Transcript 4: Comment Code 53
Santa Fe Public Hearing – Evening Session

SANTA FE PUBLIC HEARING
for the
DRAFT ENVIRONMENTAL IMPACT STATEMENT
DUAL AXIS RADIOGRAPHIC HYDRODYNAMIC TEST FACILITY

THURSDAY, JUNE 1, 1995
6:30 P.M.
HIGH MESA INN
3347 Cerrillos Road
Santa Fe, New Mexico

REPORTED BY: Irene Delgado, NM CCR 253
Joe Jameson Court Reporters
Suite 800, 320 Gold, S.W.
Albuquerque, New Mexico 87102

ROUND-TABLE APPEARANCES

M. DIANA WEBB
DOE/LAAO
528 35th Street
Los Alamos, New Mexico 87544

JAMES MERCER-SMITH
LANL
P. O. Box 1663 MS A105
Los Alamos, New Mexico 87545

ROBERT H. DAY
LANL
P. O. Box 1663
Los Alamos, New Mexico 87545

MS. WEBB: Good evening. My name is Diana Webb. I'm with the Department of Energy, Los Alamos area office. I would like to welcome you here tonight, ask you to come in, sit down, come as close to us as you would like. These seats at the table are for you, the public. We invite you to sit here with us or in one of these other chairs around the room.

This is the evening session in Santa Fe of the public hearing on the draft environmental Impact Statement on the dual axis radiographic hydrodynamic test facility, which I will refer to tonight as DARHT. With me tonight are Bob Day, who is the director of the Dynamic Experimentation Division at Los Alamos National Laboratory, and Jas Mercer-Smith who is deputy program director for the Nuclear Weapons Technology at Los Alamos National Laboratory.

Our court stenographer tonight is Irene Delgado. And we have our rotating scribe, Don McClure, who will be taking short bullet statements of the comments that are given here tonight. When we take a break, you might be interested in reading the summaries of the statements that were made this afternoon which are the similar looking sheets that are hung there on the wall behind you.

We are here tonight to listen to your

comments on the draft DARHT EIS. We are interested in your comments regarding the accuracy and adequacy of the environmental analysis document and any other comments you would like to make on the Environmental Impact Statement, the hydrodynamic testing program or any other matter relating to the environmental analysis.

The format tonight is such that we have three separate areas for you to get information and for us to hear your comments. This is the round-table discussion. This is the round table. We invite you to come and sit with us here and share your concerns with us tonight.

This session is being formally recorded. Irene is making a verbatim transcript which will be available for public review in the Los Alamos Community Reading Room. These transcripts should be available within a week or so.

In the back behind the portable wall there, we have an information area. There's a lot of technical information related to the DARHT project, the different alternatives that are analyzed in the Environmental Impact Statement and other information regarding environmental programs and other information regarding Los Alamos National Laboratory.

Across the hall, out across the atrium and

up to the side, we have a comment room or what I call the quiet room. That's a room where there is a tape recorder, if you wish to go in there and make spoken statements for the record. There are forms, if you wish to go in there and make written comments for the record. The transcription of that tape and those written comments are also part of the formal record of the proceedings here tonight.

We also have tables in the atrium out here that have additional information. There is a table where we have a lot of information regarding this Environmental Impact Statement, other related Department of Energy National Environment Policy Act reviews or NEPA reviews.

In addition to that table, there is a second table that has information that presents alternative points of view regarding this project and other matters pertaining to whatever is out there. We are here to listen to you tonight. We are willing to make this format your format. We will sit here and listen to your spoken statements, accept written comments. Bob, Jas and myself will answer questions or we will entertain an open discussion amongst the members of the group here tonight, whatever would be the wishes of this group.

A little bit about what the Environmental

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Impact Statement is about. The Department of Energy has proposed to provide enhanced high resolution radiographic capability to perform hydrodynamic tests and dynamic experiments in support of the department's historical mission near-term stewardship of the nuclear weapons stockpile.

The department's preferred alternative would be to complete and operate the DARHT facility at Los Alamos National Laboratory. The department is preparing this Environmental Impact Statement to weigh the environmental impact or the environmental consequences of what would happen if we went forward with our preferred alternative, measured against what would happen if we maintain the status quo or the no action alternative, and what would happen if we pursued several other alternatives.

The Environmental Impact Statement process has many steps. We are sort of here in the middle right now. A Notice of Intent for this Environmental Impact Statement was published in the Federal Register of November last year. That was followed by a public scoping period. In December and January, we had public scoping meetings. Many of you attended those meetings the first week of December last year.

At the end of January, we finished our

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implementation plan which documented the results of that scoping process and shows the road map that we would proceed to complete this environmental review. We have now issued the draft environmental Impact Statement. The date on that is May. We are now in a formal public comment period of which this hearing is a part to receive your comments again on the accuracy and adequacy of that review. That formal public comment period will extend until June 26. We will, however, accept written comments after that date to the extent that we are able, as long as possible.

After we consider the comments that we have received through this process, we will then finalize the document and issue a final Environmental Impact Statement on DARHT. We anticipate that that will take place in mid August.

No sooner than 30 days after that final EIS is issued, the department will issue then its Record of Decision. This will document the final decision that the department makes on whether or not to proceed with the preferred alternative to construct and operate DARHT, whether or not to follow one of the other alternatives analyzed, or whether to take no action and proceed with the status quo.

That decision will be accompanied by

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Mitigation Action Plan, which is a short document that will explain the mitigating measures that the department will take to mitigate or lessen the adverse impacts that might occur as identified in this Environmental Impact Statement.

The DARHT Environmental Impact Statement has analyzed six alternatives. As I mentioned, the no action alternative is to continue the status quo, to continue to use PHERMEX, the existing hydrodynamic test facility at Los Alamos National Laboratory. Under that alternative, we would not complete construction of DARHT as a hydrodynamic test facility, but we would complete the structure for some other use.

The second alternative analyzed, as I mentioned, is the department's preferred alternative, to complete and operate the DARHT facility. Under this alternative, the department may choose to delay completion and operation of the second axis of the two-axis facility until after the accelerator and X-ray equipment in the first axis has been installed, tested and proven.

The third alternative would be to upgrade the existing PHERMEX facility at Los Alamos National Laboratory. Under this alternative, the existing single axis, fairly short axis machine, would be enlarged; a

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second axis would be built, and the enhanced capability would be provided at that facility, similar to the DARHT equipment under the preferred alternative.

The enhanced containment alternative looks at ways to contain most or all of the experiments and tests that are planned for the facility. It is similar to the preferred alternative in that it does use the DARHT facility. There are two options that are looked at. One would be to construct a containment building in which all types of experiments would be performed. This building, then, would contain all tests.

The other option is an enhanced vessel containment option. Under this option, the department would conduct most tests and experiments in containment vessels. I would like to point out that the department now conducts some tests and experiments in contained vessels.

Under the plutonium exclusion alternative, the department would conduct essentially the same operations as under the preferred alternative, but would not conduct any experiments using plutonium at the DARHT facility. This alternative is analyzed to provide a comparative look at the difference of environmental impact if DARHT were used to perform -- I'm sorry -- to perform dynamic experiments with plutonium measured

against not using the DARHT facility to perform dynamic experiments with plutonium.

Under this alternative, however, the department would meet its need to conduct dynamic experiments involving plutonium at PHERMEX or some other facility. Under the single axis alternative, the department would complete and operate only one axis of the DARHT facility to conduct hydrodynamic and dynamic tests.

The other accelerator hall would be completed for other uses, but would not be used as a hydrodynamic test facility. Under all of the alternatives analyzed in this document, the department would continue to use the flash X-ray for FXR facilities at our sister laboratory, Lawrence Livermore, in California.

Dynamic experiments involving plutonium are planned for the future, and the department would continue to conduct its hydrodynamic testing program. The infrastructure involving research, waste management, security, maintenance, environmental monitoring or other support services would be the same or would be very similar under all of the alternatives analyzed. And the department would continue, over time, working towards the eventual decontamination and decommissioning of both

facilities.

This is a picture of the DARHT construction site as it appears today. This picture was taken on May 19, very recently. This picture is taken looking almost straight north. This eastern accelerator hall would be the hall that would be first finished under the preferred alternative. And under the single axis alternative for DARHT, it is the eastern hall that would be finished for hydrodynamic test facility.

This is a map of Los Alamos National Laboratory. The Los Alamos townsite is here. White Rock townsite is here. The Rio Grande river is here. The DARHT facility site is located here in the middle of Technical Area 15. The PHERMEX facility is located about a half mile away, very close to the same technical area. Those are in the middle of the existing explosive testing area.

The Environmental Impact Statement provides a comparative analysis of the environmental impacts that might occur under any one of those six alternatives. This chart shows a summary of those impacts, and there is another copy of this chart in the back in the information area, and I invite you to look at these during one of our breaks.

Although it's a little hard to see from

the back, the type on this is color coded. As I said, it is a comparative analysis. The environmental impacts that would be expected if we continued with the status quo, the no action alternative, are showed in the first column.

In the other five columns are the environmental impacts expected that would be under the other five alternatives. The environmental impacts that are shown in black type are those that would not change when compared to the expected impact if we continued with the existing situation.

The impacts that are shown in red are those that would be expected to have a greater adverse impact when compared with the impasse of the no action alternative. And those shown in green are those that would be expected to have a greater beneficial impact than those that would be expected under the no action alternative.

This is a copy of the Environmental Impact Statement that we are discussing tonight. If you would like a copy, would you please leave your name and address with the staff at the front desk and we will make sure you get copies of that and put you on our mailing list for any other information that we will be preparing under this project.

This is an unclassified analysis. In addition, the department has prepared a classified supplement that includes analysis and other information pertaining to this Environmental Impact Statement. The department has prepared an unclassified summary -- an unclassified summary of the impact analysis that is included in the classified document. This summary is available for you. It is out on the information table that I just mentioned.

The department has put in the public reading room at Los Alamos, the some 200-plus references that are -- were used to assist with the development of this draft environmental Impact Statement. In addition to that material, we have placed a lot of other related material in the public reading room. We have again, on the information table outside, a list of some 60-odd documents that are available there for your information. You may find them to be of interest when reviewing this material or to get a greater understanding of what the project is all about.

Tonight we would invite, first, people who represent the state, tribal governments, or local governments, people from those types of government entities who represent a constituency.

We are prepared tonight to have Bob Day

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here give us a five-minute chalk talk, and I think Bob is prepared to give us a five minute chalk talk on the DARHT project and hydrodynamic testing program in general, if you would like for him to. If you would prefer that he not give that, then we will go right into the gathering of public comments. And again, I'm going to ask you, this is your meeting, what would you like? You can nod your head, shake your head or -- I see a nod. I see a -- that's fine.

Bob, I think then it would be appropriate for you to give a five-minute Bob Day chalk talk.

MR. DAY: This is a chalk talk with no chalk. What I would like -- I would like to do a couple of things. I would like to introduce DARHT in the concept of the broader vision of the laboratory.

We hear a lot of about nuclear weapons and nuclear weapon stewardship and that is indeed a key to the DARHT project because it comes out of the -- it's an evolution of the lab's mission. And the stewardship and the ongoing maintenance of the nuclear weapons stockpile is an important mission for DARHT. But the lab's mission has evolved, and the lab's mission has been changing significantly, and DARHT plays a role in a number of areas, so I thought I would put that in context.

The other thing I thought I would do is

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introduce some of the terminology. You will hear a lot about plutonium. And you will hear a lot about conventional weapons and nuclear weapon technology and hydrodynamic testing. I will put in context a little bit of some of the terminology so we can talk about some of that as well.

But at the heart, Los Alamos has been picky about who it is and what its core capa -- capabilities are and key missions are. And at the heart of the laboratory, in the changing role that we have reducing the nuclear danger, is the key mission of the laboratory.

And there are five major components there. There are pieces that don't relate directly to DARHT or pieces that related in very strange ways. One of the pieces is environmental stewardship. This is the issue associated with the legacy of 50 years of production, not a big issue vis-a-vis DARHT, some D&D issues, but not a big issue because for over 50 years the complex, weapons complex, has a number of environmental problems that have to be addressed.

There are key capabilities out of Los Alamos that allow us to be able to address on the basis of the underlying science that's needed to address those problems efficiently and quickly, the capability to do

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that, the people have a core to do that quickly and efficiently. So that's a part of what we are at the laboratory; not a big issue with DARHT, but an important part.

Another is materials management. We at the laboratory have seen the evolution of materials, nuclear materials of all kinds, evolve in our 50 years. Part of that evolution has been in the nuclear weapons program. Actually, right now that's only a small part of that evolution of material, strongly dominated by nuclear materials in the commercial power sector. But again, a great deal of the expertise associated with maintain -- how to properly maintain, how to properly control and what possible disposition of this material could evolve is also a key part of what Los Alamos knows how to do.

A growing concern, a concern that's actually been in the news a great deal in the last months because of the renewal of the Nonproliferation Treaty is the issue of proliferating nuclear weapon technology and the ways we can counter that proliferation. Again, much of the expertise and capability in people that know that technology is important in this arena reside at the laboratory, and it's a key part of what we do.

But it's also a place where DARHT plays a role, and that's because -- because terrorist devices or

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proliferant devices are devices where we don't -- we haven't developed those. That kind of technology evolves. We learn new things about what might be done or possibly be done, and that kind of system needs to be investigated. We need to understand what is possible. We also need to understand ways to counter those kinds of systems.

Frequently they employ complex geometries of very thick materials, and that's what DARHT is all about, understanding, in detail, the interior workings of things you can't see inside. It's a radiographic machine just like an X-ray machine that you have in the medical business, only this is to look through very thick things and to get very good detail. So in the counter nonproliferation arena, the DARHT technology is a major improvement in terms of what we can know, what we can understand and how well we can impact that mission and capability in the laboratory.

There's also stockpile surveillance. We are not, as a country, certainly not as a laboratory, developing new nuclear weapons, but a large part of maintaining the stockpile is understanding the nature of the nuclear weapons we have at the present time and watching how they evolve in age. They are built of complex materials which evolve. They are built of

plastics. They are built of nuclear materials which decay and create radiation environment. They are built -- all of these objects are packed inside a relatively small volume and expected to last for very long periods of time.

Anybody who has a car knows that your dashboard decays. The plastics change. The very nature of the interaction of the radiation with material, it changes the very nature of the material. So that part of understanding what changes have occurred is again an important part of the laboratory. Understanding the nature of those parts is again a place where DARHT can play a role. It can look inside some of those parts and understand how they behave.

Another very important part of what we are doing is stockpile stewardship. This is different than surveillance. Surveillance is looking. Stewardship is much more related to understanding. As we see these changes, we see changes in the metallurgy, and we see changes in the material. What effect does that have? In a lot of cases there are no changes. Changes are seen all the time. Are the changes big or the changes small? Do they have a significant effect or insignificant effect?

We do a significant amount of work to

understand the basic nature of the material. This is what an awful lot of our dynamic experimentation is about. Usually when we use that term, it will mean the interaction of high explosives with various materials. It can be surrogate materials like steel, tantalum, depleted uranium. It can be plutonium. They can be any one of a variety of other materials that one might find in these kinds of geometries.

There's another term and that's hydrotesting. Hydrotesting is where you take a surrogate for the material that's actually in the nuclear weapon and understand its dynamics in detail. The interior parts are moved by high explosives and hydrotesting is understanding how that behaves in detail.

Again, it results in very thick, complex, highly-detailed parts. And it's the DARHT capability which allows us to understand the nature of the materials, where it is, and how it has evolved because it's those details which tell us whether or not the stockpile is reliable. And that's one of our major missions is to understand the reliability in the long run of materials of systems that were designed to last perhaps 20 years, which, at the present time, many of which are approaching their lifetime, and for which we expect and need them to last for much greater periods of

time.

So understanding what we have at the present time, that's called baselining, making sure we understand where we are now, because right now we are tightly tied to the data that we achieve from underground nuclear testing, and the last time we did a nuclear test on any device, we are sure that device works as expected to. As time goes on and changes accumulate, our confidence decreases, so understanding where we are now is important. Then going on and understanding how changes that we are seeing, that we have seen affect the devices, is also important.

Also nuclear weapons that -- issues associated with nuclear weapons -- issues associated with changes that we do in order to enhance the safety, to make sure that the safety -- safety is not affected, or changes for safety do not affect the reliability of the device, are again issues which we address with this capability.

So stockpile stewardship is the key to understanding the devices we have and the parts that they are made of. But why DARHT? We have capabilities at the present time. A couple of important reasons. We have had a 50-year evolution of this technology. It has allowed us to understand better. One the facts that it

allowed us to do more with -- with fewer underground nuclear tests and better uses and more efficient uses of resources.

The evolution of this technology has let us understand more quickly, and with aboveground experiments, how nuclear weapons work. And because of that, we've been able to have fewer underground nuclear tests. But now we're asked for something quite different. Now we are asked to maintain this capability for a long period of time without underground nuclear testing. And that's a sea change in terms of what we need to do. As a matter of fact, whether or not it is even possible is not completely known.

We need to understand what -- how these devices behave. We need to understand the inner working and materials, position, locations and shapes with much greater detail, and DARHT lets us do that. As a matter of fact, the information that we achieve on each and every one of the tests is about ten times larger than we achieve at the present time aboveground, and it has a resolution which is about three times better -- as a matter of fact, there's some very interesting pictures in the back that I highly recommend you go look at them.

It's an interesting image. You are looking at things as through a glass darkly, and as you

include the resolution, the detail that you can see improves dramatically. We have some pictures which shows how that resolution and kind of information we can achieve improves with DARHT. The other thing is, it allows us to have more dose. There is more X-rays there that allows us to go through thicker materials, it's going through the very thickest material of what we need, and that dose allows us to do that. So we see a significant increase in dose and we maybe get back to evolving further than the design parameters that we were working to at the present time.

So that's kind of the overall view of the laboratory and what we're trying to accomplish. A little bit of a piece of how it explains the nuclear weapons programs, the way in which this capability works in the nuclear weapons program. But the nuclear weapons program is not the only thing the laboratory is working on. There are other areas like conventional defense. As we rely less and less upon nuclear weapon technology, we depend more upon conventionalized. And the kind of capability we have developed here allows us to understand the details of many of our conventional munitions as well.

As a matter of fact, the interaction with the Department of Defense, coupled with our ability to

understand conventional weapons is another major mission for DARHT. So the Department of Energy, in support of the Department of Defense as one of its major missions in maintaining nuclear weapons confidence evolving in terms of technology of conventional munitions has worked with Los Alamos National Laboratory to improve our radiographic capability, improve our technology for doing this kind of work and DARHT is a piece of that process and piece of that answer.

