Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Public Workshop 2 on Unique Waste Streams - Depleted Uranium

Docket Number: (n/a)

Location: Salt Lake City, Utah

Date: Thursday, September 24, 2009

Work Order No.: NRC-3054 Pages 1-282

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NUCLEAR REGULATORY COMMISSION

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PUBLIC WORKSHOP 2 ON

UNIQUE WASTE STREAMS - DEPLETED URANIUM

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THURSDAY,

SEPTEMBER 24, 2009

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SALT LAKE CITY MARRIOTT UNIVERSITY PARK

480 WAKARA WAY

SALT LAKE CITY, UTAH 84108

PARTICIPANTS:

CHIP CAMERON, Moderator, NRC

BEATRICE BRAILSFORD, Program Director, Snake River Alliance

PATRICE M. BUBAR, NRC/FSME

PETER C. BURNS, Henry Massman Professor of Civil Engineering, University of Notre Dame

TISON AMEDEN CAMPBELL, Office of General Counsel, NRC

LARRY W. CAMPER, Director, Division of Waste Management, NRC

STEVE COWNE, Director, Quality and Regulatory Affairs, LES

DIRK DUNNING, Chemical Engineer, Oregon Department of Energy

DAVID W. ESH, Senior Systems Performance Analyst, NRC

DANE FINERFROCK, Director, Division of Radiation Control, Utah Department of Environmental Quality

CHRISTOPHER J. GROSSMAN, Systems Performance Analyst, NRC

SUSAN JABLONSKI, Director, Radioactive Materials Program, Texas Commission on Environmental Quality

SCOTT KIRK, Waste Control Specialsts

DAVID C. KOCHER, SENES Oak Ridge

GREG KOMP, Senior Health Physicist, U.S. Army Safety Office

MARTY LETOURNEAU, DOE Office of Compliance

THOMAS E. MAGETTE, Senior Vice President, Nuclear Regulatory Strategy, Energy Solutions

KELLI A. MARKHAM, NRC

CHRISTEPHER A. McKENNEY, Chief, Performance Assessment Branch, Office of Federal and State Materials and Environmental Management Programs, NRC

STEVE NELSON, Professor, Brigham Young University

VANESSA PIERCE, Executive Director, HEAL Utah

DAN SHRUM, Senior Vice President, Regulatory Compliance, Energy Solutions

DREW THATCHER, Division of Environmental Health, Office of Radiation Protection, Washington Department of Health

CHRISTOPHER THOMAS, Policy Director, HEAL Utah

STEPHEN WEBB, Distinguished Member of the Technical Staff, Sandia National Laboratories

DUNCAN WHITE, NRC/FSME

A G E N D A

P R O C E E D I N G S

(8:44 a.m.)

MR. CAMERON: Good morning, everyone. Welcome back to the second day of our Workshop on the NRC rulemaking on establishing site-specific performance assessment criteria for the disposal of depleted uranium, and other unique waste streams. I heard a lot of good discussion yesterday, and I'll do a quick summary of some of the points that I heard later on, before we get to the first substantive session. But we have several items on the agenda today, as well as some parking lot issues that we'll want to finish up with, if we don't address them during the normal course of business today. And I'll just give you a list of some of the parking lot issues that we have. And our court reporter, Mike, said that we probably need a whole parking structure now, not just a lot.

At any rate, the availability of the regulatory analysis for comment was brought up. The regulatory analysis is part of the NRC rulemaking package. And we'll see if we can get some clarification on that today. There was a point about ground water. Ground water pathway is redundant. David brought that up. Peter had a different view.

I'm not sure that we ventilated that discussion. And if it's important to do so, we will, and I hope you'll let me know about that.

There was a point about the oxidizing reduction environment. I don't know if we really devoted much time to that. This is more of a question, does the TEDE, Total Effective Dose Equivalent, okay, does that include Radon? And, David, you're saying?

(Off mic comment.)

MR. CAMERON: Okay. That's the question. We'll see if we can answer that.

There is a whole issue of validating models. And, as you'll remember, Dave talked about, and I think Drew also talked about support for models, in addition to validation. The first two sessions we have today are going to be on modeling, so we'll get to that.

There was an issue brought up from the audience about, basically, environmental justice. Where does that get considered in these types of rulemaking efforts? And, classically, it's done as part of the NEPA analysis, but I'm not sure how much we get into that in an environmental assessment, as opposed to an environmental impact statement. So,

that's in the parking lot, and I'm hoping that our lawyers and technical staff can talk about -- can confer, and we can get some answers on that.

What are the implications of a stricter NRC rule? And, Vanessa, this is a point that you brought up yesterday, and I'm not sure that I captured it exactly, as what happens if there's a stricter NRC rule in terms of the state approaches? But when we get to other considerations today, any issues like that, and if I didn't characterize it correctly, I'm sorry, but if you can just bring that up when we get to the other considerations that Patty Bubar is going to tee up for us. And that will also get to the concern that we heard a lot about yesterday, which is, what happens in the interim, before the NRC rule? What are the Agreement States doing? And that's going to be a big topic for the other considerations agenda item.

Someone thought it would be important to clarify, and I believe it was Tom, clarify the nature of Part 61. And, at some point today, we should have some discussion on that. And, Tom, at some time during the day when you think it's appropriate, or when we get to other considerations, if you could just put a finer point on that aspect of it.

So, those are some of our parking lot

issues. And we also have the regulatory guidance versus rule issue. As you remember, we said we were going to entertain comments on what should be in the rule, what should be in the guidance, as we went through each section, but we also said that we would come back and have a general session on that, after people had time to reflect on the discussion yesterday. And, perhaps, we should start with that, finish it off, drive a stake through its heart this morning before we get to the modeling thing.

For those of you in the audience, we will be going out periodically for comments on the agenda items that have been discussed. We do have a session at the end of the day where we're going to go to the audience for any comments that you might want to express, any concerns, and if there are people here who do have that type of comment, if during the break this morning they could talk to me, and I could figure out some timing issues with them, that would be helpful. And I just want to remind everybody what the NRC is doing here is trying to get comments that they're going to use to address in the regulatory basis for this rule. And, as Christopher Thomas noted yesterday in the opening, our opening statement, so to speak, he talked about that he hoped that this would

be an open and objective process; therefore, a credible process. And I think the NRC is dedicated to doing that.

Just in terms of a quick summary on significant quantities. I think that what I heard around the table matched what happened in the Bethesda Workshop, that there's not a need to define a significant quantity. The requirement for a site-specific performance assessment takes care of that. But a very important note that came out in that discussion yesterday is the trigger for doing such an assessment is if DU is going to be disposed of. That's the trigger for it.

In terms of period of performance, that was a good discussion, because we heard a lot of different approaches, and different factors that should be looked at in the period of performance. And we heard from Drew Thatcher about how the State of Washington does it, and from Susan Jablonski, and Scott Kirk on Texas. We heard from Marty on the Department of Energy approach. And some of the factors Peter Burns talked about, don't put it somewhere that you know will be a problem, bring the full weight of information to the process, is something that David said. We heard from Christopher

Thomas that the analysis should include things that could destroy the site. And these are my words. I'm just trying to give you a summary here. A 10,000-year limit buys you a lot of, I guess, safety is just a shorthand way of saying that. Steve gave us -- Steve Nelson talked about geological disposal is the only way to go. David Kocher, there's a possibility of other options besides near-surface disposal. Economics should be factored into that. And a concern about the consistency of state -- between state approaches. And I think that whatever the performance period is, the impression I got is most people thought that performance period should be in the rule itself, rather than in guidance. And what was intriguing to me is it seemed like there may be a way to combine a lot of these different factors into an approach that's acceptable to a lot of people.

Exposure scenarios, big concern was enforceability of that requirement, and there should be some general requirement on that. But a lot of cautions about put the scenarios in the guidance, rather than the rule. And source term, waste form must match the site, and ALARA and the progeny, the Radon daughters, have different geochemical implications for the waste form. And that waste form

can improve site suitability.

At any rate, that's just my take on what I heard in yesterday's discussion. Any comments on agenda for today? I guess my big question is, do you want to do a reprise on the regulatory guidance versus rule? Get that out of the way. Are there any concerns, lingering concerns on that? Do we need to have any more discussion on that? Is this microphone working?

Okay. Tom?

MR. MAGETTE: No, I don't think we do. I think what we need to do is just talk about each of these items as it comes up. That's what we did yesterday. I think that's what works the best. If there is a roll-up topic, if there's something that someone feels like is missed discussing them individually, it should be addressed. To discuss them in the aggregate, I don't, necessarily, object. That was Christopher's point. There's not anything flawed with the notion, but we do it at the end, if that were the case. And we're not at the end yet.

MR. CAMERON: All right. Thank you, Tom. Steve?

MR. NELSON: Not at the expense of substantive discussion on some of the other topics on

the agenda.

MR. CAMERON: Okay. Great. Well, if there's a burning need, it'll surface. So, why don't we start, and I think Christopher Grossman, Chris is going to tee up the Modeling of Uranium Geochemistry in a Site-Specific Analysis for us.

MR. GROSSMAN: Good morning. I want to make sure this mic is working.

I'll start off by summarizing a little bit about some of the discussion we had in Bethesda, and then walk through some of the issues that arose out of the NRC's analysis that we used to present options to the Commission on how to proceed.

A couple of things, I think, came out specifically from the Bethesda meeting, and my guess is they'll come up again. One of them already has in our discussion yesterday of the source term, and that is the compatibility of the waste form with the site geochemistry. That was one of the issues that was brought up by the panels in Bethesda. And the second one was a consideration of the effects of the chemistry from the engineered barrier system, so materials you may add to the disposal system as part of the engineered barrier system, and how they may affect the depleted uranium and its daughter products

interaction with the environment. So, keep those in mind as we go through, and we may discuss additional ones today, based on the discussion among the panelists.

Uranium and its daughters, and it has several daughters, can move through the environment at different rates, and they're dependent upon two things, the geochemical conditions, and the concentrations that are present. The geochemistry in our technical analysis was treated as epistemic uncertainty. And what we mean by "epistemic uncertainty" is that there is a lack of knowledge on certainty. So, we have used this approach, because we were doing a so-called generic site, and we were trying to incorporate a wide range of uncertainty that may be exhibited across the country. But we realized that that uncertainty may possibly be constrained at a particular site, in a site-specific analysis.

So, what that meant, practically, is that the geochemical conditions that we use in the modeling were selected, and they were held constant over all time. But between realizations, or different calculations, they were varied across an uncertainty distribution.

So, the results of that analysis suggest

that the site geochemistry may be key for the safety of near-surface disposal of depleted uranium. We found four factors that we identified that look like they would be important, and those four being the moisture content of the disposal system, and the environment around it, the pH of the carbonate concentrations in the ground waters, as well as the oxidation states. And I think Drew had mentioned -- had a question about that yesterday, so I think this will be a good place to discuss that today.

So, just a little background on mobility environment. Many may be familiar with this, but maybe not all. The mobility of uranium and its daughters, and virtually any environmental contaminant in a waste disposal site is controlled by how much can be released from the disposal facility, and its rate of movement through the environment. So, if we look at the waste release component from the source term, there are several factors that control that, solubility, how much of that can dissolve in the waters that are present, the leeching from the waste form. And, also, the oxidation state, whether it would be a reducing condition, or oxidizing condition.

As far as transport, absorption, or how well particles are retarded by the geologic media in

the environment can play a role. And I think I heard Dirk yesterday mention also colloidal transport, we left that off the slide, but that is a potential mechanism for movement through the environment, as well. Colloidal particles, if you're not aware, are small nano-scale-size particles that radionuclides may absorb to, and they move largely with the flow of water.

Solubility is a key issue, and that varies strongly for uranium, in particular, with the pH and oxidation state, as well as the carbonate concentration in the ground waters. What you find is a lot of times uranium will complex with carbonates, and its solubility will increase, and more of it will dissolve and migrate.

On this slide, we use this slide as a demonstration of some of the uncertainty, or actually variability that can occur in the geochemistry from site-to-site. And we use travel times down here, but don't focus on the numbers, themselves. Use them as a sense for how much variability can exist at a site. And the reason I say that is, these numbers are based on the assumptions that go into this calculation. They may be different for different sites, so this wouldn't be the case for all sites. But the idea here

is that between different soil types, and this is dealing - I'm sorry, I didn't explain it - this is dealing with the retardation coefficient, K_d, which is how effectively a radionuclide may be retarded in a particular geologic medium, so we have three different soil types. And the data here we used for this calculation is from the Sheppard & Thibault compendium of K_ds from across the country. We have three soil types, sand, loam, and clay. And you can see that between the soil types, there's quite a bit of variability, on the order of up to six orders of magnitude.

And then, also, one thing to take note is within a particular soil type, for instance, clay, you may have four or so orders of magnitude. And, again, don't hold me to those numbers, but it gives you an idea that there can be a great deal of variability. And that getting good site information is important to constrain that variability.

So, some of the key considerations for modeling the geochemistry, effect of the oxidation reduction potential, the pH, and the carbonate concentrations on the release of the uranium and its daughters from the source term. Modeling of the spatial and temporal differences in the geochemistry.

Some sites may be more complex than others. They may not be as uniform. You have sub-surface heterogeneities that could lead to different mobility rates. Those are things that we feel should be considered.

Differences between the near field, and the far field chemistry. Near field being close to the waste form itself, where you may have more concentrated environment, as opposed to a far field, where things begin to dilute because of the dilution processes that occur in the environment. So, the chemistry there could be drastically different. As well as site-specific differences in soil properties. You may have a sandy soil out west, or more clay soils in the east, for instance.

So, what we're asking today from the panel is public feedback on considerations for developing criteria in the regulations, or guidance on geochemical parameters. What factors do we need to consider? Are there others that we have not identified that should be considered? And are there alternative approaches that we may want to look at in terms of dealing with modeling of the geochemistry? And with that, I'll turn it back over to Chip.

MR. CAMERON: Great. Thank you very much,

Chris. Who would like to start on the geochemistry? Let's go to Steve, and then we'll go to Peter. Steve?

MR. NELSON: Yes. I think the site geochemistry is very important to consider. And in the effort to try to point out that site-specific considerations are important, I have to turn to the site I know best, which is located a little way from here.

The clay material that is used to construct the barriers, for instance, at Energy Solutions, I don't know. I don't have any detailed information on their properties. But given their depositional setting, it would not surprise me if, for example, if they were murrels, if there was not a high calcite content along with clay, or other minerals that were of clay particle size. That could have profound impacts by providing carbonate complexes to uranium and its daughter products.

For example, and I note with a little bit of irony that those materials were deposited when Lake Bonneville inundated the site just 10 or 15,000 years ago. When it comes to colloids, I think something that needs to be remembered is not only do radionuclides attach to colloids. When they do, colloids very often, if not usually, travel

significantly faster than the seepage velocity, because of size exclusion in the pores. So, that is a fast path out of a repository.

MR. CAMERON: Okay. Thank you, Steve. Let me go to Chris right now. And are those the types of considerations that would come into play?

MR. McKENNEY: Back to Steve. So, I want to reorient a little bit on the question. We've been talking a little bit on the -- bringing up the site-specific nature, which most people think of as the natural environment the site is at. And you brought up the clays they're using for barriers, which may not actually be native to the site. And, therefore, just to re-emphasize the fact that you also have to consider all of the engineered materials, and their specific properties, and how they may be different than the natural site, such as, the usual thing that some people forget in the large part is the fact that right around all buildings, and all construction usually is different, is now a disturbed soil type, not the natural soil type that was before. Is that part of your -

MR. NELSON: Well, that is correct. In the specific case I'm referring to, these clay or clay-like materials that are being used for the

engineered barrier happen to be on the site. And I actually firmly believe that is a favorable condition out at Energy Solutions. But if, and like I say, I don't know, all I said it wouldn't surprise me if they were murrells and had a high calcite content. If they do, that is part of both the engineered, and the natural system.

MR. CAMERON: Okay. Good clarification. Let's go to Peter, and then we'll go to David. Peter?

MR. BURNS: I have three points I'd like to make, and then I'd like to ask you a specific question about the models.

The first point I want to make is that on Slide Four in your show, you had a ground water flow rate of one meter per year. And I don't know how relevant that lower limit is to the situation we're talking about, which is a disposal site that's located above the groundwater table in the vadose zone where a lot of the porosity is filled with air. To make my point, I'll give an extreme example. You've probably all been on the beach, and made sand castles when you were a kid, or with your kids, or whatever, and you dump a bucket of water on the top of the sand castle, and it doesn't stick around very long. It goes down very fast, much faster than, obviously, a meter per

year. So, the low end of a meter per year is probably not unreasonable for a deep aquifer, but it is unreasonable for the vadose zone, and the immediate transport out of a disposal site.

Second point, and I made this in Bethesda, we have -- the oxidation and reduction certainly are important. The fact is, though, that these landfills are probably all going to be oxidizing, but, certainly, that's important. pH is definitely important. CO_2 concentration is definitely important. But if I understand it correctly, these landfills, at least currently, have all kinds of different waste forms in them, all kinds of different wastes. Maybe they're not necessarily in waste forms, but I'm worried about co-contaminants, in particular, organics, simple or complex organic molecules that will break down in the environment, give an abundance of oxalate and acetate, things that complex uranium and make it even more soluble than CO_2.

The third point is, I talked a little bit about the differences between near field and far field chemistry, and in there was kind of the implicit assumption that in the far field, the contaminant becomes progressively more dilute. I wanted to simply make the point that that's not always the case. If it

were, there probably wouldn't be any uranium ore deposits. I mean, there are natural conditions that lead to concentration of uranium from low abundance, or low concentration solutions. So, that should be kept in mind, that you cannot simply assume dilution as you move out in the system. There could be conditions, like a roll front-type deposit could establish, or something that would concentrate.

And the fourth point, which was a question. When I look at Slide Four, as you pointed out, for example, for clays, we have, basically, four -- three or four orders of magnitude difference for time travel of uranium in clay. Where does that uncertainty come from? You're using some K_ds for the minerals in clay, why isn't that just a dot? I mean, I understand that there are uncertainties, to some extent, in the K_ds, and there are different types of soils, but how do we get four orders of magnitude uncertainty on this prediction?

MR. CAMERON: Okay. Chris Grossman, Dave?

MR. ESH: Yes, I can talk to a couple of those things. I think in your latter point first, showing the variability in the transport rates, that's directly coming from the variability in the measured distribution coefficients for clay. So, I think as

Steve Nelson indicated in his comment about specific clay types, different clays can have different absorptive properties. So, there's also uncertainty that comes in the measurements that you do to determine the distribution coefficients, so there's a variety of sources of uncertainty, and/or real variability that's reflected in, say, that compendium of data, that then translates into those different transport rates. That's pretty common that we see from all sorts of data that is used in the performance assessments. It's not unique to the distribution coefficients.

In terms of the unsaturated transport, and the beach analogy, yes, we agree with that. And unsaturated flow phenomena, if you have a spill, or place a large volume of water, the gradient is essentially one, so it moves rapidly as the spill goes through the surface, and the water is lost as it transports into the pores. But, in general, over the long term, an arid environment will have a recharge rate, or infiltration rate that is less than the precipitation rate, and the transport rates through unsaturated media can be long in some circumstances. If you saturate unsaturated media, you have gravity driving the water. Of course, the gradient becomes

one. But, over the long term, those unsaturated media are generally not saturated, and you have variability in the transport rate.

Chris' example here for the saturated zone with the meter per year, that's just an example. Of course, an individual site could have a transport rate that's higher, much higher, or much lower than one meter per year. It's just to illustrate the variability in the geochemistry that you can get in these sorts of calculations. And in the saturated zone, you have both -- you can have a water flow velocity, and a gradient, so it depends how steep your aquifer is, basically, and that will determine your transport rate.

MR. CAMERON: Okay. Thanks, Dave. Chris, do you want to say something before we go over to David?

(Off mic comment.)

MR. CAMERON: Oh, okay. Let's go to David, and then we'll go over to Scott, and go down the table. David.

MR. KOCHER: Yes, a few simple observations, because I'm not a geochemist, so this is not my area.

On your very first substantive slide, your

first bullet made the point that the transport in the environment depends on the concentrations that are present. Alarm bells go off when I see that, because that means that your K_d model is not the right one. That's a linear model independent of concentrations. And I don't know anybody in the performance assessment business that's tried to do a non-linear model, even though it may be necessary. So, just be aware that that's a loaded statement. There's a lot of physics and chemistry behind that.

The second point is that - and, Peter, you hit me with a hammer if I'm wrong here, because this is not my area - we're dealing with potentially large volumes of depleted uranium in a small -- in a single facility, so the uranium, itself, will buffer the geochemical environment. I mean, there was a serious proposal that's still on the table to use depleted uranium as backfill at Yucca Mountain because of the desirable way that it would buffer that system. So, we're not dealing with -- so, his point about interaction of the waste with the natural environment, I would say is doubly important. I mean, it can't be more important than he made it, but it really is important.

And I guess the last point is, in thinking

of this issue of regulations versus guidance, I can't imagine anything that you could put in a regulation about this that would make any sense. I mean, this is a site-specific issue. The performance assessor has to make his case, and you have to evaluate it.

MR. CAMERON: Great. Thank you. Thank you very much, David. Do you want to respond? Go ahead.

MR. McKENNEY: Well, one example of something that Steve and I were talking about yesterday a little bit was, do we need to strengthen the regulation on being more articulate on future events and processes, and how you have to evaluate that. Because, again, how important is colloidal movement in either the near term scope and far field, because you might have different processes. One is that you have different wastes in there, and everything else that you might have to take account for. So, is there some sort of thing like that, that we have like a general requirement that would strengthen that to make sure that people have looked at all these processes, so that whatever transport model you use, or whatever the licensee and the regulatory authority are looking at, that they have addressed each of the possible processes, so that that

has been -- it's transparent that that has been looked at, has been considered. And the reason they went down whatever path they did for modeling is because of the following reasons.

In my mind, that is one way you could bring it into the rule space. It would be pretty general, it wouldn't be thou shalt include colloidal movement at every site, or thou shalt do this, but more of bringing it through, again, of what are review points that they need to address in their assessment, at least having said that they reviewed the process, and said it is applicable to my site, or it's not applicable to my site, and so forth.

MR. CAMERON: Thank you, Chris. Dave?

MR. ESH: One thing I would add to what Chris has said. One way we have attempted to do this in guidance is to provide, just for example, if we're talking about the interaction of waste. We'll provide a guidance element that talks about needing to consider the interaction of different waste. Then if we know of something, specifically, we'll also provide guidance on that specific thing. So, if we know you need to worry about chelating agents, we might provide guidance with respect to chelating agents. But we can provide a generic statement that just talks about

interaction between waste, and the effects on transport, and release, and that sort of thing. So, I'd like to hear whether the people think that sort of approach to guidance is reasonable, considering that it can be a challenge to try to think of and list every specific thing that would apply to every site. So, we try to do it in kind of a tiered manner, if we can. And I don't know if people want to comment on whether they think that's reasonable, or not.

MR. CAMERON: Okay. And we have a couple of people, Beatrice and Steve, who do want to comment on that. Why don't we close that off, if you're responding to that point. Why don't you go ahead, Beatrice and Steve, and then we'll go to Scott, Dan, and Drew, and see what they have to say, in addition, on that. Beatrice?

MS. BRAILSFORD: I just wanted to clarify. Christepher, I think, was speaking more about having a -- I don't want to use the word "generic", but sort of a guiding statement in the rule.

MR. CAMERON: Thank you. Steve?

MR. NELSON: Well, given the caveat that we shouldn't be disposing of this in landfills, the answer to your questions are yes.

MR. CAMERON: Great. Thank you. And,

Scott?

MR. KIRK: My question has to do with bringing in materials from outside the site to enhancing the characteristics of the site's natural geology. We sort of had some discussions with that when we were licensing our facility, as well. And what I was getting at is, we had a large clay north of our site, and it did have an impact in the infiltration rates during heavy rainfall periods. And our thought was is that we could fill that ply off, but after deliberations, we realized that that was really deemed an active engineered barrier. And you can take credit for that for only a certain period of time, because when everybody is dead and gone, and thousands of years into the future, you might not be able to rely on those engineering barriers. Because when you're working at regular nuclear facilities, your safety basis is piping, instrumentation, pumps, and things like that, but long into the future, your safety basis is actually your site's natural geological characteristics. And what I would say is that the rule needs to -- and the guidance really needs to make these kinds of distinctions between what is an engineered barrier, what you can do, and the time periods in which you can take credit for those.

Does that make sense?

MR. CAMERON: I see NRC agreeing with that. Thanks, Scott. Dan?

MR. SHRUM: Mr., is it Kocher? Dave? Can I call you Dave? You can call me Mr. Shrum.

Yesterday, you made a really nice analogy about football. And I know we're supposed to stay away from sports analogies, but you stated that define the goal line, and don't tell us what plays we're supposed to run. What concerns me a little bit about this specific topic is now we're being told what blade of grass to run over at any given moment in time. We need to be very careful not to dictate what site-specific parameters need to be used. I understand your thought, K_d varies. It varies with soil types, it varies with water chemistry, it varies with everything and anything imaginable.

What I would like to recommend is that this could go into guidance, should go into guidance, that, first of all, in the rule say a performance assessment needs to be done, following the best available performance tools that are out there at the time, and it needs to be revisited.

Now, this may not be the time to talk about that, but the performance assessment needs to be

a dynamic item that can be updated as additional information is determined. That would give the regulator the opportunity to review, and, once again, approve the performance assessment once it's conceptually set up, would give the public an opportunity to understand the new dynamics of the system. So, again, this may not be the time to talk about that, but that has been our intention. And I'm not going to be drawn into the Clive site, because we're going to just be different on that. However, I think it's important to update the performance assessment on a regular basis. And I would propose, although, maybe it doesn't need to go in the rule, that licenses are updated on a regular basis. Ours is updated every five years. Might that not be the time to update the performance assessment as part of getting the new license. And you can, once again, demonstrate compliance with Part 61.

MR. CAMERON: Thanks, Dan. Maybe it would be useful to see if there's any reaction either from NRC, or any of the other panelists to Dan's observation. And, Drew, let's go to you.

MR. THATCHER: I guess if you want a permanent full-time job, than yes. If you want to update the PA every five years, that's great. I think

some kind of a periodic updating of performance assessments would be a good idea. Five years might be too short, only because sometimes these can be pretty involved processes that take several years, so you just finish the one. Now you've got 18 months, and you start it all over again, so maybe 10 years, or something like that. So, I agree with the periodicity, but I think five would be too short. Can I keep going?

MR. CAMERON: Yes, please.

MR. THATCHER: Great. There's two points I want to make, one on the interaction of waste with other waste. Typically, if we're talking about a low-level waste site, the behavior, in my mind, is very similar to what happens at a Class D sanitary landfill, initially. You're initially aerobic, things break down, you have degradation, you've got the water in there, et cetera, and then it goes anaerobic. That's for it mixing with other waste. In the instance of DU, I don't know if that's going to hold true. I'm just thinking out loud here, because, typically, we're talking about big volumes, and you might have trenches that are dedicated to this only. And if that's the case, then you may not have the situation where, well, you're going to scavenge all

your oxygen, and you really won't have any CO_2. In that instance, you probably will have some, so I think that probably is going to be a site-specific thing, but I think that's something that has to be considered.

In my mind, a lot of trenches, depending on the distance between them, et cetera, kind of behave as their own little entity. If you're talking about complexing of organics, or what have you, I think you're not going to get a lot of interaction between trenches, just because there won't be -- there'll be some lateral transport, but it probably is not going to be that significant. So, I guess, you're probably going to have to leave that on a site-specific basis, but I think the analysis for DU might be entirely different than what happens for a regular waste site. Just thinking out loud.

The second point, and, Steve, it's just getting back to you. And I don't know the right answer, because I haven't done a performance analysis on the DU, but I think there are sites that could be suitable for this. And, actually, thinking of Nevada test site, I think it would be a perfect environment for that. There's a gentleman that I was talking with this morning, and they're in a net deposition area,

really no groundwater transport. You can easily bury it far enough that you mitigate the radon issues. And, actually, they've been working with the Raytrack folks, Kirk Nielsen, and Vern Rogers, and that group, to really get a better handle on the modeling for the radon diffusion coefficients. But I think there are sites that can work for that. It's just saying that out loud.

MR. CAMERON: Okay. Thanks, Drew. And, Chris, did you have a response?

(Off mic comment.)

MR. CAMERON: Oh, okay. So, we'll see how psychic he is. Marty?

MR. LETOURNEAU: Well, I was going to respond to Dan's comment. You know, the Department of Energy has right now eight operating disposal facilities that we have performance assessments for. And Dan is absolutely right, that the site-specific details that have to be addressed in those performance assessments are not something that would easily be dictated in a rule, and sometimes not even in guidance. It very much requires a technical staff that can review the site-specific performance assessment, and the site-specific aspects that are important for any given site, and determine whether

that performance assessment has the right details in it, or not. And for Drew, we do periodic updates. Most of our facilities are on at least their third generation, if not fourth generation, performance assessment.

(Off mic comment.)

MR. LETOURNEAU: Well, you know, the interesting question, when we were getting ready to -

MR. CAMERON: Can we just take a time-out so that Mike can get the -- the question was, Drew, what's the time frame for the DOE? I'm sorry for the interjection. I know we're not supposed to do that. I was just thinking if he did the third generation, is that over a 30-year period, or 20, or what have you?

MR. LETOURNEAU: We had originally contemplated having a requirement in 435.1 that would require having an automatic update every five years. And we decided against that. And what we do is, we look at the PA, and the facility on an annual basis. We do an annual review of what that facility has received, have they discovered any new information that would change our understanding of the PA? And, on an annual basis, we determine whether the PA is still okay, or whether they need to contemplate doing an update.

That being said, it does happen about every five years, on average. I mean, some of them are six, some of them are eight, but we're talking about a 20-year period over which these PAs have been -- from the time they were originally prepared, through all the updates that have been done.

MR. CAMERON: Okay. Thank you. And was your -- go ahead.

MR. McKENNEY: Well, having talked to you yesterday about the same topic, we were -- I knew your response was going to come for Drew's comment, and Dan's.

There are -- Part 61 currently does have a set of times that you do need to revise your PA at different steps of the project that are actually listed in there. But, also, at any renewal state, and the guidance in 1573 would -- that we currently have out, does support the fact that these are living -- this is a living process, and it should be being reviewed, and is it necessary to update it? And at every license renewal point of view, the regulatory agency is being asked, and, again, is there reasonable assurance that the site still meets performance objectives, and will meet performance objectives? And then there's -- when they come in for a new waste

stream, or something else like that, that, obviously, would be another trigger for a revision, potentially, that would have to be actually reviewed and licensed. I mean, it's not specifically stated thou shalt do it on this timely basis in the rule, but in the guidance space, that would be -- and the need for a decision of reasonable assurance by the regulator at any licensing step. I think that those are implied, that at least there be a review, and how good is the previous performance assessment still?

