we touched upon before would be under Part 40 and UMTRCA is the requirement to have DOE or state being the long-term steward under a general license with NRC for the requirement to have stability for 1,000 years in the erosion covers. So the commentor felt that

requirement was different than our guidance and I think the answer is this is the difference between the LTR being a performance-based regulation and the flexibility underneath that and how we're trying to take a risk-informed performance-based approach in our guidance to implement it.

That's very different than under Part 40 where you have a law requiring the approach and the prescriptive approach. So these are just different approaches. And in fact, some of the approaches that we have proposed in our guidance for engineered barriers and institutional controls are copying off of some of the approaches taken in UMTRCA, a little different language and all that, but we're trying to learn from those experiences.

We're not planning to do anything about this, but we'll inform the Commission about the views that were presented in some of these comments about different approaches. But those approaches are required and the Commission when they finalized the LTR and developed and finalized the LTR they were certainly well aware of Part 40 Appendix A and Part 61. So that was given a lot of consideration at that time.

Let's see. The next comment then would be

preference for rulemaking to implement the LTC license. Now we're not even at the guidance yet. So they're still working, the commentors are still working, on the LTR and our process. Commentors felt that this was requiring, not requiring, but including a long-term control license was quite a departure from the license termination rules. So it was a big change. Also they felt that the Commission should be, instead of implementing this option or these options with policy and guidance, using rulemarking to provide an opportunity for substantive public comment on this major change in their view.

I have to say. When we did the LTR analysis for the Commission, we looked at rulemaking, we looked at guidance and recommended guidance to the Commission. It was expected that some of these options would only be used at maybe two or three sites and it wouldn't justify a rulemaking for two or three sites. Keep in mind that when we do a rulemaking, OMB requires us to do a cost/benefit analysis of the rulemaking. So it is important to look at the cost and the benefits of that whole rulemaking process.

We felt that it was appropriate to move ahead with guidance, but the Commission felt that getting public comment was really important also. So

as you might remember, they required us to do a number of things to seek public comment. We wrote a regulatory issued summary and provided that to the public and to all the licensees to explain what the issue in this case was and what the Commission's direction was. We had a public workshop last April and the Commission specifically asked for us to provide them or inform them of the public comments on this draft and that's what we'll be doing.

I felt that the Commission really believed that input from the public on this particular issue, maybe some of the other LTR issues also, but specifically they called out this issue was important. So we proceeded with guidance, but we proceeded with opportunities for public comment and we'll inform the Commission of what those comments are. We feel that we'll be recommending to move ahead with finalizing guidance here.

Now if we move to the next slide, we get to the key comments on the draft guidance. Interestingly enough when you look at all the comments, we did have support from some of the commentors for the LTC license and they felt that the LTC license provide greater assurance. It was a strong institutional control.

As you might expect on the other hand, commentors, another commentor, State of New Jersey, did not support the concept. This happens to be their state that we're looking at the possibility of a long-term control license. But they felt that the license was really long-term storage and it wasn't permanent disposal since it would not meet the criteria that NRC has established for disposal facilities. So in a way, I think they were rejecting the LTR again and the restricted use provisions in the LTR.

They felt that moving ahead this way with the LTC concept was different than low-level waste disposal and the disposal of uranium mill tailings that had a concept of avoiding proliferation of sites. This kind of gets into the next topic on proliferation of restricted use sites and future legacy sites.

But going back, New Jersey also felt that the LTC license would be a detriment to reuse of sites because of the license itself. So they had a number of very good reasons why they were against it and I think that when you look at all comments together, it's probably what you would expect. Some are for it and some are against it and they have good reasons on both sides really. So it's a policy call. That's what it ended up in the LTR for restricted use and

likewise it was a policy call to go ahead with the option of an LTC license in the other legal agreement. It's not expected that everybody will agree with it.

Moving on to this proliferation of restricted use sites, I think some commentors felt, and they had good reason, they were worried about more sites when it's probably a good idea to have less sites and we agree with them. That's why the Commission really prefers on restricted use overall, but they've provided for an option for restricted use in some limited cases.

When you look at the requirements for restricted use, it's difficult to meet those. If you look at the requirements for the LTC license, it's ever more difficult maybe to meet those requirements. We certainly intend it to be the last resort of the last resort and maybe we have to say it better in our guidance because some of the commentors, a number of them, sort of missed that idea. If they did, we have to explain it a little bit better that it is a last resort.

Also the thing that we didn't explain in our guidance to help with this perception of what we're doing, possibly leading to many more sites, is that of the decommissioning sites that we have right

now we only have three that are considering restricted use. So we don't expect more out of the group that we currently are dealing with and those can be viewed as the existing legacy sites, the ones that have a lot of difficulties dealing with. That's sort of a finite pool right now and there's three of them that we're dealing with.

When we did the LTR analysis as most of you know of course, that we also had another whole suite of issues on preventing future legacy sites and we have a rulemaking that's starting up to deal with that. So we really agree with these commentors, the combination of the LTR being pretty stringent and applying the criteria will limit the existing use and then if we prevent the possibilities of future sites like this from occurring with the rulemaking, that should end up with very few sites. It shouldn't end up with proliferation of sites just because we have an LTC option available.

I really think that the staff and the Commission have committed to this idea of nonproliferation. I think it's a matter of people understanding that there are a number of issues we're working on and our guidance can better explain this idea of preventing future legacy sites is an important

issue and we think it will help with preventing these things happening in the future. We have to explain that better. It was a good comment.

Okay. Let's see. The next issue would be the LTC license should not provide a means of avoiding LTR requirements. I guess the commentor felt that maybe an LTC license would allow a licensee to avoid meeting all the other requirements of the LTR in 1403 and that certainly isn't the case. We've said it, but maybe not clearly enough that the LTC license acts as an institutional control. But in order to use, you have to, a licensee would have to, demonstrate compliance with all the other 1403 requirements just like any restricted use. It is not a free pass to avoid meeting all the other requirements. We just have to be sure that we're saying that clearly enough.

The next issue is one of our favorites, this case-by-case approach for prohibiting subdivision of a privately-owned site. We talked about this a lot in our June meeting and you gave us some information that was useful and we incorporated into the guidance and gave pros and cons on this particular issue. If you have a restricted use site that has a portion that could be released for unrestricted use, should you keep the whole site together so it has some value or

should you allow the licensee to subdivide it and release the unrestricted piece and end up with the small appendage, the restricted piece that likely has no value?

So we put in pros and cons in our guidance, but we did give an impression, not an impression. We did say we preferred to keep the whole site together. So some of the commentors disagreed with that approach. Some of the commentors actually agreed with keeping the site together. So again, we had sort of a mixed reaction.