MS. WEBB: Thank you, Bob. Again, I would like to invite anyone who represents the state, a tribal government, or a local government to let me know right now if you want to speak on behalf of your constituency. And seeing none, then we will open this up for general public discussion. I do not anticipate having to limit the length of time we talk tonight. This meeting was advertised to run to 9:30, but we will run as late as we need to accommodate everyone who wants to speak.

We will be taking breaks from time to time to give Irene a rest and allow you an opportunity to look at some of the other information we have. And having said that, who would like to speak first? Chris, would you like to speak first, since you are sitting with us at the table? Again, I invite anybody out there who would like to sit with us at this table, this is your table;

this is a round-table discussion. This is not the speaker's table. However, if you're going to speak, Irene can hear you a lot better if you do sit up here.

MS. CHANDLER: Do you want me to get things rolling?

MS. WEBB: Well, Christine, would you like to go first?

MS. CHANDLER: Sure. My name is Christine Chandler. If I could start off by reiterating a remark that I made last evening, I think perhaps that would be useful to get the discussion started. My review of the report leads me to the conclusion that it could be much stronger in that there is tremendous amounts of documentation which supports the notion that there are genuine questions of safety from stockpiles that is a point that is well documented. It's well documented. I would note the Miller Report which is cited in the draft EIS, yet not heavily drawn upon for its detail. 1

And I used this example last night and I'll use it again, that the WX-68 is cited as a warhead that was tested and the issues were discovered. There are numerous examples in the Miller Report like that one that could be used to enlighten the public as to the fact that, yes, there are safety questions that arise. In fact, Miller talks about the fact that one-third of the

stockpile of the tests related to nuclear tests done, one-third of those relate to safety questions and enlightened us on safety issues.

I think those sorts of points need to be made and are not made in the report and I think should be made so that the public understands what we're talking about here and the magnitude of the issues and the reality of the issues. 1

MS. WEBB: Okay, thank you very much. Who would like to speak next? We have a shy group here tonight, I guess. I see no one coming forward. In case you wondered what we were doing, we were suggesting that the noise level in the back be held down a little bit. And earlier we were doing things to the door, but apparently we have an imbalance of having airflow and being able to hear. Who would like to speak next? Yes?

MR. LOCKHART: I have a question on the summary from the classified EIS -- my name is Milton Lockhart.

MS. WEBB: Thank you.

MR. LOCKHART: Will those unclassified summary points be incorporated into the final EIS? The summary says that the original document will probably not be declassified by the time the final EIS is prepared. 2

MS. WEBB: One of the things we would like

to hear from you tonight is as to whether or not you think it would be a good idea to incorporate any of the additional information, including that piece of information, into the final Environmental Impact Statement. So I guess one of the things I would like to hear from you is; do you think that would be a good idea?

MR. LOCKHART: Yes, I do.

MS. WEBB: Thank you. We will take that under advisement. Who else would like to speak? Again, the final Environmental Impact Statement, we'll consider all of the comments that are made, whether they be a spoken comment at these meetings, whether or not they be written comments or other forms of information that you give to us.

We will consider all of those comments and we will make changes in the final Environmental Impact Statement in response to those. That's why we're having these meetings and why we have this comment period. And feel free; there's chairs, lots of chairs over here. There are some chairs here, and feel free to join us here at the table. Who would like to speak next? Mary, would you like to speak next?

MS. RISELEY: Okay. I will speak next. My name is Mary Riseley. I am with the Los Alamos Study

Group, and I believe you, Chris, were at the meeting on

3 December 8 when Dr. John Immele said there has been no question of safety that has been due to aging.

MS. CHANDLER: I don't recall that.

MS. RISELEY: I would be glad to send you the testimony. I will make sure to do that tomorrow. It's a flat statement.

MR. DAY: I think it would be interesting -- would you like a confirmation of that?

MS. RISELEY: I would rather have it from Dr. Immele.

MR. DAY: Well, John and I have talked about it. And I can tell you, the issue is, there are in stockpile, issues of reliability. There are issues of safety. There are issues of aging. There are issues of surety.

MS. RISELEY: I would like to suggest

4 there are also issues of ethics and morality.

MR. DAY: Okay. In relation to your question and the statement you made this afternoon as well, there are issues of reliability which come from the fact that the devices have aged, issues of reliabilities associated with their intrinsic nature. There are issues of safety related to the way it works, whether they have insensitive high explosives or conventional high

explosive.

Where there are issues related to -- there's also a combination of issues associated to the safety related to development over time. John's comment refers to the fact that of these combinations of about six or seven things, aging and reliability, aging and safety, reliability and safety, of those sets of combinations -- of those sets, the combination of aging and safety, those safety issues that we have seen because the devices have aged, we presently don't know of any such circumstances. So it's specific to that one case, not to the issue of whether there are questions of safety, not to the issue of whether there can be questions of reliability, but directly to the question of whether or not any safety issues we have seen because of this.

MS. RISELEY: I believe that Sandia National Laboratory did a rather elaborate study which was referred to as the Sandia Stockpile Life Study, and that study found that the number of problems that were found at all was extremely small, and I think Dr.

5 Kerlinsky can probably give you the exact numbers and most of the ones that related to reliability, only point 4 percent had a reliability difference of more than 10 percent.

MS. WEBB: Mary, for your information, Mr. Greg Mello entered that study this afternoon.

MS. RISELEY: Excellent, excellent. Very good. While we are on the subject of issues about the stockpile, I would like to bring up something that is going to happen next year, which may have a very extreme effect -- I hope, because I hope I belong to a law-abiding country -- on the United States nuclear

6 weapons posture. And that is the opinion that will be issued next year by the World Court at the request of the United Nations General Assembly on the legalities under international law of the threat, the use and threat of use of nuclear weapons.

And I think that that's very relevant to the DARHT project because DARHT does have to do with making changes in nuclear weapons. It has to do with

7 designing new weapons, at least it was justified that way for every year of its existence of the proposed project until two years ago, and if nuclear weapons are declared illegal under international law, I hope my country will proceed as quickly as possible to abide by the Article 6 obligations under the nuclear Nonproliferation Treaty to disarm.

Now, I would like to return to the DARHT EIS. And first, I want to say it is extremely impressive

that you were able to, Diana, coordinate the number of people you did and come up with a document, which, as far as it goes, is really a very commendable effort.

MS. WEBB: Thank you.

MS. RISELEY: I'm not a technical person, but I'm assured of that by the people who advise me on technical matters. But there are some things wrong with the DARHT EIS and first or foremost of them is it ignores the upcoming Stockpile Stewardship and Management 8 programmatic EIS by assuming that there is a need for a particular type of enhanced radiographic hydrotesting. That need has not yet been analyzed and will not be analyzed until the Record of Decision of the Stockpile Stewardship and Management, PEIS, so it is a premature document. And it is insufficient by definition because it is not -- you know, it ignores this other process which is ongoing.

The other thing that it doesn't consider 9 is all related actions. And that's a quote from Judge Mechem's ruling in the DARHT lawsuit which my organization and CCNF filed last fall. And there are a number of related actions. Having DARHT here would very 10 much influence the Department of Energy in its decision of whether to bring nuclear weapons manufacturing here and many of those decisions should be considered as part

of the decision as to whether to go forward with DARHT.

It also seems to me that since DARHT is one project among many in the plans for the future of LANL, that it is also out of order to do the DARHT EIS before the LANL sitewide was done. It would make a lot 11 more sense to do first the Stockpile Stewardship and Management PEIS, since that is the core mission of the whole Department of Energy now, and then do the LANL site wide EIS, and then do the DARHT EIS.

There are some areas in which it seems to us that there's 12 inadequate environmental data. And I know that other people have said these things, but since you talk up what people say and have tables that say how many people say what, I just want to go over these points.

It does not contain enough environmental data. There is no information on the geology on the 12 DARHT site, hence, there is no analysis for the potential for migration of heavy metal and radioactive materials which will be spewn onto the ground by the outdoor explosions.

A very important omission; it has been implied strongly that there will be plutonium experiments in containment vessels at the DARHT site, perhaps as many as 10 percent of the total number of experiments.

13 There's no information in this document about

13 reprocessing plutonium 242 at Savannah River and transporting it to DARHT for contained experiments there. And since that is going to happen and that is going to be a planned activity there, those environmental impacts should be considered in this EIS.

There is no analysis of potential breaching of these containment vessels, and there is no 14 analysis of the clean-out of what would be the effects of the cleaning out of the containment vessels in which the plutonium experiments will take place.

I would like to say that I was very confused by the upgrade PHERMEX alternative because it reads in this document as if what you really mean by upgrade PHERMEX is move DARHT to PHERMEX after you've 15 already halfway built DARHT at DARHT. And it seems to me that it would be better to consider simply upgrading PHERMEX than moving DARHT to PHERMEX. And in this connection, I would like to say that I understand that there was an experiment which took place at FXR at Livermore sometime I believe in April, that produced 16 images which are better than anything that is anticipated from DARHT, and I would just like to remind the people, we are talking taxpayer money here, and they spent $5 million upgrading FXR, and they got a result which is better than a one-armed DARHT.

The other possibility that we think should be considered is that, since LANL planning documents already consider or already propose building something called the advanced hydrotest facility, which would have five or six X-ray beams, and that the planning documents indicate that this facility would be commenced only one year after DARHT's second axis is on line, I really feel that you should consider the alternative of canceling DARHT and simply pushing harder for the advanced 17 hydrotest facility and see if you can get that brought forward in time. And I sincerely hope if you do build the advanced test facility, it is not within 1,000 feet of the Pajarito plateau.

The other thing that is sorely missing from the analysis is proliferation impacts. And since the Department of Energy has spent a lot of time and effort analyzing the proliferation impacts of NIF and the proliferation impacts of the initiative to bring spent fuel rods from other countries to the United States, I 18 think that proliferation impacts from DARHT should be considered. There's no mention of the possibility of any 19 kind of international oversight, and there's also no analysis of a programmatic constraint on the types of 20 experiments that would be done at DARHT.

21 And of course, our concern here is that we would have

much less objection to experiments which actually had to do with analyzing existing weapons than we would have objections to experiments that were clearly designed to look at new types of weapons. And if there were some kind of programmatic constraints and some kind of perhaps oversight from our allies, from, you know, members of the Nonproliferation Treaty or whatever kind of international oversight of the kind of experiments that were done there, we would be happy to see that kind of change.

I really want the construction of DARHT to stay on hold until the SS&M PEIS is finished. And I think it should also be on hold until the LANL plan is completed. So those are formal requests that we would make. Many experts do not believe that our weapons need any more than physical inspection, and so it is very much the burden of LANL to prove that aging weapons do need additional high-tech study.

Also, I just throw in here to the pot, that before LANL built any new weapons facilities, it should come into compliance with all relevant environmental laws; that means the Clean Air Act, the Clean Water Act and RCRA, and LANL has serious problems under all of those laws, and I think a moratorium on construction of the facility should be in place until LANL can be shown to be in compliance with all of these

environmental laws.

I spent the day today with one of the most eminent experts on nuclear weapons policy in the world. He reminded me that a building of the AGEX facilities, a suite of them of which DARHT is the flagship, followed by NIF and Atlas and Jupiter and so forth or so on, is a deal struck between the labs and Hazel O'Leary, basically; that the lab will give up their opposition to the comprehensive test ban in exchange for getting these new toys with which to design new weapons. And I would submit that the comprehensive test ban is not in hand. Comprehensive test ban is a long way from now, and it is threatened by many forces within and without this government, and I think that DARHT should not be built until we have a comprehensive test ban in hand. So thank you very much.

MS. WEBB: Thank you, Mary. Mary, you made reference to your group, and I don't remember if, for the record, you specified your group.

MS. RISELEY: It is the Los Alamos Study Group based in Santa Fe, New Mexico.

MS. WEBB: Thank you. Also, as I mentioned earlier this afternoon before you were here, when Greg Mello spoke, your group did make a request to the Department of Energy to prepare a proliferation

impact statement as you just mentioned. The correspondence -- exchange of correspondence on that issue is in the public reading room if any other members of the public would like to review that exchange.

I would also like to point out, there was an issue -- a question as to what was said at the scoping meeting in December. The verbatim transcripts of those meetings are available again in the Los Alamos Community Public Reading Room, as are all the written comments that were received on scoping. We will follow the same procedure for these meetings during this comment period. These verbatim transcripts will be made available, as soon as Irene can get them finished, in the public reading room in Los Alamos, along with all of the written comment and written statements that we receive during this period of time. Chris, you already spoke. The gentlemen next to you raised his hand.

MR. CUNNINGHAM: I would like to respond.

MS. WEBB: If you would not mind telling us your name.

MR. CUNNINGHAM: My name is Greg Cunningham, and I am a citizen of Los Alamos, and I also work for the labs, but I am here today representing myself. Mary had about, I think, 13 different comments, if I categorized them correctly. The first thing I would

like to point out is that Mary said that, I think, she and her group don't object to experiments on existing weapons.

MS. RISELEY: No, we said we would have less objection.

MR. CUNNINGHAM: Less objection?

MS. RISELEY: Yes.

MR. CUNNINGHAM: The point I would like to make is that, in fact, that your group's position and another's group's position referenced the legal foundation with which you worked, at least last fall, was essentially to try and force the stockpile to become so unreliable and potentially unsafe, that reliability is a big issue, to become so unreliable that the military leaders and political leaders would essentially mistrust them and would unilaterally disarm, and I have some testimony if you dispute that.

MS. RISELEY: That is Jackie's position, but not the Los Alamos Study Group.

MR. CUNNINGHAM: I think I have your statement from last fall. Let me read it. Let me see if I have it.

MS. RISELEY: I know Jackie said that very strongly, but that is not our position. We simply have a position that the world would be a safer place if no one

had nuclear weapons and if they were outlawed. And we hope that some of the resources of the $28 billion worth of resources that we spend on nuclear weapons in this country, we can spend that on policing and outright bans on nuclear weapons.

MS: WEBB: I'm going to ask you both to speak a little louder. Unfortunately, there is a noisy group next door. We sent out a convoy back there, found out it's not coming from our room; it's coming from next door. And I am having a hard time hearing both of you and I suspect Irene is. You can move forward and you can move into one of the closer chairs. And Mary, may I presume that by Jackie, you are --

MS. RISELEY: Jackie -- Jaqueline Cabasso, the executive director of the legal foundation. But Greg, I have to say, this is not my testimony, and I'm not going to defend it, so I don't know if it's relevant.

MR. CUNNINGHAM: Let me reject the statement. I don't have yours because the copy machine smeared everything and I can't read it. Jackie's -- my question was basically, when I went to the scoping process in the fall, I heard widely varying opinions on whether the reliability of the stockpile is important.

I believe that Jay Coghlan from CCNS, Concerned Citizens for Nuclear Safety indicated that his

group did not have an official position on reliability. And he can correct me if that's wrong.

MR. COGHLAN: I dodged it.

MR. CUNNINGHAM: Jackie Cabasso, I understood her to be working with the Los Alamos Study Group, she responded, "finally on the question of reliability, there was probably a difference of opinion around the table in the room, but I stated categorically, that I do not support -- I'm not interested in the reliability of nuclear weapons. I don't think they should be reliable. That's my organization's position. We don't think that reliability is consistent with the policy of true deterrence." And my recollection is that you essentially agreed with that statement, but maybe I am wrong.

The second comment that I have is noncompliance with environmental laws. There was an independent commission that was headed up by Robert Galvin, who is the CEO of Motorola, an excellent United States company. And Robert Galvin's committee, basically one of their conclusions was that it's fact that the laboratory is overregulated, that not only do they have to comply with state, local and federal regulations on environmental compliance, but the DOE actually puts a whole other set of compliance regulations on top of the

laboratory. And their commission's findings are basically that DOE needs to relook at how it does regulation and compliance.

So I just wanted to throw that in. The laboratory does have to meet an enormous amount of environmental regulation, and I think it tends to do so with a lot of vigor. I have -- I guess the next and most important thing that I would like to address is the safety issue because I think that is a real issue, and I think there's been a lot of misinformation about that. I have a fairly lengthy comment I would like to read, if that's okay.

MS. WEBB: That would be fine.

MR. CUNNINGHAM: It's about three pages long.

MS. WEBB: If it's three pages long, would you please summarize it and give me the three pages, unless the writing is really big.

MR. CUNNINGHAM: It's pretty big. Let me try and pick out some of the points. Basically in summary, there have been several reports, independent commissions and reviews that have indicated that there are and have been historical safety problems with the stockpile. Those historical safety problems have been detected and corrected through nuclear testing.

There's also a statement from Ray Kidder that basically flaws that the one-point safety of a -- one-point safety means when a device is initiated from a single point somewhere in the detonation around the pit that forms a nuclear part of the device, that one-point safety defects can take a long time before they are actually resolved. And they are due to an initial design flaw that remains undiscovered for a period of time and are discovered through a very vigorous testing program and continuously looks for those kind of flaws. So while there may not be significant safety effects relative to aging, there may be design flaws that remain undiscovered because they can remain undiscovered until a test shows that there's a flaw. And that has happened in the stockpile.

The second thing is that -- let's see. Another major point that I would like to talk about and read something from the Reality of Accidents Involving Nuclear Weapons. Accidents have happened involving nuclear weapons in this country's history. During the period of 1950 to 1980, there were 32 accidents involving nuclear weapons, including crashes of aircraft, including fire, including missiles, propellants exploding. It included dropping weapons, losing them at sea. Accidents happen with nuclear weapons and safety is a very

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important issue. And particularly one-point safety which needs continual testing to discover inherent design flaws that may have been undiscovered at the time of moratorium.

I would like to read a couple of quotes to substantiate what I'm saying. Basically I came up with a response to a set of questions that I thought the public might be interested in getting answers to. The questions are, why does the stockpile stewardship need to involve hydrodynamic testing? Aren't the weapons safe and reliable? Can't we just remanufacture them and encounter the design needs? Is reliability really that important? Is safety really affected that much by small factors? I have a long list of responses that I will submit for the final EIS.

I would like to read a couple of things from the Miller Report which was a response to a request from Congress. Congress, basically in the late '80s, was involved in a number of treaty negotiations and was highly concerned about the safety and reliability of our stockpile. They requested a report from Dr. Ray Kidder, Livermore, who was a theoretical physicist. He is not a weapons physicist. And Congress felt he was a very objective reporter of what the real needs are to ensure the stockpile.

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The Miller Report was a companion to that report that was prepared by a weapons physicist that had day-to-day dealing with the problems encountered with weapons and there was a lot more detail in the Miller Report than Kidder Report, but it may be somewhat biased due to the fact that it was prepared by a weapons physicist.