MR. CAMERON: Okay. Thank you. Steve?

MR. NELSON: Yes. I want to thank Drew for pointing a couple of things out. With that said, with respect to the, for instance, disposal in Nevada test site, if it's not one thing, it's another. There may be net deposition now under the current climate, that may not be true during the next glacial. But not very far away from those facilities at the Nevada test site, of course, is Yucca Mountain. The repository footprint is something like six square kilometers, and the DOE, at the urging of some of the NRC's colleagues, I might add, one in particular who will remain nameless, millions and millions of dollars have been spent characterizing quaternary faults, and quaternary volcanism. So, my point is, yes, maybe you

might be able to find something somewhere, but at the time scales over which this stuff becomes -- increases and reaches its maximum activity, I have great doubts. If it's not one thing, it's going to be another.

And I was going to hold this - I have one more brief comment. I was going to hold this until later, but I think it's pertinent now. There was some discussion yesterday about cost. When it comes to salt disposal, there's no need to reinvent the wheel. There's a disposal site functioning now for transuranic waste, so there's an awful lot known about how to engineer such a site, how to study such a site, what type of site characterizations, geochemical experiments have to be done, so I would throw a caution out to everyone, or at least an appeal, that we not make the costs a bigger deal maybe than they really are.

MR. CAMERON: Okay. Thank you, Steve. Dan?

MR. SHRUM: Just a clarification to respond to what Drew said, that I don't know what the time frame is. And a review of a performance assessment may be just to ensure that the assumptions that went into it before, are still acceptable. And I'm not talking about getting a brand new model

started every time, and reinventing the wheel, so to speak, as Dr. Nelson just said. I'm just talking -- I know you said it at a completely different reference, but I wasn't thinking of reinventing the wheel for every time we do the performance assessment. It needs to be a dynamic system that can be updated, if needed, or reviewed during the license renewal period.

MR. CAMERON: Thank you. Thank you, Dan, for that clarification. I think we're -- it seems like we're finished with this particular topic. We are due to take a break after this topic, but we're actually 15 minutes ahead of time now. Do you want to move through with the radon presentation and discussion before we take a break, or do people -- okay. Let's do that, see where we are. And Chris Grossman is going to tee that up for us, again.

MR. GROSSMAN: So, during this session we'll be talking about the Modeling of Radon in the Environment for a Site-Specific Analysis, and some of the factors that need to be considered in that.

At the Bethesda meeting in Maryland a few weeks ago, the discussion I think largely centered around whether to use a flux-based standard or the all pathways dose, and so I wanted to bring that to the attention of the participants here today. I imagine

we'll probably discuss that sort of thing again. We also received quite a bit of information on references, sources of information regarding the modeling of radon. It's a complex subject, which I'll hope to convey some of the complexities of it in this presentation. But we look forward to receiving additional information, if there's more to present on that.

So, a little background. Radon is present in the Uranium-238 decay chain, and it's shown on the slide here, that's not all the daughters, but it's some of the significant ones. As Dave pointed out yesterday, it's also present naturally in the environment, because of its association with uranium. And it's responsible for a large fraction of the natural background radiation across the country, which does vary, as Dave pointed out. The half-life of Radon-222 is around four days, which this is one of the characteristics I think that presents some of the complexity in the modeling, is the short-lived nature of the material.

And unlike other radionuclides in the uranium decay chain, radon is a noble gas. And this causes it to behave differently in terms of its environmental mobility than the other radionuclides in

the decay chain. For instance, some of radon's daughter products tend to be a little stickier, I'll say, and will glom onto surfaces, especially in buildings, and that can present a challenge in terms of modeling, and mobility.

Unlike natural uranium, or depleted uranium has been chemically separated from its progeny, and consists primarily of uranium isotopes, and the daughter radionuclides are largely not present in the DU. Over time, though, those daughters will then grow, and because of half-lives of many of those radionuclides in the uranium decay chain are extremely long, it takes a long time for radon to grow in. And the chart at the bottom here is trying to describe that. And you can see that over time, the radon is a very small, if non-existent fraction of depleted uranium, and grows into equilibrium with the Uranium-238 in the DU, very long time frames into the future. And as Steve has mentioned, with the activity of the uranium over time.

So, conceptually, how do you model the migration of radon? In this picture, you can see just some simplifications. We have a source term of depleted uranium. You may have a closure cover on site, or a radon barrier, potentially. Radon can --

will need to emanate from the material in the waste form, so it has to find a way out of the solid phase to the porous spaces of the media surrounding it, or the waste form, itself, so that can migrate to the surface. The gases will rise to the surface. They could enter a household that may be above, or an intruder, or they may enter the atmosphere, be diluted, transported off-site to a potential receptor downwind, as well as, you may have some partitioning to the liquid phase, and migration downward, or as other parents migrate downward in decayed radon, you may have some of the radon coming out further downstream from the waste form, itself. This gives a crude sense of some of the considerations.

In determining the potential future exposure to radon, we think it's important to consider the uncertainty in exposure scenario. What are some of the future land uses that the site may be involved in? For example, a person living on the site is likely to receive a higher dose than one that's living off the site. In addition, there's some uncertainty in the type of structures that may be built, depending on the land use, et cetera. The size of the structure, whether it has a basement, the type of ventilation system, these are all things that could

play into some of the uncertainties affecting doses that someone may potentially receive from radon.

One thing I think to note at the bottom here is, in this country, recently, that there's been a move toward radon mitigation systems in building codes, et cetera. It's uncertain whether future generations may employ that strategy, or not, and how widespread that practice may be.

So, as you can see, there are many challenges associated with modeling the release and transport of the radon. And this is due both to the short half-life of the radon, and its movement through the environment. It's highly dependent on how quickly it can move to the surface, and whether it can reach the surface before it decays. So, small differences in the travel time can result in a large difference in the amount of radon that reaches the surface.

In order for the radon to be mobile, it must first get from the solid waste to the gas phase, and so it's important to understand the amount of emanation of radon from radium in the solid waste form to the gas in the pore space, and the factors that influence this.

Another considerable challenge in modeling radon transport is modeling of diffusion through

partially saturated porous media. This diffusion is highly dependent on the moisture content of the soil, which can vary both temporally and spatially across the site, depending on the heterogeneity, and so forth, at the site. Another challenge that we're aware of is the uncertainty in the long-term performance of clay radon barriers. We have a research, Craig Benson out of the University of Wisconsin who's done some work for us on the effectiveness of some of these barriers at landfills, and his research has been enlightening on their performance over long time frames.

And, also, the last point here is barometric pumping can also increase the flux of radon from the subsurface to the surface. And this phenomena basically happens when we have wind blowing across the site, and it puts suction on the subsurface drawing gases to the surface. This effect is most pronounced in the case of a building being located on the site, as it can greatly increase the amount of radon that gets brought into the building.

So, again, we're looking for the panel's input, as well as members of the general public, on whether to specify criteria, or developing guidance on the modeling related to radon in terms of a site-

specific model. Are there methods for evaluating or regulating the impact of radon gas exposures that we should consider? Are there approaches for the modeling to radon emanation, transport and exposure pathways? Is there information on the selection for parameter values that we should be aware of, in terms of the modeling of radon, as it relates to disposal of low-level waste? And what considerations do we need to account for in terms of societal uncertainties in the modeling of radon? And, so, with that, I'll turn it back over to Chip.

MR. CAMERON: Okay. Thank you very much, Chris. Comments? Let's go to Steve. Steve Webb, I'm going to give you the -

MR. WEBB: One of the things, modeling of radon, what you mentioned that what you have -- other than gas phase infusion only, liquid phase ought to be part of it, too. You also ought to add adduction, which is due to water evaporation, which we talked about in Maryland. But there are also screening models which have been done by oil companies for radon flow, or not radon flow, but what I think BOC flow in the basements. You can take advantage of models which are already out there. Also, barometric pumping, you mentioned that's caused by the wind. Well, I think

that's also caused by base change barometric pressure. And other than clay radon barriers, that don't usually last very long, cause plants, animals going into them, burrowing like that, so it's kind of -- not often that effective. Chip?

(Off mic comments.)

MR. CAMERON: Thank you, Steve.

MR. KOCHER: Yes, a couple of comments here. The first one is a really minor picky point, having to do with your graph of activity of radon versus time, starting with one curie of DU. And I think that curve goes to one, not to .75.

MR. GROSSMAN: Actually, I had a question about that this morning, myself.

MR. KOCHER: I'm absolutely certain it goes to one.

MR. GROSSMAN: I checked on that, and -

MR. KOCHER: There is a branch in the decay chain, but it's farther down the road.

MR. GROSSMAN: This is on an activity basis, so my understanding is that uranium -- this is equilibrium with Uranium-238, which isn't the entire activity of DU. So, you're in equilibrium with the uranium. That's why it doesn't quite go to one on the graph.

MR. KOCHER: I'm surprised the effect is that big, but that may be it. That may be it. Okay. Thanks. Glad to be set straight on that.

You've opened the floor to the issue of how radon should be regulated, so I'm going to bite that apple for a second, if I might. Drew had a proposal yesterday, which made a certain amount of good sense; and that is, to adopt the approach from the mill tailings business, and the standards for air emissions in the EPA NESHAPs, and set a limit on emanation rate of radon from soil. And it could be augmented by what Department of Energy has done, is to use an alternative of a concentration limit in air. I think 10 years ago I would have said that's fine, and now I'm not so sure. And I'll make sort of two counter-arguments.

I'm not saying that one way is right, and one way is wrong. What I'm asking NRC to do is to be open to different possibilities to do this. And don't be stuck on one way. And in other arenas, like arguing about groundwater protection standards and things like that with your friendly fellow agents, the NRC argument has always been a dose is a dose. Well, a dose is a dose here, too. Radon is no different from anything else in terms of its impact on human

health. So, I think that's an argument for putting in the dose arena.

The question about whether a criterion in mill tailing standards is appropriate here. I would point out the following. Mill tailing standards were developed to address a palpable problem in real time. And it was necessary to write a regulation in such a way that all the quantities were measurable in the field. We are not in the business here of defining standards that must be measurable in the field, because nobody is going to be around in a million years with a radon flux meter. So, I think you should give serious consideration to including radon in dose criteria that you use.

And that did lead to a question for -- well, one more comment, and a short question. About the modeling, in general, I think everybody agrees that modeling radon transport in soil is a very difficult problem. And I heard Dave Esh mention that one approach they're going to take is to try to gather some data on natural systems, to generate data on radon emanation rates as a function of radium concentrations that are the source of the radon, which is what I call a natural analog model. And, personally, I think that's the only way to go.

You can do all the fancy modeling you want, but in the end, in order to validate or calibrate those models, to turn the crank, you're going to have to compare it with some real data, so why not use the real data as your model to begin with? I mean, this is just something for you to think about, so I really want to support the idea of trying to get some data on emanation rates, as a function of radium concentrations in soil for different kinds of environments.

This is, basically, what I did in the DOE PA's that I worked on. I just used global average concentrations in air relative to global average radium concentrations in soil. But you can certainly sharpen your pencil, and do that more on a site-specific basis.

I think that's all for now. I may remember, again, what else I had, but I just want to emphasize, be open to the idea that a dose is a dose, and that radon should be included in there.

Oh, I wanted to ask Dave, the calculations you showed yesterday, your chart of percent of realizations that met the performance objective. You did calculate dose from radon in those calculations. Right?

MR. ESH: Yes.

MR. KOCHER: What kind of dose -- how did you go from something to dose when you did that?

MR. ESH: As I indicated on the uncertainty analysis area, we identified a number of parameters that could affect the dose. We had to represent a house with a basement, and an air exchange rate, size of a basement, time spent in the basement compared to upstairs.

MR. KOCHER: Yes. I'm asking a simpler question. You had to go from calculated concentration of radon to a dose. And that's, basically, what I'm asking, how you did that.

MR. ESH: Oh, we used dose conversion factors based on the concentrations -

MR. KOCHER: Yes. And the point is, where did you get them, because the field is changing.

MR. ESH: Yes. We used FGR11, 12 publications to do the conversion of the atmospheric concentrations of dose. We didn't use the most modern information that's out there, but we didn't use the old information that we used to use, either.

MR. KOCHER: Yes. I think I'll get back with you on it offline.

MR. ESH: I understand your concern.

MR. CAMERON: And just for information, did you say FDR?

MR. ESH: Not the New Deal. FGR.

MR. CAMERON: Thank you. FGR. Okay. David raised two issues. One, what's the regulatory framework? But, also, the idea of - I'm not sure I can use the word "validating" the model, but supporting the model with real data from natural analogs. And I know that we heard something about that from Drew yesterday. So, in addition to the comments that you, Christopher, and Drew have, let's get some feedback on what David said, and, also, on what Steve said, possibly. Go ahead, David.

MR. ESH: One thing that we talked about in the last workshop, and I'll re-emphasize here is, we are interested in data sources that people might know, or have that are available, that we could use in development of this guidance, and these sorts of approaches. So, if you have data in this area, we would certainly want to see it.

MR. CAMERON: Okay. Let's go to Christopher.

MR. THOMAS: Thank you, and good morning. This follows on a little bit to what David said, so I've got a question, and then a comment. And the

question is that in the paper, David, that the NRC put out on depleted uranium, were doses to organs calculated?

MR. ESH: No, in that paper we did TEDE.

MR. THOMAS: And I guess my question is, doesn't the current law and the public protection standard require a certain limit on doses to organs?

MR. ESH: Yes, it does. In the analysis that we did, we were following the recent direction that we've had from the Commission on these types of analyses. We've done them in our incidental waste reviews under the NDAA 3116.

MR. THOMAS: Can you just say that again one more time slowly?

MR. ESH: NDAA 3116. That's where we do independent reviews for DOE's waste determinations, which involve closure of high-level waste tanks, and disposal of secondary waste generated from those sorts of activities. The Commission has given us direction to use TEDE in lieu of those organ doses, so that's why we did it.

MR. THOMAS: I'm just wondering if that means -- I guess I see one of two different outcomes of that. In one, it's almost like the other part -- it's almost like the public protection standard is

being revised, because if the law is saying the protection is based upon doses to organs, but the analyses are not calculating doses to organs, then I'm just wondering if that presents a problem. And then I want to follow-up with a comment.

MR. McKENNEY: Okay. TEDE, which is Total Effective Dose Equivalent, which is a method of calculating the dose, actually, primarily calculates the dose to organs, and then does -- adds those all up to see what the effective dose to the whole body is to the dose to all the organs. It is a system different than was established in 61. Back when 61 was produced, it was based on dose methodology that was only known, which was developed in 1960. They had no understanding of what the -- they had limited understanding of the different radio sensitivities of different organs were, and how would a millirem of dose to one organ compare to a millirem of dose to another organ, as compared to the overall effectiveness of dose to the whole body.

In the `60s, they produced a system that they could -- they had data, a medical system to figure out how those related together. That then formed the system that we went to in new Part 20, in Part 20 when we changed Part 20 in `91, that adds up

all the organ doses together, so you can compare. If I get a millirem of dose from an external source, how does that compare to a millirem of dose to a lung? And, in general -- and that's we go, and we don't calculate organ doses specifically. We hadn't had the limit back in Part 61, originally, because we couldn't compare the organs. We had to have individual organ limits. And at low doses, the only -- you can use just a TEDE standard that is equivalent. And the Commission has had this policy since the mid `90s, and has had -- and, actually, has put it into rulemaking in two different cases, has asked for public comment on that policy. So, we're still following that policy of using TEDE. It does not -- we don't ignore the organs. They are a fundamental part of making the calculation.

MR. CAMERON: And that's a very useful clarification, because as Christopher's comment has indicated, there is concern about this particular issue in terms of are we ignoring the organ dose at this point? And, Christopher, do you have a follow-up comment on this?

MR. THOMAS: I appreciate that clarification. And, I guess, I would just leave it with echoing what David said earlier, which is that

this -- I agree that radon should be factored into the dose, and not treated in some other way. I mean, to me, the idea that yes, it is naturally occurring is kind of irrelevant. I mean, for Utahans, like maybe we're exposed to more radon naturally, and maybe that's a reason that we wouldn't want more of it, not as a reason to say yes, you should allow more. So, thanks.

MR. CAMERON: Okay. And we're going to go to Drew, but I guess one question for people to think about, and consider. Is this -- the statement that radon should be considered in a dose that we heard from David and Christopher, is that controversial? Do people -- I just want to know if people -- if anybody disagrees with that.

MR. LETOURNEAU: Yes.

MR. CAMERON: Okay. That answers the question. We're done with that.

MR. MAGETTE: Yes. I could say no, but, I mean, we -- I said yesterday that we think the radon flux is okay, but I also think what Christopher just said is okay. I mean, I think you can do it a variety of ways. But I'll certainly defer to Marty to speak for why he objects to it. But that's -- it's not that big a deal.

MR. CAMERON: Okay. Thank you, Tom. And excuse us just one second, and we'll hear from the no.

MR. LETOURNEAU: I guess I'm not necessarily objecting to it, Tom, as much as I'm concerned I want NRC to be able to articulate, is this, in fact, a policy change? I mean, have we -- did we consider radon as part of the doses, the Total Effective Dose Equivalent, or the doses that were calculated in the EIS? Have we traditionally considered them as part of the all pathway doses, or is this, in fact, something new? I recognize what David Kocher is saying, that a dose is a dose, but one of the things that we're dealing with here when we talk about DU is - and the point keeps coming up - how different it is from low-level waste that we have traditionally analyzed, and that we've traditionally regulated? And, in fact, it is the radon that is what makes it so different. And we've talked about the fact that radon is the largest portion of what you receive in normal background radiation. There are a lot of issues here that I'm just wondering are we subtly making a policy change, are we subtly treading into a new area that really hasn't been addressed before? I know there's not an international consensus on how we do this. And, obviously, DOE has picked a

certain way of doing it, to do it separately, but one of the other aspects to think about is, the whole idea of doing the performance assessment is to help you understand how your facility is going to operate. And if you're going to have a mechanism, or an event that is going to swamp your understanding of that, is that really helpful, if it's rolled in with everything else? So, I'm just looking for consideration of those, and I'll look for feedback.

MR. CAMERON: Okay. And before we hear feedback on that from the NRC and others, I want to go to Drew. I think he has several points, and he may also have something on this issue. Drew?

MR. THATCHER: Thanks. First, let's go broad. I think all of the stuff for radon should go in guidance, as far as site-specific stuff. You gave the examples of home. In the case of Eastern Washington, 90 percent of all homes are built on slabs. They don't have a basement, so those kinds of things really need to be done on a site-specific basis. And then getting back to Dave's point, or even Christopher's, I do agree. I think radon -- I mean, it's like anything else. It's a contribution from the waste, then it has to be considered in terms of the total dose. And by me throwing up there the fact that

perhaps you could use a metric, or some other means, meaning a flux limit, there is a dose associated with that, and it be calculated, so it's not like you're not doing that. And, maybe, if I can just walk through, Dave and I were talking before we started this morning, and he and I are differing. I mean, I'm not saying that's the only way you can do that, but as I work through just a logic model on okay, we want to figure out the impact from radon in a million years. And once we get beyond a certain point, we all know there are glaciation events, there could be major floodings, et cetera, that you need to take into consideration.

Generally, for the analysis that I've done, all of the groundwater impacts, et cetera, have already been done by that point, so whether there's another flood or not, really matters not, at least the way I see it. But what you also have when you do that is, okay, population starts at zero all over again. Right? I mean, when we're talking these floods, it's not like oh, the Columbia River just flooded. That's a big deal. No, this is like population is gone, and now civilization, at least in that area, has to start all over again. So, how does that get factored into this? So, what I'm saying, that's how I think you

could really get yourself tripped up on this, as far as the long-term things.

One other point. I do see the -- for clay barriers, I mean, it's true. If you've got 12 inches, or whatever it is of the clay barrier, you've got multiple dry seasons. Now, it's desiccated, and your clay is not working, at least for a radon barrier. And one of the ways we've got around that is simply to take that same fraction of clay, mix it into a bigger volume, more like an ET cap, or evapo-transpiration cover, more of an effective way to do that. Tends to be self-healing, even if you get clastic dykes, even if those dykes are filled with sands, as opposed to a clay, or silt loam, you still have in aggregate a fully functioning cover that tends to work. So, any other points? I'm good. Thank you.

MR. CAMERON: Okay. Thank you, Drew. And before we go to Chris, or any of the other NRC staff on this, let's go Beatrice, Steve, Christopher, and over to Scott. And then let's see what the NRC has to say about any of those points. And, including Marty's issue of how big a policy change is going on here. Beatrice?

MS. BRAILSFORD: Well, I guess that's why I put my little tent card up, was Marty's concern

about a policy change, which I think, once again, emphasizes that the decision to put DU in Class A, and the decision to allow shallow-land burial came draped in all sorts of problems that I'm not sure that we can finesse our way out of. So, that's just sort of back to where I started out yesterday morning, that we're trying to nip and tuck something that really at the end of the day is not going to fit.

MR. CAMERON: Okay. Thank you. Thank you, Beatrice. Steve?

MR. NELSON: Yes. I realize we're working here on radon, and how to deal with it. And I appreciate that. And Peter's touched on this a little bit yesterday. There are 12 other nuclides, and at a lot of sites the exposures will be through groundwater. And I think we need to not forget, let the other dozen or so nuclides become orphans while we think only about radon.

As far as a flooding event, if anybody is interested, I have a little map that shows where the shoreline would be if it reached the elevation of Clive. And we're not talking about an instantaneous wipeout and resetting of humanity. We're talking about people that -- you're certainly talking about downtown under water, and much the northwest areas of

Salt Lake under water, but we'd be nice, and high and dry up here, most of the Salt Lake Valley, in fact. So, here we have a scenario where, effectively, a repository could go away in terms of being flooded, eroded by waves crashing on it across a lake with a large fetch, but that need not be an instantaneous catastrophic event for society in terms of immediate flood risks. As a matter of fact, in this instance, it's more likely to be a gradual thing. And people will be accommodating their lives to it.

MR. CAMERON: Okay. Thank you, Steve. And Christopher?

MR. THOMAS: I wanted to go back and clarify something, and I need to work out exactly what the best way to do it would be. But, I think any dose calculations do need to factor in radon. Now, the part that makes me uneasy about saying that's the only way to like limit radon, is what if in the site-specific analysis they don't include any on-site scenarios? Okay. Well, then I would say well, if that's the case, then there should be something like a flux limit, because, to me, at that point, then, that would be the only way to really protect somebody who might inadvertently intrude on the site. So, I think there has to be some sort of -- I just think that the

protection of an inadvertent intruder has go to be dealt with somehow, so I would just hesitate to just say yes, this is the right way to go, because it might not be, if the licensee, or whomever says okay, we don't -- we're not going to look at somebody going on the site. Okay. Thanks.

MR. CAMERON: Okay. Thank you, Christopher and Scott. And we've heard that concern before about protection of the intruder has to be key -- is a key factor here. And maybe we'll have some discussion on that. Let's go to Scott. And, David, did you have something additional? Well, let's go to Scott and David, and then let's hear NRC reaction to all this.

MR. KIRK: Yes. I think that's a good order, because I was going to really comment about what David did say. And it wasn't that long ago when the License Termination Rule was promulgated, and there was vigorous debate as to whether or not you should have a separate drinking water standard, or all pathways should be summed. And the NRC did opt that all pathways summed was the best approach to move forward. And I hadn't really thought about it before until David said it, but the radon flux limit is for real time monitoring. And it really doesn't have

anything to play in for thousands of years into the future. And I would just say, as a matter of policy, NRC should really think carefully about which approach it's going to take, so it can articulate in their regulation, and to their guidance to explain the rationale. And I say it, because my own thought would be, it would be a shame to have a License Termination Rule that is founded completely separate with a different philosophy under this rulemaking.

MR. CAMERON: Good point. David?

MR. KOCHER: Yes. Discussions take a life of their own, so let me go back to the beginning here for just a second. Contrary to what you may have heard, I did not say that one way is better than the other. Okay? Is everybody clear about that? I'm just saying that this is something for the NRC to say. Marty makes an excellent point about policy implications. There are lots of areas where we regulate radon, just like anything else already. But your point is absolutely valid.

Something else I would point out that's not been said yet, is that the -- in most scenarios that I can conceive of, the timing of exposure to radon, when they occur, will be very different from when exposures to the other radionuclides in the decay

chain occur. So, we're not likely going to be dealing with a problem of having to add doses from radon to something else. The radon exposures, once that stuff migrates downward, no radon is getting out anymore, so there are timing issues here. But my central issue here is that there's another way to do this besides the mill tailing standards. Remember what the mill tailings standards were designed to do, and that's not our problem here.

MR. CAMERON: Okay. Chris, I don't know what you want to say, but you've heard a lot of commentary, and we'll turn it over to you.

MR. McKENNEY: I just wanted to go through a little bit following Marty's point about what is the placement of radon in dose assessments currently in the policies across the NRC.

We'll start out with Part 61. There was no specific exclusion of radon in the original statement. It was not considered in the dose assessment in the EIS, but that was based on the fact that there are small amounts of source material in the EIS, so, therefore, they discounted those. But there was no specific exemption that said if you do have more source material, you don't have to calculate it.

In a later document that updated the

assessment methodology used in the EIS, there was a statement that did say that the authors of that, which had been involved in the original EIS, believed that if source material was present in greater quantities, you would have to calculate the doses for radon.

In Part 20, in general, most licensees do not have to calculate doses from radon. However, if you do have source material in significant quantities, you need to include it, and radon is not considered part of background radiation. However, in License Termination Rule, in 1997 in the Statements of Consideration, there was a Commission decision that said that since the dose limit for the License Termination Rule was very low, that -- or was at 25 millirem, and, therefore, you wouldn't have much radium to be allowed to remain behind because of that dose limit in near-surface soil, because external gamma, or somebody living on that site, that the levels of uncertainty in trying to translate the radon into a house calculation, and other things, it was not necessary to calculate the radon for unrestricted use of land. But that was specifically stated in the Statements of Consideration, that there was a exclusion. And I'm saying that there isn't any of that language in Part 61 at this time. And,

therefore, any decision to exclude, would seem to me, that we would have to explicitly put that as part of the rulemaking, and have the Commission make the policy decision to do that.

MR. CAMERON: Okay. That's very useful. And it's good that this issue has been raised, because it won't get lost. Go ahead, Drew.

MR. THATCHER: I just wanted to respond back to Beatrice. I think she made a great point about this depleted uranium, and it's currently Class A. I think the reality is, when you do a performance assessment for this stuff, there is -- you're going to have to put enough material above it to make sure your radon is effectively attenuated. That means it's really not at the top of the landfill, or top of a trench. You're really probably putting it at the bottom. I mean, she's made a great point, but I think in the performance assessment how it falls out, there's no way it's going to be treated like regular Class A waste.

MR. CAMERON: Okay. And, I guess, that's the point, isn't it, behind this whole rulemaking effort? Let's see if anybody in the audience has a comment on either the geochemistry or the radon modeling, and then we'll take a break. Does anybody

have anything to add to the discussion on those two points that we heard this morning? Okay. This is the ubiquitous Dirk from Oregon. Okay.

MR. DUNNING: I'm going to back to the geochemistry. It just happens you have with you Peter Burns, who is one of the experts on colloid chemistry for uranium. And I'd encourage you to lean heavily on what he has to tell you about some of the work that he and his colleagues have been doing.

Uranium chemistry understanding has changed rather dramatically in the last 15 years. Not only is there the soluble fractions, which you talked a bit about this morning with the carbonates and the colloids, but there's at least three different major fractions of colloids. And the simple equations that are most often used principally focus on those things that could, in some way, be represented by the K_d-kind of equations. But there's two points there. One is that the K_ds that are actually observed in the field quite often are dramatically lower than the things that were in the reference that you had. EPA's compendium on K_ds is probably a better source to use. It's a little bit more recent. A lot of the work that the Department of Energy, and the National Labs have done is probably even more recent than that. But

there is even more recent information that is probably things that should be leaned on.

A lot of the older K_ds, unfortunately, suffer from a defect in that they don't assure that there was not insoluble material present when the K_d is analyzed, so they end up biasing the K_ds very high artificially, which is something to watch for.

The other problem is that the fundamental idea of K_ds comes out of a simplification that was done decades ago, in trying to model how things moved through soil. And people forget that there are eight fundamental assumptions that go into whether or not it's valid to use a K_d. And, virtually, all eight of those are violated in most uses where the K_d equations are applied. That doesn't mean that the results are necessarily invalid, but they're brought deeply into question. So, I'd urge caution on all of that. And then when you do the modeling, assure that you look at each of the different major mobility factors, and how those work. And that the equations are capturing each of those.

MR. CAMERON: Thank you again, Dirk. Okay. Let's take about 20 minutes. Christopher?

MR. THOMAS: I just wanted to say something really quickly, Drew, to what you had said.

I don't think it's quite as simple as that. I mean, your point about burying it lower. I mean, I've heard that before, and that can mitigate certain hazards, but we're talking about something over very long time frames, and I don't see how you can guarantee that that barrier stays in tact over those kinds of time frames. So, that might be fine for the institutional control period of 100 years, but realizing what we're talking about isn't -- it isn't hazardous in that short of a time frame. And, like I said yesterday, going back to what the NRC, itself, has said about Class A material, it was conceived of as something whose hazard would have largely gone away after 100 years. And that is not the case here with this material. So, I just -- I don't think this is Class A, as it was originally conceived. It's now become a sort of catch-all thing, and I think we'll get into this a little bit more later with the unique waste streams talk.

MR. THATCHER: And, just to add, I think it really depends on the site. You've got to make sure your site scenario is net deposition instead of net erosion, so, I mean, if the site is not appropriate, then it's not appropriate.

MR. CAMERON: Okay.

MR. NELSON: For one million years, or more, it has to be a site of net deposition.

MR. CAMERON: Okay.

MR. NELSON: Good luck.

MR. CAMERON: We're going to take about 20 minutes now, and come back. So, we'll see you about 25 to 11.

(Whereupon, the above-entitled matter went off the record at 10:19 a.m., and resumed at 10:46 a.m.)

MR. CAMERON: Okay. Everybody is going to be drifting in here, and we'll just wait to see if we get some representation on this side of the table, and then we'll get started. We're going to take a little hiatus from the agenda right now, because of one of our participants is going to be leaving, Peter Burns, around lunch time. And I mentioned that we had this issue of a statement of the groundwater pathway is redundant from David yesterday, and I think there's probably been some misunderstanding about exactly what he meant by that. But right after he said that, Peter Burns had said something that seemed contrary to that. I don't think there's that big a divide, but before Peter has to leave, I wanted to make sure that we ventilated this issue, so that we could clear up any

misunderstandings, and just be clear on what both of them were saying. And, David, I guess I would just go to you to sort of clarify, or just state what you were trying to say with that statement yesterday.