And because of the timing of it all, we're actually testing, we're not testing, we're implementing this at the Shieldalloy site in New Jersey and their DP came in and said we want to subdivide the site and our affected parties, our local community, feels strongly, that it's better for them to allow the subdivision and the release of unrestricted portion. It will be better for the community. They feel that's good. After a discussion with them, they said that the licensee had discussed this with their site-specific advisory board, all the pros and cons, and on balance, they still felt that this was their approach.

So I guess my view is looking back in the

ACNW's comment letter suggested case-by-case and that's probably where in our view that's really where the guidance should be. It's probably useful to explain the pros and cons in any event so future licensees can think about it and they can discuss it. I think we should encourage discussion with the affected parties and the local people and get their input because there may be cases where it would make sense, where it would contribute to sustaining ownership over the long term without a detriment to the local community and the economy. So it's site-specific as we recognize and case-by-case would be the best approach possibly for this particular issue.

MEMBER CLARKE: Robert, do you think there would be any merit into clarifying in a little more detail what you mean when you say that the NRC prefers a particular option? That doesn't say that you're not willing to entertain approach. It says this is what you prefer.

MR. ROBERT JOHNSON: Yes, that preferred word seems to get a lot of attention. I don't know.

MEMBER CLARKE: It seems to be being interpreted as this is the way it is.

MR. ROBERT JOHNSON: Yes, I guess maybe what you're saying is that we could say we prefer it

but we realize that it may be case-by-case and there may be reasons why it wouldn't be preferred at a given site and we might word it that way.

MEMBER CLARKE: For example, use the same language with the long-term control license. You said that was preferred over the legal agreement restrictive covenant. But again to me that didn't imply that you wouldn't entertain the other. So you could make a good case for it.

MR. ROBERT JOHNSON: And that may be a way we can look at the wording that way. I think it's maybe just a balance. Sustaining ownership is important I think, but the commentors pointed out that if you have adequate financial assurance that's probably important. I think the main consequence trying to think about this a little bit more, maybe you have some ideas, but the main consequence of possibly not being able to sustain ownership in a licensee would be more of a burden on NRC to take to set up whatever needs to be set up like a custodian, some custodian trustee, that would use the available financial assurance to step in if there were a gap in ownership and licensee. So it kind of falls back on if we do allow this flexibility and allow subdivision and if there is a gap in ownership in the future, then

NRC will have to take whatever action it needs to take.

CHAIRMAN RYAN: So the preference really isn't for one alternative over the other. The preference is to sustain site ownership.

MR. ROBERT JOHNSON: The preference originally, the purpose was to, even though this is sort of abstract I think, sustain ownership and a licensee, ideally to do whatever needed to be done at the site. We would provide our normal oversight of that process as we've explained, but if there is a gap in ownership, then NRC is going to have to do more.

We're going to have to fill that, we're going to have to arrange for not fill it but we're going to have to arrange for that and that's just more of something for NRC to do and the license termination rule's whole goal was terminate and we would be done. So we're not looking for more work. We're looking for less work.

CHAIRMAN RYAN: I'm talking about the restricted release part. You're really trying to offer to the licensee a couple of options where they can maintain ownership and use the funds I would assume from sales of properties to further activities and so forth and that you're willing to do that if it

helps with your goal which is to make sure there's a competent owner in place.

MR. ROBERT JOHNSON: For any of these things --

CHAIRMAN RYAN: We're coming back to case-by-case because it really depends on the financial robustness of the licensee. That's the real fundamental issue here. If you have a licensee with a lot of money, either one works. If you have licensee that's strapped for funds, then partial site release might help alleviate that burden.

MR. ROBERT JOHNSON: I guess there's another aspect to it I think. The financial assurance that needs to be set aside for all the monitoring and maintenance should be sufficient. That's part of what the review is about. So that money theoretically should cover whatever work regardless of who's doing it. The money should be there.

So it's like who's going to be there 100 years. Will today's licensee and owner be there forever or will they sell the property or will they abandon the property? There could be a gap in that ownership and licensee and that's generally what a concern would be.

CHAIRMAN RYAN: Gotcha.

MR. ROBERT JOHNSON: The money is fine. I mean the money's not fine. You have to look at it carefully, but the system is set up to have the money there. It's just the person, the entity, to maintain the site with those funds could be fragile.

CHAIRMAN RYAN: Okay.

MR. ROBERT JOHNSON: There was another comment on flexibility for future changes under the long-term control license. One commentor felt that, asked the question, was there flexibility for a licensee to propose a restricted release with a different form of institutional control in the future? Also a question was is there flexibility for NRC to require an LTC licensee to remediate in the future when an expensive disposal option becomes available? Those are different questions. They are two really interesting ones.

The first question on flexibility, we would say, yes, there's flexibility. If there's in the future another type of institutional control becomes available, the licensee can propose what that would be instead of the LTC license and you could proceed with license termination if that's what they would desire and if it were acceptable.

So there is flexibility and of course I

think our guidance already said there's flexibility for a licensee to determine themselves if they want to clean up to unrestricted use. If there's a business decision or something, they felt like it was something they wanted to do and there is flexibility to do.

But the question that the commentor asked is is there flexibility for NRC to require clean up if there's a cheaper thing that becomes available and our thinking right now is that we wouldn't require that because under the LTC license we believe that the finality provisions in 1401(C) in the LTR apply that once that LTC license is put in place that really does complete decommissioning because it's shown that all the requirements in the LTR have been met and therefore, there would not be the potential for future clean-up unless there would be a significant safety threat and that's what 1401(C) indicates.

So we wouldn't require just because there's a cheaper way out there, we wouldn't require a licensee to clean up to unrestricted use. But if they wanted to do it from a business standpoint and there might a lot of motivation to do that, then they can do that. That's what our thinking is with respect to flexibility for future changes under the license.

The next comment is sort of related. The

question, the topic, is under a long-term control license since you're only amending the license, you're not terminating the license, then you haven't completed decommissioning. That's the point of the comment and we're considering revising the guidance to explain better that the long-term control license acts as an institutional control and as I said before, the licensee still needs to meet all the other requirements of 1403 for restricted use.

We're just basically deciding to amend the license as an administrative efficiency. We could literally terminate the license because all the requirements have been met. But administratively, it would be a lot efficient just to amend the license. But in the process, this question about you have really completed decommissioning is likely to keep coming up because part of the definition of decommissioning is that you've terminate the license.

So what we would probably say in our guidance is that we would consider that even though the license is just being amended that decommissioning is considered complete because all the requirements in 1403 have been met and we could consider even incorporating that into the long-term control license language in the event that the question comes up in

future years. Did you really clean up the site enough? Have you really decommissioned the site? If the license included in it the statement that decommissioning has been completed, then that may be a way to deal with this question.