The Miller Report said that -- and I think these are facts. I can't imagine them being disputed -- "One-third of all the weapon designs introduced into the stockpile since 1958 have required and received post deployment nuclear test resolved problems related to deterioration or aging or to correct a design that's found to not work properly under various conditions." And that's a quote from the Miller Report.

A report from the Kidder Report, which I presume to be more objective since Congress specified this individual exactly to give them an objective analysis of the situation said, "Safety in the designing of the warhead -- safety problems with nuclear warheads are generally inherent in the design of the warhead itself, not the results of aging or other problems. Such problems may not be identified until long after the warhead and the stockpiles were there to begin with."

Then you question the -- let's see. On a

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safety issue -- let's talk quickly about that, I guess, accidents. There was a 1984 DOD report entitled Narrative Summary of Accidents Involving US Nuclear Weapons 1950 to 1980. And the list includes a variety of accidents involving nuclear weapons. And I think this is important for the public to know about because they have to know that this is a real issue, that accidents can happen; safety is important, and that there are -- there can be safety issues that we need to continually address, but some type of program has to replace the nuclear testing that we have a moratorium on.

The list of accidents includes crashes, accidental jettisons, missile fuel explosions and fires. In 11 of those accidents, the HE was detonated and there was radioactive contamination from plutonium disbursed. The threat of accidental detonation is real, and if the weapons were not one-point safe, a major nuclear accident might have occurred. The necessity to aggressively test weapons for one-point safety under many circumstances, should thus be clearly seen as a real mission, but not as a covert mission.

Furthermore, the one-point safety mission for hydrotesting has been and is an ongoing mission. Hydrotesting has been a vital part of discovering one-point safety problems. And Ray Kidder talks about

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that also in another report in 1991. He basically talks about the very recent ability of the weapons laboratories to be able to do 3-D computational predictions of the behavior of a weapon.

The reason that this is a relatively new capability is because the computers, essentially, were not capable enough to be able to handle the complex information that a true 3-D model may, and it's only been since 1988 that we have been able to attempt to try to predict the behavior of a one-point safety kind of issue.

MR. COGHLAN: I want to state a procedural objection. The purpose of NEPA is for --

MS. WEBB: Irene needs to change out her tape, and then you can make your comment again.

(Break taken.)

MS. WEBB: All right. Irene now has her paper back in. Jay is talking. Dan is raising his hand. Greg you have talked for quite a few minutes. Jay, would you like to repeat, now that we are back on the record?

MR. COGHLAN: Yes. 30 seconds. I want to preface this with the fact that I feel ambiguous about stating the problem because I want to promote the

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informed, but having said that, the purpose of NEPA at these hearings is to provide the public with the
35 opportunity to provide comment on the entire project and on alternatives, et cetera, et cetera. It is not a forum for the laboratory and DOE to effectively offer rebuttal. I respectfully remind DOE and LANL that they are under order from a federal judge to follow credibly the NEPA process, and I respectfully suggest that they better do exactly that.

MS. WEBB: Thank you very much, Jay. Greg has made it quite clear that he is speaking tonight as a private citizen, and although he works for the laboratory, he is speaking here tonight as a private citizen.

Any of you that are familiar with the Los Alamos Area Office Department of Energy Stakeholder Involvement Policy in the NEPA process, should be aware of the fact that the Department of Energy employees, laboratory employees, and other federal employees may take place -- may take part as stakeholders in this NEPA process, but we do ask that they identify whether they are speaking on behalf of the laboratory or whether they are speaking on behalf of themselves as individuals.

Greg has made it quite clear tonight he is speaking on behalf of himself as an individual. Also,

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before you came in, we did mention for the record that the forum tonight would be flexible; that we would be willing to either entertain comments directly related to this Environmental Impact Statement, or we would be willing to entertain a discourse amongst the people here.

You are the first person that has suggested that perhaps that this discourse has gone on long enough between Greg and Mary. If I understand that is what you are suggesting, you are suggesting that we return more strictly to the, quote, "typical," quote, format of giving spoken comments for the record.

I'm willing to entertain that suggestion, but before I do, we did interrupt Greg. And Greg I would like to know if you are finished speaking.

MR. CUNNINGHAM: I got through 3 of Mary's comments out of 12, so --

MS. WEBB: The reason, Greg, I do remind you that you have spoken for some 15 minutes and there are quite a few people here tonight.

MR. CUNNINGHAM: Maybe -- I believe I can split it up and talk later.

MS. WEBB: I would sort of prefer if you didn't mind if we did it that way because there are a lot of folks that haven't spoken here tonight. And if we have time later, we will be glad to have you continue,

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and on the other hand, we always entertain written comment. There are several hands that have gone up.

MR. MECHELS: This is just a procedural comment. I'm Chris Mechels, retiree of Los Alamos. I think you've got the makings of a real unequal contest here. You've got lab people that can say "I'm speaking on behalf of myself, but because I'm working for Los Alamos National Laboratory, therefore I have a lot of expertise in this area, therefore my expertise overrides
36 your scope." That's an effect that you are setting up here with Los Alamos people.

However they disqualify -- however, they say, I'm speaking on my own behalf and then they proceed to take up the technical issues. They are in the position of presenting expert witness, albeit as a private citizen to override citizens who don't have access to that kind of information.

MS. WEBB: Thank you.

MR. CUNNINGHAM: I'd like to --

MS. WEBB: Just a second. Thank you for your comments, Chris. Greg, I think perhaps it's time to go on to another speaker.

MR. CUNNINGHAM: One five-second comment?

MS. WEBB: Five seconds.

MR. CUNNINGHAM: I got all of this

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information -- all of these are reference documents in the DARHT draft EIS. None of this information came from my workplace. I took a day of vacation to type this up.

MR. MECHELS: Thank you for the clarification.

MS. WEBB: Thank you very much. We have several people raising their hands. There are people in the back. There's people in the front. I'm willing to entertain whoever would like to speak next, and apparently it's the consensus -- is it the consensus of the group at this time to kind of cut back on the interactive dialogue and stick with the straight comments at this time? We can return to a different type of format later. All right. Dan, I believe you had your hand raised before the gentleman in the back or before Jay came up to the table.

DR. KERLINSKY: That's okay. Would it be okay to make a few replies to some of Greg's comments and then go on to my comments, or would that be considered out of order at this point?

MS. WEBB: I would be perfectly willing to entertain that. I would appreciate it if you would keep your remarks somewhat brief.

DR. KERLINSKY: Okay. My name is Daniel Kerlinsky. I'm the president of the New Mexico

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Physicians for Social Responsibility, and I served on the Galvin Task Force and Alternative Futures for the National Labs and had an opportunity to review a number of documents and information that we are discussing tonight.

I want to compliment the department on really the DEIS. There is a much better description of what DARHT does and doesn't do in the section on describing it in the text, and I think that's a big step forward. I know sometimes when we're talking about these subject matters to kind of simplify things to explain to the general public how these things work, and I think that's happened tonight.

I share the concerns about Greg's comments as a private individual rebutting. And I think it's good, you know, that you spoke as an individual, because in that case, when you come back and have different points of view about what you say, you are not representing the lab, and it doesn't have to have the truth value that the EIS requires of the labs and in this document. And I believe there are some significant inaccuracies, you know.

One of the main issues that was presented early on was that DARHT takes static internal pictures of the components of nuclear weapons and that this is

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37 somehow critical for assessing the current state of the so-called benchmarking. And the EIS, even though it's improved, does not really specify whether, in fact, it found that these sorts of things actually say anything about the current status and condition.

My understanding of DARHT, and as the chapter explains, these hydrodynamic tests, as Bob described, are the pictures of the active implosion of the nuclear weapons primary. It's not a static picture, and no one in my Galvin Task Force ever said they needed a better static picture of the inside of a nuclear weapon

37 to be able to tell if it was safe, reliable or aging or whatever.

So I view some of the discussion that's been presented about this better X-ray picture as intentionally or unintentionally misleading the public. It's not the same as getting an X-ray or CAT scan or MRI of your chest and lungs, and I would challenge the laboratory to really specify in more detail, as we go

37 through this process, what exactly those static pictures really are and what value they are.

In Greg's comments, most of the safety

38 issues he raised were in fact resolved in the 1960s. And for those scenarios that were described, flying around with nuclear bombs on an airplane, those problems are

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resolved by not flying around airplanes with bombs on them anymore. In fact, that's where the safety improvements come from.

Nuclear weapons are safe to the one-in-a-million kind of level, and to think that an incremental

38 improvement in this one-in-a-million really makes a difference in safety is again misleading to people. The last one-point safety issue that came up with the design flaw turned out not to be a significant problem. And what I heard from the people was that the 3-D document was not significantly better than the two-dimensional code in whether to predict whether a concern about a primary having a safety problem in fact was a real concern.

If we are not tracking or currently discovering lots of safety problems with our nuclear weapons, then the Sandia Stockpile Life Study of the weapons that are in our enduring stockpile, there are only 27 things that needed to be fixed in the stockpile over the last about 20 years and only two of them had

38 anything to do with the nuclear weapon primary. And of those two things, neither of them had to do with safety or aging problems.

The first problem was, the department decided they wanted to conserve plutonium, so they

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redesigned the pit to use less plutonium. That was not a kind of problem that would seriously impair the stockpile.

The second problem was when the insensitive high explosive was introduced and they forgot to test it in the cold, and then scientists forgot they would be storing these weapons in a variety of very cold circumstances, they had to go back and retest these weapons in the cold and do hydrodynamic tests. They did underground hydrodynamic tests just to be sure, just to be on the safe side. Nobody said that they needed a DARHT facility to resolve that problem, and in fact, most of the problems over the last 20 years in the weapons that are going to be in our enduring stockpile and not what the Miller is talking about from the 1950s and the 1960s, they have not required this facility at all. They

39 have been changing tritium vials, tritium valves, cables, electric wires, parachutes, radar equipment; these are the things that have actually been fixed. They haven't required a lot of nuclear weapons primaries design changes.

In fact, these facilities, the DARHT and the hydrodynamic facilities, aren't as important in

40 discovering the safety problems as Greg said. It's only in resolving that the solution to the safety problem is

40 in fact successful.

In my comments last fall, I suggested an alternative be considered, that is represented on 3-39 in Chapter 3, weapons design. Unfortunately the language that was summarized from my comments got it totally backwards, and the alternative reads now, "An alternative to operating DARHT to ensure weapons safety and reliability, operate DARHT to design prototype weapon..." In fact, my comment and suggestion was that DARHT be

41 specifically restricted from designing nuclear weapons and only be used to study weapons safety and reliability problems that might evolve.

In fact, that was the position of the Galvin Task Force. When we looked at hydrodynamic testing in general, the hydrodynamic testing was important only to resolve safety and reliability

42 problems -- low probability that they might or if they arise, not to be developing new weapons. And they're really only useful confirming that a re-engineered weapon really works as expected.

The comment and why this was dismissed was

43 that the number of test shots, the size of the explosive charges, et cetera, is what makes the difference to the environment, not the intended application of test results, in fact, that's not so. When nuclear weapons

are designed, typically half a dozen, a dozen underground tests, big nuclear weapons explosions were done and hundreds of hydrodynamic test shots. So if you're designing a new nuclear weapon, you may need dozens or

43 hundreds of hydrodynamic experiments. If you are confirming that a fix to a weapon problem that arises really works, you only need a couple of shots.

So the environmental impact of DARHT will

44 vary significantly depending on whether it is used for new nuclear weapons design or just to confirm changes that are made. In fact, I believe the likelihood of weapons really being required is significantly low.

The problem of reliability -- I mean, people talk about reliability -- the way Greg discusses it, it makes people feel nervous. In fact, what reliability means, if you have a nuclear weapon that

45 isn't reliable, it means it doesn't explode. Right? Which, for most people, is considered safe.

And since we are no longer in a nuclear-war fighting situation where we want to launch thousands of weapons against an opponent to try to knock out his

45 missile silos, if we are only going to use nuclear weapons for deterrence, in a situation where we really need to use nuclear weapons, not just for deterrence but for retaliation, which is not really the United States'

45 policy, if the first weapon didn't work, you can send the second one and it really wouldn't make any difference in the outcome.

So reliability is not what it sounds like. It's not that your car isn't going to start and you're going to be stuck in the middle of nowhere. The likelihood of a problem occurring in the stockpile where

46 all the weapons go bad at once is extremely low, and I really ask that the EIS look at trying to get some quality, quantitative estimates of what that likelihood really is.

I appreciate Bob's comments, you know, underlying that there's been no problem found in safety in aging, in the interaction of the aging process in weapons and I appreciate that honesty and direct discussion.

Again, the statement in S-1 executive summary that says "Uncertainty in the performance of the enduring stockpile will continue to increase with the

47 passage of time," is not correct. The Sandia Stockpile Life Study shows that these weapons actually become more reliable with age. Most of the problems are found before the weapon goes into production. And after the weapons are in production, most of the problems are found in the first three years of the weapon's life.

From years 3 to 10, the frequency of finding problems in the stockpile goes down. And from years 10 to 15, the probability of finding weapon problems goes further down. And in fact, data currently exists for nuclear weapons out to about 32 years of age, and they do not show a significant rise in weapons

47 problems being discovered as weapons get to be 28, 29 or 30 years.

People need to understand that this proposed nuclear weapon design lifetime is an arbitrary number, and Dr. Hecker has been quoted as saying that nuclear weapons can last 30, 40, 50, 60, 70 years just by maintaining them on a regular basis.

48 What Victor Reis said in the Programmatic Environmental Impact Statement Prescoping Invitation is the following: "The primary goal of the Stockpile Stewardship and Management Program is to provide high confidence in the safety, security and reliability of the nation's stockpile and to ensure the effectiveness of the nuclear deterrence while supporting arms control and nonproliferation policy."

This is really the very first time that the department has acknowledged that arms control and

48 nonproliferation impacts of new weapons design facilities are actually significant. And by providing this opening

in the Programmatic Environmental Impact Statement, I think, as Mary said, we have to consider the PEIS before 49 we look at the EIS, because the environmental impact of starting up a whole new arms race, another 20 years of the arms race without realizing it, that's happened in the 1950s. That's happened when we developed hydrogen bombs. That's happened in the 1960s when we designed multiple warheads. It happened when we went into Star Wars and antiballistic missiles. And the likelihood of starting another arms race and having to go back into 50 nuclear weapons production, which in this country is a 300-billion dollar environmental impact for the cleanup of the last generation's cleanup of nuclear weapons facility has to be considered very significant.

MS. WEBB: Dan, are you almost done?

MR. KERLINSKY: That's it. Let me see if I have anything I desperately have to -- that's enough.

MS. WEBB: Thank you. Both of you have your hands raised. You have both spoken before. There's a gentleman in the back who hasn't spoken who has had his hand raised for quite some time. I recognize you, but --

MR. WATSON: My name is Scott Watson. I'm responsible for PHERMEX operations. I speak on my own behalf tonight. People's comments previously, I just wanted to comment on these issues which I have firsthand

knowledge. Mary has asked the question why PHERMEX itself is not being upgraded and that the PHERMEX upgrade option was basically just to rebuild DARHT in a PHERMEX building.

PHERMEX is a different technology than DARHT. It's a 30-year-old technology and runs up against physical limitations which are -- we basically are up 51 against as we speak today. PHERMEX will not see future upgrades that will improve its performance nature, and that's because of the physical nature of the problems involved in that type of facility. That's exactly the reason why DARHT is a new, different type of technology.

Another comment I would like to make, Mary also made a comment that FXR has recently produced data which is superior to that which will be produced by DARHT. That is incorrect. I have a copy of that data and have offered a number of reports on the radiographic 52 quality of images obtained by these machines, and I can give you a lot of details and reasons why that particular data is not superior to what DARHT could produce, but suffice it to say that's not the case.

MS. WEBB: Thank you, Scott. And you said you were speaking on your own behalf tonight. I would also like to mention that in the description of no action alternative in Section 3.4, it specifically states that,

"Under this alternative, the facilities would be upgraded, would be maintained, would be kept up," but the alternative does not imply that there would be a static PHERMEX -- that it would never change. We did specifically state that, and I just wanted to point that out that, yes, we do take care of PHERMEX. We have to; that's our facility.

Both of you still have your hands up. Jay has been here for a while. You have also spoken before, so let's let Jay speak. I believe that that was why he wanted to come up here.

MR. COGHLAN: My name is Jay Coghlan. I am a research analyst with Concerned Citizens for Nuclear Safety. For the record, I would like to state that, I think my main criterion tonight is whether I'm bored or not, and based on this criteria, I already judged this hearing right here a resounding success.

I got a prepared statement. It will take me about three minutes, I guess, to read.

MS. WEBB: That would be great.

MR. COGHLAN: It's roughly divided into two subjects; that on possible hydronuclear testing at DARHT and on the need for programmatic review in advance of DARHT. I will state as well that I certainly plan on offering detailed comment before the comment period is

over, but I'm just going to stick to these two little subjects right now.

Now, with respect to hydrodynamic or, I mean, hydronuclear experiments possibly being conducted at DARHT -- first of all, I appreciate Bob Day being here and Jas --

MR. MERCER-SMITH: Mercer-Smith.

MR. COGHLAN: Jas, yes. I wish Dr. Immele was present as well, but I understand he's at Moffet Air Force Base right now talking on this particular subject of hydronuclear testing. It's clear to me that DOE and 53 the weapons labs want hydronuclear testing. For example, a publication just during the month of May of this year on stockpile -- what was it? -- stockpile management, states that our plan is to gather baseline hydrodynamic and hydronuclear data on all stockpiled weapons systems.

The 1995 LANL Institutional Plan essentially echoes the same. And the 1995 Draft Interagency Stockpile Stewardship Plan has six references to hydronuclear testing, and in that plan described as a planned activity for fiscal years '96 and '97, is the performance of these baseline hydronuclear experiments. In all of these documents, hydrodynamic and hydronuclear 53 experiments are often mentioned in some kind of

combination to each other.

It's well known that LANL conducted underground hydronuclear experiments during the testing moratorium of '58 to '60. And in their 1988 publication on hydronuclear experiments, the LANL authors Thorn and Vestervelt, state that in the late '50s it was recognized that contained hydronuclear experiments were theoretically possible.

The operating procedure of CREPA, which involves the graduated addition of fissionable materials until a subcritical nuclear reaction becomes detectable makes contained hydronuclear experiments feasible.