MR. KOCHER: Yes, thank you. The basic point I was trying to make is this. There are two separate and distinct performance objectives in the rule, one related to protection of off-site members of the public, and the second related to protection of inadvertent intruders. And the point I was trying to make is that those two performance objectives are intended to address two entirely separate and distinct problems. The performance objective for protection of the public at most sites would address the issue of how much can you release into water, and be transported beyond the site boundary? So, that's the performance objectives that covers the water pathway.

The function of the intruder performance objective is to determine how much can you leave behind in the disposal facility that hasn't moved? So, what I was objecting to and saying is not a particularly good idea is when you do an inadvertent intrusion analysis to include a water pathway for that individual, and that's what -- because that's what's redundant with the off-site member of the public.

Their wells are co-located really. And especially for DU, they're essentially co-located, so the two performance objectives are intended to address two entirely separate problems. They're both important. Some people, I think, got the impression that I was pooh-poohing the importance of releases to water, and all of that. That's, I'm sorry to say, not true. That's certainly not my belief, but I just want to point out that many people believe that it's inappropriate to include a water pathway.

Now, you should include a drilling scenario, but the exposure is to the solid waste that's extruded and brought to the surface, not the exposure to the water that the person might use later. Bear in mind, also, that the exposure to the solid waste, and the exposure to the water occur at different times.

MR. CAMERON: Okay. So, are you saying that when the performance assessment considers the public objective, that it is also inherently going to consider the intruder -

MR. KOCHER: There is an inherent limit on a water pathway dose to an intruder, but that's not what it's intended to do.

MR. CAMERON: Okay. Let's go to Peter.

MR. BURNS: Thanks for the clarification, because I think we're indeed on the same page. When it comes to an intruder's risk when they drill a hole, a well through a waste site with vast quantities of uranium, supposing they actually continue to drill and so on, I'm not too concerned about the water pathway. For that intruder, either they'll have figured out not to drink the water after they have all this vast quantity of uranium coming up. Or, even if they don't, it'll still be modest in terms of a dose, probably, in comparison to what they'd get from all the material they bring up. So, I'm fine with that.

I think the only confusion was with regards to which water pathway should be ignored. And for the intruder, that water pathway, I'm fine with that, if that's clear.

MS. BRAILSFORD: What was your last -

MR. BURNS: I don't recall what I said last, or first.

But, let me say that I'm not concerned, specifically, about the water exposure pathway for an intruder. I think there are other factors that are considerably more significant than the water pathway. I'm relieved to hear that we don't have disagreement on the importance of a water pathway for exposure of

the non-intruder, in other words, the people downstream that are using groundwater that may well become contaminated because of a waste site somewhere upstream that they may not even be aware exists. And they certainly haven't built a house on it, or whatever.

MR. CAMERON: Okay. And is that clear to the NRC staff? Okay. Great. And, Christopher, did you have anything you wanted to say on this?

MR. THOMAS: Now that you mention it, I'm just thinking -- I'm just trying to think through this, because, you know -- and, David, what you said, you said something about these exposures would occur at different times. And I'm just -- what I took from your comments in aggregate was that for an on-site intruder, you're going to have one exposure situation that's going to swamp everything else. Direct contact with the waste is going to swamp contact with water. But my secondary thought was, is that true over the entire time of the site and the waste as the waste evolves? It's just a question.

MR. CAMERON: Okay. I don't know if anybody wants to -- oh, go ahead, Drew.

MR. THATCHER: When we did our PA, one of the ways we handled that was simply break it out into

distinct time frames. There were -- with uncertainties, there's pretty clear time frames as to when things happen, so if you were to drill a well in the first thousand years before you had significant groundwater contamination, that's one impact. And then from one to ten, or something like that, you had another. And the two did not add up together, so that's how I handled it, anyway.

MR. CAMERON: Thank you, Drew. Chris?

MR. McKENNEY: Our general guidance right now would be that when you're looking at what sort of pathways you need to include in the various ones, would be that you'd need to -- you could exclude pathways, if they weren't a significant fraction of that, or were not likely to tie them together.

For the example of bringing waste up, it's sitting up there, and then groundwater later being a -- so the timing actually comes through. You'd also have to worry about modeling all of the removal processes for that surface contamination so it wouldn't stay at the highest concentrations right around the residence over time. So you'd have that competing loss rate to also deal with, versus the fresh high concentration stuff that may be more mobile in the environment, more exposure to the person.

So, the general thing for any type of analyses is that if you want to not include certain pathways, you do need to justify that they are a general small fraction. We do understand that sometimes you'd have a different purpose for other things, and we'll take that into consideration, too. But if we're talking about any type of pathway analyses, a lot of times if it's credible in the general pathway that -- at a general site, we would include this, this, and this, and this, and you don't want to include one of them, you need to justify why you're not including that, and to take those into account.

MR. CAMERON: Okay. Thank you. Let's move on to the definition of unique waste. And Dave Esh is going to tee this one up for us.

MR. ESH: Thank you, Chip. This is my last presentation on depleted uranium for at least a week.

A little bit of background. The 10 CFR 61 Environmental Analyses considered 1980's waste streams. There's a picture out of one of our NUREGs here on the types of things they considered. They made groups of different waste streams, and then components within those groups. And then did a sum,

and an aggregate of all those waste streams and groups to come up with an inventory that they expected for commercial low-level waste facilities.

But the question we have is what makes a waste stream unique? Is it unique because it wasn't in the original analysis? Is it unique by its characteristics? Is it unique for some other reason? And what are the criteria that you should use to determine when it's unique, and then what should you do about it?

So, why is depleted uranium unique? Well, it could be unique because of its characteristics. You say it's much more long-lived. It could be unique because of its quantity, or a combination of its characteristics and the quantity of it. Is it concentration that would cause something to be unique? It's a difficult topic to determine, I think, when you would be calling something unique, and when you would have to address the criteria that we will develop for unique waste streams. So, we're basically seeking feedback on how you determine when something in unique, or not, and when it would require the site-specific analysis.

My concern in this area is, if you're not explicit enough about when something is unique, then

everything is going to be unique. And you may be imposing analysis requirements on something that are not appropriate. You may be imposing very long-term complicated analysis if you identify a new unique waste stream that's short-lived, for instance. And, in my opinion, that wouldn't be appropriate. So, the challenge for us, I think, is to develop criteria that apply for a specific unique waste stream, like depleted uranium, but then consider whether we need to make some sort of generic, or even like a reserved part to say you need to check and see whether this -- what triggers you to say whether your new material is unique, or not. And, if it is unique, what criteria do you apply to evaluate it, or is that simply done in the site-specific analysis process?

With the caveat that I said just a bit ago of you have to be careful that the criteria that you develop for the assessment are appropriate for the material that you're trying to assess.

MR. CAMERON: Thank you. Thank you very much, David. Let's go to Tom Magette, first.

MR. MAGETTE: Thanks, Chip. When I first looked at the way the NRC had defined this problem, and the Federal Register Notices, I thought this notion of approaching a unique waste stream was a good

idea. But the more we vetted this, the more I think it, basically, is overreaching maybe - I don't know if that's too strong a word or not, but I'm reminded of what Beatrice said yesterday about the notion that what's so wrong if we are back here in 20 years? Twenty years is a long time. We know a lot about radiation protection guidelines that have changed, uranium transport has been mentioned. So, there are a lot of things that do change over time that we would want to be able to accommodate, so I don't think we have to answer, and, frankly, I don't know how we would answer how do you account for something that you can't label? I don't think you can define something that you haven't even named, so I don't believe that there's any need for, or way to define the generic unique waste stream in this rulemaking.

I believe, and this goes a little bit beyond what I said in Maryland, I actually think this probably falls into the larger rulemaking that you are contemplating in terms of Risk-Informing Part 61. I like the way DOE approaches this problem. And Marty, obviously, can talk better to that than I can, but this notion of a site-specific performance assessment that has a time horizon to it, and some requirement for periodic updates, whether that be driven by

strictly the passage of time, or the loading of various isotopes and waste types that come into a site. But the notion that this is not just a depleted uranium topic, which I think captures your concern, David, about not being overly restrictive in the law of unintended consequences capturing something in a way that's unfairly, or unnecessarily restrictive. But I do think that you're going to capture this in the source term. We didn't talk about this a lot yesterday afternoon, I don't know if it's just because people were tired of looking at each other or what, but we didn't get into source term, and what source term are you talking about the way we did in the last workshop. And the notion that that source term should be the waste that's at the site.

If you're going to do a performance assessment, you need to account for whatever it is that you're disposing of, wherever you're disposing of it. So, I think that -- to me, I think we should get away from this broadening of the topic, because I don't think it's really helpful. And, as I said, I don't know how we would do it. I think if we capture the requirement for a performance assessment, and we properly treat the source term, and we have some specific requirements for updating performance

assessments, then we will have addressed the problem.

MR. CAMERON: Okay. Thank you, Tom. I think that's a good summary of what we heard in Bethesda. And I think that there was some discussion of the source term considering what's at the site. We did it under the banner, I think, of the term "cumulative". And if I'm not mistaken, that may be something that Vanessa had brought up. But, at any rate, thank you for that summary. And, David, do you have something quickly, or not quickly, but -

MR. ESH: Yes, it is quick. Just an example I want people to think of. Say in this case depleted uranium has the potential to emit radon. Okay? And our regulations right now in low-level waste are not clear as to how you would -- whether you would apply a flux limit, or include it in the dose limit, et cetera. So, if you have a unique waste stream, whether it's depleted uranium right now that we're talking about, or something in the future, I still think there needs to be at least something to tell you when you need to look at either the technical analysis in some way, or the criteria that you're applying to insure that you don't have this uncertainty, or ability to not address appropriately the safe disposal of that material. So, that's the

analogy I would make.

MR. CAMERON: Thank you for adding that, David, because that's, indeed, the tension, so to speak, between just saying we're going to handle it in the site-specific performance assessment, so there needs to be some consideration of that. Let's start with Beatrice, and we'll go down the row here, and then over to Scott.

MS. BRAILSFORD: Okay. I, too, don't think we should try to come to grips fully with this, in this context. But I have a couple of questions, and some concerns that just this preceding discussion has raised.

This is for NRC. In the Federal Register Notice, which I realize I didn't bring into the room with me, one of the examples of a unique waste stream was, for instance, waste produced by new reprocessing facilities. And since NRC has flagged this as a problem that you think has to be addressed at some point, and I would say down the road, please tell me what currently extant waste streams you think fall into the unique waste streams.

MR. CAMERON: Okay. That's a good question. And, Dave, are you going to try and attempt to answer that?

MR. ESH: I don't have an answer for that. It's a good question, we're going to have to think about.

MS. BRAILSFORD: Well -

MR. ESH: Maybe somebody else here has -

MS. BRAILSFORD: You did the, for instance, new reprocessing facilities, so that had to -- you had to have had a barrel of waste in mind. Right?

MR. CAMERON: And Larry Camper may be able to address this.

MR. ESH: Yes. I think the bottom line is, we have to try to anticipate things that are significantly different in their characteristics, and/or quantities that would potentially be a low-level waste material. So, besides those two examples, I think, as Tom indicated, it's hard to anticipate. But what I want to know is, is there a way in some generic sense to capture that issue, even if you can't anticipate them today?

MR. CAMERON: Okay. Thank you. Thank you, David. Larry?

MR. CAMPER: In listening to Tom's comments of a few moments ago, I was reminded of the discussion that took place in Maryland a few weeks ago

on this topic, and then hearing Beatrice's question really brings it to the forefront.

The simple answer is, from a process standpoint, the reason we put this question on the table is, looking back at what happened when the Staff created Part 61, 1979-1980, and, clearly, large quantities of depleted uranium were not envisioned, as we discussed yesterday, what we're trying to do is be as visionary as we can now, and not repeat that error, or process, or what have you, again. But aside from the one or two waste streams, waste processing that have been mentioned thus far, we have not identified any.

The question was more conceptually, could we put our hands around what unique waste streams might be to prevent what happened thirty some odd years ago, or whenever it was when Part 61 was done. So it's a conceptual question. Is it possible to define unique waste stream? Is that fair, Dave?

MR. CAMERON: That's very good, because it let's you know why this is being considered. And I think that's helpful. Beatrice, before we go to Vanessa, something else?

MS. BRAILSFORD: Yes. I guess, my concern has now been enlarged.

MR. CAMERON: Thanks, Larry.

MS. BRAILSFORD: The assumption is that these unique waste streams will be low-level waste suitable for shallow land disposal, and that is, I don't think that the problem occurred in the `80s. I think the problem occurred a couple of years ago - well, last spring, this spring. So, I mean, I really -- I'm fairly confident that the Federal Register did not say unique low-level waste streams, so I suggest very strongly, let's not go there.

MR. CAMERON: Okay. Let's go to Vanessa.

MS. PIERCE: Some of my concerns are actually pretty similar to Bea's, which is that the way our current low-level regulations are set up, things are -- too many things de facto fall into the Class A category, things that do not smell, walk, or look like traditional Class A waste. So, I appreciate that this is kind of a difficult dance we're doing, given that there's some interest in revisiting the entire waste classification system, and moving from a concentration-base system to a risk-base system, but, I guess, my concern is that the discussion that we're having now is assuming that these unique waste streams would probably be in that Class A rubric, when, in fact I would posit that they should probably be in a

Class Q rubric, or something like that, because of the unique long-lived nature of those waste streams. And I think it's problematic for the siting of future low-level waste sites that if those sites are going to be sited with the current parameters that are out there, you're not, necessarily, going to have the long time frame that you need to in terms of the performance assessment in order to insure that that low-level Class A site would, in fact, be appropriate for some of these unique waste streams. So, I think that's my main concern.

And then, I guess, I just was kind of curious. We've seen reprocessed waste as kind of one of those examples of a potentially unique waste stream. And yet, the Savannah River depleted uranium that's being sent here is from reprocessing, so I just kind of wanted to know if there's any clarity in the NRC Staff's mind about reprocessed uranium, and whether that's DU, or some other type of waste?

MR. CAMERON: Could we just do a clarification on that before we move on? Chris?

MR. McKENNEY: Actually, a couple of clarifications. We understand your comment about the generic and default nature of the rules there. But I wanted to clarify that we have not made any

determination that we would be stepping away from a concentration-based classification system for the long-term rulemaking. The risk-informing part may result in changing the numbers a little bit, changing the numbers based on newer understandings of health effects and other things like that, but it could still result in a numeric classification scheme.

As to the other one about enriched, sorry, not enriched, but the uranium resulting from reprocessing, that would, potentially, be a -- one, it's very similar to current uranium, so other things that you get from low-enriched uranium facilities that currently get disposed of. So, that is a potential waste stream that would need to be considered in a site's performance assessment, in addition to the fact that reprocessed uranium doesn't contain fission products in it, which is not -- for normal uranium you get if you're just digging up dirt in Toronto, Canada and shipping it down. But, most of all, those already are in the classification scheme, so they would have to be considered.

The streams we're talking about that we're sort of envisioning in the -- when we mentioned reprocessing was that there are some waste streams out of a reprocessing plant that are low -- that are

relatively low concentration, that may be different than what we see out in nuclear power plants, and other things like that, of different levels of concentrations of Technetium in them, or Cesium, or other nuclides, but in combination may be different than the waste streams that you would have saw of something else. That was sort of the implied thing of -- and we don't know what those waste streams completely look like, because we don't know what a commercial reprocessing plant's operations are going to be at this time. We don't have rules in place for us, and we don't have actual conceptuals really out on the -- for the United States, we don't have conceptuals out there for that.

MS. PIERCE: If I could just say one kind of final thing. I think, to me, that's a very good point, and that's why I think it's important that we hold off on trying to do a whole lot, aside from maybe tag waste streams that would be -- that should be considered as unique, but not set forth any kind of guidance, or parameters, or rules about what to do with them, because we've already heard a lot of criticism and concern that we're trying to set the square peg of depleted uranium into a round hole, which is shallow land burial disposal. And I would

just hope that if there are going to be future waste streams, that we start with a clean slate for those things, and don't just try to shove them into a shallow burial facility.

MR. CAMERON: Okay. Thanks, Vanessa. And we're going to go to Dave for a point here. Go ahead, David.

MR. ESH: Yes. And I wasn't meaning to imply that in some way we would take any new material, and automatically assume it's low-level waste. We will obey all the definitions and rules regarding waste streams as to how they should be partitioned now. We may have new materials that don't fit in those definitions, or they do fit in the definition of low-level waste now that we would have to address. The bottom line is that the unique waste stream analysis and technical criteria will have to insure that it's safely disposed of, regardless of what class you would think it is. The analysis has to demonstrate a safe disposal, including the things like the panel have talked about, consideration of long-term processes, if necessary. So, that's the bottom line with regard to the unique waste stream rulemaking.

MR. CAMERON: Okay. And I don't know if

there's any symmetry here, you use the term Class Q. And I'm just thinking back to one of Tom Magette's comments about this is something that should be considered in the long-term rulemaking that re-look at classification, and maybe that's where that all gets wound up.

Beatrice, do you have a quick point before we go to Christopher?

MS. BRAILSFORD: I'm sorry. And this is just because I'm not from around here. The 14 tons of depleted uranium that are coming in soon to Energy Solutions from the Savannah River site, I guess my understanding had been that it is from reprocessing, which is kind of weird, to me. Thank you. It's not? Okay. So, I would appreciate an explanation of that. But, also, just circling back, I'm a little bit of a reprocessing obsessive. Was NRC thinking of any waste streams from pyro processing, electrometallurgical reprocessing, or were you thinking only of aqueous reprocessing, when you use that as an example of a unique waste stream?

MR. McKENNEY: We're not that specific at this point. We were thinking just a really broad picture, really big idea of, if some -

(Simultaneous speakers.)

MR. McKENNEY: In 1980, we didn't have reprocessing. We had an Executive Order that said there would be no commercial reprocessing of waste. And that's why we're saying, you know, of these waste streams, what are things that weren't some of the things from a big picture point of view, and that's why we put that example. But from a big picture point of view, what is a source of waste streams that were not included potentially in the Part 61 analyses.

MR. CAMERON: And I think it's important to get a clarification here on something, and I'm going to go to our staff that deals with reprocessing on this. And, Beatrice, in terms of your specific question, is that if that can be done offline, that's probably the way to deal with that, in terms of what's coming in here, unless when we get to Tom Magette, he has something to say on that. That would be fine. And please introduce yourself.

MS. MARKHAM: Kelli Markham, NRC. I am leading the Agency's working group for developing the regulatory framework for reprocessing, for licensing reprocessing facilities. And I would just like to say that as part of our effort, we have identified some of the issues that are being discussed here, but it is premature to start discussing specific waste streams

at this point. We are developing a series of public meetings to talk about this issue, and this issue, in specific. So, we would, at that point, have a little bit more to say on that.

MR. CAMERON: Okay. Thank you. Thank you, Kelli. Let's go to Christopher.

MR. THOMAS: Well, as I'm sitting here right now, I don't think this is that complicated of an issue, because, to me, Class A -- right now, in regulations Class A is this catch-all generic, as Vanessa said. But it doesn't have to be written that way. I mean, to me, the Class A should not be defined as what is excluded from the other categories, it should be an affirmative. And the way you get to those affirmative radionuclide concentrations is you look at what was analyzed in the EIS that is the basis of the waste classification system now. Once you have Class A being an affirmative, essentially, category, then everything else that was not analyzed in the underlying analysis becomes Class Q, or whatever you call it. And under that way of looking at it, depleted uranium of this quantity would fall into Class Q. It would not be Class A.

And just to go along with that, I mean, I really -- I'm very concerned that the initial approach

taken on this was hey, let's -- instead of calling this Class Q, let's call it Class A. Well, because we all know that it's so different than what was originally conceived of as Class A, so we've been calling it Class A with an asterisk, to mean that it is totally different. So, I would feel much more comfortable with a way of doing things that, like I said, takes Class A, makes it an affirmative category, and creates a new class for everything that was not analyzed as part of the classification table framework.

And then the other thing I did want to say is that, I think there's a topic on this later, but we started talking a little bit about this new categorization. Well, risk-informing the current classification scheme. I do want to just note that I have a concern that a state like Utah, that may say hey, we don't want to take Class B and C waste, which is what we have said, as a state. I would want to make sure that any new classification not undermine a state's ability to do something like that, kind of retroactively, because in conversations we said well, what if after the new waste classification, we don't have a Class B and C anymore, they're called something different. I just would want to make sure that if a

state like Utah had said certain things as a matter of policy, that those not be somehow totally dissolved as an unintended consequence of changing the waste classification structure. Thanks.

MR. CAMERON: Okay. Thank you, Christopher. Let's hear from Peter.

MR. BURNS: I agree with what we're saying regarding reprocessing waste streams. I think it's completely unreasonable to predict what those might look like at this moment in time. And it probably is reasonable to assume we will be seeing some of those somewhere in the next decades, but what they'll look like, who knows? There's a lot of emerging chemistry, and uranium chemistry that could change the game totally relative to the reprocessing methods that we have right now.

I wanted to try to respond to the actual question, which was, should there be a trigger to call it a unique waste? And I know nothing about these different classifications of waste streams, and so on. That's not my -- the realm I live in, but if I had to identify a trigger, it would be the length of risk, the length of time. And, in other words, it would be, is this particular waste that may be defined a unique waste stream, is this particular waste -- does it

still pose a significant risk to the environment, and to human health beyond the regulatory time frame that's set out for the waste site? And, if it does, then it's something special. Does special equal unique? I don't know, exactly, but, to me, if it's -- for example, from a reprocessing site, if we're disposing of Cesium 137, well, it's gone after 175 years, or 200 years, or whatever. That's very different than if we're disposing of Technetium 99 in some sort of a waste form, because it's half-life is 200,000 years. So, this distinction of what becomes unique, to me, might be based on time relative to performance.

MR. CAMERON: Thank you, Peter. And, David?

MR. KOCHER: Yes, I think this can be done, and I think Christopher, basically, had the right idea. I would flesh it out a little bit. I see that the fundamental problem here is that your classification tables contain too few radionuclides, potentially. So, I think what might work, and please don't go away saying that this is the only way to do it, what might work, the flaw in the present system in Part 61 is that you have no requirement for a site-specific intruder dose assessment. It's all done

generically to develop the waste classification tables. And the boogeyman here is the Class A problem, where everything that's not in the tables gets dumped in there. So, a way, not the way, a way around this is to require site-specific intruder dose assessment for radionuclides that are not in the waste classification tables. And if it's above some -- if it doesn't qualify as Class A waste, or some fraction of Class A waste, because you have to apply this sum of fractions rule to everything, then that's a trigger. I think that could work.

This is, basically, what DOE does. DOE sets disposal limits for everything, and they're not anticipating what may or may not be in waste streams. They do it for the periodic table, and go home.

MR. CAMERON: Okay. And we're going to get to Marty, and DOE on this. Let's go to -- Larry, do you have something on this that -

MR. CAMPER: I thank my colleagues in the State of Washington for using his -

MR. CAMERON: Okay.

MR. CAMPER: No, I want to share with the panel, we got to an interesting point in the discussion in Maryland, and I think you should have the benefit of that knowledge currently.

As I said a few minutes ago, the staff started trying to explore this conceptually. Could we, should we, can we identify the concept of unique waste? And we did so for the reasons that I said a moment ago; and that is, is it possible, or to what extent is it possible to prevent, or at least mitigate the process that occurred in 1979-1980.

The panel had a discussion much like this one. At some point, someone on the panel said look, you really don't need, and shouldn't try to define a unique waste stream, because, in fact, if you require a site-specific performance assessment, you will have to address, necessarily, then that particular waste. Therefore, NRC, don't waste a lot of time and energy trying to define unique waste stream, because you don't have to. Your site-specific performance assessment will get at that.

At that point, I then shared with the panel what I'll share with you now. And what I shared with them is some mission words that came out of an order, CLI-05-05 in the matter of LES on January the 18th, 2005. The Commission stated: "Indeed, when Part 61 was issued, its Environmental Impact Statement explicitly acknowledged that the NRC might receive license applications involving disposal of low-level

radioactive waste requiring either an enhanced near-surface disposal method, or intermediate land disposal methods. It was, and remains, the NRC's intent to retain the flexibility to be able to address these license applications in the existing framework, Part 61 Rule, and in the end, the bottom line for disposal of low-level radioactive waste are the performance objectives of 10 CFR Subpart C, which set forth the ultimate standard and radiation limits for, one, protection of the general population from releases of radioactivity; two, protection of individuals from inadvertent intrusion; three, protection of individuals during operations; four, and stability of a disposal site after closure. Thus, while there may not yet be detailed technical criteria established for the kinds of license disposal that might be proposed under Part 61, criteria can be developed on a case-by-case basis, as needed. Specific disposal requirements for more stringent land disposal methods, therefore, we left to be addressed in an action on a specific application, subsequent guidance, and rulemaking effort, if rulemaking is warranted." End of quote by the Commission in that order.

I asked the panel, given what they had reached in their discussion about the lack of a need

to define conceptually unique waste streams, and the fact that a site-specific performance assessment would get at that, didn't that position, that thought, seem to be consistent with what the Commission has articulated in the order? And there was general agreement, I think it's fair to say, or, certainly, not disagreement with the fact that yes, that was the case. I just wanted everyone to have the benefit of that discussion that took place in Maryland. Thank you.

MR. CAMERON: Okay. Thank you, Larry. And we're going to go to the tents that are up now. And if anybody, including you three, has any comments on what Larry just put on the record, please feel free to comment on that. Scott?

MR. KIRK: Well, I agree that unique waste streams would be very difficult to define in a rulemaking, but I would say the analog should be viewed as sort of an unreviewed safety question. If you developed a framework for intruder scenarios, and you've already bounded your performance assessments with various waste streams which defines your source term, it could be handled in licensing space. And what I mean by that is, if you get a new waste stream that comes in, and it's not included in your

application, or your performance assessment, and it hasn't been bounded by your performance assessment, then the rule could trigger, you know, you update your performance assessment. You send it to your state regulator, and they review it in this particular context. And NRC has plenty of experience on handling things for change control and the source of things, so it seems to me that would be a very viable solution to this problem.

MR. CAMERON: Thank you very much. Thanks, Scott. Marty?

MR. LETOURNEAU: Why don't you do Tom, first?

MR. CAMERON: Okay.

MR. MAGETTE: I appreciate a lot of the comments that have been made, particularly, where David was heading. Although, I still don't think that was the topic for this rulemaking. I don't agree -- I don't disagree that we shouldn't go there, but this -- the discussion of reprocessing is illustrative, I think, of part of the problem, as I think Kelli, and Chris, and David have clarified. Just to state it explicitly, there's no such thing as a reprocessing waste stream. You have multiple waste streams, some may be Class A, some may be other low-level waste

that's not Class A, some may be transuranic, some may be high-level. We don't know, as it was also pointed out, until we do have technology. There are existing technologies in other countries that we use, that do produce specific waste streams, but those are also being debated in this country because of other concerns, for example, non-proliferation concerns that you might want to change either the waste streams, or what goes into the new fuel. But the thing that's illustrative about that part of the discussion is, it's focusing on the source of the waste, as opposed to the need to protect the public health and safety and the environment from the impact of disposing the waste.

I would argue that the source of the waste is, essentially, unimportant. And we have created a system by virtue of necessity at the time it was created, that was dependent upon where did it come from? Where it came from is not as important, I would argue even that it's not important at all, but certainly not as important as where it's going. So, I don't think you're going to end up with lots of de facto Class A waste streams, which I think goes to Vanessa's concern. But that's what I think you want to get the focus on. That's what I believe is the

focus of the next rulemaking, not that they have to be separate, but as currently constructed, they are.

I also understand David's point, and I appreciate that sensitivity, but I also would argue that if you have a broader requirement for a performance assessment, that you, I don't think, should be -- I would say you wouldn't find yourself in the position. If you also make changes to Subpart C, which I think you should, as much as I argue a lot of this belongs in guidance, I also think there are some things in guidance today that belongs in regulation. Because (A), you don't want to, necessarily, give people flexibility there, and you want to clarify what's required. But if you do put those dose requirements for an inadvertent intruder, and period of performance into Subpart C, then I don't think anybody would be able to argue that they don't have to address radon.

What you talked about when the draft EIS was prepared for Part 61, I mean, the reason certain pathways were excluded, because of the relative contribution of the isotope, or the exposure to dose, made perfect sense, makes perfect sense. But nobody should be able to look back to that, to justify not analyzing an impact that's real. I'm certainly not

suggesting that we should. That's why I go back to saying the performance -- the requirement for the performance assessment to meet the performance objectives of Subpart C captures these issues. And I believe that if you do this properly today, you have, essentially, informed how the next rulemaking will look. I think you can risk-inform Part 61, but I think these issues all get captured in a performance assessment requirement, if it's correctly articulated in the regulations. And I think it's analogous to what DOE does, where, essentially, you look even at waste loading capability of a site, and you reassess when you're approaching those limits that you said were okay for this site, or if you have something coming in that you didn't analyze, you want to have something come in that meets your classification requirement, and, yet, you didn't analyze that waste type, or those isotopes, or that waste form in your existing performance assessment, then you have a requirement that you look at them. And it's not a start from scratch, reinvent the wheel, build a model. I mean, DOE does these kinds of updates in a matter of weeks, because once you've built that framework, and you have it in place, it's not then that overwhelmingly difficult of a challenge to update, to

review the changes in the waste types, or the waste loadings that you're talking about. So, I think it all comes back to the performance assessment, and the performance objectives.

MR. CAMERON: Okay. Thank you, Tom. And as many of you said, and I think Tom just said it, specifically, some of what you're discussing here is also going to be directly related to this discussion later on this afternoon about the long-term rulemaking. And one suggestion that we just heard from Tom is Subpart C and this rulemaking for a site-specific performance assessment, that may be very instrumental in terms of what is done, what comes out of the long-term rulemaking.

Marty, we've heard a lot about DOE, so let's go to DOE.

MR. LETOURNEAU: Well, I think what I just heard is that Tom agrees with what Larry read. I mean, I was hearing -

MR. CAMERON: Thank you.

MR. LETOURNEAU: And I think that that is a very good focus, and captures the issues. If there is a need to develop a definition of what a unique waste stream is, I think David Kocher has an elegant solution. It's what's not in the tables. But what I

wanted to address is this idea of reprocessing waste.

(Off mic comment.)

MR. LETOURNEAU: No, no, no, no. That's okay, Beatrice. I just want to make sure that everybody understands what we're talking about, because we use it as a verb, and an adjective, and on one level it's very innocuous, and on another level, it's a term of art that has very specific implications. So, the piece from the Federal Register Notice, which I did bring, that you were referring to is, Question II-1.5. "Should the NRC consider waste streams that result from spent fuel reprocessing, and are not high-level, or greater than Class C waste in the definition of unique waste streams?"