Moving on off the LTC license and on to the legal agreement restricted covenant, there were a couple comments we want to highlight there and that would be on the next slide. There was a question on the justification for a legal agreement restricted covenant and in our guidance we had said that one of the things that a licensee would need to do is to show that there would be a significant benefit to the licensee or affected parties of selecting the legal agreement over the long-term control license.

A number of commentors felt that that really wasn't necessary. Really, the important thing was simply that the LA/RC would be effective in the jurisdiction that you're working in. It would be just as effective as the long-term control license. And of course, the licensee would need to request the LA/RC. They just would rather have that rather than being a licensee.

And the second thing that remains very important is that for use of the LA/RC you wouldn't

have any need for expertise for monitoring and maintenance. That would be pretty complicated because that would typically require expertise in NRC review of that capability and we could do that under the license, but we can't be approving future owners having the technical expertise. We can't approve that under the LA/RC.

So essentially you can only use the LA/RC for very simply cases we feel where there isn't complicated monitoring and maintenance like of an engineered barriers that would require special expertise that would have to transfer from owner to owner to owner over time. We feel that that's about all they need to do is to justify the LA/RC and the fact that it's a benefit to them we will consider changing our guidance to remove that need to show benefit.

Another comment received was on use of environmental covenants. Some of the states said that states could have a role in the LA/RC. They also suggested that the guidance mention that states have effective environmental covenant mechanisms available which can be effective for institutional controls. In actuality, it's not just related to LA/RC. It's a broader comment that we think is really important.

Looking at it a little bit more, the Uniform Environmental Covenants Act is a model law that was enacted in 2003 by the National Conference of Commissioners on Uniform State Laws and the idea of it was putting together this legal language could solve a lot of the impediments to current institutional controls and that the enforceability of institutional controls could be improved as well as the controls applying to future owners.

In other words, running with the land could be greatly improved. So some of the causes for failures of more traditional institutional controls it's believed can be solved with applying this model law that was created. But the model law has to be enacted, of course, by the states, by each of the states. So as the comment implies, it's not necessarily readily available everywhere.

As a matter of fact, just looking at a current status of this model law, it's available right, it's been enacted, in 11 states. It's been introduced for consideration in ten other states and the key thing for us is the two states that we're working in right now don't have it. But if they were in the future to obtain a tool like this and it would be working, it could be an example of maybe being used

in the future and possibly involving the state in some way in the future if they were agreeable.

It's something to watch and we're really going to look at a little more about this and including it in the guidance in some way. We're working with OGC to look from the legal perspective what opportunities there might be for use in environmental covenants or at least making licensees aware of it so they can go pursue it and it might be a good first step to making sure they've really looked at all the possible arrangements for institutional controls in their state before they would consider NRC options. We'll look at that and possibly adjust the guidance to include that.

Those are the only major comments that I was going to address today. There were lots of other little ones. There are lots of other important ones that might be interesting, but I wasn't going to talk about any more.

I guess in a summary, a real quick summary, I would say that we're going to be probably recommending finalizing the guidance and not rulemaking like some of the commentors suggested. We'll be repeating Commission policy to implement the LTC license with an amendment and work on some

language that indicates that we would consider decommissioning be complete if all of the requirements in 1403 have been met even though we've just amended the license.

We would consider adding information on environmental covenants like I just said. We'll be working on the wording of the subdividing of the site to either explain a little more about preference or just make a case-by-case option. And then lastly, we have I think some things to clarify just because some of the commentors for whatever reason didn't pick up on some of the concepts like the last resort is the last resort. We want to explain a little more our reasons for why we think that putting these options out there should not lead to proliferation of restricted use sites and then also probably that the long-term control license can be okay for reuse of sites.

It shouldn't preclude reuse of sites in the general sense because what we're asking for is that not only do you lay out the restrictions of a path applicable to a particular site but you lay out any permitted uses of the site. So there may be options at sites where you can use it for some purposes and not others. We may explain that concept

a little bit more.

That's the end of what I was going to present. I'd be happy to answer questions that you have on what I presented or questions that you might have from other comments that the commentors have given us.

MEMBER CLARKE: Robert, thank you. David, would you like to start?

MR. KOCHER: Again going back to square one, let me make sure I understand what you mean by last resort of last resort. I guess if I heard you right that involves two things. One is you expect restricted use situations to be unusual.

MR. ROBERT JOHNSON: Yes.

MR. KOCHER: And then in the restricted space of restricted use site, you expect it to be fairly rare that a licensee cannot provide for adequate institutional controls as laid out in the rule now.

MR. ROBERT JOHNSON: That's right.

MR. KOCHER: Okay.

MEMBER CLARKE: Just to clarify, that's using the graded approach. So they might need durable controls, but there are other ways of having durable controls on the license and the legal agreement.

MR. ROBERT JOHNSON: There can be. That's right. In practicality, that may be difficult, but in concept, I think there are options that licensees could consider.

MR. KOCHER: This whole area is not something I've thought a great deal about, but I had thought of this on my own and I was receptive to comments about lack of consistency across different rules. But I think I think of that problem at 40,000 feet rather than on the ground. We're, in many areas, basically in the world of perpetual care over things, low-level waste sites, those rare sites under the license termination rule that really can't be cleaned up to restricted use, mill tailings sites. We're into watching those forever. RCRA sites, we're into watching those forever whether we like it or not. Many superfund sites the same way.

Somebody needs to think about the benefit of having some kind of uniform system for deciding who is the ultimate bagholder here and how are we going to pay for it rather than have a mishmash of different approaches to picking responsible parties and I would think the states would be very sensitive to this because they probably are the ultimate bagholder in most of these cases.

This is way above your level, but if we go about this in patchwork fashion of one set of rules for license termination rule sites and another set of rules for low-level waste and another set of rules for RCRA and a fourth set of rules for mill tailings, we have a mess. That's an editorial comment.

MR. ROBERT JOHNSON: I'll just react to the last set of comments of our own regulations. I think we have of consistency when you look at the details on the use of institutional controls. There may be different ways of going about it. The mill tailings are all DOE and under a general license, but our specific license long-term control is really just a variation on that theme and low-level waste you have government ownership under an NRC license. So I think there's a lot more similarity across our regulations.

MR. KOCHER: I didn't mean to imply that it was all different, but this was just sort of plea that somebody needs to be looking at the entire landscape here about future commitments to watch over places where we don't want people to get into.

MR. ROBERT JOHNSON: I'm not sure I can offer anything on that.

MR. KOCHER: I'm not expecting you to.

MR. ROBERT JOHNSON: Although you sure see

exactly what you're describing. That's where we are today.

MR. IKENBERRY: I had a comment on the one key comment that was the consistent analysis of the institutional controls and the engineered barriers. Those are clearly two different things. So I don't really understand the comment and it seems like that analysis would be done in the process of looking at the unrestricted release potential. So is that something that was just missed do you think by the commentors because the answer to that question gets really done as they move through the process from unrestricted release to restricted release?