In fiscal year '92, it can be documented that work was being done at LANL on "CONVEX" projects. "CONVEX" is an acronym for contained nuclear explosions and vessel experiments. The 97 LANL CAMP states that the LANL physics division is significantly involved in CONVEX projects. In early 1993, LANL took possession of a vessel that contained up to 22 pounds of TNT blast equivalent.

DOE presently states that up to 10 percent of experiments at DARHT will be contained plutonium experiments. All of these experiments are described as being hydrodynamic. Under the present US proposals for the comprehensive tests ban treaty, nuclear experiments

with fission yields of four pounds TNT equivalent would still be permissible.

Given all of this and the general feasibility that hydronuclear tests at this level could be contained, I would like to know if DOE and LANL can categorically state that no experiment at DARHT will ever be hydronuclear experiments? Can DOE categorically state that no experiment at DARHT will ever result in fission yield? I would like a direct response from present LANL and DOE people.

But in addition, should that answer be no, I ask that that be explicitly stated in the DARHT final EIS and its record of that decision. DOE would then be obliged to recognize that a decision to perform hydronuclear tests at DARHT would constitute a significant change of mission, which in turn would require public notification and due NEPA process.

On the other hand, if the answer is hydronuclear testing could be performed at DARHT, I suggest that the section on nonproliferation in the draft EIS be rewritten. That section states that our country's commitment to nonproliferation is evidenced by our goal of achieving a CTBT as soon as possible.

The main obstacle that I know of presently in place towards achieving a CTBT is the weapons states'

intention to retain various levels of permissible testing. If there are to be hydronuclear tests at DARHT, an analysis needs to be performed on the facility's possible impacts on CTBT negotiations, in addition to the usual environmental impact. I don't think it's sufficient to hide behind classification barriers on this subject. DOE needs to completely rule out hydronuclear testing at DARHT or alternatively open up the NEPA process to a discussion of its implications.

Second half of my comments on DARHT mission and the need for programmatic review. First of all, I think that the draft EIS is pretty well written, remarkably free of typos, and I assume that, in large part, that was due to your efforts and you are to be complimented, but from here I will go on to blast the EIS.

MS. WEBB: Thank you, Greg.

MR. COGHLAN: But it is a good piece of work. I think you are doing very well in attempting to impress a federal judge. The draft EIS -- excuse me -- the draft EIS is inherently prejudiced in that it assumes that enhanced radiographic hydrotesting is immediately needed regardless of alternatives analyzed or actions selected in future programmatic review. Furthermore, DOE

contends that a Record of Decision on DARHT will not prejudice the outcome of the future Stockpile Stewardship and Management Programmatic EIS.

The premise that undermines these dubious suppositions that there is some kind of safety and reliability crisis in the nuclear weapons stockpile that justifies proceeding with a decision on DARHT in advance to programmatic review, as DOE knows, while granting a preliminary injunction, a judge ruled or stated, rather, that ample evidence points to the fact that the nuclear weapons stockpile is at this time safe and reliable. He was referring to testimony in March of 1994 by Assistant Secretary Victor Reis who reported that the stockpile was indeed safe and reliable.

In addition, Dr. Immele, at the DARHT scoping hearing last December, stated no safety problems related to aging have yet been found. It's interesting that the judge ruled without knowledge of the 1993 Sandia Stockpile Life Study. The life study states that while nuclear weapons age, they do not wear out and are not allowed to degrade. They essentially last as long as the weapons communities wants them to.

Defects have, of course, been discovered, but they've been fixed with existing surveillance programs and existing facilities. Historically, defects

involved in primaries, which DARHT would ostensibly study, have been a very small percentage. If there is no real crisis in safety and reliability since these reports and testimony, what's changed since then?

DOE cites the termination of full scale underground testing as justifying the urgent need for DARHT. The life study explicitly shows that no safety or reliability defects have first been discovered through full scale underground testing; hence, the loss of underground testing is not justification for the urgent need for DARHT in advance of programmatic review. 58

In addition, the study states that, based on historic data, only one actionable defect will be discovered each year, and for the sake of emphasis, I repeat, that what defects have been discovered, have been fixed with existing programs and existing facilities. So what's the real need and purpose of DARHT? That purpose and need should be analyzed and justified in programmatic review. 58

The DARHT implementation plan shows that the largest single category of scoping comment was on this very subject. The public clearly stated that the programmatic review should precede the DARHT EIS. DOE effectively demonstrates its prejudice by disregarding this category of comment and falsely asserting that there is a safety and reliability crisis. 59

Am I doing okay on time?

MS. WEBB: Well, you're moving on there.

MR. COGHLAN: Okay. I will just sum up.

MS. WEBB: That would be good.

MR. COGHLAN: Okay. To sum up, DOE doesn't have a reasonable basis for justifying its decision on DARHT in advance of programmatic review. There is not now, nor is there likely to be in the next couple of years, the urgency for DARHT, but DOE contends that there is. There is not a crisis in the safety and reliability of the stockpile. There is no study of interconnected actions and reasonably foreseeable actions in the draft DARHT EIS. 60

That's part of my comment I just cut out. That was in reference to Reis' remark in February on potential weapons remanufacturing at LANL.

The programmatic Record of Decision is expected only one year after the DARHT's Record of Decision. It still puts the programmatic ROD two years in advance of completion of the first axis. DOE first committed to programmatic review in 1989. There is still nothing to show for it. I submit to DOE, that the department still has time to get it right. The department can still complete a bona fide programmatic

review that objectively considers the nature and content of the genuine stockpile stewardship.

DOE should let DARHT rise or fall on its own merits based on programmatic justifications and not on false pretenses. 58

MS. WEBB: Thank you, Jay. You asked some direct questions of Bob and Jas. And before they answer, Melvin and Christine have both had their hands up for a long time. Before they speak again, is there anybody that has not spoken that would like to speak --

MR. LOCKHART: Point of procedure.

MS. WEBB: And I'm sorry, Melvin has a point of procedure.

MR. LOCKHART: My name is Milton Lockhart. In view of the ruling to change the format, are direct questions allowable?

MS. WEBB: That was one of the reasons I didn't entertain it at this time.

MR. LOCKHART: So we're still in the dialogue?

MS. WEBB: At this moment, we are just sort of having people talk. We will collect questions here as I am writing them down. Then if people would like, a little bit later we will let Bob and Jas answer all of them at once.

MR. LOCKHART: Next point, since apparently most of the comments are coming back to the need to establish safety and reliability of the weapons systems and since Greg has been asked to furnish written comment, I would suggest that any comment on safety and reliability be submitted written rather than verbally --

MS. WEBB: I will --

MR. LOCKHART: -- now.

MS. WEBB: I will accept comments either way, and if after we have a few other people talk, then I will be glad, after we have -- everybody has had a chance to speak, to reopen the floor to Greg so he can finish reading his statement if he would like to do it that way. But thank you, Melvin, for your point of order.

MS. CHANDLER: Milton.

MS. WEBB: Milton?

MS. CHANDLER: Milton, yes.

MS. WEBB: Sorry.

MR. LOCKHART: Mervin --

MS. CHANDLER: Melvin, Martin --

MS. WEBB: And I called you "Greg," Jay. All right. First then we will let Chris say something. Then we will let Susan say something. And then we'll let Christine say something. Then if you have more to say, we will do it in that order. Chris?

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MR. MECHELS: I'll stand up so people can hear me. I'm Chris Mechels, retiree of Los Alamos. What I noted about the DARHT was I thought that the -- two of the alternatives that I thought was a better alternative were not considered, and they had to do with the FXR facility out in Livermore. One of the alternatives which is on Page 34 was the preferred alternative, a single site.

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There's some quotes in there which I think are pretty disingenuous and there's no supporting documentation or data provided. One of the, you know, the reasons for not considering the single site when you consider the alternatives was, quote, "The number of shots that could be scheduled to support both programs could be a problem -- could be a problem." "This could be detrimental to both sites -- could be detrimental." There is no supporting data as to what kind of test schedules they have or shots or anything like that. It's just a conjectural statement, and that's a pretty weak reason to dismiss that alternative.

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The other comments under the same alternative is that DOD would have to continue to operate PHERMEX to support smaller tests for dynamic experimentation which would not be cost effective to transport to other sites. There is nothing else to

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support that. It's just another convenient statement, in my opinion, to justify not considering the alternative.

A third statement in that same alternative is that this would not meet the need to replace PHERMEX. Well, I suggest that FXR, from my understanding, is quite capable of being used in place of PHERMEX. The issue is where it's located.

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On Page 338, the other alternative concerning FXR is dismissed, as the dual axis upgraded FXR in Livermore was not considered, as DOE does not conduct dynamic experiments with plutonium in Livermore. Well, we know they don't conduct dynamic experiments in Livermore; they conduct them in Los Alamos. That doesn't mean they couldn't conduct them in Livermore. If you are doing a fully contained experiment, they specifically ought to conduct them in Livermore. Again, this is just a statement that's made, they dismiss them because they don't conduct them in Livermore. Well, of course, they conduct them at Los Alamos. That is a very weak reason for dismissing an otherwise interesting alternative. So I think that the alternatives, both of those alternatives were incorrectly dismissed on very weak reasons, no supporting numbers.

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Another comment concerning FXR, there is a paper in the reading room, unfortunately I don't have it

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with me tonight, which is analysis -- I'm sure Bob has it -- analysis by an outside panel looking at some problems with DARHT. Some of their conclusions were that for right now, that DARHT is currently envisioned as having some problems running it under full voltage, and they are talking about hoping to raise that up to their design voltage. Right now they can't run it full voltage. They are operating at 300 KV. That's very clear from that report.

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It's also very clear from that report that the spot size that's offered is one of the big reasons to build DARHT. It's a big improvement, a hope -- they hope they can achieve that spot size. When DARHT comes on line, it won't have that spot size. They may be surprised. It's very clear in that paper. They hope some day after operating it 50 years, they'll gather enough data finally in the process to finally achieve the design spot size. That's very unclear.

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None of this -- I mean, it's all presented that we're going to turn this sucker around when it's built, when in fact you won't get a sucker on there built. You're going to sucker us running reduced voltage for a spot size that's optimal. That's very clear in the report. The other thing that's quite clear in the report is their analysis of the FXR, when upgraded, is at least

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as capable as DARHT. Again that's no reason not to dismiss FXR alternatives. I suggest that FXR, that the whole complex needs to be looked at in total. What you have is an excellent prospect to upgrade DARHT. Then you can upgrade FXR. Then Sandia can upgrade their stuff and basically you have a testing race going on between three laboratories.

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Mary has spoken to the fact that they should do sitewide or stockpile stewardship evaluation before they do all of this craziness. I totally agree, because what you have here is an arms race going on between the weapons labs. Thank you.

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MS. WEBB: Thank you, Chris. All right. Susan, I believe you had your arm up. Susan, and if you wouldn't mind, if you would come a little closer to our stenographer.

MS. HIRSHBERG: I do have a quiet voice and for that reason I will also stand. I'm Susan Hirshberg. I'm the nuclear waste and contamination director for concerned citizens for nuclear safety, and my comments at this point are quite brief, but I probably will have some more at some point and be submitting written comments as well.

I do not in any way want to undermine what has been said by my colleagues, Jay, Mary, Dan and

various other folks here, but I will be concentrating particularly on what I do believe are the environmental effects of the PEIS as mentioned here, and -- I'm sorry -- the EIS as mentioned here, although I do also 64 believe that programmatic planning should take place first.

One of the things that concerns me is that I don't believe PHERMEX is as good a facility as it was perhaps intended to be, not in the sense of not being able to carry out programmatic requirements but in the sense of environmental contamination. There -- there is considerable amounts, I believe, I am hoping I'm not wrong, of this much depleted uranium around the PHERMEX site.

Also recently at PHERMEX there was a fire, 65 which released both high explosive residues which are -- do contain several toxic components and lithium hydride into the air, and this fire caused seven firemen to be -- to end up going to the hospital for possibility of serious injuries. That fire burned for nine hours. And since this was an accidental fire, that was not included as a kind of thing that would be considered part of normal operations of PHERMEX. And my fear is that you could have a similar kind of accident occur at DARHT, 65 which would cause considerable amounts of environmental

contamination that are not being considered here. I don't believe you have sufficient worse-case scenarios for the facility as it stands.

Some other environmental concerns that have been raised to you right now is that you have a situation where both DARHT and PHERMEX are located near the edge of the mesa top, so that in high-rain 66 conditions, I would imagine that it would be quite simple for there to be fairly contaminated runoff into the canyons. And I think, in general, that that's a not great place to put these kind of things, and obviously you have a problem at Los Alamos because Los Alamos is mostly mesa tops, but I do think that has to be kept in mind and made a little more clear of what exactly the 66 effects of being on top of the mesa would have.

That brings me to my next point which is that there -- presently at Los Alamos there is a problem which is that the extent to which the laboratory has contaminated the deep aquifer is unknown, and that's why 67 I have the situation where you have the State of New Mexico engaging with the laboratory to try to find out really what has been the effect on the deep aquifer.

There is some evidence that suggests that the deep aquifer has been recharged more recently than has been previously associated -- assumed by LANL

scientists and that in fact you may very well have some contamination from facilities that are ongoing. I don't believe it's appropriate to say that facilities such as PHERMEX or DARHT have not contaminated -- have not caused 68 significant environmental problems before you know whether the laboratory in general has affected the deep aquifer. Now obviously it would be difficult to say it was PHERMEX as opposed to something else, but I think it is a very important issue that needs to be brought up.

Also, we are facing, through the administration and Congress, some considerable cuts in environmental restoration and waste management, and I 69 think that it's extraordinarily important that those cuts be included as a scenario for what we're really facing with DARHT if you're going to, for instance, affect the ability of DARHT to -- or would it increase contamination from the DARHT facility if those cuts were to go through? And I think it's a very real possibility. People may know that our organization is fighting hard against some of those cuts, but we are -- there's a limit to what we can do.

The other thing that I think is important and it's somewhat of a different tack, is the fact that 70 the Pajarito Plateau is such a very rich archeological reserve, and that you have some -- an incredibly huge

number of archeological sites within 200 kilometers -- I can't offhand recall, but it's well over a couple of hundred -- within --

MS. RISELEY: A thousand.

MS. HIRSHBERG: It's a thousand?

MS. RISELEY: A thousand.

MS. HIRSHBERG: I know that's within the 4,000 meter range, so -- now, a large majority of these 70 archeological sites are eligible for the national register for historical places. Partially because of the protection they have received from the laboratory, so far they are in quite good condition. This is something that needs to be considered if archeologists are ever to get to those archeological resources. It needs to be very 71 clear that the ground will or will not be contaminated, so that they can dig in the future.

So I have been told by the national registry of historic places that it must be considered an effect of the facility if the facility was making it so that archeologist cannot get to those resources in the future through fear of contamination or whatever.

At this point, that's the end of my comments, and as I said, I may have some more later.

MS. WEBB: I appreciate that and I expect to receive your comments later. Christine, I told you

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some time ago you could speak next.

MS. CHANDLER: In starting, I would like to thank you for noting our right to speak as private citizens at these functions and again, thank you. I want to revert back to some comments that Mary made. She questioned me, and then I wasn't given to the opportunity to respond to the question, so if I can do so now I would like to do that.

Yes, I am aware that LASG does cite some of John Immele's remarks. However, my experience with those sorts of quotations is, they are generally taken out of context and it is my practice to discount them and look at the original source. I appreciate Jay Coghlan's -- I don't know if I pronounced your name correctly --

MR. COGHLAN: It doesn't matter.

MS. CHANDLER: -- accurate quoting of Dr. Immele's specific statements that were made at the December meeting. That is my response to Mary's questions to me.

With regard to Mary's reference to the World Court, I have to confess, I find that an incredibly bogus argument. I say that with some expertise. I have a law degree in international law from Georgetown University, so I think I can speak with some expertise on

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the point. The World Court decision will have no bearing on our ability to test or not to test. International -- first of all, it would not constitute international law.

Second of all, under our system of government, domestic law takes precedence over international law. It's the domestic policy of this country, as it was articulated by the president of the United States, that we will have a nuclear stockpile; that it will be safe and reliable. That is the law. That is the domestic policy that governs, and if there is some problem with that, there is a political means to address it; we can vote. We have a Congress and we have an elected body of officials who dictate that policy.

With regard to international oversight -- and this is my last comment, I would object to any imposition of international oversight. I regard that as an infringement on our own sovereignty. I will reiterate again; it's the American people and the American political leaders that dictate how we operate American facilities, and I would object to any move that would impose foreign control over our nuclear stockpile.

Thank you.

MS. WEBB: Thank you. Mr. Lockhart, did you want to say anything else?

MR. LOCKHART: No, thank you, I got mine

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in a few minutes ago.

MS. WEBB: Thank you. Greg, before we return to you, or Jay before we return to you, I think there are some other people that want to speak and have not yet done so. Did you want to speak, ma'am? And if you wouldn't mind identifying yourself for our reporter.

MS. WEST: To answer your first question, I think I want to speak. I'm not sure, so, yes; I will say, yes, I want to speak. My name is Elizabeth West and I live in Santa Fe. And I heard kind of by word of mouth about this and I have absolutely none of the expertise that evidently you-all have.

When I came out here, I didn't know exactly what this meeting was going to be like, and so I suddenly realized, I'm not at all nervous, because I -- I don't know how to talk on the level that you-all do. It feels like, to me, it's just kind of a regular person who, on the fringe, is just interested and wants to know more about this. This feels like a very weird -- a very weird meeting.

But I suppose I would like to say also kind of in a funny footnote that I appreciate the fact that we were able to do it -- I assume it, as a United States citizen. And I don't know this woman's name

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(indicating). I have forgotten and I'm sorry, and I may not get everything accurate but I think she said something that is germane to what I'm feeling here. Pardon me if I talk too long. It will be a couple of more minutes.

MS. WEBB: That's fine. You just go ahead and talk.

MS. WEST: What I see up on the wall there, if we can call these things walls; I mean, you can hear everything going on in the next room and I don't know what they're doing over there. The process, which is an important thing that we all need to take into consideration, of course, whether we're scientists or people like me wondering what to do next, it begins with the notice of intent.

And my -- my bias or personal opinions on how we all work together has to do with this business of intent in this chaotic and crazy world that we're in because we're more aware of how chaos works supposedly on a scientific level. It's pretty much known by scientists and little people like me alike that where there is shared intent, there does not have to be a complicity in result. We don't all have to have the same results happen, as long as there is a shared intent. And just because we have decided to try to work together, that's

very good, as far as it's going.