Typically, when we're talking about reprocessing, that's code for reprocessing of spent fuel. That's important, as many of us know, because the Nuclear Waste Policy Act definition is that waste from reprocessing of spent fuel is high-level waste. So, when we talk about reprocessing of other things, we're not, necessarily, talking about generating high-level waste. But if we are talking about reprocessing of spent fuel, then we are talking about generating high-level waste. And the issue that some of us have been bouncing around here is, that some of those waste

streams that come from reprocessing of spent fuel, that otherwise fit the definition of high-level waste, may be very dilute, may have very low concentrations of key radionuclides, and could be solidified, be less than Class C limit, and be managed to meet the low-level waste performance objectives. And I think that's really the issue that you were talking about, isn't it?

MS. BRAILSFORD: It's part of the issue.

MR. CAMERON: Okay. Could we -- it's part of the issue is the response from Beatrice. Okay. Thank you. Thank you, Marty. Let's go to Vanessa.

MS. PIERCE: Two -- well, one just quick thing. I was wondering if, at some point, Larry could provide us a copy with the statement that he read, because it's a little bit hard for some of us to process things if we don't read that technical language.

MS. BRAILSFORD: Or reprocess them.

MS. PIERCE: Or reprocess them, exactly. And I wanted to respond to some of Tom's comments. I agree that it's problematic that we have more of a nuclear waste caste system than a classification system. I know I'm not the first one to have said this, but I think it's a good analogy. We look and

care more how the waste was born, than on its radiologic characteristics. And an example of why I think it would be good to reexamine that is, here in Utah, we've had a problem with mill tailing waste being reclassified, or renamed, so that waste can be disposed of at a low-level waste site, that in certain concentrations that might not have jived with our existing standards for Class A, B, and C. And you also have a similar issue of waste that should be treated as low-level waste, being processed through a uranium mill, and the State of Utah raised concerns about sham disposal. So, I think that if you got rid of the caste system, and just looked at the properties of the materials themselves, you wouldn't have these kind of strange loopholes of waste going to facilities that might not normally be important, if you actually just looked at the radionuclide.

MR. CAMERON: Okay. Thank you, Vanessa. And what Larry read is a public document, and, of course, it can be reached through the NRC website, but Priya has assured me that we would try to make copies, hard copies of that segment of it available this afternoon.

(Off mic comments.)

MR. CAMERON: I think we should give it to

everybody. Okay? So, we'll do that for you. And if you want to see the whole opinion, it is accessible through the website. And if you want some guidance about how to find it on the website, we'll be doing another two-day workshop on that.

MR. CAMERON: No. We'll try to tell you how to get to that. Christopher?

MR. THOMAS: Well, I think we just had a rare, I might even say beautiful moment of rare agreement between Heal Utah, and Energy Solutions, I suspect. So, I kind of hesitate to say what I'm going to say now, but there was a lot that I liked in what you said, Tom. The problem -- so, if you look at what Larry read, and what I think Tom largely agreed with, in principle, it sounds good. It sounds really good. However, I've got to compare that with what has actually happened. And part of my criticism is that in the site that I'm most familiar with, which is the Energy Solution site, I've seen letters from the site to the -- I think this particular letter was to the NRC, and it said look, we've already done a site-specific analysis on our site with depleted uranium, and according to that, you could fill the entire site with depleted uranium, and it would meet the performance objectives.

So, you have to ask yourself why? And you have to ask yourself what were the assumptions underlying that analysis, that reached that conclusion. So, I guess my concern is that the principle on paper, and the reality, to me, have had a big disconnect. And, David, when I hear you talk about your concern, I think what we're really talking about is a higher standard of review, potentially, for unique waste streams that were not considered in the previous low-level waste classification rulemaking. And I tend to agree with that.

And I'll go back to what I said before, that, to me, this isn't that difficult. You've got a space that's been analyzed, and you've got a space that's been unanalyzed. That space that's been unanalyzed should probably have a very set standard of review, so that, at least, there's some agreement from the parties up front what's important to deal with, and what isn't.

MR. CAMERON: Okay. Thank you, and I'm glad you brought that back up to a generic point. I mean, it's always easy to go into what is happening in Utah now. And, obviously, a big issue of concern for everyone, including the licensee -- and we're not here to debate the merits of the Clive disposal, but the

issue of what happens if there are more stringent requirements. The difference between the principle that Larry read, and the reality is an important issue for the NRC to consider. And we may get back to that again when we talk about what are the Agreement States doing in the interim? What happens when the NRC rule comes out? What implications would the NRC rule have for the existing Agreement State schemes?

David, and then we'll -- Dave, did you have something else you want to offer before we go to Dave?

MR. ESH: Mine was just along what Chris said. I think he expressed the view that I was trying to express, initially, but maybe not from a depth of review standpoint, but in a clarity of regulatory requirement standpoint. But it's, essentially, the same concept of how do you insure that reality meets the principle?

MR. CAMERON: Good. Okay. Great. Let's go to Dave Kocher, and then Tom Magette, and then perhaps we'll see if the public has anything on this particular issue. David?

MR. KOCHER: Yes. Can I say, I basically agree with Tom and Marty's opinion that my scheme would work. I do have one concern about the statement

by the Commissioners, and that is, what do they mean by "site-specific assessment?" Because in NRC space that term doesn't mean site-specific intruder dose assessment. It only refers to the off-site stuff. So, this is the major thing that would have to be incorporated into this process for performance assessment to handle the problem.

MR. CAMERON: Does the NRC agree with David's characterization that it does not include the intruder?

(Off mic comment.)

MR. CAMERON: Okay. The NRC agrees. Go ahead, David, put that on the record.

MR. ESH: Yes, I agree with David, currently.

MR. CAMERON: Okay. And, Tom?

MR. MAGETTE: I think that, obviously, I agree with David, too. I think it's clear, that's I think the reason we're here. I mean, I have said that I think that Subpart C should be tightened up to take what's currently in guidance, and put in the regulation. We don't have any objection to that. So, without trying to discuss performance assessment of Clive, per se, or what's been done, or why it was done, or what the regulatory standard that was done to

meet, apart from that, I think what we're trying to do today, essentially, is advance the ball. And, also, with the risk-informing approach to the overall Part 61, I think it's important to recognize, this came up a little bit yesterday, this is why I had you put this in the parking lot, Chip, about Part 61. Part 61 is license requirements for the disposal of radioactive waste. And it reads, in many cases, like it's a siting, or a licensing analysis that you would do on the front end, and once you've done it, you're finished. And Vanessa had some questions about this yesterday. But it's a rule that applies -- it wasn't used to license the Clive site, but it certainly applies to us. And we have to comply with those regulations, even Subpart D, that seemingly might have had only some application in the past. That's not the case. Licenses can be modified, licenses can be revoked. That's a real time regulation that we have to comply with in real time, or, in our case, in an Agreement State with the Utah version of that. So, I think -- I just want to be clear about the application, the broad application of Part 61, however you might read it, those words at face value. It does apply, and to the extent that we don't comply, there is regulatory action that can be taken. So, I think

what we're looking at in this process is a way to establish what it is that you have to do in a performance assessment, when you have to do it, and how you then demonstrate that you comply with the performance objectives in Subpart C. Going back to the agenda topic of this session, does one then, therefore, need to come up with a new definition of a unique waste stream in order to accomplish that? I would say no, you don't.

MR. CAMERON: Okay. Thank you, Tom. Marty?

MR. LETOURNEAU: One of the themes that we have touched on throughout the two days is what goes into regulation versus what goes into guidance. And I think that this is, again, a good example of where are you on the margin? If you put enough into the regulation, do you need to put a little bit more? I can look at Part 61, specifically, the performance objective for protection of the intruder, and I can say that implies nothing in terms of a site-specific analysis. That could be, just tell me what general things you're going to do to protect the intruder. How big are your boulders going to be? What signs are you going to put up?

Alternatively, in 435.1, we went a little

bit further, and we said you will do an analysis of the potential for impact to an intruder, both in an acute scenario, and a chronic scenario, and you're going to use 100 millirem, and 500 millirem for your objectives that you're going to measure against. So, again, this is just one of those issues of yes, maybe we need to revisit how much is in the regulation, versus how much is in the guidance.

MR. CAMERON: And DOE Order 435.1 might give an example of how you might, in terms of the intruder, of how you might deal with that.

MR. LETOURNEAU: I'm not saying that's the way to do it, but that's what we did.

MR. CAMERON: Okay. Thank you very much. Thank you all for that discussion. Do we have anybody in the audience on unique, who wants to comment, or ask questions about unique waste streams? And, Dirk, I'm going over towards you.

MR. DUNNING: A couple of things. You've covered a broad range this morning. The first thing I'm struck with is, you were talking about potentially redoing the classification scheme entirely. And the thing that is interesting about that is, that if you wait long enough, all things come around and are new again. 2009 marks the 20th anniversary of a Joint

Petition by the States of Oregon, Washington, and the Yakima Nation to do precisely that.

One of the comments that, or questions earlier, had to do with reprocessing. One of the things I'd encourage you as you think through this, consider that if you do the reprocessing, or if that somehow gets folded into this, or later rules or other actions, that you also need to be thinking about all the other ancillary and associated facilities, whether it's fuel fabrication, vitrification facilities, pre-treatment facilities, treatment facilities, there's a long list. And it's likely much too long and complex to fold into this process.

The other one, in thinking about some of the questions earlier about Technetium and some of other specific ones, is to remember, and this really for everybody, to remember that if this is really that broad a rulemaking, that those things include things like the mortonite filters for silver, and the zeolites, and ultra filter leavings, and all kinds of other things. Particularly, DOE is coming up against this now looking out 10 years from now at the operation of the vitrification plant at Hanford, where there's a whole lot of things there that are going to end up being miscellaneous cats, and stray dogs, and

some of them are going to be really difficult to deal with, and really hot. And they're going through a lot of these processes in parallel with the things you're beginning to talk about.

The one question I'd have for you is, at the same time, DOE is also dealing with other leftovers of days gone by. In particular, a very large quantity, about 2 metric tons of Uranium-233. The current plan for that is to dilute it to 1 percent in U-238, and dispose it at WIPP as transuranic waste. For that, and thorium waste, and other related things that are also stray cats and dogs, is this process intended to address those, as well?

MR. CAMERON: Dave, stray cats and dogs?

Okay. I guess that's the answer. And we may want to talk to Dirk offline more on that. Chris, did you have something to say on that?

MR. McKENNEY: Stray cats and dogs is the point of sort of trying to say do we need a definition of unique waste streams? But, also, making sure that the philosophy of any changes are such that they are broad enough, have the right triggers in place and stuff to analyze if those radionuclides aren't properly analyzed for a disposal site. I think from the discussions that we just had, I think that's the

philosophy that came out, was are you still within the envelope of you've already assessed for safety of the facility, or is it something that is different in some aspect from what was already analyzed? So, if it is, then you're going have to re-analyze. I think that's from the discussion. So, will we look at a specific cat or dog that's been listed? I don't think that that was the point. The point was more of, you need to set up the process such that you can just find out when you do have a cat or dog, and then you need to go down the point of assessing that, specifically.

MR. CAMERON: Okay. Thank you, Chris. John Greeves?

MR. GREEVES: Yes. Good discussion this morning. I'd just point out that this discussion of a Class Q, that's a good concept. And I would -- if I had to do that, at the present time, I would point to 61.58. The people that put together Part 61, I don't know whether it was wisdom, or just luck, or something, but they built in a 61.58 provision. And if you get what I call an unreviewed safety question, whoever you are, the NRC and Agreement State, you have the opportunity to run into 61.58 and chase this Class Q question. So, it's there. In fact, I'll assert the NRC Staff has been doing this for a long time, and

they do it under the 3116 waste determination process. And you use a 61.58 process to answer the Class Q question. So, Chris, you know what I'm talking about?

MR. McKENNEY: I'd say we do something similar that would be expected in a 61.58 analysis. We don't actually do it under 61.58.

MR. GREEVES: For all practical purposes, it's a 61.58-type analysis, so I -- it answered the lady's rightful question about hey, it's not in the tables. Dave said that. Okay. You don't need actually a rule change to chase that issue. There's something in Part 61 that allows you to address an unreviewed safety question right now.

MR. CAMERON: Thank you, John. And, Vanessa, I guess you added a new phrase to the Lexicon, Class Q. And did you have something you wanted to say?

MS. PIERCE: Just one real quick second plug for, I think the easiest way to nail down what would be in Class Q, is to nail down, as Christopher said, what's in Class A. Once you define Class A, then whatever falls outside of that goes into Class Q. And that can trigger the -

MR. CAMERON: Okay. Thank you. And, let's go out for a final question or comment here

before lunch. Yes, ma'am. And please introduce yourself.

MS. CHANCELLOR: Denise Chancellor from the Utah Attorney General's Office. Have you given any consideration to what may be considered unique waste streams to be imported from foreign countries? And I have a second question, and that is, if you go forward with unique waste streams as Class A waste, how would that dovetail with NRC's proposed changes to waste blending? Could a licensee meet performance objectives through waste blending? Thank you.

MR. CAMERON: Okay. Thank you, Denise. Can someone from the NRC answer both of those questions?

MR. McKENNEY: Again, I think whether it's foreign or domestic, I think the way that coming into either the Class Q, or the general concept that if it's not been analyzed coming into the site, and it's not within the envelope already analyzed, then it would require some level of analysis, and to make sure that the time frames are appropriate, and everything else, for the material -- the radioactivity within the material that is coming into the disposal site. Whether it's foreign, or it's domestic.

As to the other one on blending, which is

outside of the DU, and some other issues of this, which is more of a particular about characterization, and classification, and when do you actually classify a material when it becomes waste? At what point in the process? That's sort of outside today's discussion, and is a matter that we are going to have public meetings on, changes to the Branch Technical Position on concentration averaging in the future. We're trying to set that up, and that would be the forum that we could get into much more details about the idiosyncracies about that.

MR. CAMERON: Okay. And Larry Camper?

MR. CAMPER: Thank you, Chris. I would only add to that a couple of points. At the moment, there is no policy consideration in play with regards to changing anything relative to the term "blending". The Staff is currently working to revise and update the Branch Technical Position on concentration averaging. Blending could be touched upon in that guidance update. What you have today is a set of -- blending, as we had said recently in our letter to Energy Solutions, blending is not prohibited by regulations, nor is explicitly addressed by a regulation. You find different verbiage over time in guidance space about this concept of blending, whether

you can do it, you can't do it, to what extent you can do it, and so forth.

The Staff is gathering a lot of information about blending. We're thinking about it a lot. We may, at some point, determine that it would be appropriate to speak to the Commission, confer with the Commission about blending in policy space, but we have not done that at this point.

MR. CAMERON: Okay. Thank you, Larry. We're going to break for lunch. There is a buffet, and Priya, correct me if I'm wrong, but isn't it out in this tent? Okay. So, the buffet, no tent. So, sorry about that, but there is a buffet. We have an hour for lunch, so come back around 1:00. Thank you.

(Whereupon, the above-entitled matter went off the record at 12:01 p.m., and resumed at 1:15 p.m.)

MR. CAMERON: Okay. I guess we'll get started with the first topic for this afternoon. And just let me do an agenda check, and then maybe we'll get all the rest of the people here. We're going to start out with Agreement State Compatibility. Then we're going to go to the Long-Term Rulemaking on Waste Classification, because we know there's interest in that. And there's been a lot of implications for that

out of things that have been said over the past day and a half. Then we have Other Considerations, and we had some specific things in mind when we put that on the agenda. We also have some related topics to add to that, and some parking lot items. And then we're going to wrap-up around the table, and we're going to listen to anybody who wants to make a comment to the NRC. And all of this discussion, all of the comment from the public is happening before the NRC makes a decision, so we're looking forward to that as being helpful to us.

And, with that, are you ready? Duncan White is going to tee up the Compatibility issue for us. It's a little longer than some of the tee ups, so just because we want to make sure that you have the information about how this works. And, Dave, did you want to offer anything? Okay. Go ahead, Duncan.

MR. WHITE: Thanks a lot, Chip. Yes, good afternoon, everybody. Again, my name is Duncan White, and I'm the Branch Chief for the Agreement Statement Program Branch to the NRC. And I'll be discussing Compatibility of Agreement State and NRC regulations.

Needless to say, compatibility is a complex issue. And before I talk about compatibility and its role it plays with Agreement State and NRC

regulations, I'd like to provide some background for you on the compatibility, and the NRC's Agreement State program.

The Agreement State program has been around for almost over 50 years now. Congress passed Section 274 of the Atomic Energy Act in response to increased state interest in radiation protection, and to also provide a mechanism to turn certain classes of radioactive materials to the states.

So, what is an Agreement State? It's a formal agreement between the Governor and the NRC Chairman, in which the NRC discontinues certain authorities, and the state assumes the regulation of radioactive material within its borders. The authorities assumed by the state normally include the regulation of byproduct, source, and special nuclear material less than a critical mass. It also may include the regulation to evaluate sealed sources and device, low-level waste disposal, and uranium recovery.

States become Agreement States for a variety of reasons. Recently, the assumption of NARM authority by the NRC under the Energy Policy Act of 2005, was a driving force for Virginia and New Jersey to become Agreement States. Motivated for nearly all

states to become Agreement States is to bring the various aspects of radiation protection under one roof. State regulation allows the states to exercise regulation oversight tailored to their local concerns and needs. Lower fees than the NRC, and maintaining these fees locally are also a strong driving force.

Besides the distinct feature of discontinuing certain authorities, instead of the typical federal-state relationship of delegating a program, the Congress envisioned the Agreement State Program to promote an orderly regulatory pattern, and encourage the states and the NRC to cooperate in the development of radiation standards.

Although, NRC discontinues its regulatory authority to an Agreement State, it does maintain an element of that responsibility to insure that the Agreement State maintains a program that is adequate to protect public health and safety, and compatible with NRC regulations.

Topic of low-level waste disposal, eventually, includes the topic of compacts. Although, Agreement States can be members of compacts, let me draw a few important distinctions between the two. The constitution allows a state to enter into a compact with another state, but only with the consent

of Congress. Congressional consent allows compacts to assume powers normally attributed to Congress, but only as explicitly authorized under the compact. The Low-Level radioactive Policy Amendments Act of 1985 authorizes states to enter into compacts to establish and operate regional low-level waste disposal sites. These compacts authorize the limit access to compact disposal facilities to compact states. The compact can limit disposal of low-level waste to compact sites, but they do not regulate matters of health and safety. These responsibilities stay with the NRC, and the Agreement States.

Regardless of the low-level waste disposal site's compact status, the Agreement State will license and inspect any low-level waste sites in its jurisdiction to insure compliance with health and safety regulations. The Agreement States performs their activities, again, with regulations that are compatible with the NRC's.

Key elements that make up an Agreement State program can be summarized in four broad areas. These areas also serve as the basis for the review of a prospective Agreement State. There has to be a licensing inspection, and incident response program designed to adequately protect public health and

safety, and compatibility with NRC regs, a program that has sufficient staff and technical training to regulate the licensees under their jurisdiction. Although, the NRC does pay for the technical training of the inspection license reviewers, the state may need to hire individuals with more specialized disciplines, if they're regulating areas, such as sealed source and device low-level waste, or uranium recovery.

With the exception of NRC money for training, the states have to fund their own program. This is usually done with user fees, and for most states, some allocation from the general fund. And to meet the compatibility with NRC regulations, each Agreement State needs enabling statutes, and regulations consistent with their state's administrative laws and statutes.

As you can see from this map, Agreement States play a prominent role in the regulation of radioactive material in the United States. There are 36 Agreement States which regulate approximately 85 percent of the 22,400 licensees in the country. New Jersey will become the 37th Agreement State at the end of the month.

As already been mentioned, the four

licensed waste sites in the country are all in Agreement States. The major waste processors in the country are also regulated by Agreement States. And if you notice, the map does not have a Region II. Region II still exists, but the reason it's not on there is, the Region II office is not involved with the oversight of radioactive material in the Agreement State program. The Region II office oversees reactors, and fuel cycle facilities. So, this is -- we don't have a new -- something didn't happen in the last week with the NRC.

As I discussed earlier, Congress requires the NRC to maintain oversight of the Agreement States. This is achieved through the Integrated Materials Performance Evaluation Program, or IMPEP. The IMPEP program is not only used to review Agreement States, but it's also to review the NRC's Regional Materials Programs, and the sealed source and device program based in headquarters. IMPEP reviews are performance-based risk-informed reviews. The reviews do not look at all activities, or all actions taken by the program during the review period, but focus on those that have particular health and safety significance. If an Agreement State performance is lacking in a particular area, the review will examine that aspect of the

program in more detail to determine the root cause of the performance problem.

IMPEP reviews are performed at least every four years, with a team of three to eight individuals, NRC and Agreement State technical staff. The on-site review is normally completed in a week, but may also include additional review time. The team will accompany the State or NRC inspectors during the review. This is usually done before the IMPEP review on-site. The team will look at five common performance indicators for the state or regional program. These include incidents, incident allegation programs, licensing, inspections. They also look, for Agreement States they'll look at compatibility, and if the Agreement State has that low-level waste program, or uranium recovery program, or sealed source and device, they'll look at that, also.

The team report is reviewed by senior NRC Management, and an Agreement State Program Director before the report and its findings are finalized. This matching review board is conducted at the public meeting held about two and a half months after the completion of the on-site review. The final report includes a determination of adequacy and compatibility for the program.

The performance criteria used for an IMPEP review is detailed in Management Directive 5.6. Management Directives contain the policy and procedures that govern internal NRC functions necessary for the Agency to accomplish its regulatory mission. The IMPEP program also has a number of implementing procedures issued by FSME, which are designed to provide specific guidance to the team on individual indicators, including low-level waste disposal.

So with all that set up, so, what is compatibility, and how does it relate to our discussion at this workshop? As I mentioned earlier, Section 274 of the Atomic Energy Act requires that the NRC insure that an orderly regulatory pattern between the 36 Agreement States and the NRC be maintained with the NRC regulations serving as the benchmark for the compatibility requirements. This requires that the Agreement State regulations contain no gaps, conflicts, or duplications with the NRC regulations.

Compatibility does not mean that everyone's regulations are the same. It was the intent of Congress to allow Agreement States to have some flexibility to regulate radioactive material under their jurisdiction to accommodate local and

regional concerns. Compatibility not only relates to regulations, but also to legally binding requirements, such as license conditions, and program elements, such as implementing procedures. The process that NRC uses to determine compatibility of regulations, legally binding requirements, and program elements are detailed in Management Directive 5.9.

So, how do we apply this concept? In Management Directive 5.9, there is an evaluation process to determine the compatibility category for each section, or even subsection of the NRC regulations that are required for Agreement State compatibility. It is not uncommon for the subsections of a particular regulation to have different compatibility terminations. The six compatibility categories that are in the Management Directive can be divided in three broad groups.

For Categories A and B, the Agreement State regulations must be essentially identical to the NRC's. This means, essentially, word-for-word. The basis for each category is different, but the result is the same. An example of a regulation that's Category A would be the basic dose limit of 5 rem per year in Part 20. An example of Category B would be the transportation regulations in Part 71. For

Category C, the Agreement State regulations must contain the essential objective of a section or subsection of the regulation. For compatibility health and safety, the regulations must embody the essential objectives for health and safety. For these two compatibility categories, the Agreement States can be more restrictive to the NRC.

Let me give you an example to illustrate what we mean by Compatibility B, and how we work it. I'll use the example of a radiation survey. The NRC regulation may specify how that survey is done, and how frequently it should be done. To meet the essential objective, the Agreement State regulation must also require the performance of a radiation survey, but the Agreement State may choose to require this survey to be done in a different manner, or at different, more frequent interval. This is acceptable, and the NRC will conclude that the state is compatible with regard to that requirement.

The last two categories, Category D is not required for compatibility, but the states may choose to adopt this particular section of the regulation. And Compatibility NRC cannot be adopted by the Agreement States, since the authority has not been transferred to the state. An example of Compatibility

NRC would be the review and approval of Type E shipping containers, which are detailed in Part 71.

Here are some examples of compatibility categories for different subsections of Part 61. As you can see, the Agreement States are required to have essentially identical regulations for Subsection 41 and 55, and have some flexibility to impose more restrictive requirements in 61.56.

During this workshop, we've had discussion regarding the proposed inclusion of a waste classification specific to depleted uranium. If the NRC proposed such a new classification under 61.55, the compatibility category proposed by the NRC would, in all likelihood, be the same as the current regulation, or Category B. If the final rule designates the new compatibility category as B, the Agreement State is required to have the same waste classification as the NRC. Again, something that essentially looks word-for-word as ours.

How does a performance assessment fit into compatibility? How the Agreement State performs or reviews the performance assessment will be part of the Agreement State's implementing procedures. The Agreement State's implementing procedures are part of what I referred to earlier as program elements.

Agreement State's implementing procedures for low-level waste are Compatibility Category C. And if a new Agreement State has to adopt essentially identical regulations for the DU classification, as I speculated earlier, how is the public going to get input into this process?

Yesterday, Andy provided an overview of the rulemaking process. The figure here is essentially the same, but it's been changed a little bit to emphasize compatibility. The rulemaking working group makes the initial compatibility determination. During the internal review process, the proposed rule compatibility determinations are reviewed by a compatibility committee, consisting of NRC and Agreement State staff, to insure consistent application of Management Directive 5.9, the implementation of the rule.

After the public comments are reviewed and evaluated, NRC Staff prepares the final rule with compatibility determinations. Before the final rule is published, the Commission will review the rule, and its compatibility designation. And the Commission has the final say on the rule's compatibility. The States normally have three years after the date the NRC implements the final rule to adopt compatible

regulations according with their own rulemaking process. Occasionally, the Commission has required a shorter time period for Agreement States to adopt compatible regulations.

As you can see from the figure, once the NRC adopts the rule as final, an Agreement State has to adopt the rules, the opportunity to effect the compatibility of the rule has passed. The opportunity for public input into the compatibility designation is during the NRC rulemaking process, before the final rule is approved.

The NRC reviews all drafts and the final version of all Agreement State regulations to insure that they are compatible with NRC regulations. This process is also applicable to proposed State statute changes that impact the Agreement State program.

In addition to review by the NRC Technical Staff, the NRC's Office of General Counsel also reviews each draft and final rule. The NRC Staff prepares a written response to the Agreement State that is reviewed and signed by NRC Management, and the review of all the regulations are tracked, and they are all publicly available on FSME's public website.

So, the compatibility process, as well as IMPEP and the rest of the policy and procedures that govern

Agreement State programs are publicly available on the public website. The FSME public website is linked to the main NRC website, which, as everyone know, is NRC.gov. The Management Directives I mentioned can also be found on the public website.

Of interest is the regulation toolbox, which has a complete breakdown of all NRC regulations required for Agreement State compatibility, and if you print them out, you're going to print 180 pages of information.

With that, thank you for your attention, and I'll be happy to answer questions.

MR. CAMERON: Okay. We're going to have questions and discussion around the table, and then we will go out to the audience for any questions or comments that they have. Vanessa?

MS. PIERCE: Thank you. I would like to have a little bit more clarification about this issue, and I'm glad that we're talking about it, because we recently have kind of butted our heads against the compatibility issue, the rocky road of compatibility with regard to depleted uranium disposal in Utah, came up at the Radiation Control Board meeting that happened the other day. And the way that the -- let me just say our understanding, and then I'd like to

express the understanding that I kind of received from hearing NRC yesterday, and then I'd like your clarification on the whole kit and caboodle.

Our understanding is that, as an Agreement State, if we move to impose the more stringent standards about waste disposal in order to protect the health and safety of Utahns, and if there is a solid fact-based decision for moving in that direction, that that is part of the prerogative of an Agreement State. The impression that we were given by the NRC's presentation at the meeting the other day is that, if an Agreement State imposes more stringent standards for health and safety purposes, that is a problem for the NRC. I believe that was the exact phrase, "That is a problem." And that, ultimately, that could jeopardize the state's Agreement State status. So, I'd like a clarification on that, so that we understand why the heck it is somebody would want to be an Agreement State, if we can't protect our own people.

MR. CAMERON: Okay. Duncan, are you going to take that?

MR. WHITE: I'll take that.

MR. CAMERON: All right.

MR. WHITE: What we -- I was at the

meeting on Tuesday afternoon. What we said in our slide is, it depends on the basis of the moratorium or ban, if it was a compatibility problem, or not. And what we also outlined on that slide is what steps we would take to look at such a moratorium, or ban. And, you're right, the -- one of the important things we said on that slide was the -- what the basis for that is. And there might be some basis where that might be not a compatibility problem, and there might be the basis that there might be. Again, we cannot make that determination until we see what is actually the final ban, or how it's finally implemented and approved. We don't know that.

As for the other part of your question about how it impacts Agreement State compatibility. Again, it depends on what the states put forward. Again, we would certainly review, and provide some sort of feedback on that. If there was a problem, we would provide that feedback in writing back to the Agreement State, and hope to work to get them to achieve compatibility. But, to answer your question, it depends on what the basis of the ban is. Again, that's -- again, we didn't know. Again, the question we -- again, we were asked by the Board was very broad. Again, we didn't have any real specifics.

MS. PIERCE: So, to clarify just a little bit more, if the basis of that ban was to protect the health and safety of Utahns, it seems that that would be less problematic, than if the basis were some other thing. My understanding is that if the basis is for protection of public health and safety, that that is kind of where the state has the advantage of passing more stringent restrictions.

MR. WHITE: Yes. Again, potentially, again, it depends on what the basis of the ban was. Again, and now we use this -

MS. PIERCE: Can you give me some concrete examples of what a basis might be?

MR. WHITE: I was just going to say that. Let me give you, for example. Perhaps, there was a performance assessment done at the site, and the performance assessment which was tied to a dose limit, that's part of the regulations, said they would only restrict the amount of DU to come into the site to X amount of material. And the decision of the Board may have been we'll accept material up until we have this much, and then we're going to have to -- we can't accept any more, because we're going to exceed our dose limit. That might be viewed as an acceptable response.

(Off mic comment.)

MR. CAMERON: Beatrice, you're going to have to speak into the microphone, please.

MS. BRAILSFORD: And an example of an unacceptable one?

MR. WHITE: It wasn't based on sort of health and safety requirement.

MS. BRAILSFORD: But give us a scenario.

MR. WHITE: For example, say the Board said we don't like DU, and we're not going to -- we don't want to bring it in. That's a very extreme example, but that's -- again, there's no basis for us to -- and the reason I say that is that what that would appear to do -- again, we'd have to see what the exact wording is, and what it exactly says. But that would that would produce a gap in this orderly regulatory pattern I was talking about.

MS. BRAILSFORD: Okay. So, then describe to me what happened in NRC when Utah, essentially, decided not to accept B and C, not enviro -- or Energy Solutions.

MR. WHITE: Well, my -

MS. BRAILSFORD: And a follow-on. Has -- do you have an example for real life of a state trying to impose, based on health and safety, whether

or not you thought it was legitimate, health and safety considerations that the Nuclear Regulatory Commission rejected that state's actions? That's directed to -

MR. WHITE: Well, let me answer the first part about the B and C waste. Again, if we use the example of -- it can be Utah, or any state. If the state -- if the practice of disposing B and C waste is part of what we turn over to the state, the state never receives an application, or request to determine that, that's okay. There's no -- they're not stopping anything, that's okay. No one has asked for -- they don't have to give it out. Again, it depends on the basis. If the B and C application was given to a state, and they reject it for health and safety reasons, say, for whatever the reasons, they did an evaluation, they reject it on that basis, that might be a very legitimate acceptable response. Again, if it was, again, say, rejected for purely political reasons - again, maybe an extreme case - that would probably be a compatibility issue.