MR. ROBERT JOHNSON: I don't think it was missed. I think it was just viewed if you're assuming institutional controls failed, then you ought to be conservative and assume engineered barriers failed. I'm pretty sure they know exactly what they're saying in that.

MR. IKENBERRY: Right. But if you did an unrestricted release analysis and say you have 80 millirem a year for example, by assuming failure of institutional controls and of engineered barriers you basically are getting back towards that same number, are you not, that drove you from the unrestricted

release to the long-term control?

MR. ROBERT JOHNSON: You're likely to have a very high number in any event.

MR. IKENBERRY: Right.

MR. ROBERT JOHNSON: If you can't rely on any controls at all, you're going to end up with a very high number. That's right back to where you are today is what you're saying.

MR. IKENBERRY: Right.

MR. ROBERT JOHNSON: I just think that commentor knew. They were just trying to put that out on the table because before the West Valley policy statement there was an issue in the LTR that engineered barriers could be considered as institutional controls. From a legal standpoint, the wording and all that stuff was not clear.

So some people really felt I think originally that the LTR was ambiguous on this subject to the point where the Commission addressed it in the West Valley Policy Statement and explained it and made it very clear that they are separate.

MR. IKENBERRY: Okay.

MR. ROBERT JOHNSON: So in parts it's people reading the language that's just not seeing what the Commission has said maybe in the West Valley

Policy Statement, not being aware of all these different pieces of paper that are hard to keep track of even for us and just reading maybe literally the LTR and thinking that engineered barriers are institutional controls. It could have been as simple as that. I'm not really sure, but it's sometimes hard to keep track of all the different pieces of paper that present an evolution of the implementation of the LTR.

MR. IKENBERRY: I guess maybe I'm coming a little bit more from a safety analysis perspective too where those are clearly defined separately and treated quite different.

MR. ROBERT JOHNSON: And I believe we felt so too. So that's why it was clarified but the language was allowing people to question it.

MR. IKENBERRY: To make that. Okay.

MR. ROBERT JOHNSON: It was a way of trying to settle that issue and I think they did settle it.

MR. IKENBERRY: Okay.

MR. ABELQUIST: I just have a positive comment to share. I think the long-term control license is the ideal solution for a difficult situation. It maintains the unrestricted release

option as clearly the preferred option and so from the standpoint of incentivizing unrestricted release, it does that. It helps the licensee to focus on I'd like to get to unrestricted release. If I can't in the short term, maybe short term is ten years, I have a vehicle now.

When the LTR came out in the late `90s, it was uncertain how unrestricted release was going to work and I think this long-term control license is really a very good vehicle to maintain that balance between still incentivizing the preferred solution which is let's to try to get to the unrestricted release. But in the event that you can't because of financial restriction usually, you have at least some closure that you have decommissioned, but there's still going to be this long-term durable institutional control. So I really like the direction that things have been going in the last few years.

MR. NAUMAN: I have a couple questions. You mentioned getting involvement from the stakeholders, the SSACs, for the various areas. What if the licensee doesn't get buy-in from the stakeholders and it is only a preferred option for the NRC, but the licensee still wants to go down his own path?

MR. ROBERT JOHNSON: I think the LTR and the guidance is pretty clear that the requirements seek advice from the affected parties, not get agreement, not get closure, consensus. It also requires the licensee to document what comments they did get from their affected parties and how they considered them. So it doesn't require consensus but it does require accountability and explaining and that's in general on the use of institutional controls. I'm more reacting to this particular issue of subdividing.

MR. NAUMAN: That's the fundamental issue that I was getting at was the subdivision.

MR. ROBERT JOHNSON: Yes. Right.

MR. NAUMAN: And the advantages and disadvantages of a subdivision.

MR. ROBERT JOHNSON: And I think in this case, my own opinion, is their input was valuable and it sort of made sense and when you look at the tradeoffs, it's not necessarily a pure safety call here. So it's sort of important I think in this case to hear how they feel for that particular site. It would be site specific and it may not matter at all for some other sight, hypothetical site, but in this case, it is important to those parties.

MR. NAUMAN: Yes, and an example that came to mind was say you have a power reactor that for the near term you're going to have to worry about that ISFSI that's going to be onsite that's going to maintain your spent fuel. That's a small section of the territory. You can release hundreds of acres of the property unrelated to that and just maintain your license for that or for that storage facility. It may be in the licensee's best interest especially for the locations of some of these facilities to want to go to just maintaining that ISFSI and selling off the rest of the property because of the location and the value of the property.

Big Rock Point is a prime example. They have lake front property there that's very valuable in a very high demand area and they want to be able to sell off their properties and subdivide. So in their case, they may say the community doesn't buy in to subdivision. They want to get rid of the whole thing but we feel in our business perspective that it's the best thing for us and we want to do it. And okay, it's not the preferred method. They don't have the buy-in but they can do it anyway. They can go in that direction anyway. That's about it for now.

MR. ROBERT JOHNSON: Okay.

MR. DAROIS: I'm set.

MEMBER WEINER: I'm concerned about the implementing the last resort of last resort and I was going to suggest what you're really with the LTC and the LA/RC is creating legacy sites. These are legacy sites by another name. Isn't that correct?

MR. ROBERT JOHNSON: No, there are ways of dealing with two legacy sites.

MEMBER WEINER: Okay.

MR. ROBERT JOHNSON: That is provided for under the LTR.

MEMBER WEINER: That's right, but you are admitting that you're dealing with these sites in a fashion that makes them legacy sites.

MR. ROBERT JOHNSON: Other legacy sites to begin with because they can't deal with the --

MEMBER WEINER: Yes. Okay.

MR. ROBERT JOHNSON: They don't have an answer.

MEMBER WEINER: Okay. Let me get to my point which is that just saying this is the last resort of the last resort and saying we're going to do this on a case-by-case basis, I think would be supported by the former statement in the guidance that you want to avoid or prevent or minimize the creation

of legacy sites. You don't want -- This is something that NRC doesn't want to do but will handle it if it has to. That's the thing I was getting to.

MR. ROBERT JOHNSON: Yes, and we have to improve our guidance. It's saying that right up front.

MEMBER WEINER: Yes.

MR. ROBERT JOHNSON: It's the first thing maybe they see.

MEMBER WEINER: Right. We don't want to do this.

MR. ROBERT JOHNSON: We don't want to do this. We're struck with some today. This is what we have to do to deal with them.

MEMBER WEINER: The other question I wanted to comment on was the subdivision question where I think you're very wise to look at this on a case-by-case basis and here if you have relatively urban site, it's probably an option to be considered if it's a site in the middle of nowhere and nowhere cares. But if it's a relatively urban site, we've all had experience with abandoned sites in a city and what kind of a blight they can be. So if you can release part of that site, it's probably a good idea not only economically but just for the community as a whole.