I -- I hope that it's somehow based in some kind of truth in that -- in other words, this shared intent of trying to work things out, and come to more understanding and maybe even effect a change, no matter what side of this issue one is on, won't be dropped after these meetings. And that's what I would like to say, when this woman, young woman -- she's probably about my age, but I'm in my next half of the century, so -- said NATO or whatever that world organization was has nothing much to do with this, of course we know legally that domestic rules and laws dictate certain behaviors and outcomes, but we also know that we are part of a global effort, whether we agree or not; it just is happening.

And so I hope -- and I would like to put it down in writing or something -- that this notice of intent is carried forward and so that we do continue to keep open ideas coming and going. And I will tell you what it smells like to me. It smells like DARHT is going to happen. It's probably already happening. I don't know anything about it, but that's my guess, based on rough estimations of history, based on need, based on scientific and emotional needs, monetary, also, and based on the fact that we really don't know how to make change until somebody helps us see it.

So since I can't give you an idea of what to see and how I wish we didn't have to do it, I certainly don't think a no action alternative is good, but I don't have the alternative. I think, since it's probably going to happen in some form, continue to have meetings, continue to have things be open because there is a history in this area and in our country and internationally for behavior that causes lack of trust.

Now we all know we don't really care about that, as long as we can get what we want done, and supposedly for the safety of our country and world, we don't really care if people trust us or not, but actually I think that is an important component. And so that I would disagree with the heat behind what this woman was saying and that, no, we must consider global interaction.

And I believe -- I believe this is my last statement here. Too bad to end it kind of naively -- but I actually believe we have a pretty nifty country. And I'm a little bit of a Pollyanna, but I would like to see us take a means that is more creative, more interactive and more cognizant of the importance of shared intent. So thank you.

MS. WEBB: Thank you very much. All right. George, you haven't spoken yet tonight and your hand is up. Again this meeting was advertised to go to

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9:00, but obviously we are going to be running over, and I just want to let everybody know that we will entertain all of the comments of all the people that want to speak tonight. George?

MR. CHANDLER: Thank you, Diana. I would like to make a couple of comments and then address a couple of points that have been raised. My comment is on the -- on the -- as exemplified by Mr. Coghlan's objection, the process here has been dominated by the desire of the LASG CCNS group to have no opposition, to have the floor to themselves, and you saw an example there.

And when a Los Alamos person with expertise who has studied this issue using public sources -- by the way, as I have -- has studied this issue who is making important points that have been raised by people who oppose the DARHT, suddenly there's an effort to shut him up, and this has -- this has been characteristic of this process from the beginning.

We have had an instance where pressure has been brought to bear on people from Los Alamos employees, through the DOE and through their jobs, to stop them from public participation in this process. And the laboratory and University of California, to their credit, have defended the rights of the laboratory workers to speak at

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these meetings on their own as private citizens.

You see in this room a lot of people from Los Alamos who work in this area, and I think the reason that you see these people here is that we have become tired of reading in the papers and seeing the laboratory and the city of Los Alamos trashed by activists accusing us unjustly and irrationally of contaminating the environment, contaminating Northern New Mexico with no credible evidence that that's ever happened or has in any way happened. We've become tired of these accusations unrefuted, and so you see people here without expertise who can address these misrepresentations and try to bring knowledge to the public about what their real practice on them about Los Alamos and the operation there.

Last night I failed to compliment you, as everyone else has, on this very thorough document, which you supervised. I did criticize it, and I will try to use what's happened here tonight as a way of trying to make the point again that I tried to make last night; that there needs to be in this document a succinct statement of the problems that have arisen in the stockpile. The way that aging takes place, the misrepresentation that Dr. Kerlinsky has perpetrated here on the aging process is -- I hope more than any -- I hate to tell you, it's malice.

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But of course any system, most reliability -- any reliable engineer knows the -- the feature -- there are criterion known as bathtub curves where a system that goes on-line, in its first few months or years, may have a high grade and so what's called 75 infant mortality takes place. And then there's a long period of reasonably steady reliability, and when aging of the components takes place, the system begins to become unreliable again.

The people who design such systems as this work with bombs, as well as any other engineering systems, try to estimate what that period of steady reliability is. It's a very difficult process, and then there is a huge effort in the engineering community to try to make these predictions more accurate. These predictions have been made in the weapons in the stockpile; however, on the people at Sandia who would like to toss off some of these things rather briefly would acknowledge, there is no way to predict when that bathtub curve starts to turn up again and all the components in it.

It's constantly cited by the LASG CCNS, the safety record of the stockpile. If it's been so safe, why do we need to worry about it? The fact of the matter is, the stockpile doesn't just sit there. It's

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75 kept safe, it's maintained safe by a constant surveillance and testing of those components, and problems are turned up in testing. And that testing has to continue. There's no way for that safety record for that 10 to the minus 6 -- that you like to quote -- to be maintained without an ongoing test program. You cannot. So I will stop there. Thank you.

MS. WEBB: Okay, thank you, George. Some other people want to talk and, Kip, I see your hand; however, I'm getting frantic notes from people that we have been sitting here for a couple of hours and we would like to take a break. If you have a very short thing, I will entertain it, otherwise we will take break. You have something short?

MR. CORNELI: I'm sorry; I don't know your definition of short, but it's one page.

MS. WEBB: That's short.

MR. CORNELI: And I will try to stick to the script as close as I can. My name is Kip Corneli. And I live here in town. I'm not associated with any particular group, but concerned about the old nuclear program starting back. Long ago when I was told as a vet of World War II that I could throw away my electric meter because the nuclear system was going to take care of everything instead, I have -- in fact I became a little

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skeptical about some of the things I read, and the EIS did not particularly settle my mind at ease regarding the skepticism.

I appreciate the opportunity to speak. I'm going to address just one particular item in the draft EIS, although there were quite a few things that puzzled me, the redundancy, the shallowness of it, but it was very nice that you spoke of my item because that's what I have on my page. I was a farmer for 30 years back in Wisconsin, and we maintained our own machinery or I supervised the people who maintained it. And I'm not impressed with analogies that have come down to me about comparing the maintenance of the stockpile or safety of the stockpile, the aging of the stockpile, to old cars that don't start after 25 years. If you saw what Woody Allen in Sleeper, you know that Volkswagens are very reliable.

I recognize that farm machinery is not nearly as complex by a long shot as the systems and the products that come from the weapons programs and from LANL, but I suggest, there are certain parallels. I feel 76 strongly that the EIS does not, in any way, prove that aging weapons need additional high-tech -- and I underline -- high-tech study.

I was also a private pilot for a number of

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years and when my airplane needed an overhaul, they were able to detect cracks in the engine block by various examinations, Magnaflux and some others that did not require an ADA million-dollar machine or I wouldn't be flying. Here are some of my reasons; some experts have said that thorough physical inspections will reveal most 76 problems, as I just mentioned, and would suffice stockpile stewardship. My own experience about machinery deterioration leads me to give way to this view, at the same time, even examining or testing every component regularly, let alone on a sampling basis, will not prevent all breakdowns or accidents.

Number two, the EIS provides no summary of 77 results from the several years of existing radiographic tests. I have read reports in a recent New Mexican paper that aging problems have not caused the removal of any nuclear weapons from the stockpile and only 257 defects relating to safety and reliability have been found out of I believe the entire 70,000 nuclear weapon stockpile. That's three-tenths of one percent.

We currently are able to have 8,000. To get down to 8,000 nuclear weapons, three-tenths of a percent of that, if my calculation is right, 24 weapons would have those -- might have those defects. Surely when we attack Bagdad, we're not going to go there with

just one weapon, anyway.

77 I would like to know, for example, how -- how many cracks have been found, where they were, whether we are talking metallic fatigue, cracks, or problems like in the Challenger episode, or what these cracks were. The EIS was very uninformative on that. I don't quite see what this kind of information should be classified as especially when we are talking about an 88 million-dollar facility where depleted uranium will be exploded, and we all know that depleted uranium does not mean it is not dangerous.

78 Number three, if the design life of an on atom bomb is 25 years, when is it considered to be aging? There's the bathtub curve. When does it kick in? You asked that question yourself. I would like to know. As I recall, bombs and nuclear growth around the world, it's really not many years apart from the SAC strategy where the bombs used at that time. At what ages were they discarded or reworked or were defects found before discarding?

What's happened to the information that's been derived from underground testing, from retesting the 79 SAC weapons, all the others that have come and gone through the testing. Can't we perhaps work on good -- haven't we been able to develop good computer models that

would tell us where these things are? I'm not sure if the EIS explained to me that every one of the weapons that's out there in the stockpile that's going to be dismantled and tested, I expect it will be on a 80 statistical sampling basis, and what happens with the other ones that are not checked?

In short, we need a great deal more 81 information where I'm convinced that the task of stockpile stewardship actually requires a facility like DARHT and unfortunately the EIS did not convince me of that, either. Thank you very much.

MS. WEBB: Thank you, Kip. What I would like to do at this time is, it's ten minutes until 9:00. I would like to take a 20-minute break to allow everyone time to disburse, reassemble, have a look at information in the other room. And as Bob Day said earlier, it's extremely good and, I think, interesting. After that, we will reconvene. Greg, you've been wanting to talk again. Jay --

MR. COGHLAN: I have one other response of a question.

MS. WEBB: And we'll readdress those when we reconvene, so until ten after.

(Break taken at 8:47 p.m.)

MS. WEBB: All right. Let's reconvene.

Thank you, we ran a little bit long on that break, but I think I needed it. And it's 20 after the hour. There's a few people I think that wanted to speak but haven't spoken. But before we took the break, what we said we would do next is let Bob and Jas answer a couple of questions they have been itching here to answer, and then we will let you speak. You haven't spoken yet, and Greg we had promised you that you could have the floor again tonight, also. So first of all -- where are my notes? Here are my notes. First of all, Bob was asked the direct question by Jay that he would like to answer.

MR. DAY: The -- I don't have a quote. The question related to hydronuclear experiments in front of DARHT, plans and expectations for that, I believe is the question. Is that correct, Jay?

MR. COGHLAN: Yes, and I was looking essentially for a categorical answer as to whether or not they may occur.

MR. DAY: I think a number of people may not know what a hydronuclear experiment is. There is a report; you have it obviously, and it may be in the public reading room by Vestervelt and Thorn, which talks and defines nuclear experiments. And the definition there is hydronuclear experiments are experiments where you have some nuclear yield. And it talks about yields

up to four pounds, four pounds of high-explosive equivalent.

There are no plans for such experiments in front of DARHT, no preparations, no plans for that kind of experimentation, and -- and no requirement on the part of DOE for such experiments. There would have -- DOE, in order to do such experiments, would have to have all the appropriate documentation that would be necessary to do that, involving all the plans necessary to do that, if that was a requirement. There are no plans, no expectation for that now or in the future.

DR. KERLINSKY: Could it be done? Could four pounds be contained within a vessel?

MR. MERCER-SMITH: Of course. The yield of the high explosives is significantly higher than four pounds and, yes, you could well contain that. However, the question is whether it is a good idea to conduct an experiment which, if it got out of hand, was in a double-walled container right next to a 100-million-dollar machine. It does not seem to me to be a particularly wise idea.

If you were going to do a hydronuclear experiment, the Nevada test site would be the obvious site to do it, where you have a variety of containment techniques. But again the issues of hydronuclears are

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national policy issues. I personally wouldn't do one next to a machine that sensitive.

MS. WEBB: Bob, do you want to say anything else about it?

MR. DAY: No.

MS. WEBB: Jay, does that answer your question?

MR. COGHLAN: Yes, thank you.

MS. WEBB: Thank you. All right, we also had a couple of direct questions here, I believe, from -- from Dan. Dan, you asked a couple of questions, and I was not clear if they were rhetorical questions or direct questions regarding static radiography at DARHT, 3-D codes, and what is meant by reliability in the context of what we're talking about here. And you made some statements regarding the Galvin Task Force. Although obviously the Galvin Task Force report is in the LANL Community Reading Room, I was wondering if you intended to have us -- were you asking us to include the Galvin Task Force Report as part of the record of this proceeding? Obviously you don't need to give me a copy, if you wanted to do that because I have a copy, but I'm asking you, and you are nodding your head, yes.

DR. KERLINSKY: Thank you for making that nice suggestion, and just the national security section

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would suffice where you could -- it would be easier to find the recommendations about stockpile stewardship and hydrodynamic testing in the context of the national security section of the Galvin Task Force Report.

MS. WEBB: All right. Then we will enter that section of the Galvin Task Report for the record for this meeting. Even though you didn't physically hand me one, I know what you mean. Thank you. And then you had some other questions of Bob or Jas. Would you like to respond in retrospect to some of the things Dan asked earlier or, Dan, did you want them to respond?

DR. KERLINSKY: Sure.

MR. DAY: The issue of static pictures. I think it was stated in a way where we may be confusing a statement asked as a question -- stated as a question, and we could be creating confusion between static pictures and dynamic pictures. I think that's true. There could be some confusion.

MR. MERCER-SMITH: And the question also was whether you would use DARHT to --

MR. DAY: Do static --

MR. MERCER-SMITH: -- do surveillance.

MR. DAY: The surveillance program, static radiography is done by different kinds of machines. It is not done by DARHT. The analogy with the dental X-ray

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is, quite frankly, one that I use because I understand it. It's the way, you know, you look for a cavity or hole or something in the tooth. You can take an X-ray picture and get a piece of film. And when we are looking for our data, we take an X-ray of sorts and get a piece of film.

One of the major points is that that picture has to be very short because things are moving very fast. So it's not a static radiograph in the sense that the dentist does, where the technician asks you to hold real still. It's a radiograph where you're trying to make the pulse real short so as the stuff is moving you can freeze it, freeze frame it, and get information about where things are in time. And that's one of the key points about DARHT. And it's actually one of the important points is, that high quality in that kind of situation is very hard to achieve. It requires very precise control down to the electrons; very short pulse, in this case, about 15 nanoseconds, 16 nanoseconds, very tight control of the energy to make sure all the source is real small.

And that's been when Scott talked about the technology. Those are some of the technology issues that we have been developing and which we've been able to control in order to improve this, in order to improve

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this source, and one of the reasons we will be able to get much better data.

DR. KERLINSKY: I just want to say thank you very much for that clarification because I think it's important to note that, going through this EIS process, we are actually clarifying statements. We were just reviewing the Notice of Intent, and the language of the Notice of Intent talked about the X-ray pictures telling us details about the 3-dimensional condition of internal components, and I think this is very helpful.

MR. MERCER-SMITH: Let me try to explain that. If all you are interested in is static radiography, there are much easier ways to get it.

DR. KERLINSKY: That's right.

MR. MERCER-SMITH: The issue that DARHT has is the dynamic response of materials to shockloading, and so how do materials behave after they've been subjected to the shockfront developed by high explosives. And that's the function where DARHT and the plan for that machine are unique.

DR. KERLINSKY: The second part of the question about surveillance being done at DARHT or not being done at DARHT, a similar kind of clarification?

MR. DAY: Let's go back, though, one step. Issues related to surveillance can and are

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addressed at DARHT.

DR. KERLINSKY: Issues related?

MR. DAY: Related to surveillance can and are addressed at DARHT, because frequently as a result of surveillance, you find it. We find the dents and cracks and holes and changes and those kinds of activities. And as part of fulfillment of the -- of that program, we investigate those kinds of issues in a dynamic sense.

DR. KERLINSKY: Right.

MR. DAY: Because it's not the fact that they are static that's the issue. The issue is what effect do they have dynamically.

DR. KERLINSKY: Right.

MR. DAY: So if -- so DARHT is related in a very tight way, in some cases, to issues related to the surveillance program. It is not the first thing you do in a surveillance program. The first thing you do is you look at the static radiographs, look and take things apart and -- but it is a piece of how you handle surveillance issues.

DR. KERLINSKY: Let me see if I've got it right. Do you expect to find flaws in an aging weapon by -- in DARHT, or once you find a defect, are you going to use DARHT to analyze?

MR. DAY: You actually do both. The

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baselining that we talk about is part of that where you actually look to see what you have, and then compare, in the future, dynamics, because it's the dynamic part of the process that's part of the key. Can they or can you see all such issues in static pictures? And the answer is, no, you can't see all such issues.

DR. KERLINSKY: You see, the major issue that I was asking for resolution is, how, using mock materials, you know, not the real plutonium, but a mock material to simulate the pit, you know, and compressing that with the explosion and taking a picture of that explosion really tells you about either the current status of the real pit, or tells you about an aging effect of an aging pit, because the material you are compressing is not the real material. That's where I have been stuck. If you guys could help me clarify what that is, really what was initially described as benchmark.

MR. DAY: Let's step back one step from that, because this is also the issue related to nuclear testing. In order to ensure that the devices work, we have one sure way of doing it, and that's to take them to Nevada and see that they perform as we expect.

That technique is not available to us. There is a moratorium on comprehensive test bans, and

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that's full of high fidelity. Highest fidelity experiment is not available, so we do -- our job is to do the highest fidelity experiment that we can do under the constraints that we have, so the surrogate materials are -- provide some of the highest fidelity information that we can get in a routine -- in a routine way. And that information can be key to understanding some problems. I don't think we propose that it will understand all problems in the stockpile, but there are pieces and parts that we may not be able to sample, and the answer to that is yes.

DR. KERLINSKY: There is a wonderful discussion in 3-3 where you talk about surrogate materials and describe the difference between tantalum and weapons with plutonium, higher strength, higher melting point; the difference between lead that's sometimes used that has lower strength and lower melting point, you know. Do you currently have a simulated material that is described that acts as current status of these various weapons, and do you currently have a simulated material to -- to simulate, you know, for an aging effect?

MR. DAY: We do many experiment to understand aging effects. We try to accelerate the aging process. Sometimes we heat something and that

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accelerates the aging process, and there are other things you can do that can help you understand how things might age. And we do those -- we do those kind of experiments, and we try to use materials which have as high a fidelity as we can achieve. And there are -- there are no -- there's no way of addressing all of the issues without a full scale test.

DR. KERLINSKY: So --

MR. TRAPP: Can I put an example in here?

MS. WEBB: Could you please identify yourself for the record?

MR. TRAPP: Yeah, T. J. Trapp, nuclear materials program manager from Los Alamos. Let me just give him a good example of the kinds of things we do. Plutonium is an alloy, and that alloy seems to me -- it does things all the time. It changes, and some of the things that can change are like the grain structure, things like microstructures; it might be cracks or something. Now doing things like DARHT gives you the capability to take one material with small grain structure, look at that, take another case with a larger grain structure, see the difference in behavior. Then even though it's not the same material, you can extrapolate that material to see how you would expect any issues of -- any safety issues, any reliability issues

and other operative issues from the basic material and have an understanding of knowing a change happened, and someone doing a test can be given material that relies on a surrogate, if you do stability tests because that's an aging effect, that's a real life aging effect.