MR. CAMERON: And before we go back to Vanessa and Beatrice, and, of course, to Christopher, Larry, do you want to add something to this? And, of course, to the other side of the table, too. Go

ahead, Larry Camper.

MR. CAMPER: Beatrice, during the Board proceedings the other day, we had a slide that the question that the Board had asked of us is, if the State of Utah either banned, or placed a moratorium on DU disposal within the state, what would NRC reaction be? Would this action threaten Utah's inclusion as one of the Agreement States? In the course of answering that slide, our slide said, "This depends upon the basis of the ban or moratorium. Utah should provide NRC with any proposed changes. NRC staff would make a determination regarding compatibility. NRC would work with the state to resolve any issues that affect compatibility of the Low-Level Waste program." And then the last point in the slide was, "This action could affect compatibility for this specific area."

In the course of questions being rendered by the Board, and in the flow of discussion, I was asked with more specificity what that meant. And what I said was that a moratorium based upon health and safety concerns would almost certainly create compatibility problems. As I explained, the problem is if the Board had chosen to issue a moratorium to ban a category of waste from being disposed in the

State of Utah, that is otherwise authorized in federal regulations for disposal, that could pose a compatibility problem. That's because a federal entity has preeminence in this case, and you would butt up against that kind of problem.

I went on to say that that raises as many questions, as it does answers. The compatibility arrangement we have with the Agreement States is a very complex process, and would have to be looked at very carefully.

I was subsequently asked by a Board member, would we pull the agreement from Utah if they did that? My response was, pulling Agreement State compatibility agreements is at the draconian end of possibilities. That is not something we would readily do. We would have to look at the issue, we would have to confer with the state, and figure out what it all meant in the final analysis. But that was the essence of the communication that went on around this topic. But it has to do with the idea that a category of waste, call it DU, call it any waste stream that is banned, that is otherwise authorized, there is a federal set of regulations in place that indicates that it's to protect public health and safety, that's the compatibility problem. We would have to work our

way through that.

MR. CAMERON: And we're going to come back. Okay? Let's get other views on the table on this, and then let's see what questions we have.

MS. BRAILSFORD: I did have a second half of my question to Duncan.

MR. CAMERON: Oh, go ahead.

MS. BRAILSFORD: You know, I already expressed it. Duncan, could you tell me if there's ever -

MR. WHITE: Yes. You asked me about an example of -- I can't think of any direct example, but I can give you something of an -- a similar one, where the NRC adopted regulations that required compatibility determination, which mean the state, essentially, had to have identical programs. In that particular case, a number of states already had a similar program in place that -- this involved the registration of General Electric's devices, a much broader registration General Electric's devices, something they've been doing for 20-25 years. NRC Commission decided that our rule should be Compatibility B, which means the states would have had to have regulations nearly identical to ours, so they would have had to shrink -- no longer register the

devices they felt was important locally. And what the states decided to do in that case was they petitioned the NRC, and we're in the process of -- we looked at the petition, agreed with them, and we're in the process of changing that rule.

MR. CAMERON: Okay. Do you want to add something to that, Larry?

MR. CAMPER: I want to try to further clarify Vanessa's question. Vanessa, depending upon the level of compatibility that is assigned to a regulation, or a subset part of a regulation. For example, if something requires the most stringent category of compatibility, for example, definitions. It says that a state can't define something, a RAD, or some other term differently. It's the same thing in Massachusetts as it is in Utah, and so forth, and so on. Another category says it has to be essentially the same, it has to be at least as restrictive as. In that case, a state may, in fact, impose a more restrictive requirement. And, in many cases, states have done that. That's not the issue here.

The issue is when a state, any state, any Agreement State would ban an activity that is otherwise authorized in the regulation that is found to be suitable to protect public health and safety,

that's the problem. In this case, it happens to be banning the disposal of depleted uranium. But that was the essence of the problem.

MR. CAMERON: Go ahead, Vanessa.

MS. PIERCE: Sure. And just quick response to that, is that the intent, and maybe this wasn't made explicitly clear, or maybe I'm parsing words that matter to me, and not as much to the NRC, but the intent of the Radiation Control Board was not to ban, but moratorium means a temporary ban, to put a hold on disposing of depleted uranium in Utah while this rulemaking process is underway to insure that any disposal of this material that has been identified by your staff as problematic, and not fitting in, there are health and safety concerns about DU disposal that were identified in the SECY paper, to put a hold on disposing of that while this rulemaking process was underway; recognizing that health and safety was identified by the NRC, itself.

MR. CAMPER: Yes, I do understand what the moratorium, or the ban was intended to do. But the fact of the matter is, had the Board passed the moratorium, it would have banned this particular category of waste from being disposed in this state for some period of time. The essence of that outcome

would have been the same, it would have been something that we would have had to have looked at in compatibility space.

And no one said that the NRC was going to issue sanctions against the State of Utah. What was said was, we would have to look at it, because it does raise a compatibility problem. We have a very interesting delicate, and important relationship with the Agreement States, and compatibility issues are not something that we take lightly. We would have had to have communicated with the state about it, and we would have had to have done it very quickly, because there are shipments earmarked for disposal near-term, which is why I said during the Board proceeding, we would have to look at this very quickly.

Normally, as Duncan pointed out, the way we examine compatibility issues is during a proposed rulemaking. But in this case, it would depend upon the action taken by the Board, and the basis for that action, and the need for us to look at in near-term, whatever looking at it means, because shipments are imminent.

MR. CAMERON: Okay. I don't want to cut this discussion off, because it's very important to all of you, but I do want to draw it back to this

particular rulemaking. In other words, what the NRC is looking for is what compatibility category should this be? And forget about all of the categories, but perhaps what is the -- should the states have the flexibility to establish more specific standards, different standards? That's going to be the question that is asked in this proposed rule.

Now, we know the Board did not, for the time being, they did not declare a moratorium, but there could be a situation in the future for Utah, Washington, Texas, where the state regulatory agency wanted to establish more stringent standards than the NRC has. So, we need to address those particular questions, I mean, because I think that that's a very real situation that could happen.

Let's go to Christopher, and then let's go down the line, and we're going to come back to Steve. Go ahead, Christopher.

MR. THOMAS: Well, I just want to bring up one particular thing that I've always, not always, but I've been curious about for quite a while. And I think it's good as an illustrative example, which is that, as I understand it, the State of Utah rules define Radium-226 in its classification tables, but the NRC does not. And, so, I'm wondering how that --

how did that play out when that happened? Because I've actually been to the FSME website, and I was trying to -- well, I didn't spend a ton of time there, but I was trying to find anything on Radium-226. And I would just love to hear how that came to be, did it pose any compatibility problems, all that sort of stuff.

MR. WHITE: Yes. There's actually a pretty straightforward answer to that. Part 61 was adopted 20-something years ago. At that time, NRC did not have regulatory authority for NARM. We only got that -- and radium. Only got that in 2005. And when we got the authorization to regulate radium, we did amend some of our regulations to include radium as part of how we regulate byproduct material, and how we oversee it. But I don't believe -- we did not change Part 61.

With that in mind, you look at the State of Utah, Utah has always had the authority to regulate Radium-226. And, probably, what they did is, they probably included that with their regulations when they adopted Part 61. Again, at the time we would have reviewed those regulations, we would have not made a comment about the Radium-226, because that was clearly under the state's jurisdiction. We did not

have any authority at that time to say anything about it, and we just -- whatever they decided where it should go, that's where it went.

MR. THOMAS: Just a part -- I appreciate that. I'm glad to know what that history is. And just sort of a parting comment, I'm not willing to admit that current NRC regulations specifically talk about depleted uranium of this quantity. I think it's entirely possible that federal regulations are silent on large quantities of depleted uranium, because they weren't in the underlying analysis. So, that puts things into a different space, if you look at it from that standpoint.

MR. CAMERON: Okay. Thank you, Christopher.

MR. CAMPER: I understand why you would say that. I think it's a very good point. What we have to -- what we would have to cling to at the moment, though, are two things. One, during the LES proceeding, the Commission did indicate that it was Class A waste for purposes of that proceeding. That's a recent -

MR. THOMAS: Low-level waste, wasn't it?

MR. CAMPER: Class A, or low-level waste. That's a position. The second one is, when this

current rulemaking effort was initiated, the Commission did not change the class of waste, and the subject at hand was large quantities of depleted uranium. So, at the moment, then because of that, it remains Class A waste, and one could argue that the issue of large quantities has been recently vented with the Commission.

MR. CAMERON: Okay. Let's -

MR. CAMPER: In our SECY 08-0147.

MR. CAMERON: Let's get some other views on this. And I think we're going to go to Marty, and then Tom. Marty, Tom, Dan.

MR. LETOURNEAU: This is a different issue, but what I wanted to try to understand a little bit better is, how compatibility classifications are assigned to the requirements. Is that done as part of the rulemaking, is it part of Management Directive? And can those classifications change over time? So, for instance, if, as a result of this limited rulemaking the Commission were to decide that here's where we're going to put something about DU. And, oh, gee, maybe I want to change the classification of that requirement, how would that happen?

MR. WHITE: As I said during one of my slides, the working group, or the people who write the

draft rule, they take an initial shot at the compatibility determination, and they will use Management Directive 5.9 to do that. There's a group of people who do reviews internally for compatibility standpoint, and make sure it's consistent with 5.9, and implementation issues.

Now, once the rule is -- the Commission will vote on the final rule, and say that it's compatibility is whatever it is, and that's what our office would use to evaluate state regulations from that point on. How that would change is the Commission may decide to change -- at a later time change that. Again, the Commission can only make that change. The Staff can't arbitrarily say it should be C now. They made a mistake, and it should be something different. The rule has to be -- the Commission has to make that -- has to direct Staff to make that change. And that could be during -- most likely during another rulemaking.

MR. LETOURNEAU: But could the Commission make that change without going through rulemaking?

MR. WHITE: Normally, it's during a proposed rule phase. Again, they'll get public input, the public will have input on the rule, and they will make the final determination.

MR. CAMERON: Tom?

MR. MAGETTE: Thanks, Chip. I'd like to go back to the question you posed regarding what we're looking at in terms of this rulemaking action. Noting that we don't have a proposed rulemaking on the table, but, nonetheless, we do have an SRM, a Secretarial Requirements Document that directed the Staff to modify 10 CFR 61.55(a) to add a line, or lines requiring the performance of a site-specific performance assessment for the disposal of large quantities of depleted uranium. I would suggest that since 61.55 is a compatibility category B, that there's simply nothing I can see that would distinguish this addition to that portion of the regulations. And that is one part that's not disaggregated among multiple compatibility categories, if you're just looking at that 61.55. Obviously, lots of other parts of 61 are, as Duncan pointed out. But that there's really no reason to say that this one new part of 61.55 should be a different compatibility category. I think there clearly are transboundary impacts if you look at depleted uranium in the states where the material is generated, and the states where it potentially would be disposed. So, I think it is appropriate that it be Compatibility Category B.

MR. CAMERON: Okay. And, we're going to go down the rest of the cards. We're going to hear from the states, Texas, and Jablonski. We're going to go back over to Steve. But just so everybody is clear on what Tom is saying, Category B, Duncan, again, means what?

MR. DUNCAN: It means there is direct transboundary issues with this section, and it should be at B. Again, it goes across -

MR. CAMERON: And what does it mean in terms of what the state is allowed to do?

MR. DUNCAN: It means the state regulations have to be essentially identical to the NRC regulations.

MR. CAMERON: Okay. I just want to make sure everybody understands that. Dan, go ahead.

MR. SHRUM: I'd like to also agree that I think this needs to be a Category B. But I was waiting for the opportunity to talk about unique waste streams here, simply because I would like to bring up a simple fact, and that is, John Greeves mentioned that 61.58 on the alternative requirements for waste that can come in, and be evaluated, and do a site-specific analysis. That has not been adopted by the State of Utah. And if we are going to come up with a

definition of unique waste stream, if we're going to try to tie it into 61.58, somehow, if all those things happen, I would like you to consider including that as a Category -- or something that the State of Utah could, or should, adopt.

MR. CAMERON: Okay. Larry?

MR. CAMPER: Two points. Regarding 61.58, we talked about this in the SECY. The Staff amongst our initial considerations about how to address this issue, was to look at the alternate waste classification possibilities espoused in 61.58. Based upon discussions with the Office of General Counsel, we were advised that 61.58 could not be used as a means of solving this particular issue, because 61.58 is designed to be a by-exception provision. And if we were going to impose a new requirement, that being a site-specific performance assessment, that 61.58 would not be a viable pathway to do that. That's point number one.

Point number two, I think it's very important, and I think Tom really just put at the doorstep of the panel the essence of the question. The proposed rule will contain a category of compatibility. The question that we're asking the panel is, what does the panel think that level of

compatibility should be? For example, Duncan just said it would be a B, which means it has to be identical. That would mean, as a practical matter, the state would be required to conduct a site-specific performance assessment. The state would be required to evaluate those technical parameters that we identify in the regulation. For example, for sake of discussion, period of performance, intruder analysis, receptors, and other things that would be expected, and required to be reviewed. And then there would be guidance to help the applicant, or the state, in conducting that type of performance assessment.

Now, Duncan, if the state wanted to impose -- have the flexibility to impose additional parameters to be evaluated beyond that which we specify in our regulation, what category of compatibility would, necessarily, have to be assigned?

MR. WHITE: Most often when there is a -- when the regulation lays out certain areas that should be looked at in doing an evaluation, or assessment, often those are either listed as usually category health and safety. Sometimes, they're C. It depends. Again, that gives the state flexibility to say look at their unique situation, because they have a specific type of site. They say we also should look

at this other factor, too, this is important to this site, for example. And then, frankly, there might be something there in that list that NRC provides that may not be important to the state, may not need to focus on that.

MR. CAMERON: Okay. Thank you. And, Dan, just your last point.

MR. SHRUM: Yes. Larry, I was not intending to suggest that disposal of large volumes of DU was supposed to be a 61.58 issue, so that's not what my intent was. It was, in my mind, I have separated disposal of large volumes of DU, and this unique waste streams that we haven't been able to get our hands around to-date, based off the discussion here, that if we are to define unique waste streams, that we, in the State of Utah, we don't have a way to use 61.58 to analyze a unique waste stream. That if we do define a unique waste stream that may be able to use a performance assessment, or a risk-informed way to receive and dispose of, that that be considered Compatibility B.

MR. CAMERON: And this is if the unique waste stream is defined.

MR. SHRUM: If it is decided to be defined, then we don't have that -- and I'm not asking

for 61.58 to be adopted. I'm saying if unique waste streams are adopted, then let's consider that as a higher category. And I thought that fit in here okay.

MR. CAMERON: And I think that that's clear. Thank you, Dan. We're going to go to Steve, to Susan, over to Steve Nelson, and back to Marty. Steve Cowne.

MR. COWNE: Sure, thank you. I've got a short couple of things I just wanted to say to Duncan and Larry, but I wanted, number one, to support the NRC's position on federal preeminence. And I'd like to also encourage you to, in the future as you go forward, to insure that any deviations from compatibility are based on sound engineering judgment, and do not impact the ability to implement a valid license.

And then, Larry, to sort of support you a little bit on the LES proceedings, I do believe that the LES proceedings, and the Commission took into account large quantities of depleted uranium. LES' production facility, obviously, will produce over 200,000 tons of depleted uranium, Hexafluoride, and the staff was well aware of that. So, I think that's been taken into account.

MR. CAMERON: Okay. Thank you, Steve.

Susan?

MS. JABLONSKI: I guess there's a couple of things, and from a state perspective, and having some rules that aren't, necessarily -- we don't know if they will be consistent with what the NRC is contemplating at this point. I don't know if it's a straightforward answer, at least from us, or whether it's one rating, depending on the breadth of what this rulemaking does. If you look at 61.55, its definitional things, it's what categories waste are put in. When you start going to the measure of what requirements for performance assessment, those are two -- there's a lot more flexibility of the state. And we're using that flexibility right now to do things that, if that was limited, it would change what we've done across the board in performance assessment, and it could pose problems for us. So, I think it depends on the breadth of what this rule looks like. It might not be a one-size-fits-all for compatibility rating. And we, too, we do not have the 61.58 in Texas, either. It's an optional requirement. We didn't adopt it, but we do have other additional requirements that we chose to implement in areas where we have flexibility under the rule. So, that's the caution that I have in that, that it's not a straightforward

answer.

MR. CAMERON: Yes. And I think that that gives a lot of explanation to all of this. It also emphasizes the importance of the working group that the NRC puts together with the states to work on this, because you're all going to be looking at this rule, and you're going to be seeing where it differs from yours, and you're going to making arguments about well, this is what it should be, not only substantively in a rule, but what the compatibility categories should be.

MS. JABLONSKI: Correct. I have a question for Steve, based on his comments that he --

MR. CAMERON: Steve Cowne? Okay.

MS. JABLONSKI: I wasn't sure what you were directing that at, but it should be based on sound engineering. Are you addressing when the states exercise their ability to have a different compatibility, and make choices? Is that what your comment was about?

MR. COWNE: No, what I was -- not, necessarily. What I was talking about is if the state, or some entity, is proposing to have a regulation, or a standard, that is different than the federal regulation, you can call it more stringent, if

you want to, but if the basis for that is not based on sound engineering judgment, rather than emotion, or something like that, or fear, then it shouldn't be considered.

MS. JABLONSKI: I think I need to address that, because we have our own rulemaking process in the state, and if it's not a matter of compatibility, and we're implementing the state policy via legislation, or something else, we don't necessarily have an engineering standard associated with all of the rules that don't have compatibility ratings. We have no requirement to do that, so that's about state rights to have requirements for those states. So, the NRC can, and sometimes does, give advice in these areas when they get comments. But I know my own state, sometimes we say thank you for your advice, but we're going to follow what our legislature has told us to do.

MR. CAMERON: Okay. Thank you, Susan. We're going to hear from another state soon. Steve?

MR. NELSON: I'm going to spend some emotional capital here.

Uranium, a moratorium on depleted uranium is based on sound science. It's based on the acceptance of material that the high surface area that

becomes increasingly radioactive over a period of a million years. Having said that, I appreciate Mr. Camper's honest response to an honest question about the way in which you responded at Tuesday's meeting. I chose not to attend that meeting. That was a conscious choice. I didn't have any classes to teach that day, and I certainly could have gone, had I chose to. But I'm going to give you my reaction, because in the Agreement State process, individuals at different regulatory agencies have to interact with one another. And, to be quite honest, your statement came across to me as a veiled threat from Big Brother. And had I been on the Board, and been on the fence, that would have pushed me to vote for the moratorium.

MR. CAMERON: Okay. Larry, do you really want to continue this?

MR. CAMPER: No, the answer is no, I don't. But I'm going to repeat what I said, Steve. There was no intended veiled threat. The Board asked us a question. This is a legal issue. The Board is entitled to a thorough and precise answer, and we would have been remiss if we had not raised the fact that it may raise compatibility problems, purely a legal issue. I'm not -- no one is calling into question the basis of the science, or the intent of

the moratorium. It came down to a purely legal issue. We owed the Board an accurate answer.

MR. NELSON: And, like I said, you gave an honest response to an honest question. But I'm telling you what my reaction is.

MR. CAMERON: Okay. I think we're going to try to go back somewhere, other than this. But let's go to Marty, and Scott, and, I'm sorry, Chris, I know you've been waiting.

MR. LETOURNEAU: Don't go away, Larry.

MR. CAMERON: Okay, Marty.

MR. LETOURNEAU: I am not playing beat up on Larry here, but when you were talking about your hypothetical situation, or quasi-hypothetical about the requirements going to the state, you made a statement that I wanted to make sure that I either misunderstood, or maybe you want clarified. I thought I heard you say that the state would be required to prepare the performance assessment. And I think what you probably meant was the state would be required to require the facility -

MR. CAMPER: I'm sorry. In this case, the states would be required to -- their requirements would then require that a site-specific performance assessment be developed, that would be developed by

the licensee. You're correct. The state would be required to insure that one is required. Obviously, it's incumbent upon them to review it, and the technical parameters that would have to be evaluated would be the same, because of the level of compatibility assigned to it.

MR. LETOURNEAU: I thought that's what you meant. I just wanted to make sure there wasn't some bizarre nuance of this that I had missed up to this point.

MR. CAMPER: No. Thank you for that clarification.

MR. CAMERON: Okay. And thank you, Marty. We're going to Scott, over to Chris, and then we're going to go Drew. Scott?

MR. KIRK: I'm still confused about the compatibility requirements, and how they apply to depleted uranium. If depleted uranium is Class A waste today, even based upon the Commission's directive, as it has been, what I heard is, is that states cannot impose restrictions, or limitations, for disposing of those waste materials if they've been assessed. I mean, is that true or false?

MR. CAMERON: Duncan, we're going to go to Duncan.

MR. WHITE: Well, what the states may -- you mean -- the states may choose to do is -- it's so-called Class A waste, but, again, the state, for example, has done a performance assessment for their site and it says, you know, if we take X amount of material -- more than X amount of material, DU at this site, we're going to exceed the dose limit, then that's a basis for them to maybe restrict the amount of DU going into that site. That's a health and safety-based evaluation.

MR. KIRK: No, I understand that, but if, for example, the performance assessment indicated that it did not, and that that waste was acceptable for disposal at a Part 61 facility, I mean, is there a restriction in which that waste could not be disposed of? And, I guess, what I'm getting at, and I understand states' rights, and I'm sensitive to it, but it seems to me that we're also waiting for a rulemaking. And there's this wait-and-see attitude, does a licensee have to wait for a wait-and-see attitude for a time period for the rule to be proposed, if they've already demonstrated it's Class A waste, and is suitable for shallow land disposal?

MR. CAMPER: Again, Scott, I think the essence of your point gets at the fact that there was

a very precise legal question on the table, and that was banning, albeit, temporarily, albeit, permanently, banning the disposal of a category of waste in an Agreement State was the problem. Okay? And it would have depended, as I said, upon the nature of the moratorium, or ban, and the basis for the moratorium and ban. And that could have posed compatibility problems, as we enunciated during the Board meeting when we had to look at that.

Now, what you're saying, you're getting back to the notion, and the issue that, if a state has done a performance assessment that determined that a particular category of waste is suitable for disposal there, as a practical matter, it should be able to be disposed there, if I understand your point. Is that right?

MR. KIRK: Yes, hypothetically. That's correct.

MR. CAMPER: But that -- in the case of Utah, a performance assessment has been done for the disposal of depleted uranium, presumably, it's a satisfactory performance assessment, but that wasn't the question. The question was a very legal fine line.

MR. CAMERON: Okay. I don't think that

Scott -- I don't think that that was -- the question really goes to something that we're going to talk about when we get to Other Consideration, is what is going to happen in the interim? What is a licensee's expectation? So, I think we're going to hold that issue, and we're going to come back to that very thing, Scott.

MR. KIRK: I understand that. And, Larry, I understand your answer, too.

MR. CAMERON: Okay. Let's go to Drew, and Susan, and then back to Marty. Drew, State of Washington.

MR. THATCHER: Thanks, Chip. I just wanted to give, at least what I hear is the big picture perspective, and then maybe the State of Washington, or perhaps mine, if my boss finds out what I said.

You know, I see, sometimes, a situation where you've got, at least in the federal level, you have to have the ability to do disposal of waste, and what you can't have is a NIMBYism that happens at the state level. At the same time, you know, Greg's brought up, I'm sorry, Steve brought up a very good point, that if you have a technical basis for excluding something, then you've got a good basis to

move forward on something, but it has to be -- it can't be a situation where the state, as in my case, very much doesn't like radioactive waste, and would rather not have any, at all. So, you have to prevent that kind of situation, where it's not a sound technical basis from driving decision. And I completely agree with that.

MR. CAMERON: Okay. Thanks, Drew. And just let me get -- Chris has been waiting for a while. Why don't you go ahead, and then we'll go to Susan, and Marty, and Christopher. Go ahead.

MR. McKENNEY: Okay. I was going to be bringing this back to what we have been discussing. And over the past couple of days, we talked about a different -- actually, when we talk about rule versus guidance, we've talked about a number of possible different lines, or features, or criteria possible in the rules. Not all of them may be co-located in 61.55. So, I was just going to go through to keep people's mind up on some of those that we talked about, and how they might change in this classification, which is what we are sort of asking about.

One is the basic one, which came sort out of the SRM, which is, we'll have to put it someplace,

which is that strengthening the discussion and need for a performance assessment. And what are aspects of that performance assessment, such as, the degree you need to have evaluated all the future events and processes at your site for the time periods that you are going to be analyzing for. You are having to assess safety. Do you want to have that at a different category? Would people want that at a different category classification than just the need to have a performance assessment criteria?

We've also talked about possibly modifying the limits, or adding a limit for intruder dose analyses in 61.42. And then that would probably be in our basic system, in the first place, would be that would go A, just because all base limits go -

(Off mic comment.)

MR. McKENNEY: I'm sorry. If we added a dose limit to the intruder protection standard in the performance objectives, 61.41, 42, 43, and 44, are all currently A. Everybody -- every states' laws have to read essentially identical. So, therefore, if we modified that section, and added anything to it, or even reworded it, it would probably be likely that that would have to stay A, just from its being sort of the foundation of the framework of this process.

Period of performance is one that we talked about quite a bit, and how that could -- we need period of performance in there. Whether that is B, or A, or, basically, essentially identical -- do people want it essentially identical that says thou shalt do analyses for X amount of time, and everybody has that in it, or would it be better to allow flexibility on the state level to do it under the public -- the health and safety level of the compatibility level, which allows the state to have essentially the same, but they can also be more restrictive. In other words, in a period of performance, it would mean that you allow longer time periods, probably, to be analyzing, to be able to be -- essentially meet ours, but then go more restrictive. Those are sort of the things that -- trying to take it back to those things that we've been trying to get into, what is the rules, what -- for us, going forward, what are the views on how people might want to parse out what we've been discussing the last couple of days, of possible things to go into the rulemaking.

MR. CAMERON: Okay. That's sort of a preview of what you're going to see in the proposed rule. Duncan wants to add to that. Then we're going

to go and take these three cards, and I'm going to see if anybody in the audience has a comment on this. Duncan, adding to the preview that Chris just gave, what did you want to add?

MR. WHITE: Yes. One of the beauties of compatibility is just when you have it all figured out, there are some curve balls. I think Chris is basically right. Almost all our dose limits are Category A. There is one that's Category C, and that's the License Termination Rule. The License Termination Rule, and the NRC regulations requires clean-up to 25 millirem, but it is Compatibility C, and some states, a number of states have clean-up levels that are less than 25. Again, the Commission made the decision. Again, the way the Commission looked at that, there was no transboundary issues. This is totally within the state's borders.

MR. CAMERON: So, what exactly is a basic standard may be up for grabs. Okay. Adding to the certainty of this whole process. Susan, go ahead.

MS. JABLONSKI: I'll try to be brief, with a couple of clarifications from an Agreement State. And I heard Chris say some of these things. Submission of a performance assessment is not the bar for being able to deliver the material that you want

to deliver. That is the piece of it that gets the review running, but that's not the bar, the submission.

In our state, in the absence of the rules, the very things that we're talking about here, we had the discussion on period of performance. We had, in our rule, peak dose. Those rules were judged compatible by the NRC. They're in our state active today, and we are going to apply them. So, the idea that we would stop doing that in the interim is just not even an option. It's a rulemaking that went through extensive public comment, in an area that was not part of NRC compatibility. We asked the NRC specifically, because we knew when we were doing this, we asked them for input, and the concepts peak dose, and period of performance. And we received some. So, at this point, we have done everything that we can as a state to try to get in front of an issue that's currently under discussion. And we would really hate to have to roll any of that back after the effort that we spent trying to get in front of an issue.

MR. CAMERON: Okay. Very instructive. Thank you, Susan. Marty, and then we'll go to Christopher.

MR. LETOURNEAU: I'm going to pass. We're

back on the agenda, and I don't want to get us off it.

MR. CAMERON: Okay. And let's hear from Christopher, and then let's go out to the audience on that. Christopher?

MR. THOMAS: Quick clarification question. Currently, in the review of an Agreement State from the NRC's perspective, do you look at any of the licensee's current existing performance assessments? Do you evaluate those in any way?

MR. WHITE: I can answer that one. During an IMPEP review, we would -- normally, during the period of review, which is usually a four-year period since the last review, if, for example, there was a licensing action taken involving a performance assessment as part, that we would probably look at it.

MR. THOMAS: And then, is there like a report done?

MR. WHITE: Oh, yes. There is -- the IMPEP -- the whole IMPEP process, there is a final report issued on that.

MR. THOMAS: And then a quick -- and I use it as a comment, which is, there's this interesting land ownership requirement, which has been an interesting thing in Utah. And I'm curious, I don't know what level of compatibility that's assigned, but

I think that may be an open issue with depleted uranium, because it is such a long-lived hazard, that you may want to have a more -- we would argue for a more stringent application of that, that the land be owned by a -- in-fee, by the federal government, or a state government.

Oh, and then I'll just tack on, this is a little bit different, but I would argue that maybe the requirement for a site-specific analysis be -- maybe that be required in sort of an A, or a B level, but then maybe some of the specific parameters could be more -- could be health and safety. And, therefore, a state could adopt the more stringent parameter. That makes sense to me.

MR. CAMERON: Are you suggesting that the site-specific performance assessment rulemaking should include a requirement on land ownership?

MR. McKENNEY: I think he's questioning the fact that we do have a rule right now in Part 61 about land ownership. And he was asking about whether that's in the compatibility areas, or not. I believe it is, but I'm not aware of how the compatibility review went for Utah.

MR. CAMERON: But you may want to -- if it's not part of this particular rulemaking effort,

we may want to talk to Christopher offline about it.

MR. McKENNEY: I can tell you what we just did. We did have that sort of discussion with the State of Texas just recently on that sort of -- as to reviewing PAs during IMPEPs, I did do the IMPEP for the State of Texas during the middle of their review. There is no way I'm going to read 20,000 pages, and do all the analyses in two days. If we did, we wouldn't need 15-month review cycles.

MR. CAMERON: So, make it long.