Those were the only comments I had. I want to thank you though for a very enlightening and thorough discussion of what is clearly a very difficult issue.

MR. ROBERT JOHNSON: Thank you.

VICE CHAIRMAN CROFF: Dave Kocher noted that we're stuck with institutional controls basically whether we like it or not. That seems to be a given. I'm going to suggest that some institutional controls are more effective than other institutional controls. By effective, I mean they have a higher probability of persisting longer into the future and watching over whatever the site is.

I think the guidance, it may not be possible this time around, but you need to head in the direction of providing guidance on let me call them preferred or the preferences for institutional controls and I'm talking about the case where the site owner, the licensee, is setting them up. In the guidance now, there's a list of the number of possibilities, deed restriction, zoning and it goes on down a list. But not all of those are created equal and I think there is evidence and I think there can probably be developed more evidence as to which ones those work better or worse. You need to head in the

direction of including that in the guidance to try to get them headed in the right direction and as a basis for your own decision making on whether their proposal is a better one or a worse one. Enough said.

MR. ROBERT JOHNSON: I think that's a fair comment. We wouldn't be able to get that into this version, but it may be a future version to think about that and to be able to maybe leverage off of some of the other agencies' experiences that are evaluating effectiveness of controls like EPA and others that use them more than we do. We have very limited experience with using them, but that's a good suggestion.

CHAIRMAN RYAN: All the presentations today are very thought-provoking. So thanks to everybody that did a great job giving us all this information. As I think about the path forward, let's assume the guidance is finalized and is out there working, what's the agenda look like for sites that will be decommissioned to which the LTR will be applied in say the next five years? Can you give me just some ball park?

MR. ROBERT JOHNSON: For the restricted use sites?

CHAIRMAN RYAN: For the LTR as a whole? How many sites are very simple and are terminated

quickly versus some of the intermediate ones and then the hard ones? There are probably some tears here. But the reason I'm asking is I think it would be interesting to think about now before the guidance is finalized what sort of profile of information you're going to capture about each one of the terminated licenses because somewhere down the line whether it's the financial assurance aspects or the monitoring and modeling aspects or the engineered barriers aspects of all the things that get used it would be really kind of interesting to see if you could develop up front some sort of an information profile for each one that will go under this. Now's not a bad time to think about it actually.

So I just challenge you to maybe think about that. It may be too much work to get in the guidance, but as you begin to apply it, it might be interesting to think about because it might get at some of the questions that Allen raised and David raised and all of have kind of speculated a bit about how things will work in the future if we can begin to gather information and, of course, as a result of good information gathering, we would make better decisions as time goes on.

MR. ROBERT JOHNSON: We could also get

what you were talking about earlier or what Dave was saying that for engineered barriers we really don't have many sites. So it's this how much guidance, how much detail is appropriate for the sites that we might see in our horizon in the next five or ten years. In other words, what should you target your guidance for?

CHAIRMAN RYAN: I've heard a couple of the Commissioners talk about knowledge management and the fact that there's a lot of folks in the agency that are at or near or are retiring as we speak and so forth. It would be very helpful, I think, to the folks who are here 10 or 15 or 20 years from to have a body of information of how terminations work and whether it's worked well and what of the things we're talking about this week and in this guidance would really stand the test of time.

MEMBER HINZE: A couple of very brief comments. I know that there is a desire and a need to maintain flexibility as much as possible, but as I look at the comments that relate to the LTC and the LA/RC, it seems to me that it would be worthwhile for you to go back and look at your specification of when those are possible and to make certain that they are as specific as possible so the LTC is not viewed as an impossible means of avoiding the LTR requirements.

There's this tradeoff between flexibility and specificity and I think that would be worthwhile since people are misunderstanding and these are knowledgeable people that are misunderstanding that perhaps you can use a greater degree of specificity.

The second comment is really a follow-up I think to what Mike has just said and that is that as we look at new nuclear facilities that the guidance that is being provided here should be made readily available or should be incorporated somehow into licensing of the new nuclear facilities and I look at some of the requests for permits for new nuclear power plants. Let's make certain that this guidance is thought about up front.

MR. ROBERT JOHNSON: I would say that I know that idea is being thought of in our rulemaking for preventing future legacy sites and lessons learned, how do you get like you're saying new applicants to be considering decommissioning up front in their designs and application phase.

MEMBER HINZE: And they have so many things to worry about as they prepare their licenses that closing down isn't very high on the agenda, but I think that this guidance is terribly important, very important, for them to think about early in the game.

MEMBER CLARKE: Just picking up on that, I think you all know how the Committee feels about that. We've made that suggestion in the first letter that we wrote about starting with a clean sheet of paper if you will and designing with the end in mind. This is a great opportunity to do that.

This is a very difficult topic and all of these are very difficult and as I listen to the discussion, I thought back to a time when Allen and I worked together on a committee that struggled with these issues ten years ago I guess or even longer.

MEMBER HINZE: And you didn't solve them then?

MEMBER CLARKE: We didn't. We didn't and shame on us. But we wouldn't be here today if we had.

CHAIRMAN RYAN: You'd be rich.

MEMBER CLARKE: And we're still struggling with them. But one comment and a question. I too want to make a very positive comment. You began your presentation by reminding us that you were taking a graded approach to institutional controls and I was very pleased to see that you also in your guidance have graded approach to engineered barriers. I think this is truly risk-informed guidance and I think you really should be complimented for taking that

approach. And quite frankly from where I sit, this approach is very commendable compared to what other people are doing, wrestling with the same issues and trying to issue guidance and regulation for the same kinds of problems.

The question I had is what about lessons learned. You may be the wrong guy to ask that. but could we get a brief status on where that is?

MR. ROBERT JOHNSON: Yes, I'll probably need some help. Drew?

MR. PERSINKO: Hi, my name is Drew Persinko, Section Chief. Last time we met with you was June last year and we did have a brief presentation by Rafael Rodriguez on lesson learned. Since then, we have formulated an approach since then. What we have done is we took a lot of your comments last time. I remember you cautioned us in a number of ways about this a very large effort, be careful and you pointed out a number of potential pitfalls for us to consider because at that time I think as I like to say, I think we were going to eat the whole elephant ourselves.

This time though we formulated an approach where we formed a, we have a, I don't know if you want to call it a working group, but it's a group composed

of industry groups such as NEI, Fuel Cycle Facility Forum, Organization of Agreement States and we've some, three of four, meetings on the subject and we're working as a group now trying to figure out what pieces of the elephant each of us want to eat and how we're going to do that, too.