DR. KERLINSKY: So let me ask, looking at the grain structure change, have people constructed a surrogate material for that and carried out a hydrodynamic test to see what the compressibility of that surrogate material was to be able to see if they could extrapolate that to the plutonium?

MR. TRAPP: There is no surrogate that behaves in every sense like plutonium. So what you have to do is take a material and mimic one particular piece, and sometimes another material can mimic another particular behavior pattern. And in between doing all of those, you can put together something that's somewhat of a representation of plutonium. And yes, people have done that. That's the kind of thing that people are doing. One of the things that people are trying to do in the surveillance area is moving from what I call a retrospective surveillance, looking at something to see if it's gone wrong, to something that's predictive. We can look and make sure nothing is going to happen in the future, and that's where the question becomes very

important, how do we know whether or not anything is going to happen in the future? This is predictive capability when you start looking forward.

DR. KERLINSKY: So if you want ballpark, how many shots were done in the last year for simulation of the current status of plutonium?

MR. TRAPP: I don't know the answer to that.

MS. WEBB: Dan, in the interest of not trying to cut this off, Mr. McCorkle had raised his hand quite some time ago, said he wanted to say something, and now I see him packing up his materials and looking to dart out, and I would like to give him the opportunity of saying something.

MR. McCORKLE: I have something that I wanted to say to Jay, and I think there's probably room to say it in private, and I don't want to make a public statement and I, yes, I was getting ready to leave.

MS. WEBB: Thank you, and we appreciate you coming here tonight.

DR. KERLINSKY: Let me wrap up. I didn't hear the answer on how imploding a surrogate material really tells you about the current status about aging, future status.

MR. DAY: They can tell you a lot about

the hydrodynamics. It can tell you a lot about the complexion. You can follow density. Because the nature of the materials are different and the nature of the materials in the devices, you then have to compare how well you can predict those with what you predict in the devices that we have in the stockpile. And there's a computational part which is always part of what we do. You've got to understand that -- that -- you have to understand, there's an issue here.

MR. MERCER-SMITH: There are a variety of computational issues. If you think of the simplest possible geometry and impose a hole in it, you know, I drill a hole in it and impose geometry, that gives rise to a shape change. That is something that is addressable by some types of calculations. And part of what we do is, by using surrogate materials, follow the hydrodynamics of that sort of process, computationally, and then see how well we have done. And then we can consider extrapolating to those materials.

DR. KERLINSKY: And are there currently any holes in pits, I mean, that you would be simulating the status of? I mean, that's -- or is this just a hypothetical exercise?

MR. DAY: I think there is another point that we need to go after here and that is the process is

not just data. A process is the relationship between the data and the calculations. And then taking that data and those calculations and extrapolating to conditions in a full up device. And so what you do is, you take a set of data -- and this is also true in the underground test program in terms of understanding. You can validate most of the military requirements with real experiments, but in the case of trying to understand how the device works, and the data tells you how well the code works. And so there is this -- there is this constant process, part of the scientific process of having data, comparing it with calculations, using those calculations to drive what you don't understand to go back to create additional data which better illuminates the code, and it's through that process of calculating and experimenting that you get a better understanding.

DR. KERLINSKY: One last one from a comment.

MS. WEBB: All right. Your last one was your last one. So is this one your last one?

DR. KERLINSKY: This will be my last one. There is one sure that way you knew weapons would work; that is underground testing. Isn't it true they stopped doing underground experiments over a decade ago because every time they set off an old one, it went off as

predicted. So this argument about the only sure way of knowing it's going to work is by blowing it up. It was a question that had been resolved within a laboratory community quite some time back.

MR. DAY: No, that's not true. Reliability tests have been done routinely, and of our systems that have been in the stockpile, and those -- those were being done throughout the -- throughout the program.

DR. KERLINSKY: And were there yield effects that were significantly different than were predicted on those older weapons?

MR. DAY: We have seen effects of systems that have been in the stockpile that gave us new information about how they work and that would cause us concern about how well they would work in the future.

DR. KERLINSKY: Is that a yes or no?

MR. DAY: Again, it's the issue of understanding. Also there's another point I think should be clarified. And it seems to be the point that gets made a number of times that somehow the only way you can address aging issues is by actually aging it for a long period of time, and a lot of aging issues are related to changes. When you test a new system, you are testing a system or looking at a system -- in a way you are testing

a system in a way where there are changes. Those changes are what you see as you age so that every experiment that we have done in Nevada and in our experiments have helped to give us information on aging because, again, it's experiment in comparison with the calculation that gives us the confidence in both the aging issues as well as the other issues that we had. So it's not -- the situation is not quite as straightforward as you would -- as we might believe from that kind of a statement.

MR. MECHELS: A clarification. I think when you talk about doing full up tests in Nevada, you must not be talking about testing 150 kiloton warhead because I don't think Nevada has announced any testing. So what are you testing? Are you taking testing -- testing primaries?

MR. MERCER-SMITH: He's referring to a time when we did test, in the past, in the past tense.

MR. MECHELS: He was in the past? But I thought Dan was saying you hadn't tested full up since ten years. I don't know. I don't see you testing big things in Nevada, so you could not be testing unless you are dropping in holes.

MS. WEBB: Suffice it to say that we are not conducting underground nuclear tests in Nevada.

MR. DAY: And have not in 1994.

MR. MECHELS: What I'm saying, I didn't see you dropping 150 kilotons. I saw you test the small stuff so that's the best guess. I'm wondering if you were talking about testing primaries. Are you really telling us, if you are talking about ICBM and throwing them in holes and shooting them.

MR. MERCER-SMITH: Those were called stockpile confidence tests.

MR. MECHELS: And those were --

MR. MERCER-SMITH: And they were systems that had been in the field.

MR. MECHELS: And they were taking real systems and dropping them in, because I am very unclear.

MR. MERCER-SMITH: Real systems under the constraints of 150 kiloton threshold test bans.

MR. MECHELS: So if you had a system any bigger than -- like if you had some 300, you just can't do that; right?

MR. MERCER-SMITH: You could not test it at full yield --

MS. WEBB: Not under the constraints.

MR. MERCER-SMITH: -- under the constraints.

MR. MECHELS: Since that wasn't a full yield, that means you had to modify if you were going to

test it.

MS. WEBB: Chris, you said you had a brief comment.

MR. MECHELS: I thought it was brief, but it's more complicated than I thought. I am still unclear.

MS. WEBB: I would like to note for the record, during the break, Kip informed me he would like to correct his testimony and he will be providing me with a written correction to that. So I just want to note for the record that we will be looking for that.

We have promised Greg a long time ago that he could talk. And Greg, it's been a long time, and we appreciate your patience.

MR. CUNNINGHAM: I just wanted to try and answer some of the questions in the two and a half hours since I last talked.

MS. WEBB: And we appreciate your patience.

MR. CUNNINGHAM: One of my questions that the gentlemen back here asked was the average age the weapons that were retired back when there were B-52s, and I think you are referring to maybe '50s, '60s, '70s, that time frame. And up until 1958, the average age of retiring a weapon was 4.5 years. During the 1960s, the

84 average age was approximately 11 years, and we now are going to have weapons in stockpile for much, much longer than that, just to answer that question.

MR. CORNELI: What was done with the weapons after 11 years?

MR. CUNNINGHAM: They were retired from stockpiles. They have been out of the stockpile for many years.

MR. CORNELI: Were they refabricated?

MR. CUNNINGHAM: I don't know how to answer that question.

MR. DAY: The components would be disassembled. Usually the special nuclear materials would be reprocessed and used again, but the device itself would be disassembled.

DR. KERLINSKY: And you use data from the '70s and '80s to compare with the '50s and '60s?

MR. CUNNINGHAM: I don't recall what was compared. This is out of an old report.

The next question that I wanted to answer was in terms of access to documents. Jay made a comment that since I work for the laboratory I have special access to documents, special access to knowledge. One document that I don't have is the Sandia Stockpile Lifetime Survey because it's not being made available to

the public is my understanding.

MS. WEBB: Thanks to you --

MR. CUNNINGHAM: That's one document that Dan, Jay, everybody else seems to have except the representatives from the laboratory.

MS. WEBB: Thanks to the fact that Greg Mello earlier this evening submitted it for the record, we will now have it in the public reading room along with the transcript of this as soon as we have it.

MR. CUNNINGHAM: I would like to ask Greg Mello about that a week ago when I was in the office gathering all of this information, but I guess I will research --

MS. WEBB: I don't think Greg Mello is here. I don't see him.

MR. CUNNINGHAM: I question the special access to information at any rate. The next question is relative to something that Elizabeth -- I think it is? -- she's not here. She talks about shared intent, and I think I volunteered that one of the things that came out of the meeting that citizens of Los Alamos have in

85 response to the forum last fall was that we didn't think there was very good justification for why containment vessels should not be used. It seems like containment vessels solved some of the problems in terms of

environmental impact.

And we think that if containment vessels

85 aren't going to be used, we need a stronger justification for why their use is not justifiable. It's too costly. I think the operating cost I saw indicated the operating cost would double by using containment vessels from 6 million to 10 million per year. And so I think that needs to be made clear that by using containment vessels, it's going to cost an extra $4 million a year. Is that

85 worth the advantage you gain in terms of not contaminating the environment any more than it already is?

My last -- or not last question, but fourth response, is with respect to the Galvin Commission. Dr. Dan Kerlinsky served on the Galvin Commission, which I hope allows everybody to realize that a lot of the commissions that I'm citing, review committees that I'm citing, were independent commissions. And Dan, obviously, is an independent thinker.

The Galvin Commission was headed up by Robert Young, a CEO at Motorola. And there was a variety of industrial, academic, and what I would call activists, for lack of a better term. That Galvin Commission came up -- the first recommendation in the list of recommendations was to implement DARHT. The first

86 recommendation of the Galvin Commission was to implement DARHT.

And another recommendation that the Galvin commission came out with was to eliminate the stockpile stewardship activity in Lawrence Livermore which presumably is enough justification to not consider alternatives that would locate a very central part of those science based stockpile stewardship activities at Livermore, which answers Chris Mechel's comments.

Jay made a comment about hydronuclears. He said that he wanted a categorical exclusion on hydronuclear and Bob and Jas tried to answer that question, and I would just like to add my view on that. I think that obviously it depends highly on the comprehensive test ban being negotiated and hopefully implemented. And that it depends on the threshold of the comprehensive test ban, and we should take advantage of whatever that threshold is, and it just depends on what that threshold ends up being. Jay also stated that --

MR. COGHLAN: Can I correct one thing, though?

MR. CUNNINGHAM: One more comment and you can comment. Jay also stated that it's the quote, unquote, weapons states that are pushing for higher thresholds on the comprehensive test bans, and I

would like documentation made available for that, if you have a document that supports that.

MR. COGHLAN: The correction -- I didn't ask for a categorical exclusion; I asked for a categorical answer to the question.

MR. CUNNINGHAM: Your words were categorical exclusion.

MR. COGHLAN: I did not say that. I asked for a response to the question of whether or not there will or will not be hydronuclear tests.

MR. CUNNINGHAM: Either you or Dan said categorical exclusion.

MS. WEBB: Perhaps we will have to wait for Irene to get her transcript typed up, and then we can see who said what because, to tell you the truth, I don't remember the verbatim quote. Please let Greg finish.

MR. CUNNINGHAM: Three more points.

87 Dr. Kerlinsky indicated that most of the safety problems have been solved in the 1960s. The one-point safety criterion was not even established until 1968, but the one-point safety criterion indicates that you have to have a one in a million, only a one in a million or less chance of getting nuclear yield out of a device, out of a device that's accidentally detonated. That criterion was not established until the 1960s and computer counts

87 didn't have the predictive capability to predict one-point safety until 1988, according to Dr. Kidder in one of his reports to Congress.

And I would argue that one-point safety is 87 a -- is a very vital mission that we serve, because one-point safety is not related necessarily primarily to aging. It's related to inherent design flaws that potentially take years and years of testing to decide whether or not that it is a design flaw that could cause a one-point safety failure. The reason is, the sensitivity to various points on the outerexplosive where the one point would be initiated is not well understood and needs to be multiple tested, multiple different points in a code that can reliably predict such performance. And we don't have a 3-D code that can 87 reliably predict such performance because we don't have the 3-D information that would be provided by DARHT to benchmark that kind of a code.

Last comment on Dr. Kerlinsky's statement. He said that the Sandia Report indicated that high maintenance is needed, and I have a very long statement here that I won't read, but to summarize, there are many 88 problems with just having an inspection, maintenance, replacement kind of strategy as your entire science based stockpile stewardship program. That's called

surveillance. That's not science based stockpile 88 stewardship.

One problem is that materials can become unavailable. A very explicit example of this is, the Rocky Flats Production Plant was the only plant producing the pits that formed the central core of a primary of a nuclear device. Rocky Flats stopped producing pits, and for that reason, two of the weapons that remain in our stockpile, according to the recent Nuclear Posture Review headed by the Secretary of Defense, two of our weapons do not have insensitive high explosives. They have the old style high explosive, which makes them more susceptible to one-point safety hazards.

That is to say, if they have a one-point safety problem, the fact that they have old high explosives makes them more susceptible to accidental detonation and potential nuclear disaster. Those devices were not upgraded to devices that could have IHE, insensitive high explosives, because there was no vendor to produce substitute pits that would not have required the experiments and testing that would be required to solve the problem otherwise.

And the other solution was to essentially take used pits from the stockpiles, and the weapons experts decided that it would be more testing and more

costly and there would be underground testing and they did not do it.

So for that reason there has not been a safety upgrade. So in effect, not having done this whole concept of inspection, maintenance, replacement is seriously affected. Vendors do go out of business. Materials do disappear. Furthermore processes include 88 undocumented capabilities and styles of individuals who retire or just leave. You can't fully specify every aspect of a production process. We don't fully understand the production process in enough detail to know whether or not there are certain missing documentation of production processes.

I think I -- I have two more areas that I would like to comment on and maybe I will comment on them if other people comment on them; that is, with respect to the Nuclear Posture Review, which is available in the community reading room, and that declares why we need to have nuclear weapons. What our objectives are in having nuclear weapons and gives very explicit figures on how 89 many weapons we have taken out of the stockpile, how much we have reduced the stockpile, what kind of capabilities we have eliminated to save money, how many personnel now have access to weapons. It's been reduced by 70 percent. 70 percent fewer people have access or control of nuclear

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weapons. There are 70 percent, or on that order, fewer storage locations. There are 79 percent -- by the year 2003, there will be 79 percent less weapons in the stockpile.

There is a very vigorous and two-phase operation to eliminate very large portions of our capability in nuclear weapons. We are leading the way and eliminating weapons in the stockpile. But at the same time we need to hedge our weapons, we need to hedge those bets with other reliable deterrence. That's been stated by the Secretary of Defense and President of the United States. I would be willing to comment if people have questions about this.

And the last item is related to DARHT specifications and how exactly quantitatively DARHT will improve our ability to do hydrodynamic tests and how explicit this information will be, and I have some figures related to that that I would like to discuss if anybody is interested and asks questions.

MS. WEBB: Greg, I would like to just clarify something you mentioned. You mentioned that the Nuclear Posture Review is available in the community reading room. I would presume that we are referring to the unclassified summary of the Nuclear Posture Review and not the classified report itself?

MR. CUNNINGHAM: It's actually imbedded -- I had to sort through 100 documents to find it. It's actually imbedded in a document that's entitled Background Information on DARHT EIS.

MS. WEBB: When we sent it over it was not imbedded and I cannot answer as to why it is now imbedded. Jas indicated to me here by hand gestures that he would like to clarify something.

MR. MERCER-SMITH: There is a technically incorrect statement in something that Greg just said. There is not a direct relationship between the use of insensitive high explosive and one-point safety. The weapons in the stockpile are in fact one-point safe. The use of insensitive high explosives is valuable because -- in case of an accidental detonation and the likelihood of dispersal of plutonium; it is not directly related to one-point safety.

MR. CUNNINGHAM: To restate what I said before, the fact that it does not have IHE makes it more prone to accidental detonation which makes the one-point safety more important.

MR. MERCER-SMITH: It is not related to one-point safety.

MS. WEBB: All right. Perhaps you guys can have a little explanation on this offline.

MR. MECHELS: Could I answer very quickly to one point that he made? I was speaking to FXR LLNL, and his statement was that because they were targeted by the Galvin Task Force to go out of business that FXR is properly excluded from the evaluation. I certainly question that because Mr. Tarter out of Livermore hasn't gotten the message. He has every intention to upgrade FXR and it will cost about $40 million. I haven't seen anybody shutting the funding off. They are fighting very hard it keep it.

My comment was, we seem to have a complex wide arms race within the complexes to see who can build the fanciest gear, and I suggest it implies to me that before we build DARHT and fancy gear in competition with

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each other, that we have a stockpile stewardship evaluation to see what the heck we're doing.

MR. CUNNINGHAM: I can respond to that briefly.

MS. WEBB: Can I respond to it? I would just like to point out for the record that the Galvin Task Force was an independent task force report. The Department of Energy has not come out with a formal position regarding the recommendations of the Galvin Task Force Report. The Department of Energy has not suggested at this time that anybody should shut down the FXR

facility at Lawrence Livermore, and that is so stated in the draft EIS somewhere. I forget which page. Greg, please.

MR. CUNNINGHAM: Just a brief response. Dr. Ray Kidder at Lawrence Livermore National Laboratories is a highly respected theoretical physicist, who Congress repeatedly has asked for objective reviews

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of the current state of our nuclear stockpile. He had an article in the Bulletin of the Atomic Scientists entitled, "Shopping Spree Stop and Started." He itemized $2 billion worth of proposed facilities, out of which I think he approved of two facilities, DARHT being one -- another one, and that substantiates the need for DARHT.

MS. WEBB: Okay. Thank you, Greg. Christine has kind of been indicating that she wants to talk, and Chris is making noises over here, but Christine indicated she wanted to talk first.

MS. CHANDLER: This is really a question on process and procedure about the EIS and DARHT as well as the future ones occurring, and that has to do with employees -- people who happen to be employees that participate. At the break you pointed out I should always be clear in what capacity I speak. I question that as an approach, frankly.

We have two designated officials here who

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speak for the lab. I frankly think that the preferred approach should be, people who are clearly designated to speak for the lab -- people who are not clearly designated, the presumption should be that they speak in their own capacity until such time that they identify themselves in the official capacity. I would request that that be the approach for all the PEIS that DOE is going to be conducting. I know you only have control over this one or some authority over that, but I would suggest that is a proper process.