MR. McKENNEY: Yes. Well, the process is, is we go in and we start asking the staff what are they looking at? And we're looking not -- we're not, necessarily, in most of our review situations second-guessing the state on individual items. We're asking, are they following our process? Are they looking at it from a technical standpoint, from that process, which is a lot easier during the process, which I was lucky to do during the middle of the process while they were doing questioning, while they were setting up RAIs; was, so, what are you looking at? How are you comparing things? Are you doing independent analyses? Are you doing -- I was able to ask the individual staff members that, and try to go through the whole process, and stuff, instead of going oh,

they published it now, now we'll go in and say, do we have problems or not? So, I can't say what was done back when the IMPEPs were done in the mid-90s. I cannot speak to that. But I can say that the process we do to say, how much do we look over the PA itself directly right now, is that we would be asking the staff, themselves, how do they go about reviewing it, and how did they go about making decisions in it? To say that were they following a confident process, and with their regulations.

MR. CAMERON: Okay. Thank you.

MR. THOMAS: The IMPEP review could have caught some of these issues earlier with the DU, and the fact that the analysis wasn't appropriate for that material. Thank you.

MR. CAMERON: Okay. Audience? Yes, ma'am. And could you just identify yourself for us, please.

MS. GETTIS: I'm Claire Gettis, Citizen Activist. I've had two organizations before, and worked on this issue for quite a few years.

(Off mic comment.)

MS. GETTIS: I've worked on -- I've had two organizations over the last 12 or 14 years, and worked on this particular issue. And I've spent a lot

of time dealing with Energy Solutions, and prior to Enviro Care. I'm pretty astounded at the conversation here. I thought that our end goal was to have safe disposal. And when you have regulations that, basically, lump categories together, because they just happen to fall out of another category, seems, to put it mildly, insane.

You have a facility out there that has been engineered for 100 years, and now we're being told that it's all right to bring something out there that has a life of something 10,000, to a million? I mean, this not in my backyard is nonsense. We're only asking that we have correct engineering, background on what we're doing, and when you make a rule like this, and then you say oh, you bring that out, and put it there, and then three years down the road, we'll find out if it's okay. And you think the public is going to fly for that?

The other thing I have to say is, you talked a lot about the rules, and how we go making these decisions. And my understanding was that the federal government has -- the states should have similar rules. Am I right?

(Off mic comment.)

MS. GETTIS: Okay. When this decision was

made in Washington, I pretty much understand there were a vote, and information was taken. There was responses from the public. What I saw at the Radiation Control Board the other day was, I saw Energy Solutions come in the day before the meeting and drop a letter on the desk of our head of DEQ. On a phone call without anybody having any chance to respond to this, she leads the Board into making a decision to not have a moratorium; but, further, to amend the license. Now, there was no process here whatsoever.

As a citizen, what input do we have, and do you expect any of us to have any kind of faith in what you're doing? I mean, this seems -- to the average person, they get it. Maybe we've been in a room together too long. But I can't understand how in any way, shape, or form you can send that kind of waste to a facility that's engineered for 100 years.

MR. CAMERON: Okay. Once again, we did have a general public comment session scheduled for five this afternoon. We've taken an early comment. Thank you, Claire. Does anybody have anything on this particular issue? All right.

MS. LOCKHART: I'm Laura Lockhart. I'm with the Utah Attorney General's office, and I'm a

little puzzled about a difference that I'm hearing between the compatibility program that Duncan is describing, and the one that Larry's describing. And, specifically, the one that Duncan is describing sounds really like a one plus one equals two kind of thing, either it is, or it isn't. It's in the rule. It's pretty easy to figure out. The one I'm hearing Larry describe is one that has some discretion in it. We'll work with you. We'll look at the specific examples, and things like that. And I'm not sure -- I think the difference between what I'm hearing is probably significant to helping us understand how the compatibility program works. And I don't get it.

MR. CAMERON: This is an important clarification, and I don't know whether -- Duncan, can you try to clarify the discretion aspect that Larry was describing, so that we can just give some clarification.

MR. WHITE: I think I can.

MR. CAMERON: Good.

MR. WHITE: What we are talking about here is, you know -- what we we're going to do with regulations, if we add DU to 61.55, what the compatibility would be for that. We were talking a lot about that.

One of the things that compatibility -- it doesn't also cover regulation, it covers other things that the state may do. And one of the things I mentioned during my presentation was things like program elements. And sometimes states do other -- take other actions that may affect compatibility. Again, like a license condition, or something like that. Again, we would look -- again, it may not fit in a particular hole. It may not fit under this section of the regulation. But the other thing we also look at carefully is -- one of the important aspects of compatibility is does it create a gap, is it duplication? And that's what we kind of look at. Again, if there's some action that is taken like that, then we have to look at that. Again, that is very specific on what's done. It's almost how it's written. Again, how it's written could -- we could say it is a compatibility issue, it is not a compatibility issue, it depends on how it's written.

MR. CAMERON: Okay. Let's move on to the next topic. And you may want to talk with Duncan and Larry offline, if that does not -- if that did not clear it up. Okay. Thank you.

Do you guys want to take a break now? Okay. Let's take a break, be back in 15 minutes, but

please come back.

(Whereupon, the above-entitled matter went off the record at 2:33 p.m. and resumed at 2:51 p.m.)

MR. CAMERON: Okay, we knew that the NRC knew that there would be interest in the so-called long-term rulemaking that is to follow on after this rulemaking, so Larry Camper of compatibility fame is going to tee this one up for us and then we'll go for discussion.

MR. CAMPER: Good afternoon, everyone. Thank you for your perseverance and for still being here. We appreciate that.

Yesterday, I did cite the fact that this is a two-part process. And what I want to talk about now is the second part of the process that the Commission the staff to follow.

Again, I'm going to read prepared comments because I want everyone here to hear the same things that was said in Maryland a few weeks ago, so the panel has the benefit of the exact same consideration and the audience hears the same thing as well. So bear with me as I read those words.

The second part of this rulemaking effort is what we are calling the longer-term rulemaking. In the staff requirements memorandum, the Commission says

specifically they directed the staff to propose the necessary resources for a comprehensive revision to risk-informed, the 10 CFR Part 61 waste classification framework, with conforming changes to the regulations, as needed, using updated assumptions and referencing the latest International Committee on Radiation Protection methodology, the ICRP.

As part of this effort, staff will identify any corollary or conforming legislative changes necessary to support this rulemaking, if any, as well as recommendations on how to proceed absent that legislation being enacted and other agencies that may be impacted by any changes.

This effort should explicitly address the waste classification of depleted uranium.

In addition, this effort should include the performance of a technical analysis for public comment concerning the disposal in a near-surface facility of any long-lived radionuclide, including uranium. This analysis and the resulting comments should inform the staff's eventual recommendation to the Commission on an appropriate, generic requirement addressing such disposal. This revision would likely involve different, updated methodologies and assumptions than the original Part 61 methodology for

key variables such as disposal configurations, performance periods, institutional control periods, waste forms, site conditions, exposure pathways, and receptor scenarios.

In terms of the long-term rulemaking, this effort would explicitly address the waste classification for DU, as I mentioned, and it would reflect current knowledge of the performance of low-level waste disposal facilities and would present risk-informed concentration limits for all radionuclides, not selectively for depleted uranium. This revision would accurately represent our increased understanding today, rather than relying upon the Part 61 analysis conducted approximately 30 years ago.

An update of the methodology used to develop the concentration limits would result or could result in higher or lower concentration limits than the currently -- than those currently used, which could actually increase or decrease disposal options for some types of waste, for example, current class BC waste which in some cases could be become class A waste or conversely for that matter.

In terms of the international front, it's been mentioned several times over the last day and a half, as part of the staff's evaluation, we will

consider the international waste classification system and see if it is applicable to our low-level waste environment here in the United States. Internationally, they have six different classes of waste, five of those being for low-level waste, as depicted here; there being exempt waste, very short-lived waste, very low-level waste, low-level waste, intermediate-level waste, and of course, high-level waste.

Internationally, countries have also stressed the role for a site-specific performance assessment. The IAEA, that is, International Atomic Energy Agency, has published as Safety Guide No. 111-G-1.1 that is about to be updated from the 1994 edition. The updated version distinguishes between LLW, low-level waste, and intermediate-level waste for long-lived alpha emitters like Uranium-238. The Guide says that national authorities should establish limitations for the disposal of long-lived radionuclides for near-surface disposal facilities based on safety assessment of a particular disposal facility.

The Guide also states that a very definitive boundary between ILW, intermediate-level waste and LLW, low-level waste, cannot be provided.

Waste acceptance criteria for particular facilities will be dependent upon the actual design of and planning for a near-surface disposal facility, for example, engineered barriers, duration of institutional controls and site-specific factors.

It is important to note that overseas, most countries have not disposed of significant quantities of depleted uranium. According to a 2001 National Energy Agency report, management of depleted uranium, all of the major nuclear fuel-producing countries are storing depleted uranium with expectations that an eventual use will be found for it.

In the United States, NRC's policy is that the generator can determine if there is a use for their depleted uranium or when it, in fact, becomes waste and if a generator determines it to be waste, it is deemed to be low-level waste at this point in time.

As we proceed with this second phase of this project, this longer-term rulemaking, we plan to have additional workshops to collect the input from the public at various stages along the way. And there will be numerous opportunities to address both technical and legal issues as we proceed with the rulemaking.

Because of the scope of this long-term rulemaking, we assume that it will take a considerable amount of time and we will afford many opportunities for public comment along the way, such as public workshops on various parts of the rulemaking as we proceed ahead.

So that concludes my comments on the long-term rulemaking and would address any questions or clarification.

Thank you.

MR. CAMERON: Thank you, Larry. And if you could join us down at the -- why don't you join us at the table for this discussion. We've already heard intonations on this particular issue from Dave Kocher, from Vanessa, from Tom Magette, in terms of the relationship between this initial rulemaking and what might happen. So it's been teed up a lot.

Let's go to Beatrice, and then we'll go to Vanessa, and then to Dave Kocher and then over to the other side of the table.

Beatrice?

MS. BRAILSFORD: Thank you. Vanessa did actually turn up her tent card first, but I have always taken advantage of the alphabetical order of B and V.

So Larry, it is in the long-term rulemaking that the NRC will explicitly address the waste classification of depleted uranium?

MR. CAMPER: We will address all radionuclides in the existing waste classification scheme. The Commission also put language in the staff requirements memorandum that explicitly called upon the need to examine the classification of depleted uranium. That's correct.

MS. BRAILSFORD: In the long-term rulemaking?

MR. CAMPER: That's correct.

MS. PIERCE: One issue that I wanted to raise here, and I'm not certain if this is the best place to raise it, but I guess one thing that I would suggest be considered for the long-term rulemaking is something that I see as an inconsistency within the NRC's own rules which is calling depleted uranium Class A waste and then 10 CFR 61.7 subsection (b)(4) which says "institutional control of access to the site is required for up to 100 years. This permits the disposal of Class A and Class B waste without special provisions for intrusion protection since these classes of waste contain types and quantities of radioisotopes that will decay during the 100-year

period and will present an acceptable hazard to an intruder after that time."

And then it later goes on to say that "waste that will not decay to levels which present an acceptable hazard to an intruder within 100 years is designated as Class C waste." I see a very important contradiction between calling DU which is hazardous for a million years and the typical definition of Class A waste or the way that it's handled in that section of the rule.

MR. CAMPER: I understand your point. I think the challenge that the staff will face -- it's interesting. When the Commission asks us to risk-inform the waste classification scheme, you know, the word risk-informing when uttered seem relatively straight forward. However, what the staff is going to try to do is to approach the assignment with an open mind up to and including examining whether a different waste classification scheme would be an appropriate course of action as for example, the international scheme which I cited.

So I won't sit here and pretend to prejudge what the ultimate outcome will be or which radionuclides will go from C to B or B to A. But I will say this. I think your point is extremely well

made in the following regard. It's one thing to modify the waste classification scheme. There are other parts of Part 61 that have a direct bearing upon the waste classification scheme. And those will need to be looked at and carefully examined as well. You make a very good point.

MR. CAMERON: Okay, thank you, Vanessa. Thank you, Larry.

Let's go to Dave and then we'll go to the cards over there and then we'll come back to Christopher.

MR. KOCHER: I have learned a heck of a lot in the last day and a half and I really appreciate the opportunity for this. It's increasingly clear that DU really is a different beast in the following way. I think everybody in this room would admit that if DU were submitted to waste classification in the same way that other stuff was 30 years ago, it's not Class A waste.

Furthermore, if the same rules, the same impacts analysis methodology were applied, it's pretty clear to me that it would not be Class C waste either because a key factor in defining Class C waste is that the volumes had to be small and we are clearly not dealing with small volumes of stuff. So earlier

today, I took it as a somewhat facetious comment that -- and I apologize if I misread it, that we needed to call this Class Q, but I think that is a valid point. DU simply doesn't fit into the waste classification system as it's present constituted and as the numbers in the tables were derived.

This is a different beast.

MR. CAMPER: I think your point is well made. I think one of the driving principles in requiring a site-specific performance assessment is to ensure that you would achieve the same level of public health and safety as if you were to call a waste a particular class, whatever that class might be.

But having said that, having said that, what that does do is address the immediate issue with regards to disposal of depleted uranium. Now when you start to look at the longer-term rule and you start to risk-inform the waste classification scheme, the Commission has asked, directed us to specifically look at depleted uranium. You make very good points.

MR. KOCHER: By saying that it's a different beast entirely doesn't imply that it can't be handled. Let me be clear about that. But it's clear in my thinking that it just doesn't fit into the traditional Class A, Class C system for long-lived

radionuclides.

The other point I want to make is a little bit more general and I know the smart people at the NRC are fully aware of this. As you undertake a special interim rulemaking for DU only, you may or may not set precedence which are a good thing for the long-term, more general rulemaking and just sort of keep this in mind as you proceed. You may do things in regulating DU that may or may not be a good idea and regulating other things, so try to be aware of the connections with a possible long-term rulemaking as you go forward with this.

MR. CAMERON: Thank you, David.

Scott, let's go to you and then we'll go down the room.

MR. KIRK: I was speaking to Susan Jablonski about this outside a little bit and what I would encourage the NRC to do for the long-term rulemaking is sort of take your lessons learned and the frameworks you're developing for DU and see how you can extend that for the new rulemaking for revising Part 60.

And what I'm getting at is for DU it's very long-lived, but there's other long-lived radionuclides and if you developed a framework that

has long performance periods such as peak dose or very long time periods into the future, if you look at requirements for intrusion barriers, whether it's concrete canisters or additional intruders and barriers, you know, if you address the issue about radon and whether you want it to be all pathway sumped, you're halfway there or probably much further than that for many of the other radionuclides.

And when you start to consider that for like change control provisions, unreviewed safety questions and things like that, I think it might go a long way for helping you think about how you're going to be revising Part 61. And I would even say to go back to the revisions -- or the inception of Part 61, back in the '80s. That was developed to solve a problem that existed back in the '60s and the '70s, which don't exist today, but there's also other challenges that are coming. There's new reactors coming on line. There's a need for a national supply of radioisotopes. The nuclear renaissance is coming and so whatever you do, it needs to serve that generation as well.

MR. CAMERON: Thank you.

MR. CAMPER: I appreciate the comment and as you were saying that I was thinking back to a slide

that Dave had in one of his presentations where he was pointing out, you know, we have this 100 years of institutional controls for low-level waste in Part 61. But there are many radionuclides that continue decay well beyond 100 years and in fact, experience some sort of growth, end growth themselves along the way, well out into the future.

So it's -- your point is well made.

MR. CAMERON: Okay, let's go to Marty.

MR. LETOURNEAU: I have to agree very much with David. I thought that was very well said. And it is sobering, but by the same token, I'd like to think that if we turn the clock all the way back and we were the ones that were sitting there writing the EIS and we had DU on our plate that at that time we might recognize how incredibly different it was and that we might actually have subjected it to a different type of analysis or a different set of scenarios than the ones that we're used to develop the rest of the classification system.

That being said, I want to go back to one of the comments that Larry made because I think it's a really important comment. We haven't really emphasized it directly, so I want to touch on it. It's something that Chris and I and David and others

would know very well, but Larry said that there are other things other than the classification system that get effected and are important. And there's a construct here that is captured in the IAEA framework and it's reflected in our framework and the NRC's regulatory regime reflects it too.

The performance assessment is not everything. In the international parlance, it's a safety assessment. They have the safety case and the safety assessment. The safety assessment is what we're talking about as a performance assessment. It's the model and the calculations.

The safety case is -- or the performance assessment or the safety assessment is part of the safety case, but then the total safety case is all of the other things that inform your decision making and support your understanding that you can have a reasonable expectation or a reasonable assurance that the performance objectives are not going to be exceeded. It includes institutional policies. It includes multiple barriers, defense-in-depth, land use policies, all sorts of other considerations that get built into that.

So I just wanted to make sure that we recognize that point that that's really what Larry was

getting to, that it's not just the classification system. It's not just the performance assessment. There are a lot of other things that have to be taken into consideration and do get taken into consideration that are part of what is on the table when the decision maker makes their decision and I just want to make sure we don't forget that.

MR. CAMERON: Thank you, Marty. And Tom?

MR. MAGETTE: Thank you, Chip. I would like to just start with a boilerplate statement that I am definitely in favor of an updating and a risk-informing of Part 61 that clearly does go beyond the waste classification tables. I think it allows us to correct the historical focus on a source of radioactive waste as opposed to the potential impacts and potential environmental effects and potential effects on human health and safety which is where our attention most appropriately belongs. It also allows us to make some straightforward updates, science-based updates based on advancements in our knowledge and our understanding of fate and transport and of health physics which have clearly changed since the time the rule was put in place. Nothing wrong with what was done then, it's just that we know a lot of things now. I think it's very much ripe for review.

I appreciate what David has said and Scott and Marty. I think I would put a slightly different spin on David's point. I think using the depleted uranium as an example is a really good point for a couple of reasons, one going to the nature of the rulemaking. I see this as an opportunity for the NRC to essentially lay the foundation and the groundwork for the next rulemaking and having done this one correctly will essentially have a framework for how to look at the larger picture. And I would expand that by saying it's not just depleted uranium that doesn't fit the tables.

A lot of things don't fit the tables. The tables don't capture all of the issues that we face in trying to figure out what a suitable disposal path for low-level radioactive waste is. So I think this gives us the opportunity to correct some of those things. I think I'd go a little bit beyond what David and Scott said, although I certainly agree with them.

To Marty's point, I think the international analogy is absolutely applicable here in the United States. I echo what he said. It is not just about a performance assessment or a risk assessment or a technology analysis, depending on which phrase, which part of the regs you look at, the

phrases that have been used. This is also part of a broader system that depends on siting. So you have a geographical isolation from human populations or sensitive portions of the environment, engineered barriers which augment that, institutional controls, as Marty mentioned. So there are a lot of things that go into the decision making process and identifying the proper way to dispose of low-level radioactive waste.

I think there are a lot of good comments that have been made. I think there is a way to look more broadly at the question based on what we know today which would give us a better technical foundation for the decisions that we make.

Thank you.

MR. CAMERON: And Tom, I think based on what you're saying, you would agree with and I'm going to characterize this hopefully correctly, David, your comment about when doing this short-term so to speak rulemaking, that the NRC should keep its eye on the long-term needs.

MR. MAGETTE: Yes, I think that's a fair statement. I just look at it slightly differently which is that even by focusing on this problem, you will have laid, I think, an appropriate foundation for

the next problem. But to take David's comment, takes it a step further which says don't just focus on this with the notion that you will have laid the groundwork, but be mindful of how what you're doing today may be used as a foundation and therefore be enlightened by how that will then effect the larger rulemaking which is kind of what I see his point as being. And I absolutely agree with that.

MR. CAMERON: Good. Thank you for articulating that.

Drew?

MR. THATCHER: Two points I'd like to make. One, I'd like just to request that the NRC define low-level waste. I don't know whether that's explicitly done through the international -- because I'm not that familiar with that. Let's just define where the box is and really say what low-level waste is. I think that would be helpful.

The second is and I'm going to have to do a little story here, but it's a concern that the state has that any new classification system may exclude something that currently is allowed. And the history here would be transuranic waste. The Department of Energy initially said back in 1970, 10 nanocuries per gram. Took about a decade, I think, for the NRC to

say okay, 10. Then in '83 we came by and said okay, anything that's greater than 100 nanocuries per gram is by definition high-level waste and we're going to store that in a separate location.

Well, the problem that the State of Washington is facing right now is we're getting a lot of pressure to remove that waste. We only have a couple hundred pounds, but they want us to go into the trenches we have and dig that up. Now we've already included the analysis and the performance assessment for the site, the impact of the plutonium and everything else from transuranic waste. It's not a big driver at all. But that isn't stopping the public from looking at this and going you know, you guys said this was safe here, but then after a while you said that was high-level waste. Do you really know what you're doing? I mean let's make sure we have a good framework for this.

The same thing could be said for depleted uranium. We have about 1500 curies at the U.S. Ecology site, not a lot. But nonetheless, I could see the same thing going forward with this as well. So that's the State of Washington's perspective on classifications.

MR. CAMERON: Thank you. Drew.

Christopher, and then Steve.

Christopher? Do you want to respond to that? Go ahead, Chris.

MR. McKENNEY: One thing that Larry didn't mention about the SRM which goes directly to Dan's point is, is that in addition to us reviewing it from a staff level on what sort of changes need to be made potentially to the rules is that we're supposed to do and suggest what sort of potential legislative changes are needed to parallel the process and to make it more cohesive. That would be everything from possibly asking the legislature to actually change low-level waste policy to actually define low-level waste, rather than the current definition which is a catch-all in its own case.

So we'll take that comment.

MR. CAMERON: Do you think that if you propose legislative changes, the proposed rule is going to go out for comment, but will you get input from the public on proposed legislative changes?

MR. McKENNEY: When we propose in the legislature and they bring them up in bills, I mean we don't have much pull first of all in getting legislative changes, so --

MR. CAMPER: Fundamentally, the problem,

for example, is if we were to -- if we were to change the waste classification scheme today, there are parts of low-level waste policy and law that cites the current waste classification system. If you didn't make corollary changes, you would end up with two waste classification systems. So as you know, what happens is we would propose legislative changes for consideration by Congress to cause an alignment. And in those legislative changes run through the process that Congress follows.

MR. CAMERON: So the NRC may need to see if legislative changes are possible before it proceeds with the proposed rulemaking?

I'm just trying to clarify this for the public so that they know what to expect.

Tison, can you come to the table and --

MR. CAMPBELL: Chip, I think I can add some clarification here.

MR. CAMERON: Great.

MR. CAMPBELL: When Congress passed the low-level waste -- the Low-Level Radioactive Waste Amendments Act in 1985, they acknowledged in the legislative history that the purpose for allocating responsibility for disposal of low-level waste based upon the 1983 regulations was the only reason they

cited to our regulations in the Act. And they acknowledged that NRC or the agreement states or the compacts could change the classification system. And they said that would be fine. The Act would remain as it is. And that would determine how responsibility for disposal was allocated. But NRC or the agreement states could impose additional requirements for disposal.

So although I think Larry and Chris are right, we should probably go to Congress and suggest changes to the legislation. The difference between the legislation and the classifications were contemplated by Congress in 1985.

MR. CAMERON: Okay, so that the NRC has the discretion to do a comprehensive job on this?

MR. CAMPBELL: Yes.

MR. CAMPER: And let me reiterate, if I might, Chip. We're not suggesting that the waste classification scheme is necessarily going to be abandoned or changed. We're saying that in the process of risk-informing the waste classification scheme, the staff needs to look at all the options. They need to be going into it with an open mind.

MR. CAMERON: Okay. Thanks, Larry, for that clarification. Let's hear from Christopher and

Steve and then go over to Susan.

MR. THOMAS: I wanted to reiterate something. There's a historical association that goes along with these classifications, right? So that in Utah, if you asked anyone of our legislators what is Class A waste, they'll say well, it's something that's going to be safe after 100 years. And there have been comments made that hey, you could build a house up there and grow potatoes up there after 100 years and it would be fine because Class A waste will all be gone and there won't be a hazard.

And I think what we've heard today acknowledges that that just simply isn't the case, that there are long-lived radionuclides in current Class A waste and the problem even becomes more difficult when you're talking about something like depleted uranium because it is so different. So my point is that as the classification -- like in other words, if there is no A, B, and C later, let me just predicate it with this, that also Utah doesn't allow Class B and C waste to be disposed.

So if the current A, B, C go away, that's -- I mean what does the Utah State statute mean? Correspondingly, let's say A, B, and C stay -- there are still an A, B, and C, but the levels change, well,

suddenly now what everybody thought A meant doesn't mean that any more. And so that's why I just think, I would just caution to tread carefully around that and to not only consult maybe the agreement state folks, but maybe also I don't know who else you would consult, but maybe the Council of State Governments or some other legislative bodies as well.

MR. CAMERON: Okay, thank you, Christopher.

Steve?

MR. NELSON: I'm really glad we had this discussion about long-term rulemaking. I'm also glad there's beginning to become a consensus that depleted uranium really is something different. And if it is classified as such at some point in the future, which it certainly ought to be, it begs the question what about those 11,000 tons that are just about -- a few weeks away from being delivered here?

What are the impacts of having a regulatory vacuum? And the thing I would like to not only make as a recommendation, but a specific request, I think the staff needs to go to the Commission and make a recommendation that the Commission place a moratorium on the disposal of depleted uranium until this is sorted out.

MR. CAMERON: Okay, so noted for the staff, and one thing we are going to talk about in the next session is what should be done in the interim between now and the completion of the short-term rule.

Susan?

MS. JABLONSKI: I have a comment and probably a question on the waste classification and if I look at Larry's slides, they're pretty generic talking about -- we're not focused on Part 61, necessarily on your slides, but I think all of our discussion has been about the classification scheme in Part 61. There are groups within the state. There's Organization of Agreement States. There's also the Council of Radiation Control Program Directors. Both of those groups deal with the agreement states on this issue and NRC knows the states' issues with, you know, a rem is a rem, what about all classification, because we approach all waste by origin.

And so I wondered if the NRC or is this the beginning of a larger move to look at the whole classification scheme, not just Part 61 with low-level waste or you know, do you have any feel for that in understanding there's going to be some -- those big questions you're going to be covering in this context of waste. But we're dealing with other wastes out

there. We're generating 11(e)(2) waste in our state right now. It's a ramp up of that activity in our state.

Do we look to those things as well and the comparisons that might be made down the road with other waste?

MR. CAMPER: Well, at the moment, we have specific direction from the Commission in the staff memorandum to budget for reexamining the waste classification scheme in Part 61. We take that direction to budget for as direction to proceed to risk-informed waste classification scheme of Part 61. That is the assignment that we have.

Now as we proceed down the road and begin to examine the risk-informed waste classification scheme a litany of questions will surface, but at the moment, that's the assignment that we have.

MR. CAMERON: Okay, thank you, Susan. Thanks, Larry.

Vanessa?

MS. PIERCE: Just a quick point that actually really dovetails with what Christopher just said, but as somebody who interfaces with policy makers that also grappling with questions about nuclear waste disposal policy, I do think there are

some challenges about risk-informing our classification system in terms of, as Christopher said, how do the new risk-informed rules or guidance jive with the existing A, B, C categories if you're allowing long-lived products like depleted uranium in the Class A system when elected officials in the state might have decided to place a ban on the disposal of B and C waste because of concerns that it's hotter and longer-lived and more dangerous.

Besides encouraging you to solicit input from those types of policy makers, I would also ask of the NRC that you somehow address this in a meaningful and useful way for those policy makers, so that they can kind of understand what the hell just happened to our state laws and how do we make sure that our state laws remain intact with our desire to prevent certain types of waste from coming in.

MR. CAMERON: This could have a dramatic effect on the state legislative framework and a good note in terms of outreach to National Conference of State Legislators and the individual state legislators early in the game is coming about.

Did you want to say something else? Okay. Thanks, Susan.

This session on long-term was meant to not

only give you information about what's happening in the future, but also it elicited some good suggestions for the NRC to take into account as it works on the short-term rulemaking. So thank you.

We're going to go right into other considerations now and then we're going to go after that discussion out to the public for comments on any of this and general comments.

Patty Bubar is going to tee this up and we've already had some -- we'll deal with the cats and dogs of the parking lot also after we discuss some of these major issues.

Patty Bubar.

MS. BUBAR: Good afternoon. As I mentioned earlier, or yesterday, I'm the Deputy in the Division of Waste Management Environmental Protection. And what we wanted to try to do this afternoon is in this session is to really, as we were structuring the agenda for the meeting, we went and took each of the questions that we had in the Federal Register notice and made sure that we had time on the agenda to get input on each of those technical questions and parameters. But we realize that there were other questions or concerns that were relevant to the discussion, but not necessarily to the purpose of the

meeting which was for us to get input to help us to develop the technical basis.

So we consciously put this item on the agenda to be able to get some input on some of these questions that we pre-selected ourselves, based on what we had been reading and seeing and hearing out in the news and talking to people. So there may be other issues that you want to discuss during this time period and so we're open to doing that.

The ones that we just pre-identified were what -- and we've talked about some of these already. What do we do about previously disposed depleted uranium? Any insight on that question about how to handle it. What do we do about disposing about significant amounts of depleted uranium before the rulemaking is complete? And we've talked a little bit about that also. And then just what we were discussing right before this session is what happened or what do we need to be conscious of in terms of if we make any major changes to the classification system, how we would handle -- what was done previously. So we can take each of those and discuss them if you feel like those are the right questions for us to discuss in this forum, or we can open it up and see if there's other more important things that

you want to talk about or go to the parking lot item?

MR. CAMERON: Let's -- one of the things that was brought up and it concerns the interim, maybe we should start with what happens in the interim. I know that a couple of people and Beatrice, for example, were talking about what are the agreement states going to do in the interim? Larry referred to that in his opening remarks and coming on to the tail end of that discussion, there was also the suggestion of do we need earlier NRC guidance for the agreement states? It seems like that's one package. Maybe we could deal with the interim and then go back to that first issue.

MS. BUBAR: Yes, on that one, I think Larry may have even mentioned this, but certainly before this meeting we had put out in some communication messages and we've reiterated it that it would be prudent for the performance assessment, for the licensees and the states to work together to have the performance assessment updated before any large quantities of depleted uranium were received. And the criteria that were in the SECY paper can be used as guidance as to what might you want to consider in that updating.

So certainly that's a key method. I think

somebody asked Larry yesterday, is that a recommendation or a decision? It isn't, but we also talked about putting out some guidance in the interim and I think that certainly coming away from this meeting, we're pretty clear that that's a necessary thing to do that, that we will need to put out guidance on what does happen in the interim while -- or what should be happening in the interim while we're doing the rulemaking, taking into account all the things that we've heard over these past couple of sessions.

MR. CAMERON: Thanks for that, Patty. I wanted to get some input from the agreement states first as we started out on this topic.

And Susan, you're the one who is here right now, so --

(Laughter.)

So if you could just talk to this point?

MS. JABLONSKI: Well, in the interim, we have these requirements for the site-specific analysis and peak dose is already part of our rules. And so as it sits in the license that we have issued, it is not allowed under the current license for large quantities until those questions could be addressed.

MR. CAMERON: So Texas is prepared at this

point.

MS. JABLONSKI: I hope so.