We don't have our answers yet, but we at least have an approach. We've met with Fuel Cycle Facility Forum, the group in its entirety, several times. EPRI is another member of the group.

The first step we've done right now though is we've put a bibliography together of all the existing lessons learned that the group is aware of. It's on our website right now of all the documents that we've compiled. We have some. EPRI has some. Fuel Cycle Facility Forum had some. NEI had some. So that was our first step to just try to figure out all the material that's out there.

The second step is most likely going to be to try to sift through those documents and sift our lessons learned and then categorize them. We don't know exactly how we'll do that yet, but we'll sift through them and we'll try to have to figure out what level do we want to get into in lessons learned as we sift through it and how we're going to do that and who

is the owner of what lessons learned.

And then we're also trying to figure out a way of capturing them for the future. What's the best way to do that and we're doing it right now we're anticipating on a website. We're also talking about maybe every so often putting what we have on the website onto a CD and/or maybe also hard copy so that periodically down the road, we'll have some hard copy to back up what our website has because it's very possible at some point in time maybe the website will go away. You never know.

But that's what we have in mind right now and that's what we've done since we last met with you in June. And we had several -- There was a recent conference, the Waste Management Conference out in Arizona. There was a whole session on lessons learned. Dan Gillen was on a panel at that meeting and so were some of the members on the group, Fuel Cycle Facility Forum, where they talked about it and tried to get any inputs from anybody who was attending that session.

I guess that's our status report right now. Still more to come, but I think we've changed our approach since the last time we've met with you and a large reason was that probably because of the

cautionary statements we received from you.

CHAIRMAN RYAN: When do you think would be a good, and I'm not really pressing for this today, tomorrow or next month, but when do you think we could anticipate an update on where you are at a time when it's right for you?

MR. PERSINKO: I think we could do that maybe the spring/summer time frame.

CHAIRMAN RYAN: Okay.

MR. PERSINKO: And we could do it earlier, but I think the spring/summer we might have more to tell you.

CHAIRMAN RYAN: No, whenever it's better for you, that's fine. Somewhere in the next six months sounds like.

MR. PERSINKO: Yes, I think so.

CHAIRMAN RYAN: Okay. That's great. Okay.

MEMBER CLARKE: Drew, thank you. Appreciate it.

MR. PERSINKO: Thanks.

MEMBER CLARKE: Dr. Hinze has another question please.

MEMBER HINZE: If I might. In my mental notes, I believe Duane said early on in the morning

that few comments were received from licensees. Is that correct? Is that mental note correct and if it is correct, why didn't you receive many comments from the licensees? What are the implications of that in terms of this whole process?

CHAIRMAN RYAN: And you though you were done. That was four questions.

MEMBER HINZE: Answer those in any order.

MR. SCHMIDT: Most of those might be is we'll think some more about that. I wanted to just look at my list of commentors. We did get comments from Connecticut Yankee. We did get comments from Kennecott Uranium Company. And that's who we got comments for from licensees.

CHAIRMAN RYAN: How about agreement state licensee? Is that in your tally?

MR. SCHMIDT: That's it that I'm seeing.

CHAIRMAN RYAN: Two?

MR. SCHMIDT: Right.

MR. NAUMAN: And Connecticut Yankee will soon be out of business. It's all those other people that have the long-term effects here that seem not to be paying attention.

MR. SCHMIDT: I think that's a thought-provoking question especially about what are the

implications of that. I was a little bit surprised. I'm not sure what to think about implications. It's a good question.

MEMBER HINZE: The Commission very much pushed for these public comments and I think they're going to be surprised that there are so few licensees that are commenting and frankly, I don't know how to read that. But it does have implications in terms of what you are responding to.

MR. SCHMIDT: It certainly does. Robert, go ahead.

MR. ROBERT JOHNSON: If I could just add a comment -- mentioned and you were all in attendance in their workshop in April. There was a lot of attendance there and licensees there. So just speculating, there was interest and there was feedback provided in that workshop. So that's a good thing that we had that also as another form of providing comment instead of just the written comment.

CHAIRMAN RYAN: You know it could be possible feedback in that after the workshop and the other input that you have received and took to your writing and the draft that you got it right. That could be.

MEMBER HINZE: Right. Half full.

MR. ABELQUIST: I think from my perspective a lot of the issues we've been talking about today are pretty fine issues and the audience that they apply to is pretty small. I think a lot of the major decommissioning issues are largely settled and the regulated community is pretty happy with the guidance that's out there. That's my take on it.

MEMBER HINZE: That's an important implication.

MR. DAROIS: I think also that of the licensees that were in attendance in April I think a lot of traction of them were somehow actively in decommissioning. Since then, Maine Yankee has effectively gone away. Big Rock Point is just about gone. I mean they're not going to -- Connecticut Yankee responded, but Yankee Road didn't. I don't know how many of the total, but I know there was a fair amount that were in the decommissioning world and I don't recall seeing too many from the nuclear power plant side operating nuclear power plants in attendance. I could be wrong, but I don't remember it that way.

MEMBER CLARKE: Any other questions?

CHAIRMAN RYAN: Use the microphone. Tell us who you are.

MR. DIAS: I am Antonio Dias from the Expansion Project Office and the only question that came to my mind when you mentioned that you were surprised that you got very few comments from the licensees was could it be that licensees were using other venues to express some of these comments like NEI. You mentioned that you had meetings with NEI. NEI tends to be very active in expressing their ideas. In general, they actually represent any ideas that they've heard from the licensees, from their own members. So not that I know, but it could have been that in somewhat disguised manner you did hear comments from licensees. That's what I was thinking.

MEMBER CLARKE: Thank you. Any other questions? Okay. Let's take a break and we're a little ahead of schedule. Let's come back at 4:10 p.m. and wrap up. Off the record.

(Whereupon, the foregoing matter went off the record at 3:54 p.m. and went back on the record at 4:11 p.m.)

MEMBER CLARKE: On the record. Okay. Let's resume please. This last section is a roundtable discussion. There are a number of ways we could approach this. At some point, we definitely want to hear from our panel members as to a summary of

their thoughts and their suggestions as we move forward. We could do that now. We could do that later. Do you want to start with that?

CHAIRMAN RYAN: Sure.

MEMBER CLARKE: Okay. I think that's a little bit of a short warning, but they were with us once before and know how we work. Okay. Let's start with that if you could. Let's start with Eric.

MR. DAROIS: Thank you for the opportunity to join you folks again for the second time. Overall, I think the guidance is coming together quite well. We went through an interesting evolution that started in April with the public meeting and have been through it since then. That's my general overall comment. I think this is going on the right track.

Of course, my favorite topic is one of Duane's favorite topics and that's the whole issue of onsite disposal in terms of where we are today and what impact all of this may have on operating facilities in existing licensees. So I'm not going to belabor those comments again, but I think that certainly requires some consideration, taking a look at where that belongs in the regulatory scheme of things and all that we discussed earlier. With that said, I'll turn it back over to Tom.