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I think by calling out people, where they are an employee, is inappropriate and I would request that that process be stopped.

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MS. WEBB: Okay. I appreciate that comment. It is true that Bob and Jas, if they would care to comment on the Environmental Impact Statement, I would have suggested to them that probably they should be speaking as private individuals since they are here in their official capacity. We have several other folks here, such as the people who are staffing the information room. It's little bit less clear, if they wanted to speak tonight, if they would be speaking as an individual or in the capacity in which I asked them to come and help out in the information room.

MR. DAY: Let me clarify that. They are

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here as representatives of the laboratory, with materials presented and prepared by the laboratory, so people in the other room are here as representatives of the laboratory, not in their individual private citizen capacity.

MS. WEBB: And there's a lot of other people who work at the laboratory but they are here tonight because I presume they are interested in being here, either that or their spouse made them come, and they are here in their capacity as private citizens. I don't make a habit of asking people on the record where they work, and I hope I did not do that.

I, quite frankly, am not really interested, too much -- I mean, sometimes it's really interesting where people work, but for the most part, I'm sorry if I left the --

MS. CHANDLER: I didn't mean that as a criticism, Diane. I think it's inherent in some of the things going on in this meeting, as well as the others. I think we need to put it out on the table and address it.

MS. WEBB: All right. I appreciate that comment. Mary, you were raising your hand.

MS. RISELEY: I like to think it's completely irrelevant if the people work at the lab or if

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they are a member of the public; they have a right to speak. But I would like to say that tonight we lost track of the vector that is expected by NEPA. And the vector in a DARHT comment meeting, or in a scoping meeting, is comments from the public to DOE. And it

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seems like a lot of what happened this evening is that that was passed on to other people, and they prepared rebuttal testimony rather than commenting on the DARHT EIS itself. And I don't know if it's possible to do anything like that, but maybe a reminder every once in a while that the purpose of meeting is to evaluate publicly the DARHT EIS, and presenting your own personal opinion about the various alternatives rather than the ideas of some other members of the public.

MS. WEBB: About ten hands went up, and I do appreciate that comment, Mary. And I did say earlier on that the purpose of the meeting is to discuss the accuracy and adequacy of the EIS, specifically the environmental analysis contained therein. I did however say that we would entertain comments on other aspects of the project for this review project. However, you are absolutely correct the main focus of this meeting is to get your comments on the adequacy and accuracy of the environmental impact analysis in the document. A bunch of hands went up simultaneously, and Chris is one.

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Greg is one. Dan is one.

DR. KERLINSKY: We will go around this way.

MR. MECHELS: I like that.

MS. WEBB: All right, Chris. You may say something.

MR. MECHELS: Because of my earlier noted trouble with members of Los Alamos National Laboratory throwing off statements which the public cannot rebut, I mean, I would like to get a clarification on the statement he just made; that part of the reason we need DARHT is because, quote, that the -- "that you don't really understand the production process." Is that the official laboratory position from these two gentlemen?

MR. CUNNINGHAM: I'm not representing the laboratory's position.

MR. MECHELS: As a member of the a laboratory and making a comment like that, is that true? I'm just saying, is that true?

MR. CUNNINGHAM: Get it out of the Miller Report. They don't --

MR. MECHELS: Wait a minute. Is that true? Here are two people who work at the laboratory and are experts in that area.

MR. MECHELS: I don't care what the Miller

Report said.

MS. WEBB: Bob, would you care to address that?

MR. DAY: As I understand the question -- let me clarify. Are there details in the production process that are undocumented that give rise to -- undocumented, that had an effect on the stockpile?

MR. MECHELS: What he said, and of course I'm asking for his comment, was that part of reason you need an instrument like DARHT is because you don't fully understand the production process.

MR. CUNNINGHAM: That's not what I said. He's telling me what I said.

MR. MECHELS: What did you say?

MR. CUNNINGHAM: What I said was, there are flaws in the premise that you can ensure the stockpile through a surveillance program to consist of inspection, maintenance and replacement. That's what I said. I didn't say that DARHT resolved the problems. I didn't say that was what DARHT was for. That's what I said.

MR. MECHELS: I have a got, you say, part of the reason you need DARHT is you don't fully understand --

MS. WEBB: Once again, I would invite --

MR. MECHELS: I'm just questioning that. I'm just saying, is it true?

MS. WEBB: Okay. Chris and Helen indicated that they know what Greg said. I would suggest that we wait until we read Irene's transcript to find out what Greg said. And Mr. Trapp is trying to say something.

MR. TRAPP: The answer to that question is that our real life experience is that every time you do something on a different piece of equipment in a different way, things change. So no matter how well you characterize and understand the process, if you think you will duplicate the same thing again on a different piece of equipment with slightly different characteristics, there's something different.

So the truth is, always things change. And we have many, many examples of very well characterized processes. In one case if we pick the process, and they did this on uranium out of the 1960s, there Oak Ridge has developed, and they did a wonderful job, documented it very well, put it away. We tried to duplicate the same thing. It took them six weeks to do it. It took us two years. What it lead up to was cool-down cycles and different purities in the equipment you make between the 1960s and now.

So the real world is, every time you change equipment and do the same thing again, something is slightly different, and that's it.

MR. MECHELS: Thank you.

MS. WEBB: All right, and then Milton -- can I get your last name?

MR. LOCKHART: Milton Lockhart. I have a comment on the discussion as developed tonight over the need for safety and reliability. This flies in the face of strictly commenting on the environmental effects of DARHT. It really doesn't impact the environmental effects. Having DARHT does cause environmental effects. But if we restricted it to just the environmental impact -- we have spent over half of our time tonight talking about a topic which is not relevant

MS. WEBB: Or possibly more than half of our time. An Dan would you like to say something?

DR. KERLINSKY: Two things. One is, if there isn't a justification for a new facility that 94 stands up, then whatever environmental impact comes from, that facility isn't justified, so that's kind of part of the --

MR. LOCKHART: That's a give and take and I agree with that.

DR. KERLINSKY: So we would've thought

it's better to create another alternative to look at in the PEIS -- I know it's getting late but -- what another 95 no action alternative or another proposal would be, would be to really look at, when do we need to do hydrodynamic tests, period? regardless of whether or not we build the DARHT or PHERMEX or FXR, and really specify when those tests need to be done, and that should be in some ways a different alternative.

What I would like to propose, getting near to wrapping up -- what people were talking about in the break, we kind of like this debate format, you know. It's like, why can't we keep doing it? So the suggestion was maybe as part of the EIS process, we could actually set up a more formal discussion where the round-table 96 part is more like a format for going back and forth or on particular points and we ask Bob and Jas and maybe the Sandia guys and some other folks to actually sit around -- do more of like a debate on the kinds of points that come up, and that might be interesting and good for the process.

MS. WEBB: Well, no one is falling asleep, yet, so we assume it's an interesting exchange, and we will take it under advisement. Greg, you had raised your hand a while ago when all the hands went up.

MR. CUNNINGHAM: Just a response to Mary's

or somebody's comments. I can't remember whose comment, but basically on NEPA. To me what NEPA is, it's about public involvement. To me the public being involved and informed, and I feel very strongly because of the comments I presented today and being able to do that.

So I feel that the NEPA process is all about involvement, not about some kind of formal specification of how comments are solicited. 97

MS. WEBB: Thanks. And Christine, I think your hand went up when all the hands --

MS. CHANDLER: No.

MS. WEBB: It didn't go up? I'm sorry

MS. CHANDLER: The one time.

MS. WEBB: George, your hand went up.

MR. CHANDLER: I will make an environmental comment on the environmental section of this report, which I think is outstanding. There are more thorough documents produced by the laboratory on lab surveillance and I think it's clear from what's in this report and from other things, that the laboratory dedicates large amounts of resources to environmental surveillance, tests everything conceivable, looking for migration of radionuclides off the laboratory property into the general environment, and has found nothing credible that would pose any credible threat to any of

its neighbors. 98

Mostly the -- there's, for example, when you look at the numbers you see a lot of plutonium numbers along the Rio Grande, and you find out that's all from atmospheric testing. There's a hint in a couple of places that there may have been some migration of plutonium down from the Bayo Canyon or the Pueblo Canyon but the amount that's there is minuscule compared to what's in the atmosphere from atmospheric testing.

The uranium content in northern New Mexico is very hot, and a lot of uranium -- there is a lot of uranium radioactivity. There is essentially no contribution from the laboratory of uranium into the environment that is made. There is a large amount of uranium on the mesa where these tests take place, 144,000 kilograms -- that's a number; that's a big number -- that's been expended out there carefully continuously monitored for any sign of migration, and there are in fact cleanup activities on the way. 98

So I think one of the things that's very important about this report is it documents the care that the laboratory takes to protect its neighbors from any kind of threat from activity out there, and those activities -- my personal observations are, they're increasing.

MS. WEBB: Thanks. Something else regarding EIS analyses, which I just wanted to say again; we talked a little bit about safety and reliability, which was part in the EIS of the purpose and need. An EIS specifies and identifies the purpose and need, but the purpose of an EIS is not precisely to debate or analyze the purpose and need. The purpose of an Environmental Impact Statement is to analyze the environmental impact of a proposal, in this case, the preferred alternative and the various alternatives to. The Environmental Impact Statement is one facet but not the only facet that will lead to the ultimate decision. Other things that are not analyzed in EIS, such as cost benefit analysis, programmatic studies, and other things of that type, will enter into the decision process, but are not part of the environmental analysis that's included in the Environmental Impact Statement. Does anybody else -- well, we are having a round of applause from next door.

MR. LYLES: John Lyles and I have heard a lot of ideology and statistics about weapons and production rates and various reasons or not reasons to finish building DARHT. I was wondering, since you've been bringing up the environmental part in the last few minutes towards the end here, the archeological part,

has -- in the last two days of these meetings, have any representatives of the pueblos been coming to these and actually having input because they are the most affected. It's their ruins and sites there. 99

MS. WEBB: Representatives of the pueblos have certainly been invited to these meetings. As with other types of other government entities, we make special provisions to make sure their comments are heard, as I have made the offer to other government entities, I have made the offer to go to the pueblos and speak to the tribal governments directly. They have accepted those invitations and these types of interchanges will continue. We do, under law, regulation and good-neighbor practices, take into account the input and give special deference to the input of the tribal governments as well as the state and local governments.

MR. CUNNINGHAM: Can I comment real briefly? I know Bev Larson, who is the archeologist, I believe, that did some the work on the archeological -- the cultural impact, if you will, Nake'muu, which is one of the sites that might be impacted and she has had several discussions. She had a very active discussion with the pueblo. One example I think is kind of interesting, I think; you guys correct me if this is wrong, but I believe the pueblos were interested in

taking earth and putting it over some of the ruins and they felt that that was the appropriate mechanism to ensure that resource, and they were much more willing to do that, for instance, than having it torn apart, and the pueblos were consulted to make sure that resources were being handled in an appropriate way.

MS. WEBB: What you're referring to was there was an archeological site that was covered by this earthen berm. The laboratory did consult with the local pueblos and at the request of the local pueblos, the archeological site was covered and is banked under that big mound of earth. That was not the preferred approach that had been suggested by the State of New Mexico State Historical Preservation Officer, but they did again -- again the state deferred to the wishes of the pueblo. Beverly was here earlier. I don't know if she's still with us. Beverly did contribute to this Environmental Impact Statement. I might just mention that the analysis was done by members of the Pacific Northwest Laboratories. The gentleman from Pacific Northwest Laboratories who did this analysis is also here tonight, somewhere. I don't see him at the moment, but he is here tonight, so if somebody wants to specifically ask about that.

MR. WATSON: I would like to make an

observation. My name is Scott Watson, speaking on my own behalf. About the Indian ruins, I think you pointed out earlier that the Indians ruins around the site which have been doing open-air hydrotesting for some 30 years now is excellent. I would like to add to that observation. As a citizen of Los Alamos I'm well aware of the number of ruins around the mesa tops, for example, White Rock Canyon, Bandelier, other areas, and we have observed those, as someone who likes ruin areas, and observed the damage done to them by hikers, bikers, motorcycle riders and people of the general public, and I have had the

100 opportunity to observe the condition of the ruins at the laboratory site and comparatively say, those ruins at the laboratory sites are in much better condition, which indicates to me that the laboratory, as a responsible steward of the archeological site and laboratory, actually maintain archeologists on-site and require reviews of these sites before such construction can take

100 place. So I think it's important that the public be aware that these sites are being well preserved and the fact that this ruin is in such good condition is testimony of that.

MS. WEBB: Thank you, Scott. We seem to be winding down. Who else would like to speak? There are some people who haven't said anything tonight. I

wasn't one of them. Ken?

MR. BAUER: Diane, I'm going to push the envelope a little. My name is Ken Bauer. I work at the lab as well, even in the stakeholder office, but I wish to speak as a private citizen. So in that sense, it is a little late, and I'm off the clock; I guess I can do that.

With respect to the format of individuals rebutting each other over time, I would like to suggest

101 that that is an adversarial situation where -- where we're pitting each other's rhetorical skills against one another, and perhaps it's not as constructive as speaking to -- to the goal of the meeting and working toward certain decision points that may be enhanced by that discussion.

The reason I wanted to break my silence was to say that -- that with respect to the adequacy of the of the draft, I was surprised that the air quality

102 was significantly worse with the containment option. And since this hasn't come up, I would like to suggest that in the final draft, the final EIS, a fuller explanation is made of how an identical set of calculations for an open air explosion versus an explosion that takes place inside containment and is properly vented, and so you on can come out significantly worse in that case where it's

contained. The socioeconomic consequences of using containment, of course, have been stated many times. It costs more money to that do that. As a chemist, I -- I learn to accept the -- to reject the notion that it was -- that the solution to pollution was dilution. And often the statement is made, 500 feet out from the site, you won't find any soil, any soil contamination in that background. The air quality 3-, 400 feet away is at background again, this is -- this is because of the incredible dilution effect that takes place over this

103 distance, and I think that as -- as citizens and scientists, we should reject the notion that by diluting 20 pounds of lead over the course of a year or 30 pounds of beryllium and large amounts of uranium, that just because it gets diluted over that large space, that it's acceptable because we can't measure any more out at this certain point.

So in that respect, I would like to argue

104 that containment has merits that should be embraced by the community members and by the scientific participants. Thank you.

MS. WEBB: Thank you, Ken. All right. Anybody else want to say anything to us tonight?

MR. MECHELS: One last comment is that I personally think that this is a bit adversarial in this

format. I came here specifically to speak to the DARHT EIS. I did, so my main objections were specifically
105 against that I think that we don't do very well when we have people saying, "So and so said so. I said so," and so I wish to refute them. I don't think it's useful.

MS. WEBB: If anybody else has comments on the format, I would be glad to hear then them now or there's evaluation forms out at the front desk and you can write those types of comments down.

Who else would like to speak? Jay is looking.

MR. COGHLAN: I propose to adjourn.

MS. WEBB: Jay is entertaining a proposal to adjourn, and I think it sounds like a good idea. So again, thank you all very much for coming. I know that you're all busy. I appreciate your taking the time to be here tonight.

(Hearing adjourned at 10:20 p.m.)

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, IRENE DELGADO, New Mexico CCR 253, DO HEREBY CERTIFY that I did report in stenographic shorthand the foregoing proceeding as set forth herein; that the foregoing pages are a true and correct transcript of my stenographic notes and were reduced to typewritten transcript through Computer-Aided Transcription.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case, and that I have no interest in the final disposition of this case in any court; that on the date I reported these proceedings, I was a New Mexico Certified Court Reporter.

IRENE DELGADO, NM CCR 253
Notary Public Expires: 5-1-96

Transcript Attachment
Comment Code 54

DARHT EIS COMMENTS FOR PUBLIC FORUM

1. Are the activist groups really interested in ensuring a safe and healthy environment in the context of ongoing work, or is their true agenda to eliminate all work on or related to nuclear weapons? Does the lab expend energy on meeting environmental requirements? Are these requirements too lax?
   a. Quotes from Mary Risely and Jackie Cabasso
   b. Galvin commission's findings on over-regulation by DOE (page 10 bottom).
2. Why does the US need to retain its nuclear weapons?
   a. Deterrence: In July of 1994, President Clinton said "We wil retain strategic nuclear forces sufficient to deter any future hostile foreign leadership with access to strategic nuclear forces from acting against our vital interests and to convince it that seeking a nuclear advantage would be futile" (slide 2 of Background Information for DARHT).
   b. Deterrence: In September of 1994, the Nuclear Posture Review concluded that we should "lead" in the area of reducing the nuclear danger and stemming proliferation. As part of these goals, the active stockpile has been reduced by 59% since 1988 and will be reduced by 79% in by 2003; storage locations have been reduced by over 75%, and personnel access to weapons or control has been cut by 70%. Furthermore, the US has and will presumably continue to support treaties that reduce the potential for non-nuclear states to gain a nuclear capability. However, the Nuclear Posture Review also emphasized that we must "preserve options in the case that reform fails in Russia" and "maintain good stewardship" of the weapons that remain in our stockpile.
   c. Non-proliferation: The DARHT EIS references the Presidential Decision Directive when it says that a safe and reliable US nuclear stockpile supports non-proliferation insofar as it provides and umbrella for our non-nuclear allies. As an example, what would happen if North Korea pursued a path toward nuclear armament, threatening non-nuclear states like South Korea and Japan. Would not a unilateral disarmament by the US increase the chances of those countries attempting to arm themselves?
3. Why does the US need national labs to continue to have nuclear weapons programs, in particular the SBSS program?
   a. To ensure the continued safety and reliability of the stockpile, in support of our deterrence hedge against Russia's probable success in reform and also in support of non-proliferation. The independent Galvin commission, headed by Robert Galvin, the CEO of Motorola, strongly supported the role of the

laboratories in administering the SBSS, particularly LANL, in saying (in Section VIIIA) that
   i. "the primary mission of the weapons laboratories MUST be a safe, secure AND RELIABLE nuclear stockpile in the absence of nuclear testing..."
      "It requires the following rank-order priorities"
      (1) Attracting and retaining skilled scientists, ...
      (2) Enhancing surveillance of weapons in stockpile...
      (3) Continued hydrodynamic testing to cope with problems
      (4) Assessing problems, reanalyzing previous data through numerical simulations, ...
      (5) Sustaining the scientific process of inquiry through experimentation.
      The Galvin commission also recommends that LLNL relinquish its peer review role in SBSS and that DARHT get continued funding. The JASON report, which was chaired by Dr. Sid Drell of Stanford University, said in its conclusions that
      (6) A strong SBSS program, such as we recommend in this report, is an essential component for the US to maintain confidence in the performance of a safe and reliable nuclear deterrent under a CTB. The technical skill base it will help maintain and renew in the defense program and weapons labs will also be important for assessing emerging threats from proliferant nations and developing possible technical response thereto.
      (7) ... it is CLEAR that IMPROVED hydrotesting is crucial to continued confidence in the safety and reliability of nuclear primaries ...
      (8) the first of 7 recommendations (and presumably the most important) is to continue building DARHT, as it (page 4) "would provide important information about the time development as well as the 3-dimensional structure of the implosion" and it "will provide GREATLY enhanced capabilities of importance in the absence of underground tests"
   b. A SBSS program is necessary to maintain confidence in the stockpile, which is a necessary ingredient for our political leaders to negotiate treaties that stem proliferation while still ensuring our interests, such as NPT or CTB. This concern is evident in the requests made by Congress in the late 80's and early 90's to

have Dr. Ray Kidder of LLNL provide a summary of the evidence surrounding the need for nuclear tests to ensure the safety and reliability of a static stockpile, made in the context of treaty negotiations. Dr. Kidder, and several other eminent scientists often quoted by anti-nuclear activists, re-assured the Congress that a CBT would not risk our losing confidence in the stockpile, AS LONG AS several actions were taken:

i. from Ray Kidder's report to Congress on July 26, 1991 (page 9, question 7), the Congressmen asked "What nonnuclear-explosive measures, if any, are currently used to assess the desired one-point safety characteristic of nuclear weapons?" Kidder's response "it has recently (1988) become possible to conduct moderately faithful computer simulations of 3D hydronuclear behavior... which permits a preliminary evlauation of one-point safety of a nuclear warhead without a nuclear test... Such computer simulations are still too rudimentary to be relied on to certify one-point safety..." but guide choices about what region of the device might be most sensitive to one-point safety to define nuclear tests (one-point safety requirements were initiated in 1968 and means that the device has a less than a one in a million chance of releasing a nuclear yield if detonated at ANY single point).