MR. CAMERON: Okay. Comments around the table around the interim issue and NRC early guidance?

Steve?

MR. NELSON: Yes, I'll try to be as brief as I can, but -- well, I won't. But I'll try to be reasonably brief.

When I left the Board, about the time I left the Board just over a year ago, it was the time that revelations came forward in the media that depleted uranium, this is right up there, box number one, had been disposed at Energy Solutions. And of course, I've been interested in when, how much, what concentration. All that is a little bit of a mystery to me, but I've come to understand and I'm willing to be corrected if I'm wrong, that there was some concentrated material that was disposed in 2000.

And this happened under my nose as a member of the Utah Radiation Control Board. I didn't know it was happening. I don't know if the state knew it was happening. I have a recollection, vague as it may be, about an Energy Solutions representative at a Radiation Control Board meeting being asked has depleted uranium been disposed and if my recollection

is wrong, so be it, and I'll be willing to stand corrected, but my recollection is the response was no. And this would have been certainly long after 2000.

So I think there is some need for the NRC and perhaps even state regulators in Utah, with respect to this issue of previously disposed DU, need to mend their reputation for one.

Now what do we do about it? I don't know that I have an answer. It's out there. You know the question is what do we do about previously disposed DU? Well, I guess one option would be to try to dig it up. But I'm not going to offer specific suggestion there.

With respect to your second box, I think the answer is obvious. You dispose of no more depleted uranium until rulemaking and classification is complete. You know, what is the Hippocratic Oath say, first, do no harm or the old saying when you find yourself in a hole and you can't get out the first thing to do is stop digging. Well, let's stop digging. Okay?

And with respect to kind of a combination of the second and third squares you have up there, some of us -- some of here have, I think, have reached something of a consensus that DU is a different

animal. I said at the outset of this meeting yesterday that the whole -- this whole meeting is asking the wrong question. I mean nothing has happened here other than to confirm that. And I and I'm sure others around this table have grave reservations about the disposal of depleted uranium in shallow facilities. So really, the thing to do is to stop digging.

Now I think if faced with the regulatory uncertainty, I actually would propose that it might be in both the generators' and the disposal companies' interest to maybe hold off. I don't know that I would want to jump into this can of worms if I were them. I would certainly say that it's from my perspective, it's not in the public's interest for us to go ahead and continue to dispose of depleted uranium before we decide what we're going to do with it. That's the classic cart before the horse. I don't think it's in the state's interest. I don't think it's in Dane's and his staff and whoever their successors may be interest to have to backfill, no pun intended, this issue, continuing to dispose when there are grave reservations and again, I come to the conclusion that there ought to be a moratorium on this and if the only body that can do that is the Commission, then maybe

the Commission ought to be the one to do.

MR. CAMERON: And to broaden out these remarks into a broader context, we just heard from the State of Texas that they feel prepared with their performance assessment requirements for this situation. And we also did hear, I think yesterday, in terms of previously disposed that would have to be considered when any waste was proposed to come into a site that you have to look at the existing source term.

But before we go to others, I wanted to just ask Drew, we're talking about how the agreement states are prepared to go forward in the interim before the NRC rule is finalized. And of course, we heard one suggestion of a solution from Steve that there should be a moratorium. We heard from Susan that Texas has performance assessment requirements and that she feels that they're prepared on this issue.

I just wanted to give you as the other agreement state rep at the table to comment, to give your perspective on this before we go to others around here.

MR. THATCHER: Sure, thanks, Chip. Two things. One, along with Susan, that we would require performance assessment for the disposal of -- and what

I'm going to say is any significant quantities of depleted uranium. We did an Environmental Impact Statement and performed an assessment in a sense and as part of that we allowed for a given estimate of -- until we close in 2056 how much more waste we will take in. Part of that, and I'm going to say it was like 100 curies, so it's not a lot of stuff. If there were anything that were proposed in the next few years that exceeded that amount or it looked like it would pop us in the future past that, we would do a performance assessment. And then we would go from there.

So that's how I see the state handling this. And I don't actually see anything in the next two- to three-year time frame coming to the state that would potentially impact that. So we could probably sit tight.

MR. CAMERON: Okay, thank you, Drew. I'm going to go to Tom and Dan and then come back to Christopher and Vanessa and Beatrice.

MR. MAGETTE: Thanks, Chip. I would start off by saying that there's somehow a notion that's being promulgated that this is something new or just popped up or just came up and I think that's simply not the case. The idea that nobody knew anything

about depleted uranium or where it was or where it was coming from or where it was going until very recently isn't the case. I would go back for one thing to the LES proceedings which have been mentioned here already.

In the LES proceedings, the Atomic Safety and Licensing Board, the technical licensing board of the NRC heard expert witness testimony on the topic of whether or not there were suitable shallow-land burial alternatives for the disposal of depleted uranium and determined that there were. Those decisions by the ASLB were appealed to the full Commission on more than one occasion and on all occasions were confirmed by the Commission. So this is not something that hasn't been thought about, hasn't been deliberated. And the Commission in one of those orders went to the staff and said you need to reconsider this. You need to look at this in more detail which the staff which is reported in the SECY 080147 that we've heard a lot about. David's talked about that.

There's a lot of technical work in that. It supports the notion of shallow-land burial and there's specific comments about the types of sites that may be suitable, the types of depth of burial that may be suitable that we use, in part, for our

support for the notion that Clive is a good site for the disposal of depleted uranium. We don't base this on its Class A that some box has been checked. We base this on a technical analysis and we understand both the usefulness and the limits of the modeling work that was done as part of SECY 080147. But Marty pointed out that's not a licensing tool. It's not a specific confirmation. We don't disagree with that. But we do understand how one can be informed by and apply that work.

And it is useful, applicable, scientifically sound work. And furthermore, staff and the Commission specifically addressed the question of immediate health and safety. Is there an immediate threat to health and safety. Confirmed no. They looked at using an expedited rulemaking process. They looked at issuing an order. This is not a new idea that somehow the NRC should look at doing something in the interim, they forgot to, or didn't do that right. They did look at that. They can speak for themselves. There's several of them here. But I will just echo what they have said in multiple public meetings, including this one, about the immediacy of the problem.

So I don't think that there is interim

action that's necessary. I do agree that with the guidance Patty just confirmed what Larry has said about looking at a performance assessment in the near term as I have said repeatedly, the NRC has certain expectations of its licensees, all licensees regarding how they should deal with, whether it's a formal USQ, like John has talked about or any new information that they don't expect licensees to sit back with their arms crossed and wait for a rulemaking, a multi-year rulemaking to take place. When there's new data available, the NRC expects its licensees and expects the same thing of agreement state licensees to act, to act prudently and to act as soon as they can. And that's what we're doing in Energy Solutions regarding the Clive site. So that's a reasonable expectation. I certainly don't dispute it. And no one is saying we should sit back and wait. But we think we have a very sound technical basis.

We've talked a lot about waste forms, how they behave, certain waste forms in concern with the environment in which they will be disposed. Those are things that we have looked at, that we have a lot of confidence in, including the near-term acceptance of depleted uranium waste from the Savannah River site which will go on essentially in the basement at Energy

Solutions site at Clive.

So I don't accept the notion that this is new or unthought about or an immediate threat that requires an immediate action other than taking the prudent steps to prepare a performance assessment even in advance of knowing the specific criteria that the NRC is going to apply. I think that's our position on all of those topics.

MR. CAMERON: Okay, so basically, you don't think that there's anything that needs -- you think that the structure that's in place is going to take care of things in the interim between now and when the rule is finalized?

MR. MAGETTE: I think that the steps that the NRC is taking and has taken are adequate to protect the public health and safety and the environment now and in the future.

MR. CAMERON: Okay. We're going to go to Dan and then we're going to go to Christopher, Beatrice, Vanessa, and Steve.

Dan and then Scott.

MR. SHRUM: I hate going after Tom. I'm working on my pregnant pauses on emphasizing things.

I've chosen not to bite on the attacks of our facility for the reason that that has not been the

intent of this workshop. I'd like to start out by saying how much I appreciated everyone's comments and input. It's been very useful for me as somebody who is going to have to go out and do a lot of this work.

I will choose to address the comment that Steve or Dr. Nelson made earlier and because I was probably part of that discussion. Dr. Nelson used to take students out to our facility and we would show them around and these are students, much like I was, geology students at BYU, that may have an interest in going into this type of profession.

And one of the things we would -- I would say what would you like me to talk about? And they'd say talk about how you've done the modeling and what you've done there. And I thought I remember distinctly talking about the modeling that we had done to date, what it represented and that we had modeled the cell not for the disposal of DU, but for the disposal of Unat because that was more problematic and that's what we agreed with with the state and that we had modeled the cell at 100 percent of Unat.

Now I fully recognize the limitations of the model that we have at our facility to date. I realize and understand completely the purpose for which that model was created and participated in most

of the models that were done there. So my intention was never or the company's intention was never to mislead or to misdirect. It was always to say this is what we're expecting to receive at our facility and this is what we indeed do receive at our facility.

It may not be any comfort to anyone in this room, but we have received DU. We have received what sounds like a lot of DU, 47,000 tons, but when you put it into perspective of the size of the embankments at our facility, it's a very, very low percentage and again, I'm hearing ahh. Well, that's the truth. I've always spoken the truth. That's the reality. That's previously disposed DU.

Tom has given a very stout argument of why we believe it's still acceptable to take additional DU and I don't disagree that it's a problem, but I do want to state that we are working on that problem and we will be diligent in working through this issue with everyone involved.

MR. CAMERON: Thank you. Thank you, Dan.

MS. BRAILSFORD: What is Unat?

MR. SHRUM: Sorry, that's U natural. It's as if you had removed it out of the ground. Be careful, as an ore, but concentrated it. So it's not mill tail ends. It's actual ore.

MR. CAMERON: Okay. Christopher?

MR. THOMAS: You know, I think there are two things that I think have been most useful that I will take out of this workshop, this exercise. One of them is this slide and the other one is the concept of Class Q. And I want to talk about what the practical ramifications of Class Q versus this weird contrivance of having this DU in Class A.

So as you know, Energy Solutions can take Class A waste. So in the interim, they can take depleted uranium. If it was Class Q, on the other hand, they wouldn't probably, they may not be allowed to take it because it would not be considered Class A. It would be something else.

So my concern here is that you could go through this whole slide here, initial rulemaking to long-term rulemaking. You could have the Department of Energy's stockpile 700,000 metric tons of depleted uranium disposed in Utah as a Class A waste. And then the problem -- this is the same problem you find with the previously disposed DU. Well, if you try to excise that, if you try to dig it back up, I think you run into ALARA considerations and it's just -- so as low as reasonably achievable which would dictate that it's safer to leave that stuff buried.

So I'm saying to myself this is really strange. We've got a performance assessment that I think Energy Solutions has acknowledged does have some limitations in the current framework. I would say those include only looking at 500 years. So these considerations have not been caught on the front end. However, if you try to remedy them on the back end, you run into other health and safety considerations that mean that it should stay there necessarily. And maybe at the end of this whole thing you get to DU -- oh geez, it's actually not Class A, it's Class Z or whatever the heck it is. And then it wouldn't actually have been allowed that whole time.

So again, that's why -- this has practical considerations for us as a state. I know it has practical considerations for Energy Solutions. It has practical considerations for us. But I think that's why to me I would like NRC to say let's hold -- in fact, NRC has said -- it's told its agreement states, hey, why don't you wait, update the performance assessments and then dispose. And Energy Solutions and the State of Utah apparently have said we're going to do it anyway. I mean I would just ask Energy Solutions just go with the NRC's request to wait to update the performance assessment and then do it. I

think that's what I've heard the NRC has asked. It is not dictated. But if it comes to that, I think it should dictate.

And moreover, I think Department of Energy, Marty, needs to go back and say look, we did a whole environmental assessment on where to put our stockpile of depleted uranium, but that performance assessment only looked at 500 years. Shouldn't we put the brakes on this? And Congressman Jim Matheson from Utah has basically asked that.

So I think there's a lot of people who can intervene to do the right thing, in my estimation, and I'm asking that one of those players magnanimously step up and say okay, we'll hold off for a bit.

MR. CAMERON: Thank you. And let me try to broaden the context here and I think we need to get clarification on what the NRC did say to the states and Christopher you phrased it as ask the state to wait until they updated their performance assessment.

And I just want to explore that point outside of the context of talking about Utah and Clive, but obviously they're included. What did the NRC and the states discuss and I just don't want to hear from the NRC. I want to find out what the understanding of the agreement states, Washington and

Texas was on this.

And Patty, can you start us off on this?

MS. BUBAR: Yes. First of all, I want to clarify the way we said this. We said this in a communication plan and in questions and answers or frequently asked questions that were put up on our website. Prior to putting those frequently asked questions on our website, we had conversations with the agreement states, the four agreement states that hosted the disposal facilities, to ensure that we were putting out a message that they supported.

So what we said was given the possibility that large quantities of depleted uranium will be disposed before NRC completes its rulemaking, it would be prudent for the site operator and state regulator to review the existing site-specific performance assessment. The performance assessment should minimally be reviewed against the initial parameters staff identified in SECY 08-0147. That is what we said.

What we said today is that we will take it to a more formal level and put out guidance because this was frequently asked questions and a communication mechanism. We did not say do not dispose in the interim. What we said is what I just

read.

MR. CAMERON: And let's hear from Drew and if Susan wants to offer anything additional, fine, but also note that Patty -- I just want you to confirm, too, that you said that the NRC will develop guidance in this interim period?

MS. BUBAR: Yes. In fact, we actually discussed that as an option as we were preparing for these meetings and that was something we seriously considered, but we knew practically we would not be able to get out guidance before these workshops. So putting these messages out and these frequently asked questions was something that we knew we could do in the time frame that was available to us.

MR. CAMERON: Okay. Let's hear from Drew and then let's go to Beatrice and Vanessa and Steve and Scott and Steve.

MR. THATCHER: Thanks, Chip. Yes, from the State of Washington standpoint, Patty was exactly correct. Initially, the first part of the conversations with the states were what do you guys do -- the State of Washington was kind of in a unique position in that we had done this huge Environmental Impact Statement, essentially a huge performance assessment and we were like yes, we had not accounted

for that. We got a buffer of how much uranium we think we're going to take and there's someone in the audience who knows exactly how many pounds and everything. But nonetheless, we said well, no. We'd simply perform another performance assessment if we needed to to revise that.

One of the details that you all, being the NRC, wanted to know was well, give us some more details about what that PA really involved. And we did a stochastic analysis. We did a very robust analysis and we were very comfortable with that. And it would not take us much, as a matter of fact, it was like 50 grand for us to redo that, to look at that.

Now it doesn't say I can't commit to the quantities of depleted uranium we could take, because it wouldn't know until you come out the other side of the analysis, but it's like yes, we could certainly do this process and that's what we would do. So yes, there was never any discussion through all the conference calls and everything else that sit tight. Because actually, the State of Washington feels like yes, we could actually do this. We would never be able to take the million cubic meters of waste, so that's really not on the table for the State of Washington in any way.

MR. CAMERON: Okay. Patty, did you -- let's go down the row here and then we'll go back over there.

Beatrice?

MS. BRAILSFORD: Okay, I'm going to just ask for clarification about a couple of specific points on this dialogue and then I would like to go back to the other considerations slide.

I do think you had said that US Ecology in Washington cannot take waste from out of state for some short period of time. No. Okay.

MR. THATCHER: No, I don't believe that's correct. We do have a compact and actually Mike Garner is here and he can talk about the compact and what you can take and whether out of compact waste, but no, I don't believe I made that statement.

MS. BRAILSFORD: Okay, and then Marty, since you are the generator in question, you had said that Mr. Matheson had sent Secretary Chu a letter requesting that DOE hold in abeyance these 11,000 tons.

MR. LETOURNEAU: Yes.

MS. BRAILSFORD: And that the Department of Energy is considering that request?

MR. LETOURNEAU: The Department of Energy

is trying to formulate what it's position is going to be and we'll be responding to that letter. It was dated the 16th, so it's just a week and a day old. We didn't get it in on the 16th. I think we probably got it on the 18th. So there's a lot of staff work that still has to be done, but absolutely. We're going to formulate a response and respond to that.

MS. BRAILSFORD: Okay, and I guess I would note that there is a federal agency and as near as I know, Savannah River has a fair amount of nuclear waste so that maybe you could accommodate storing this material for a while longer.

MR. CAMERON: You're going to have to go to another.

MS. BRAILSFORD: All right. I said yesterday morning or last year, whenever it was, "see Utah and die" that I was concerned that we were approaching this problem in the reverse order and I would like to restate that. And it is based, in part, on -- I've watched Department of Energy and I was actually kind of pleased to hear DOE's waste policies praised today. Some of the decisions DOE has made over the years have not been particularly praiseworthy and come under the rubric of if you're in a hole, stop digging.

I do think that if we don't come to terms with the larger frame, what we will be left with is future decisions being guided by decisions that we might have made differently if we had looked at the big picture. And disposing of transuranic waste in shallow-land burial is one of them, but there are others.

So I would -- I understand that you have this -- the golden tablets or whatever these Commission memos are written on. I understand that you have received those, but I would strongly encourage all of us as we are looking at how to move forward to start with the broader frame and then narrow down and I don't think that the nation will come to its knees if we don't dispose of the DOE depleted uranium. So it's just a real -- we have spent so much energy in this country treating every waste stream at least once and moving every waste stream at least twice. And I would suggest that this might be the time to step back and do some reevaluation.

MR. CAMERON: And when you say the larger frame, you mean the long-term rulemaking?

MS. BRAILSFORD: Yes.

MR. CAMERON: Thank you, Beatrice.

Vanessa?

MS. PIERCE: All right. One just quick thing to get on the record. At some point, I know you've asked agreement states to chime in on answers to two of your questions. You've heard a lot from HEAL Utah, a former Radiation Control Board Member and right now Utah is not even at the table. So at some point I would like you to reiterate those questions and have Dane or a representative of the State of Utah answer them because I, myself, am interested in hearing the answer to those questions.

MR. CAMERON: In other words, hearing from the State of Utah what you've heard from Texas?

MS. PIERCE: Yes. I would like to hear our state chime in.

MR. CAMERON: Okay, that's fine.

MS. PIERCE: A separate point, however, to get to this question about initial rulemaking. And this was raised a little bit earlier, but I don't think fully addressed. I would like to see the issue of land ownership addressed in the initial rulemaking. So -- and this goes back to this issue of what's Class A versus what's Class Q.

Energy Solutions was granted an exemption to the federal law about having federal or state

ownership of land that is used for commercial nuclear waste disposal. That one could make the case that is okay or less problematic for waste streams that typically decay to a reasonably hazardous level within a couple hundred years? But given the longevity of depleted uranium I do think that it is important in the initial rulemaking to address who will be the legal responsible guardian of the land where this depleted uranium is disposed of.

MR. CAMERON: Okay, thank you, Vanessa. That's the same point we heard from Christopher earlier on land ownership. Okay, great.

Steve, and then we'll go to Christopher, go back to Scott and Marty and Steve.

MR. NELSON: I suspect that -- and I am addressing these points on the board, on the screen, and I hope that we can differentiate between what are in my mind legitimate concerns about previous disposal, pending disposal with respect to the eventual disposition rulemaking as being separate from an attack, okay?

And if it happens to be that Energy Solutions interprets it that way and if I were in their shoes I probably would view it and characterize it as an attack. But it's borne out of a

consideration for doing the right thing with an animal that is very, very different.

And by the way, I think it's a great site for the conventional, for want of a better term, Class A waste.

Now with respect to all of this having been done in the open, all I can offer is that as a Radiation Control Board member for ten years, I was hardly a casual observer and I did not know until it was revealed in the media that depleted uranium had been received and accepted at the Energy Solutions site.

MR. CAMERON: Steve, I think we're just going to have to stop beating on that drum, okay? That's not really what we're about here. It's an important issue and you've made your statements before, fine. We heard Energy Solutions, but I just don't want to keep going back and forth on this particular issue about who knew what when because it's not instructive for the NRC's rulemaking effort.

MR. NELSON: I think it's very instructive for the NRC's rulemaking so the affected parties know what's happening because in the past they haven't.

MR. CAMERON: Okay. Well, then that said, that's the point. Okay.

MR. NELSON: Okay, then finally to this I was going to ask some rhetorical questions. I'll just make a statement that reviewing a performance assessment for depleted uranium that extends out to what, 500 years, and then deciding it's okay is a meaningless exercise when we all know and we all acknowledge that the peak activities will be reached much, much later than that.

MR. CAMERON: Okay. And Christopher, and then we're going to go to Scott, Marty, and Steve.

MR. THOMAS: And I'm glad -- because Patty, I just wanted to go back to you. My point is that revisiting a performance assessment may take some time, so if the goal is to revisit a performance assessment before a lot more of the material under consideration arrives, that can take some time. So again, going back to the request of for this middle box, disposal of significant amounts of DU before the rulemaking is complete that at least a performance assessment is in place and has been reviewed by the agreement program, that at least more -- much more closely resembles the issues that were brought up in the SECY paper and in the DU analysis.

So you know, looking a thousand to a million years to me is a lot different than looking at

500. We don't need to go any further than that to say it would be nice to have a performance assessment redone and reviewed by the state that more approximates that one thousand to a million year time frame before more significant material is coming. That was my point.

MS. BUBAR: I understand. Thank you for that clarification.

MR. THOMAS: Thank you.

MR. CAMERON: All right, Scott.

MR. KIRK: Patty, what I heard you say is that you expect a performance assessment to be done so that you can assure that the action is safe and that's sort of in alignment with your philosophy on safety culture that you analyze it first and you demonstrate it safe before you take the action.

But I would get at is that based on all of these discussions that we've had today, those three questions should be specifically addressed. Sometimes I forget what's said in these meetings. It must come and I think it would be really helpful for you guys to put together what you think the thoughts and positions of the Commission on these three questions, on the slide, based on the discussions that we had today.

MR. CAMERON: Thank you, Scott. And

Marty.

MR. LETOURNEAU: I did not attend the Radiation Control Board meeting, but one of the things that I understand and if I don't get this correct, Tom, or somebody can correct me, but what I heard was that the Radiation Control Board told Energy Solutions that if they continued to go forward that they would still be expected to meet whatever requirements that would come out of this rulemaking and that if that was problematic, they'd have to fix it. I mean is that, in essence, what I heard?

So I mean there is some safety measure that has been put in place here that recognizes that there could be action that had to be taken based on what comes out of the rulemaking.

The second thing is that and it's related to the safety measures. The NRC has issued a pretty clear, strong suggestion to the agreement states and to the disposal facilities to look at their performance assessments and look at not only the DU that may already be there, but the DU that is expected to come before the rulemaking is in place. And identify if there is a potential for an issue there.

So it's not -- I don't think it's a complete free for all, and I do see what appears to be

prudent measures being taken. I know that everyone would prefer that everything stop until the rulemaking is completed. But there are some practical reasons why that may not be so.

MR. CAMERON: Thank you, Marty. And let's go to Steve, Steve Cowne.

MR. COWNE: Yes, I'd like to pull the string a little bit more on something that Tom was saying earlier and mainly along the lines of the LES proceedings. What we're talking about here the issues about disposal of DU were evaluated previously by the ASLB and the Commission and quite a bit of discussion took place, quite a bit of technical discussion and evaluations and it was determined that DU could safely be disposed of at that time. And so I would just caution the NRC that if we go forward with regulatory guidance in the interim before the long-term rulemaking is made, that we make sure that somehow that guidance doesn't change or trump or do anything different than what the regulations state.

We have valid regulations in place right now. There's no urgency. We've talked a lot here about the time periods involved with this issue. There's no urgency to take action that may not be the right action in the next couple of years. Let's take

our time and follow our process. We have a process to use. So thank you.

MR. CAMERON: Okay, thank you, Steve. Beatrice and then Christopher and then we're going to go out to the audience.

Beatrice?

MS. BRAILSFORD: I actually was at the meeting, Marty, and the assurance of -- and I would really rather -- I think the key things are those questions on the slide. But the safety assurances were in a fairly ad hoc manner and I think what I was saying in response to the questions on the slide, I did want us to acknowledge how much energy and money, frankly, you know, the Department of Energy will end up spending hundreds of billions of dollars correcting mistakes that might not have been mistakes at the time. And we've got better things to do.

MR. CAMERON: Okay, Christopher?

MR. THOMAS: Thanks. Two points, just real brief. One is could ALARA preclude removal in the future? I just want to note that again and hopefully maybe get a response in a more formal way. And two, I would be happy off line to talk to Marty or whomever at the Department of Energy because you made the statement there are reasons why it should happen

now and I would like to have a better understanding of what those reasons are.

MR. LETOURNEAU: That's not exactly what I said.

MR. THOMAS: Okay, I'm happy for you to restate.

MR. LETOURNEAU: We'll deal with it off line.

MR. THOMAS: Okay.

MR. CAMERON: Thank you. Thank you very much. On ALARA, Chris?

MR. McKENNEY: Any action of remediation, of course, you'd have to look at all types of options of what would necessarily be needed and that includes feasibility. That includes risks to actual people today and trying to balance that versus future generational risks. That's true whether we're talking about waste sites, decommissioning of a reactor or a license termination, there's always health and safety that you have to worry about to make sure it's safe. You can't just say well, we need to dig something up. It's 180 feet down. We'll drop a guy on a string all the way down. You need -- all those things do have to be taken into account on what options are viable.

MR. CAMERON: Okay, we're going to the

public now for comments and we're going to come back up to the table and I'm going to ask Larry at the appropriate time, senior official here, just close out the meeting for us. But I want to go around and let any of you at the table who wants to make a final comment, talk, and then we will adjourn. But we do want to go to the public and I'm going to go to this young lady first, and then we'll come over.

MS. WOODRUFF: Hello. My name is Liz Woodruff, and I'm an energy policy analyst for the Snake River Alliance in Idaho. This is only my second engagement with NRC processes and procedures and I would just like to say it's -- the best word I think is fascinating, so thank you for the opportunity to be here and participate.

I'm here assisting and supporting Bea Brailsford. She's the expert in our program. I do outreach and education work on these issues, just so you understand where I'm coming to this from and I'd ask that as I make these comments, please correct any assumptions, misassumptions that I make and I have two kind of areas I'd like to cover and the second one I think is more of a general context comment and I do recognize that it's not as relevant to the substantive issue of the rule before you.

The first point I'd like to address is the time frame issues. So just from kind of an outside perspective, not sitting at the table, I know this has been hit a few times, but I've reviewed the minutes of the D.C. workshop and I wanted to kind of pull a thread through from that. Depleted uranium is a unique characteristic of increasing in radioactivity over time, results in the need for disposal pathway with accounts for longer time lines and deeper exploration of implications of potential unpredictable factors that could change the viability of any given site.

And I think this especially applies to the Energy Solutions site because it's an above-grade site. At the least from this workshop it's clear that near surface disposal is not appropriate for DU. And according to the NRC's own parameters of low-level waste, even enhanced or near surface disposal does not seem to overcome these issues associated with DU's characteristics. So whether a performance assessment accounts for the failures of a given site or not, the time frame issues associated with DU presents serious mitigating factors for any appropriate disposal pathways.

So I heard Tom's point earlier that the

rule of low-level waste does seem to apply to the Energy Solutions site, but that is in opposition to most of the testimony we've heard here and indicates that that simply is not the case. So many of those factors have been addressed by Steve and others of these long-term consequences of DU becoming most dangerous starting in its hundred thousandth year up to the millionth year. But in the D.C. workshop, Dr. Makhijani addressed and I think he addressed it to David Esh the concerns around climate. And I just would like to pull that thread through that the base assumption of the parameters in the performance assessments, etcetera, were made on the assumption that climate is in a static state. Climate changes in a static state. And I haven't heard that addressed here.

The factors that are associated with climate change, whether human centered or not, have consequences that have been addressed. And I don't think that it has been resolved. And I think it really indicates that the disposal of DU, especially at the Energy Solutions site would be inappropriate.

And the second point is on the difficulties of disposal related to current quantities of DU and potential new quantities. So we know that

there are waste quantities out there, 700,000 tons from DOE, potentially 14,000 tons from the LES site in Eunice, New Mexico that is beginning to be operational. But this does not indicate that there's a need for disposal, that there is a need for new quantities of DU to be produced, that that is somehow an inevitability, right?

So the question is, is new enrichment necessary. Why not decrease the apparent urgency for making this rule and postpone the licensing of any new enrichment facilities until the current depleted uranium can be properly disposed of? So rather than focus on how to make a rule for an ever-increasing quantity and concentration of DU, why are we not addressing the actual cause of the problem, rather than the symptom? In other words, instead of trying to form a rule that accounts for inevitable large quantities of depleted uranium and from enrichment, why are we not looking to decrease potential future quantities of DU?

So obviously, the LES site is going to inevitably be producing depleted uranium, but that doesn't mean that there's a need for more enriched uranium in this country. As a matter of fact, I would argue that the nuclear renaissance, quote unquote, is

stalled significantly. And there isn't a supply need.

So in that instance, I think we should be asking larger questions about -- I know that Mr. Camper addressed the notion that originally back at the D.C. workshop that originally when the DU rule was formed, it was based on the assumption that there wouldn't be large quantities and he asserted in his introduction in D.C. that that landscape has changed. But the changing of that landscape is not an inevitability and it seems to me as though at the very least for the NRC to be acting responsibly there should not be licensing of any new enrichment facilities until this rule is established and a need is justified.

MR. CAMERON: Okay, thank you for that comment. And I just want to emphasize for everybody here around the table and in the audience that the NRC did build in this opportunity for let me call them larger issues such as we've heard to be addressed, to give the public an opportunity to say those. So if anybody is feeling well what does that have to do with the rulemaking, this is a larger opportunity here to hear from the public.

And could you introduce yourself again, Claire?

MS. GEDDES: It's Claire Geddes. I wanted to address, first I want to thank you all for giving us the opportunity to come here. It's been very helpful for me and it's something that we've never -- we didn't get on the state level when this decision was made and that's something I want to talk about.

It's been said here that the Board voted on this. And any of you who were at the meeting know exactly how it happened. I was astounded. There was a letter dropped off apparently the night before at the head of DEQ. And these board members were told through the director that she had this letter and this was okay, they could do this. There was no time for any of us to even speak. There was absolutely nothing. I've never seen -- when we've had a decision of this magnitude on -- they did it as an amendment to the license. We always went through several stages and I mean this is very concerning to me because I know there is a very strong consensus out in the community that they don't want this waste. And it looks to me like it's being shoved down our throats in a very improper manner and I think that's one thing that should be addressed.

We should be able to have a process like I hear you're talking about that you have at the state

level. I'm also concerned we don't even have a person here. And that tells me a lot. I feel like I'm not comfortable at all with the regulation I've seen in Utah and I believe the regulation is too close to the company and that's the thing I'd like the NRC to address.

MR. CAMERON: Okay, thank you for that comment and would you like to make a comment also? Just introduce yourself to us.