MEMBER CLARKE: Okay. And we'll have discussion after we have from each of you as well. You folks work together very synergistically I've observed. So you'll have an opportunity to tell us again. Tom.

MR. NAUMAN: Like Eric, I would like to thank everyone for having the opportunity to be here and participate in this. It's always informative and enlightening.

MEMBER HINZE: Go Solucies (PH).

MR. NAUMAN: Exactly. Well, they're kind of out now. You can't get everything in life you know. Anyway, we hit upon the topic that cut near and dear to my heart a little bit and that's the lack of support or participation by the utilities here. I think in our last discussion in June I pointed out that decommissioning wave, the first wave, is coming to an end. It's coming to a close and all the utilities since they've gotten in relicensing their plants, this has drifted off of their immediate horizon and off into the future somewhere.

They're not particularly focused on decommissioning and how it will affect them. They've learned enough over the last eight years that they probably have a pretty good handle on how to keep

track of their spills, their 7075(g) record keeping and their estimating and their updating of their decommissioning estimates. So I think across the board they have a good handle on the business and they just don't see it coming any time soon, so they're not overly concerned or overly worried about it. But this is a great opportunity to capture lessons learned and I'm glad that topic came up. I think everybody pulling together and getting all the information they can out of this wave and laying the foundation for the future is a critical thing to do and I support that idea quite a bit.

Segmentation and partial release and full release of the sites, the only concern I see is the online instances at the ongoing plants and there's not going to be anything critical happen on those in the near future. So release of the rest of the site like they've done at Maine Yankee and other places is a good direction to follow and I think it's probably a good example for you to include.

Other than that, I would like to point out that decommissioning in the industry has been done very safely. A lot of the initial concerns in the business were over total dose, over safety, because there's a different type of work. But it's been done

very safely across industry and very effectively and some of the lessons learned that we can pick up here they're already looking at to implement over in the UK for their wave of work that's coming. I comment your efforts to pull this together and get a solid guidance for the future. That's all I have to say.

MEMBER CLARKE: Thank you, Tom.

MR. ABELQUIST: I appreciate the opportunity to listen to the presentations as well. I think one area that I want to spend a little time addressing is the one that I was initially concerned about and that is the intentional mixing of contaminated soil and I agree with the comments, I guess there were comments on both sides of this issue, but the comments that address the concern of mixing in clean soil. That's certainly problematic in my opinion as well.

But I think there's another use of intentional mixing that it wasn't obviously to me until my second read on this whole issue and that is if you have a burial and let's say it's a low-level burial and in fact you know where it is but you don't expect there to be a whole lot of contamination. You start putting in some characterization sample locations and maybe you get a couple of hits. Maybe

10, 15 percent of your hits actually find anything above background.

But the total volume of soil could easily be thousands of cubic meters and you can't just adopt an approach that says let's just keep sticking more and more bore holes in because you're going to continue to end up with a similarly low hit rate and ultimately, you get to the point where if we're ever going to characterize this well enough, we need to dig it up because we just can't access the discrete nature of the problem by continuing to sample with bore.

So if you adopt this intentional mixing, what that allows for is a way to remove soil and when you do find the discrete source terms, if you will, you could apply ALARA by saying we're not going to mix these into it. Now that we've found our treasure, so to speak, we deal with it. But ultimately, you're going to end up with 90 percent or more of this former burial that's really fine, maybe some minimal contamination.

I think if you mix that back up and put it back in the hole you've done two things. One is you've applied ALARA. You've removed some of the higher level contamination and you certainly have provided a better characterization of that area. If

you just continue the approach of sticking bore holes in the ground, you're never going to have a real satisfying assessment of what the source term is.

When I read through the guidance on intentional mixing again, it seemed to me that that application to facilitate characterization was one that initially had escaped me. So I don't see it as attractive from the standpoint of reducing the contamination to put it back in, but certainly to help characterize what's there and then applying ALARA when you do find the more discrete piles of whatever it is, debris or barrels. You can remove those and then put everything back in and I think that might be an application as well to consider.

MEMBER CLARKE: Thank you.

MR. SCHMIDT: Sorry. Just a quick response. I hadn't thought of that and thought of it that way either. I think that could be useful in certain cases.

MR. IKENBERRY: We've seen some of the initial changes in supplement one to the draft and the ones I've read in there look very good. I had read that first, pieces of it, and some of the issues that were brought up in the comments that need further explanation I think have been addressed very well in

the initial changes to the supplement. That effort is going very well, what we've seen so far.

I think one thing that we talked about on the onsite disposal of the radioactive materials it's worth looking at keeping all the options in that for some of the, Eric and I had talked about, long-lived radioactive material and I think for those in particular that it's definitely worth taking a look at those as well.

Richard Johnson had mentioned in the restricted use and institutional controls, it came up only at the very end about the risk-informed graded approach and that's in my opinion a philosophy to live by really in the business that we're in and I think that can be applied throughout. I think that that is implicitly done for the onsite disposal and that's reflected all through here.

You might be able to emphasize that more throughout the entire supplement because that's really what you're doing here. I think that's an excellent philosophy and approach to the work that could be emphasized more. I think everything is looking very good with the direction you're going.

MEMBER CLARKE: Thank you. David.

MR. KOCHER: I certainly learned a heck of

a lot here today and probably gave back very little. A couple of themes that occurred to me that I'm sure the NRC is aware of. In at least a couple of the areas that we talked about, it seemed to me that buy-in by the public and other stakeholders is really crucial, not crucial, important and very helpful to the process, certainly selecting whatever scenario you're going to chose to base your decision on.

In the guidance, I don't think you want to really even pretend that you're projecting what is going to happen even a 100 years from now let alone 1,000 years from now in the way of potential exposure situations. We are developing reference assumptions if you will about hypothetical things and you want those reference assumptions to be reasonably representative of a suite of things that might actually happen. But there should be no pretense that we're estimating real doses to real people. So public buy-in on that is very helpful.

An idea that I first heard elucidated by Charles McCumbey had to do with the 10,000 year business in the high-level waste area where the way he put it to present this to the public is that you're pretending that you put waste in the ground 10,000 years ago and then you're telling the public what is

happening now. That is a way to kind of frame this. But get public buy-in on this because the scenario obviously can have a great deal to do with what an allowable level of residual radioactivity is to meet a free release criterion. It can change a lot.

I wasn't clear in the discussion of this. It sounded like you would be investigating less likely scenarios like a resident farmer say or a guy with a garden in the backyard. It wasn't clear to me how analyses of those scenarios would factor into a decision when say a base case was a golf course or an industrial use or a commercial use or something like that. I don't know the extent to which the guidance would need to be prescriptive about this, but I just didn't get a sense of how doses in there other scenarios would factor in. What happens if it's 20 millirem in your preferred scenario but it's 500 in a worst case scenario? What do you do about that?