MS. SERLES: I'm Christine Serles and I'm just a little public bird here today, but as I was growing up I watched them move uranium tailings from 21st South and 500 West and I had been over there as a kid several times and I thought if this stuff so safe why is it we're moving it from 21st South and I never really did understand where they did move it. But I remember it costing a lot of money. Now those are just my recollections as a child, but also I want to know if we do put this out there at Energy Solutions, my mother is buried deeper than that. I know she is, because we dug double deep, okay? And that does make me worry because it says low level if you inhale it is dangerous, even fatal.

So digging down ten feet and we're burying it, also, isn't there water down underneath this

little valley here that I remember somebody talking about pumping out and using? That's been a few years ago, but I just want us to look at all of these options and again, our mountains do capture the water and it rolls downhill. So let's look at all these things that we should look at for not just us, our children, our children's children and we are very, very populated here with children.

I want to thank you also for being very honest because honesty is the best policy and if you speak honest, people understand that. Not dancing around words, not dancing around the questions, not coming back and forth to these questions, but just straight forward in the first place.

MR. CAMERON: Thank you. Others on either the issues? Okay. And we're going to go to you. And then we're going to go over there.

Please introduce yourself again to us, please?

MS. FRANKLIN: My name is Naomi Franklin. I am a research professor of biology and a very concerned environmentalist.

I will not reiterate all of the cart before the horse instances in this particular situation. I find it particularly egregious that

another 14,000 metric tons of DU were agreed to be delivered to Clive during the summer at a time when the Utah Board was supposed to be considering a moratorium on DU delivery, a moratorium that was advocated by HEAL Utah.

It was also at a time before Energy Solutions had assigned any particular advisor to prepare them for the delivery of this kind of material. They seem now to require an advisor for that purpose, but it didn't come up previously.

But I think I have learned a good deal from the discussion here and in particular I have the impression from what I've heard that the NRC has been under particular pressure to deliver DU waste to a repository in a big hurry. They found it convenient to classify the waste as low level, although as we heard there was considerable discrepancy in thinking on that subject.

(Pause.)

It seems like there's a peculiar sudden accumulation of DU at the uranium enrichment plants which are licensed by the NRC. I would like to understand this particularly large surge in the presence of DU in our enrichment system. Is it because there is no longer a call for commercial uses

or is it because there is an increase in the amount of uranium being enriched?

I'm very much in agreement with the previous statement made by the young lady over there that it seems that the expectation for one million tons of DU which is now being stated by the NRC, this is a very peculiar large expectation. Why are we enriching uranium at this point in our considerations? The President and many nations are calling for a reduction in the presence of nuclear arms. Is the uranium being produced for fuel in nuclear energy plants? I would not imagine that it was being used for nuclear weapons at this time. But perhaps that could be accounted for.

I would really like to understand the expectation of one million metric tons of DU in our system and this, it seems to me, is the question that should be asked.

MR. CAMERON: Thank you, Naomi.

Yes, sir. Please introduce yourself to us.

MR. MARKS: Thank you. My name is Jay Marks. I work for the Proposition 1 Committee in Washington, D.C. We're touring the country in favor of nuclear disarmament and economic conversion of the

nuclear industrial complex to peaceful purposes and renewable energy.

Thank you for holding this hearing and for taking public comment.

I guess the good news is that this stream of depleted uranium is not being channeled further into the military industrial complex and not being used to create more weapons that are ultimately radioactive the way depleted uranium has been used in Iraq on separate occasions and in former Yugoslavia. So that's the good news.

I'd certainly like to echo this woman's comment and other comments earlier about what is the expectation of this amount of new depleted uranium? Why on earth would we be expecting that? I recognize that certainly the nuclear industry is hoping that there will be a so-called nuclear renaissance and that nuclear energy is a fuel for the future, but I think anyone who has been looking at the reality of the climate and looks at the reality of the waste stream generated, not just depleted uranium, obviously, but the entire waste stream of nuclear energy cycle, understands that nuclear is not an energy of the future. It's actually an energy of the 20th century and the past. And the real energy of the future for a

sustainable environment, the one that we all hope to have and share for many, many generations is solar, wind, truly renewable energy and I hope that Energy Solutions of Utah channels some of their future thinking towards expanding, developing, and deploying truly renewable technology.

Utah is very rich in solar and wind resources. If we can just muster the energy and the resources that are now being spent on getting ready to expand the nuclear industrial complex, if we channeled a fraction of that towards development and deployment of truly renewable technologies, this is not just for you and the NRC. I recognize it's not the job of the NRC to plan for the eventual demise of the nuclear industrial complex, but I hope that in the Department of Energy it would be nice if the Department of Energy actually were looking towards renewable energy solutions, rather than basically being the Department of Nuclear Weapons and Nuclear Materials.

We do finally recognize that the end product of the nuclear energy process cycle, plutonium being one of the end products, is really the beginning product of the nuclear weapons cycle and at a moment when our President is chairing the Security Council and leading the world towards a world free of nuclear

weapons, something else that I hope and trust that we all yearn for and work for, that perhaps it's not necessary for us to continue a technology that is building -- that is creating plutonium which at the very least is an environmental hazard and a security risk forever, and at worse, might end up in more nuclear weapons.

Thanks again for the opportunity to speak on this.

MR. CAMERON: Thank you. John, do you have something? Then I'll go over here.

MR. GREEVES: John Greeves. Two comments. First, and they're completely separate comments. Unique waste streams, you're charged with looking at Part 61. I'd ask you to pay attention. There are other ways to disposition waste. There are a number of exemptions in the regulations. If you're going to require site-specific analysis that accounts for what's already in the ground, what you're disposing today and what you're anticipating, I urge you to look across the various pathways for disposal, not just Part 61. That's a comment. I think you understand what I'm saying.

Second, the topic of the long-term rulemaking, my observation is I think there's a

tension between the short-term rulemaking and the long-term rulemaking. I don't think you can do the short-term rulemaking in 10 CFR 61.55 without dragging a little bit of the longer term with you.

Chris McKenney made an eloquent discussion. I invite you to examine the transcript after the meeting. In 61.42, I believe what he said was we need to improve the way that we require site-specific analysis. I don't think you can do it in 61.55. You've got to jump into 61.42. He also pointed to the period of performance. So I just invite you to examine that I think you're going to actually end up with a bit of the longer term piece, some of us think in longer term pieces. You're going to have to look at that even with the shorter-term piece.

It's an observation and I've heard others say it in different words. So thank you for the time.

MR. CAMERON: Thank you. Yes, sir.

DR. MOENCH: Brian Moench, President of the Utah Physicians for a Healthy Environment.

Most of the depleted uranium in this country is stored in large steel cylinders that it's been well documented they originated were constructed for containing phosgene gas. And the Department of

Energy acknowledged as of 2000 that the phosgene was not adequately -- these steel cylinders were not adequately cleaned after containing phosgene.

Disregarding that issue for a moment, there is no question that nobody considered the storage of depleted uranium in these steel cylinders as anything other than a short-term solution to a long-term problem. And yet, the whole strategy here of sending these steel cylinders to Energy Solutions to be buried under X number of feet of earth is obviously designed to be a long-term solution. So if, in fact, these steel cylinders were constructed at one time with the intent of lasting at least decades, but certainly not much longer than that, and then these steel cylinders are going to be buried underneath the ground as part of a long-term strategy, there's an inherent contradiction there.

There's photographic documentation of the fact that many of these steel cylinders are already being breached and eroding and seeing how some of the depleted uranium in these cylinders is already in the form of uranium gas, if these steel cylinders continue to be breached, whether or not they're under the ground, eventually that uranium gas will at some point reach the atmosphere. So I'd like to know how anyone

addresses this sort of inherent contradiction.

MR. CAMERON: Thank you, sir. I'm going to come back to the table now and I want to give everybody around the table, if they wish, pardon me?

What did you want to ask? Okay. We're not into clarification, but ask quickly.

MS. ANDERSON: Sorry, guys. I'm a little out of turn. So I just want a little bit of clarification from NRC staff about -- I'm Sarah Anderson with Radwaste Monitor and I wanted a clarification from staff. I know that now Chairman Jaczko was kind of the strongest voice on the Commission about opposing DU being Class A waste and given that we've heard that NRC is going to come back with near-term guidance I was interested in what the time line was for that more near-term guidance and whether or not there is any possibility that the near-term calculation might change or that the NRC might more strongly recommend doing performance assessments before interim storage of DU?

MR. CAMERON: Okay, and let's deal with this rather efficiently. In terms of the guidance question, do we have an answer for when that might be available?

MS. BUBAR: We don't because we haven't

really sat and talked about what the resources associated with it would be and what would be the relative prioritization of the guidance versus everything that the staff has to do to actually begin the development of the technical basis now that we're finished these meetings. So I can't give an answer without having had a chance to discuss it amongst all of ourselves.

MR. CAMERON: Let me just add from a process point of view on those other issues is that as I said at the Bethesda workshop, although the staff has the -- as Beatrice called them, the golden tablets -- staff requirements memorandum that gave the staff direction from the Commission, majority of the Commission to do this initial rulemaking and then to do the long-term rulemaking that comments from people around the table was we heard Beatrice say the larger frame should be first. We've heard comments like that, that even though those are not directly related to this initial rulemaking, that those comments of that type will be communicated to the Commission for their reflection and as usual with the relationship with the staff and the Commission, if the Commission thinks that this should be reexamined, they will certainly discuss that and tell the staff about that.

And what I'd like to do now is I'd just like to thank all of you around the table for great discussion. Obviously, we got into some commentary on the situation in Utah which is only natural, but most of the commentary was relevant to these rulemaking issues. And I would just thank you for all of the discussion and I asked Larry to close the meeting out for us, but I wanted to give all of you an opportunity first around the table to just offer any remarks about process or whatever and I'm going to start with Beatrice and let's go to the external participants on this and then we'll let Larry close it off.

Beatrice, would you like to say anything?

MS. BRAILSFORD: Thank you. I think this has been a very valuable process. I would like to encourage you -- and I won't say again that I don't think -- well, yes, I guess I will say again that I don't think depleted uranium is appropriate for shallow land burial. I will say again that I think you do have to look at the larger frame or we'll be right back in the mare's nest we're in now.

I would like to ask you, Chip, just because there are a lot of people in this room, to emphasize that the comment period for this, that we've been spending two days talking about, the comment

period for this decision, this path forward, whatever you want to call it, doesn't end until October 30th, so we have lots of time to continue to mold the issues, both those of us who have listened to all sides for the last two days and everyone. I mean this is a big damn deal. And if Chip could put the comment period deadline and the ways to get your voice heard in this process, I think we'll have a better decision in the long run.

MR. CAMERON: Okay, thank you for that, Beatrice. And it is October 30, 2009. There's various ways, electronically, hard copy, to provide comments. We have the Federal Register notice out there on the table and right on the front page of that, you don't have to dig through it, right on the front page it has how people can comment on this issue. Thank you, Beatrice, for bringing that up.

Vanessa?

MS. PIERCE: I, too, would just like to thank everybody who participated in this process. I thought we did have a lot of good discussion and there were a couple of times where HEAL Utah and Energy Solutions agreed on some things, so that's kind of exciting.

(Laughter.)

I guess my bottom lines would be that we would also urge the Commission to consider taking a step back and considering whether evaluating a geologic repository would be a more ideal way to handle the disposal of depleted uranium. We would also strongly urge the NRC to consider nailing down the definition of Class A waste, rather than allowing it to persist as a catch-all category which I think is the root of a lot of the problems that we've been discussing today. And I would also continue my suggestion for considering Class Q waste.

Thank you.

MR. CAMERON: All right, thanks, Vanessa.

Steve? Steve Nelson.

MR. NELSON: I was just going to simply say that I had said too much already and not say anything, but I decided not to do that, but I will be brief. With respect to something you said, Chip, to begin this final round of comments, I suspect that the choice of Utah for a workshop was not made in a vacuum. Whether you view it as an attack or a relevant part of a discussion, Clive is a relevant case study to many of the things we've talked about today and yesterday, performance period, site-specific criteria. And also, most recently, under your issue

five, other considerations, should we proceed to in place or should we not. And also relative to issue five is trust and transparency and I think everybody knows what I'm alluding to there. That is also a relevant consideration. Oh, and salt.

MR. CAMERON: Thank you, Steve. Christopher.

MR. THOMAS: I guess I came into this really wanting to -- well, first of all, let me say thank you again, too. I've learned a lot. I've enjoyed my interactions and conversations with many of you.

Tom, if there's a time that we can talk about alternate feed, we would be open to that discussion. But I want to -- here's my main concern. My concern is that the outcome of this process not be predetermined. Nothing in it has happened here has actually quenched that concern as I looked at those boxes, because I feel as though as long as you want depleted uranium of this type and quantity into Class A, it's going to be coming to Utah. And even if later there's something that says okay, geez, maybe that wasn't good, well then you've got other issues you have to deal with like ALARA. So I'm not sure at that point that you have a remedy.

The question is, is there a remedy for the thing that happens in the interim if it turns out to be not good later. And I think all of a sudden there is no remedy and you're in the realm of mitigation. Well, so maybe you do the best you can to mitigate from then until some future point where it does become a problem and then we're in a situation as Bea talked about where you are having to spend lots and lots of money. Maybe everything else has decayed pretty much, but you've got -- well, even though I don't know if it would be safe to take out and put somewhere else.

So anyway, I'm just saying the way it's set up now I'm concerned that there's a predetermined answer for what's going to happen with the DU, the depleted uranium from Department of Energy.

Secondly, I think we have talked about some of these larger issues -- oh yes, and I think that's a function of the narrowness of the way the Commission order was drafted. It was drafted in a very narrow way to amend a certain part of the regulations that would make DU Class A and all that stuff, but I would say there is an opening, I think, however small, to pursue a different approach. Because as I looked at that Commission order I thought this is really interesting. There's a statement here

that says as an initial approach. Do all this as an initial approach to this issue.

So I would just encourage other panelists who have some comments outside of the very narrow frame of this looking at as a Class A waste, etcetera, to really let the NRC know we think this should be approached in a different way because I do think there is some consensus on that. And that's certainly going to be some of our comments and I think we would prefer to step back and not dispose of this before more analysis is done that I think everybody would feel more comfortable with.

Thank you.

MR. CAMERON: Thank you very much.

David?

MR. KOCHER: Thank you. I want to make two points in closing. I'm going to do something that you shouldn't do at this stage and that's just mention a new issue that has not been discussed at all.

(Laughter.)

But I'm just going to throw it out, but that's the second point.

The first point, I referred to DU as a different kind of beast. Let's be clear that it's not just because the half life is very long. It's not

just because the activity increases over time. It's not just because radon builds in. It's because we have lots of it. It's the one million cubic meters is really a key part of this issue. If we just had a few barrels of depleted uranium I don't think we'd be here.

The issue I want to raise is about chemical toxicity of depleted uranium. One of the frequently asked questions in the communication plan raised this issue and basically the answer was the NRC is not going to deal with this. I would suggest that's not an enlightened approach. It may turn out that chemical toxicity is not more important than radiation dose from depleted uranium, but it may not, the opposite may be true.

So at a minimum, the NRC needs to have in its desk drawer some calculations which if you receive a dose of 25 millirem, what's the impact on the kidney? Is it above a threshold? Is it below a threshold? Is it not? You really have to do this and if the NRC doesn't do it, the states should require it.

Thank you.

MR. CAMERON: Okay, thank you, David.

Susan? Scott?

MR. KIRK: I found these hearings very helpful and educational for me. There's a lot of good back and forth, a lot of good discussions. It was very helpful for me to understand the issues and other people's perspectives.

I compliment the NRC for putting so much time and effort to putting this workshop together and I'm very interested in seeing the outcome and I hope it's not a predetermined outcome either and again, I just look forward to seeing the guidance.

I don't mean to be impolite right now, but I must go to the airport and again, I just want to say thank you very much for your time.

MR. CAMERON: Thank you, Scott.

Marty?

MR. LETOURNEAU: I would like to express my appreciation to the NRC for creating this type of an event. I think this was a fantastic panel. I think that it's fantastic that the public gets the opportunity to see these types of interchanges. This panel was chock full of people that had important perspectives and knew their fields and this was very much a pleasure for me, a privilege to be a part of this.

I wanted to thank everybody in the

audience who took the time to come here, to listen or to learn or just to be here to share your opinion with us. I thank you very much. And this is a good model for how things should be done.

MR. MAGETTE: First of all, I'd like to thank you, Chip, personally for the work that you've done. We really couldn't have done this panel in any sort of way half this effectively without your guidance and your hand on the tiller, so I appreciate that. I appreciate also what the NRC is doing with this process. I think I like the process. I think it is important and will help you find a better proposed rule the first time around having done this. I appreciate the fact that you hold these workshops. I personally appreciate the fact that you've included me. I'm privileged to have done that, as Marty said. I'm especially privileged that you've allowed me to do it twice.

(Laughter.)

Maybe next time you could just ask me to do it once. But I also appreciate the other panelists and the contributions that everybody has made. The different viewpoints have been helpful.

I would also like to thank the NRC for the work that they've done going into this. As I said

before, I do think that there's a lot of technical work that we're building on and the one difference I have with some of the comments is the suggestion that we're starting from scratch because I don't think we are.

And I'd like to conclude by saying what I would like to see the rule look like, give you some specific feedback as to the specific topic of these workshops. I agree with the selection of the second option with what the Commission has directed. I think that's a sound approach. I agree with the notion of the two-phased approach that's been suggested that they could merge or be one or that the larger one could go first.

I don't necessarily disagree with that. I think there's a lot to that idea, but I still think it's actually better to do it this way because I do think having done this you will really have done a lot of the work for the next one. And it will be more helpful to have done it with the focus on the depleted uranium waste form. So I think that is a good approach.

I like the idea of the -- in this particular case, a new regulation that requires a site-specific performance assessment for the disposal

of large quantities of depleted uranium without specifying what that minimum quantity is, that the trigger point be the disposal and if you need phraseology, it could be for example, pure waste streams from the deconversion process from enrichment of uranium, but that that's the kind of trigger you should have.

I also believe that you shouldn't try to include something called other unique waste streams because I think that will cloud the issue and I don't think you can appropriately define that. Furthermore, I think the performance of a site-specific performance assessment with an evaluation of the complete source term and in something like a DOE Order 435.1 approach, you will capture those issues and you can also capture them in a predictive way when you have a waste stream coming that you haven't previously specifically analyzed and it's not a start from scratch with your performance assessment if you have to do that.

I don't like the idea of trying to define something that you don't know what it is. So I would again urge you not to do that.

I also think the distinction between rule and guidance is extremely important. I think the rule should be fairly simple. But I also think that there

are things in your guidance today that belong in rule. And so I would urge you to revise subpart C of Part 61, the performance objectives that I have referred to several times to specify an intruder dose at a period of performance because I don't think having those in guidance is really sufficient to get the end result that you want and need.

As for guidance, if you're going to talk about scenario selection, whether you're talking about thefts or taken in transport for -- transport pathways or dose pathways or dose receptors, whatever all those things might get in terms of the treatment that you give them or the minimum specifications, or as you put it, in the Federal Register notice the criteria that you want to include, those belong in guidance, not rule.

So thank you for the opportunity to make these comments. I have enjoyed being a participant here.

MR. CAMERON: Thank you, Tom.

Dan?

MR. SHRUM: Oh, good. I'm after Tom, again. Is that better?

Again, I'd like to thank everyone who has participated. I'd especially like to thank the NRC.

I know that this is informative for you, but it's also fairly stressful. I'd also like to thank those who have shown up. It's been encouraging to see the positions that have been expressed and the way that they've been expressed have been very fair and I would encourage that into the future.

I would just reiterate what Tom said, that it's important that the rule be usable for those who have to implement it. I'm not going to repeat what Tom said. It's on the record, but it will look about like what he just suggested.

And again, thank you. And thanks to Chip, I list the things that I wouldn't do well and being a moderator something like this is in the top ten. So he's done an excellent job and I thank him for that.

MR. CAMERON: Thank you. Drew.

MR. THATCHER: Thanks, Chip. Everything I was going to say just went out of my head. You guys had mentioned the possibility of a town hall meeting, etcetera. I've been to tons of meetings in my life. One of the things that's a real drawback in a town hall meeting as opposed to this is that people pose a question and then nobody answers it. And in this case, except for the very end here, in almost every instance, we answered questions and we kept talking

about them until we resolved it, at least as much as we could. And that is a real benefit in that I tell you, in a town hall meeting when someone voices a concern, and that's it. It doesn't help them and I don't think it helps anybody. So I don't like that format, so just from my own standpoint.

I had about six things I was going to say, but you know what, there's no point. I think this is very, very good and I appreciate being involved.

MR. CAMERON: Thanks, Drew.

Steve?

MR. COWNE: Yes, I'd like to thank the NRC, Chip, in particular, for sponsoring the workshop. I thought it was a very useful forum to have. I'd like to thank all of the panel members for their contribution, everyone. I was very impressed with the professionalism and the honesty and integrity of everybody here involved. So I go away with a positive experience on that.

One of the things I wanted to say though about the NRC, I noticed a couple of line of questions or tones or whatever, maybe the question of whether or not the motive or whether or not the NRC has the public health and safety foremost in mind. And I wanted to reflect upon that by saying that I've been

in the nuclear industry now for 26 years, always as a licensee on the other side of the table from the NRC. And I haven't always agreed with them on their positions, but the one thing I can say is I believe the Nuclear Regulatory Commission is the most competent and most professional federal agency that there is and you've always had public health and safety foremost in mind.

Thank you.

MR. CAMERON: Thank you, Steve.

And Greg Komp from the Army had to leave early, but he has a colleague here who is going to offer a few words.

MR. CORNETTE: Hi. My name is Derek Cornette with the Army Safety Office and Greg wanted me to thank the NRC for inviting the Department of Defense. This is my first meeting like this and it's been quite informative. I've learned a lot and DOD would definitely like to be included in any future meetings.

MR. CAMERON: Thank you, Derek.

Larry, I'm going to go you now.

MR. CAMPER: Thank you, Chip. I do have some concluding remarks that I will make and they will be very similar to those that I made in Maryland a few

weeks ago. But before I go into those concluding remarks, I do want to pick up on a theme that I've heard in the last hour, in particular, although throughout the meeting along the way, but certainly in the public commentary from the members of the audience, members around the panel as well. And that's this issue of Commission awareness. The Commission deliberated this issue at some length before it made a decision. And the Commission remains very interested in this issue. We will, of course -- this meeting is transcribed. We will review the transcription. We will summarize key findings of the meeting.

Each of the Commissioners have Commissioners' Assistants. The Commissioners' Assistants review transcripts from meetings such as this. We also plan to conduct a briefing of the Commissioners' Assistants to share with them what we've heard in these two workshops.

Yes, this workshop, these two workshops have been principally designed to address the technical issues that you had before you that Dr. Esh, in particular, and other members of the staff have shared with you to help initiate the process for developing the technical basis for a rulemaking. But

in addition to that, the Commission is greatly interested in hearing stakeholders' concerns at large. So I assure you that we will be informing the Commission about everything that we've heard here, what are all the key points that have been made.

Chairman Jaczko has already asked me for a briefing of him after the meetings are concluded and I would not be at all surprised, and in fact, we probably expect for the other two Commissioners to ask for a face-to-face briefing as well. That is at their discretion, but I would not be surprised.

So the Commission will be fully aware of what has transpired here in this workshop and the last workshop.

Let me, in closing though, let me continue the thanks. I want to thank my staff, not only for the work that went into preparing for this workshop, but it's also an issue that the staff has wrestled with diligently for about the last two and a half years, ever since the Commission gave us the SRM, at least two and a half, three years ago. And I must tell you that looking back over the many, many discussions that I had with the staff, the incredibly lively, animated, deeply intellectual, highly sophisticated, scientific discussions about this

issue, it would be an understatement to say that the staff has worked very hard on this issue and I thank them profoundly for their work and their competence and their dedication to addressing this very, very difficult issue.

In terms of the meeting itself, Priya and Dave and everyone on the staff that has touched this issue, a tremendous amount of work goes into planning for a workshop like this. It just does not happen. There's logistics, of course. There's the Federal Register notice. There's trying to identify the right questions to share with the panelists. It's a tremendous amount of work and I thank the staff for the actual work devoted to the workshops themselves.

The panelists, you know, what can you say, where do you begin to thank the panelists for your input, for your dialogue, for your debate, for your experience, for the diversity of the views that you bring to the table? The diversity of those views serves an extremely valuable purpose and sometimes the dialogue that goes back and forth, people have strong feelings about these things. On some occasions, they're emotionally charged about it. That's okay. It's okay. It's part of the process.

We asked Chip to construct a diverse panel

of stakeholders and I think that has proven to be the case here and in Washington and we knew especially it would be the case here in Utah. Why wouldn't it be? The disposal facility is in your state. So your views have been greatly appreciated by all the members of the panel.

Chip, I would continue the praise for you. I've had the good fortune to work with Chip in many, many public meetings on many, many issues in many places. He is always masterful at what he does. He puts a great deal of care and interest into it and he works very hard to be neutral, neutral, as a facilitator. And he's very, very good at it and we thank you for those efforts, Chip.

This is, to say the least, a challenging issue. There are approximately today 700,000 metric tons of depleted uranium that need to be disposed of. There will be more depleted uranium coming down the pike, presumably as much as on the order of 1.4 million metric tons if all of the commercial enrichment facilities that are in play now under consideration at license review are, in fact, licensed. That represents a challenging, national issue. It's extremely important then that what we are wrestling with here is not only important to the

citizens of Utah, to the local residents nearby, to the country at large, a terribly important issue, and your input is extremely invaluable in addressing that issue.

This is the beginning of a regulatory process to address the challenges that disposal of large quantities of depleted uranium present. And I'd like to leave you with one final, basic message. I think that our colleagues, in particular, from Snake River Alliance, from HEAL Utah, have touched upon this several times. I think that there has been a great deal of criticism levied about the fact that depleted uranium is Class A waste by default. We have certainly heard that loud and clear. It was expressed to some degree in the public meeting in Maryland, perhaps not to the same degree, but again, that's to be expected. But I think there is a general recognition that at the time the rule was put in place and there was a default provision created, that that caused us some challenges.

So the final message that I would like to leave everyone with, and by the way, I do want to thank the audience too. It's not easy to sit out there for two full days and only have limited opportunities to speak what's on your mind, so we

regularly appreciate your patience and we greatly appreciate all the commentary that you offered.

So the final message is this, the NRC realizes the initial assumption made during the development of the Part 61 waste classification table that all radionuclides not limited on the table by default are Class A waste may be viewed as a faulty approach. That is not in any way to slight those who worked on the rule at the time. They did not envision, how could they? We are 30 years smarter now than we were then. But nonetheless, it could arguably be viewed as a faulty approach.

It was arguably erroneous, therefore, to consider the waste streams considered in the Part 61 draft Environmental Impact Statement as being sufficiently comprehensive such that a new waste stream, i.e., large quantities of depleted uranium would not arise in the future and be subject to this default classification.

In order to correct this problem, the NRC plans and is undertaking its normal stakeholder process to do a formal rulemaking addressing stakeholder concerns and evaluating technical and legislative factors associated with the safe disposal of large quantities of depleted uranium. The NRC

believes this is the most prudent course to address the existing waste classification issues associated with depleted uranium and ensure that there is adequate protection to ensure protection of the public health and safety. The Commission has directed the staff to do this in two parts: with limited rulemaking which has been the subject of this particular workshop, and later to look at risk-informing the waste classification scheme in Part 61.

So we've embarked on a long journey, but that is why we are doing it and that is the reasons that we have started this process and all of you, as panelists in particular, but also members of the audience, have been and will continue to be a key part of that process and we thank you for that.

MR. CAMERON: I wasn't going to say anything, but as enjoyable as this has been for all of us, we're probably looking forward to it coming to an end, but in all fairness, we had someone come in who was trying to be here for the 4:45 public comment period, so I wanted to give her an opportunity to just say something to all of us. And can you introduce yourself?

MS. EFRAMO: Thank you very much. I got lost. My name is Alexandra Eframo. I live at 3735

Judd Circle in West Jordan. I have never been married, don't have children, but I am frightened to no end about nuclear waste. You allow a little bit to come in, and then you allow a little bit more to come in and a little bit more and Governor Huntsman was adamantly opposed to Italian nuclear waste coming in to Utah. Now our current governor is saying well, I think we ought to look at the money.

You know, my mother died of cancer when I was 7 years old. Okay, we don't know about Energy Solutions. In the paper it's stated that the vats that contain the nuclear waste is only going to be good for a hundred years. Okay, I don't have children or grandchildren, but what about our great, great grandchildren? I am frightened to no end about that. To say that the vats that contain the nuclear waste are only good for a hundred years. What do we do in 80 years? Do we have new vats and then transfer that nuclear waste into the other vats? I am frightened to no end, not for me, but for all the million generations to come.

I don't think the world is going to blow up like many people advocate. We're going to be around for a long time. And I am appalled at the governor to say that well, okay, we can have $1

million a year from Energy Solutions to store the nuclear waste. Look at the money we're going to have. Hey, we can't solve cancer. That's our number thing. We cannot, cannot put dollar amounts on nuclear waste. Thank you very much.

MR. CAMERON: Thank you. And you have to have an excuse. Did you get lost? Okay.

(Laughter.)

MR. DAMIAN: My name is Robert Damian. I'm a graduate electrical engineer from the University of Utah. I know a great deal about nuclear power plants and nuclear issues. The depleted uranium issue has been around since the first concentration of uranium started in 1943. So it's not a particularly big issue.

I have a written statement and the written statement is this. All uranium is depleted uranium except that uranium made for bombs and fuel rods. All uranium in nature is depleted of the bomb-making isotope of the years. This process is still going on even in uranium that has been depleted even more by man-made processes. This is the depleted uranium that is the subject of these meetings.

Of all of the known dangers to human life, any uranium or any kind is extremely low on the list,

unless used in a military way. Just driving or even walking to this meeting is statistically far more dangerous. Most anti-nuclear material activists do not tell people that they and all plants and animals have always had built-in nuclear radiation. They also do not tell you that all balance farm, lawn, garden fertilizers, even organic ones, must have built-in radioactivity. Some of them do not even know this. Some do not want to learn this.

The activists also do not talk much about the radioactivity that comes from space or the fact that radon is delivered with your clean natural gas, that it also comes right out of the ground in most places in Utah and elsewhere, including the Salt Lake Temple.

Those who smoke or drink alcohol or ride motorcycles or allow the sale of smoking materials have no reason to attempt to control the far, far lesser dangers of depleted uranium storage. Depleted uranium is not waste. There are nuclear reactors in operation that use it and others have been invented that can use it. The new processes that more efficiently extract the short-lived life of isotopes will be able to use it to produce fuel for any existing nuclear reactor.

Thank you.

MR. CAMERON: Thank you. And I think we are adjourned now. And have a good evening.

(Whereupon, at 5:17 p.m., the workshop was concluded.)