There are certainly possibilities here for what I call gaming the system if you're not careful and this is something that NRC staff is clearly aware of. The whole business about intentional mixing and the whole business about onsite disposal, continue on the path of prescribing these in such a way that people can't game the system, no end runs around Part

61, that kind of thing.

But quite honestly, I didn't hear anything here today that I thought was a show stopper, something that was going to bring this thing to a halt in its tracks. The staff is clearly very thoughtful about all of these and I just say keep on keeping on.

MEMBER CLARKE: Thank you. Let's open it up. Any others?

MEMBER HINZE: This may come across as a criticism and I guess it is, but it's really a recommendation too. It seems to me that I've heard slippery slope today from someone. I think there's a lot of room for misunderstanding in this particular guidance, things like mixing in clean soil, preservation of caps, misunderstanding about developing more legacy sites, etc.

I think what that says to me in the comments that we've heard is that the staff is going to have to be very careful that they describe these things with a lot of clarity and there needs to be a preamble on many of these areas explaining what the end game is here, what you're really trying to accomplish. Maybe all that is written in there but it isn't written in there by virtue of the comments that we've seen. A clarification to me, I've heard that,

maybe I've been tuned to it, but clarification is probably one of the most used words today and I frankly think that's telling the staff something and telling us something.

MEMBER CLARKE: Ruth.

MEMBER WEINER: I was, just to follow on the clarification question, also disturbed once it was mentioned that you did not have more direct comments from licensees and recognizing that there are other venues, there are other ways in which licensees can make input. I think it's going to be very important that termination, decommissioning, be considered up front that somehow this guidance becomes incorporated or attached or in some way proposed to new licensees.

And I'm sure that NRC has ways of doing it. You don't want to tell them you have to do this, you have to do that. But you do want to make them aware early on of the problems that can occur with decommissioning and they have to consider it up front. I remember Commissioner Merrifield made this point at the workshop that it should be part of building a new facility.

So I would almost encourage you to seek out more comments from licensees if that's possible to do and see what they do think because I think you just

have a limited view here. Thank you. Thank you, Jim.

MEMBER CLARKE: Yes. Mike.

CHAIRMAN RYAN: I just want to add my thanks to the NRC staff for really informative presentations and discussions and I want to especially thank our expert panel members for taking their time and talent in bringing it to us today and I really appreciate the positive comments. We embarked with Robert Johnson and company back before the decommissioning public meeting that we were really starting a new way for us to gather information and to help us offer advice to the Commission and it's great to hear such positive feedback that all that hard work, our work contemporaneous with the work of the staff, really has resulted in something that you see as good and getting better as it comes to bear fruit. So we really appreciate everybody's input and the staff's cooperative effort with us to make it happen.

But I want to add just my special thanks for you taking your time and energy to be with us on these two events. We really appreciate your input. I believe it's made it a lot better. We appreciate it and it helps us give better guidance to the Commission. So thanks a lot.

MEMBER CLARKE: Okay. Allen.

VICE CHAIRMAN CROFF: I don't have any thoughts right now.

MEMBER CLARKE: I certainly want to thank everyone too. It was very tremendously done and before we close, I would like to ask Drew and Duane and Robert if they would like to share some comments as well.

MR. PERSINKO: Yes, I would. First of all, I just want to say that I'm going to add a little bit about what we talked about, lack of participation by utilities. Before we had the workshop last spring, we had, and NMSS had gone over to NRR and made specific contact with one of the division directors over there in charge of operating reactors, and specifically had informed the operating utilities through our contacts over in NRR. So I was a little disappointed not to see many any utility representatives from operating plants at the workshop. But I know you guess it's the choice of resources and where an operating plant wants to put their emphasis.

I also wanted to mention there was also quite a bit of talk today about getting in on the ground floor for the design of new plants. We have been working more closely with NRR with trying to factor in our lessons learned into the new plant

design and in fact, they have a standard review plant that is being developed and it's well along being developed I'm told and they actually have a hold point for us to insert some information in there. What exactly we're going to insert right now, I'm not exactly sure. But they're waiting for us to work with them on that now.

Now there seems to be a little bit of a lag here. I mean they're really to roll with the SRP and we're kind of in the formulation stages a bit with our lessons learned program. So we have a lot of lessons learned but we don't have it in the format we exactly want right now. But yet, we will be providing input to NRR so that they can incorporate it into the standard review plan for the design of the new plan. I just want to let you know that.

We're working -- Actually in one of our meetings that I mentioned with the utility with our working group on lessons learned, we had a representative from NRR actually at one of those meetings. So we've kind of crossed the divide so to speak between NRR and NMSS on this issue.

As far as today's meeting goes, I would like to say that I think it was a very good meeting. I think there were a number of good comments today

made by the Committee and by the Working Group and I think a number of those we'll definitely incorporate into our guidance directly and others we'll look at carefully. I would also like to add though that if the Committee decides to write a letter on Friday, we'll be anxiously awaiting to see what's in the letter as well. But I think it was a very good exchange of information today and I thank you.

CHAIRMAN RYAN: I'm going to guess you can plan on us writing a letter.

MR. PERSINKO: I wanted to leave the option open.

CHAIRMAN RYAN: We'll talk Friday about bullet points as we collect our thoughts at that time. But you can plan on a letter coming forward and I think a lot of it will be the positive things we've talked about and some of the suggestions we've pretty much covered today. It will be up to Jim to organize that and give you some preview on what's coming. But thanks very much.

MEMBER CLARKE: Thank you, Drew. Duane, Robert. Let me again thank you, Drew and Duane and Robert and Chris, who isn't here for your presentations. As I said earlier, we appreciate very much the early involvement we had in this process and

the continued involvement. And we look forward to the next round. We will be writing a letter as our Chairman said and we'll spend the time Friday talking about how we might approach that and what that might include and we would welcome your presence in that discussion as well.

Let me again thank the panel, all of you. For all of you, this is your second working group meeting and for one of you this is your third. He's the one smiling over there. He's anonymous but you can figure it out. You've been very gracious with your time and you've been very helpful in this process and we really appreciate it. Mike Lee, thank you for pulling this together and organizing this and making it possible. If there isn't anything else, I'll turn the meeting back to our Chairman.

CHAIRMAN RYAN: And with that, Jim, thank you very much for any excellent working group meeting and if there are no other comments, last chance, we'll adjourn for the afternoon and again thank everybody for their participation and excellent work and great input. Thank you all very much. Off the record.

(Whereupon, at 4:36 p.m., the above-entitled matter was concluded.)