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The Congressmen next asked what methods could be used "to establish that thoroughly-tested nuclear warhead designs ... would CONTINUE to meet the one-point safety criterion", indicating their concern that new tests and simulations might reveal a previously undiscovered design flaw that might affect one-point safety. In a July 1994 article entitled "Shopping Spree Softens Test-Ban Sorrows," Kidder criticizes many planned or in-construction DOE complex facilities, including an AHF, but says "Given the importance of hydrodynamic testing, completion of DARHT may be justified." DARHT would give feedback on 3D features to improve the 3D codes' predictive ability, presumably enabling them to be sufficiently reliable to certify one-point safety.

c. Finally, maintaining competence about nuclear weapons was favored 2 to 1 over relinquishing competence in Sandia National Lab's public opinion poll. ← also Galvin + SAIC Ei + Ober ajr. Comm

4. Why does SBSS need to involve hydrodynamic testing? Aren't the weapons safe and reliable? Can't we just remanufacture them when they encounter the end of their design lives? Is reliability really that important? Is safety really affected all that much by small factors?

a. Weapons in the existing stockpile have been certified to be safe and reliable in the context of the missions they were designed to serve, the requirements they were forced to satisfy and the length of time they were anticipated to be in the stockpile, and through limited post-deployment nuclear testing, safety and reliability problems have been discovered and remedied in approximately 1/3 of the weapons in stockpile. From the Miller report to Congress in 1987 (page 7 bottom right): "One-third of all the weapon designs introduced into the stockpile since 1958 have required and received post-deployment nuclear tests to resolve problems related to deterioration or aging or to correct a design that is found not to work properly under various conditions." Nuclear testing has historically allowed us to place high confidence in the stockpile. Without nuclear testing, aging of the stockpile, potential changes in requirements, environment or components, and undiscovered design flaws will not allow us to continue this high level of confidence without a partial replacement for nuclear testing. Hydrodynamic testing, and dynamic radiography in particular, is seen as the only alternative to nuclear testing to certify re-manufactured or re-designed weapons, and to continue to look for design flaws that may affect one-point safety, for as Dr. Kidder says (page 6 bottom right of 91 report) "Safety problems with nuclear warheads are generally inherent in the design of the warhead itself, not the result of aging or other causes. Such problems may not be identified until LONG AFTER the warhead enters stockpile, but they were there to begin with." The JASON report also notes that "Several techniques are available to study the non-nuclear implosion of the primary," but "the properties of the pit at the late stages can be addressed only through dynamic radiography... It is this latter class of msmts that is the most difficult and requires the largest facilities."

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need for dynamic radiograph

b. Hydrodynamic testing will partially compensate for nuclear testing by comparing benchmark hydrodynamic tests against continuing post-deployment tests. These tests will help designers to detect changes in behavior due to

i. aging materials
ii. re-manufacture/re-design of components
iii. new environments/requirements
iv. ongoing evaluation and scrutiny of one-point safety

c. Re-manufacturing, in concert with tight surveillance,

would allow the US to maintain confidence in its stockpile (while losing design competence entirely) if not for several complications that make testing a necessity.

i. Historically, materials and components have become unavailable when vendors go out of business, and materials have been discovered to be hazardous to work with, requiring substitute materials or new work processes. Either of these scenarios can mean that new materials must be used in the weapon, and testing must be done to re-certify performance. The 1987 Miller report to Congress testified that, in fact, nuclear testing was desirable to certify even these types of changes due to the fact that "we simply cannot get the detailed information to tell what is really going on and to identify what might be wrong with our simulations." The 1991 Kidder report notes that nuclear tests would be needed to bring the Trident and Minuteman missiles up to current safety standards (they contain HE, not IHE, and are presumably more susceptible to accidental detonation, making one-point safety critical) because Rocky Flats was no longer producing substitute pits that would have made the additional nuclear tests unnecessary. To the best of my knowledge (as stated in the Nuclear Posture Review) the warheads used in the Trident and Minuteman remain in the stockpile today without IHE due to unavailability of a substitute component.

ii. Processes are not just a set of documents, but include important undocumented capabilities and styles of individuals who retire or leave without passing on their knowledge. Thus, processes can change even thought the material or component is presumed to be the same. Again, continuous testing against benchmark performance is required to detect changes in behavior due to a change in cthe weapon components (Miller et. al. report).

iii. Continued IMPROVEMENT in 3D codes and experiments are needed to continue the search for design defects that may affect one-point safety. The variety of circumstances and one-point detonation locations requires a vigorous hydrotest program. The need to exhaustively test these scenarios is illustrated by the set of 32 accidents that are documented in the 1984 DOD report "Narrative Summaries of Accidents Involving US Nuclear Weapons 1950-1980". The list includes aircraft

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crashes, accidental jettisons, missile fuel explosion, and fires. In 11 of those accidents, the HE was detonated, and in 10 there was radioactive contamination. The threat of accidental detonation is real, and if the weapons were not one-point safe, a major nuclear accident might have occurred. The necessity to exhaustively test weapons for one-point safety under many circumstances should thus be clearly seen as a real mission, and not as an excuse for some covert mission. Furthermore, the one-point safety mission for hydrotesting has been and is an ONGOING mission.

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The weapons currently in the stockpile were designed to meet a set of prioritized military characteristics that forced designers to create highly optimized weapons. The highest priority is nuclear safety, meaning that accidental or unauthorized detonation of the device should not produce a nuclear yield, and over 1/3 of all nuclear tests have bee performed to ensure nuclear safety. Several nuclear and non-nuclear tests showed that accidental detonation in some devices could have caused nuclear yield. All of the KNOWN safety problems with weapons in the stockpile have been resolved. As regards reliability, in many cases, the weapons' primaries were designed with very low weights so that the delivery missiles could travel long distances with high accuracy. The low weights necessitated "boosting" the primary, a process that is not well-characterized or predicted using current computer models and hydrodynamic test capabilities. There have been many problems with the reliability of primaries that have been due to aging or re-manufacture, and have been discovered through post-deployment nuclear and non-nuclear testing. Reliability of the primary is essential for ignition of the secondary, from which almost all of the destructive power of the weapon is derived. If the primary malfunctions, there is a good chance that the weapon will be a dud.

5. How and why is DARHT a major improvement in hydrodynamic testing? Wasn't DARHT designed to help in the effort to design new nuclear weapons? Why should we believe that DARHT won't be used for weapons design now?

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a. DARHT is a major improvement in current hydrodynamic test capability for several reasons

i. Dose - the two axes of DARHT will generate many

more x-rays than PHERMEX or FXR (>2x), and so will decrease the noise in radiographs and be able to penetrate thicker systems than both PHERMEX and FXR.

ii. Resolution - the smaller spot size afforded by DARHT (2x-3x better than PHERMEX) will mean a much improved ability to see the hydrodynamic contributors to the boosting process, which is the most important and least understood part of the operation of the primary. Current PHERMEX resolution and dose make it impossible to get enough detail to improve the calculational codes. Furthermore, better resolution allows an experimenter to use a more optimal geometry (object closer to x-ray source) to take better advantage of the dose that he has.

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iii. Lower energy - DARHT will have a lower energy than PHERMEX, and close to that of FXR. A lower energy means that there are more photons for a given dose level (so the penetrating ability is improved) and the attenuation to photons of the heavy metals that we radiograph is less so that a higher percentage of photons is able to penetrate.

iv. Shorter pulse - the pulse width of DARHT is 60 nanoseconds, compared to 200 nsec for PHERMEX, so that better "stop-action" data is taken, wherein material boundaries (which are dynamically evolving) are not allowed to "smear" the radiograph to as high a degree.

v. Multiple views or time snapshots - an analysis of the one-point safety of devices requires multiple views at one time of the device, which only multiple independent axes can provide with the needed dose and resolution. A benchmark hydrodynamic test which will be compared to future tests in order to detect performance changes will require more than one time snapshot of the device. This is due to the shot-to-shot variability in determining the absolute timing of the test. Determining relative timing between two snapshots in a single test can be done with higher precision and will thus allow a more predictable, as well as more informative, benchmark test.

vi. Of course, more axes, more dose, better resolution, and more time snapshots will make the benchmark test even more predictable and informative, but a facility such as the Advanced Hydrotest Facility will require much riskier technology and much more money than that required by DARHT. DARHT is a necessary first step toward

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providing the additional information needed to improve predictive computer codes, define and develop the testing components of a SBSS program, implement and improve moderate-risk components of a proposed AHF, and further define requirements for an AHF. This approach is endorsed by several independent panels, review committees, and commissions (HPAIC, DAIC, JASONs, e.g.). It is anticipated that even more capability than that offerred by DARHT will be needed to maintain the extremely high confidence in our country's stockpile that we have historically enjoyed due to a limited, but vitally important, nuclear testing program. The degree to which additional money should be spent on such a facility should be guided by our experience with DARHT and our nation's evolving nuclear policy.

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b. DARHT was indeed conceived in an era when new weapons designs were being developed, and would have been used in that capacity were it completed in an era when ongoing designs were needed. However, hydrodynamic testing has also played a vital historical role in discovering potential safety and reliability problems with deployed and developmental weapons. Remember that fully 1/3 of all nuclear tests were executed to ensure the nuclear safety of weapons, which was the highest priority for weapons' designers to observe. Finally, hydrodynamic testing has played a vital and historic role in helping designers to modify and improve their predictive calculational codes (whereas nuclear testing is imperative for certification). Thus, DARHT would have been used in the many of the same capacities it is being promoted for today even if new designs were being explored.

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c. DARHT will not be used to implement new designs because there is a presidential order that prohibits such activity. However, even if new designs were desired, DARHT (and even a more capable AHF) would simply not provide enough information for designers to certify a completely new design without a nuclear test. That this is so is stated many times in the Kidder and Miller reports. Nuclear testing is still essential for certifying that a new weapon design will be safe and reliable, and the need for nuclear testing will not be eliminated until a replacement program is validated by nuclear tests. Such a validation of a replacement program will be necessary before it is accepted by weapons' designers and responsible military and political leaders. This validation of a replacement to nuclear testing has not taken place and cannot take

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place as long as there is a moratorium on nuclear testing. Thus, there should be little concern that DARHT will be used to design new weapons. However, changes in behavior as a result of small changes in existing devices due to new materials, processes, components, and incremental re-designs due to any of the above, may be detectable by DARHT and perhaps diagnosable and correctable using DARHT or an AHF. This would be an essential component of a meaningful SBSS program.

Chapter 3

Responses to Public Comments

COMMENT CODE	LOCATION OF EIS REVISION(S)
1 - 1	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 1	None required

RESPONSE

The documents referred to in this comment have been superseded by the DARHT EIS, but are available for review in the LANL Community Reading Room. DOE prepared these DARHT environmental documents (Action Description Memoranda), during the 1980s under prior environmental review procedures then in effect. The general biological environment of LANL was discussed in the 1979 Sitewide EIS for LANL (DOE/EIS-0018) and served as a baseline for those reviews. DOE revised its NEPA documentation requirements in 1990. DOE/LAAO revised its NEPA review procedures in 1994 and now routinely makes all NEPA reviews available to the general public and other Federal agencies; however, prior to the policy changes in 1990 DOE did not generally make NEPA reviews (except for EISs) available except on request. Because the 1980s reviews did not identify the presence of federally-listed species, DOE was not required to initiate consultation with the USFWS under Section 7 of the ESA. DOE will provide copies of the Action Description Memorandum to the Albuquerque office of the USFWS for their files.

DOE has considered DOI's comment regarding reissuing of the draft EIS or allowing more than 30-days for review of the final EIS prior to reissuing a ROD. DOE believe that concerns raised by the DOI have been adequately considered in preparing the final EIS and that it is unnecessary to reissue the draft EIS or to provide more than 30 days review of the final EIS. DOE has closely coordinated with the Albuquerque office of the USFWS to ensure that issues raised by that office and DOI, in particular issues related to the Mexican spotted owl and implementing the associated mitigation measures identified in appendix K, have been adequately addressed.

In a telephone conversation on August 15, 1995, DOI agreed that proceeding with a final EIS with a 30-day review was appropriate, and DOE has agreed that it would continue to meet with the USFWS New Mexico Ecological Services State Office periodically.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 2	Section 2.3.1

RESPONSE

Baseline research will be conducted at many sites and facilities, not just at DARHT or PHERMEX at LANL, and is expected to take several years. Baselining to document the current physical status of the weapons systems will involve a broad range of observations, measurements, and tests. "Baselining" will involve many different types of calculations, tests and experiments performed at different DOE weapons facilities, primary LANL, LLNL, and SNL. Among these activities will be hydrodynamic testing conducted at LANL or LLNL as appropriate to research each type of information needed to answer a particular question. The extent and duration of these activities will depend in part on the nature of the results, but several years is the best early estimate. Text has been added to section 2.3.1 to clarify baselining.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 3	None required.

RESPONSE

Section 3.3.3 of the EIS states that DARHT would take advantage of the existing infrastructure established to support PHERMEX. This infrastructure is outlined in Table 3-1, which has been revised to indicate the existing facilities involved. The term "infrastructure" in this section of the DARHT EIS refers to the larger relationships among facilities at LANL; although the term "infrastructure" is sometimes used to mean improvements such as fence lines, roadways and utilities, these features are already in place for the facilities listed in table 3-1. Tables 3-3 and 3-4 contain an outline of the utilities required for each of the alternatives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 4	None required.

RESPONSE

Potential impacts from construction and operation of the Radiographic Support Laboratory (RSL) were considered in a series of environmental reviews prior to initiating its construction in 1988. No significant impacts were found. Impacts from construction of the RSL (e.g., habitat reduction) have already occurred and now apply equally to all alternatives analyzed in the DARHT EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 5	Appendix K.

RESPONSE

DOE completed its Biological Assessment of the DARHT site in July 1995, and has consulted with the USFWS. The assessment addresses potential impacts on all threatened and endangered species from activities at the proposed DARHT site, as well as mitigation measures. See appendix K for this assessment and USFWS letter to DOE dated August 3, 1995, concurring with DOE's determination that the operation of the DARHT facility is not likely to adversely affect the Mexican spotted owl. DOE appreciates the cooperation it has received from the USFWS' New Mexico Ecological Services State Office and will continue consultation, as appropriate, with the Service regarding implementing mitigation measures identified in appendix K.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 6	Section K.3.2

RESPONSE

The DOE has consulted with the USFWS regarding methods to minimize and mitigate adverse impacts to wildlife, and the Service has concurred with DOE's findings (see appendix K).

Modeling of fragment distribution has shown that there would be minimal amounts of test materials past an 800-ft (245-m) radius. Most of these materials would be sand size particles that have traveled in an upward trajectory and fall back to earth at a nonlethal velocity. DOE has calculated the potential for wildlife to be struck by a piece of flying debris to be less than 1 in 10 million at 1,200 ft (365 m) (see appendix K, section K.3.2). The DARHT EIS evaluates accidents on a "what if" basis, i.e., assume the accident occurs and describe the impacts of the event. DOE does not consider the possibility of beams "escaping" the DARHT as a credible event. The firing area would be cleared prior to a shot to prevent accidents to personnel; this clearing procedure would also prevent large wildlife from being present on the mesa top when the experiment takes place. Thus, accidents in the immediate vicinity of the firing point should not be a concern to wildlife.

The EIS identifies mitigation measures which will result in the avoidance and minimization of significant adverse impacts (see chapter 5 and specifically section 5.11). Further the Record of Decision for this EIS will document major mitigation measures, and a Mitigation Action Plan will be issued sometime following the ROD in which all mitigation measures will be identified.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 7	Tables S-1 and 3-3

RESPONSE

Section 4.1.1 of the DARHT EIS acknowledges that 8 ac (2.3 ha) of land has been disturbed by previous construction at the DARHT site. Any habitat reduction from this construction has already occurred. Because these impacts have already taken place, DOE cannot ignore them, but they apply equally to all alternatives analyzed in the DARHT EIS, and would not serve to help DOE select among the alternatives analyzed. Table 3.3 has been revised to indicate that no additional habitat reduction would occur as a result of implementing the DARHT Baseline Alternative.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 8	None required.

RESPONSE

DOE acknowledges that construction of the DARHT facility began before this EIS was started. For the purposes of the DARHT EIS, DOE considers that the impacts that have already occurred at the DARHT site due to construction prior to the decision to prepare this EIS to be part of the existing environment. An EIS is prepared to assist a federal agency in decision-making; the decisions facing DOE at this time do not include a decision whether or not to begin construction (that has already occurred) but instead include a decision whether or not to complete the DARHT facility to conduct enhanced radiographic hydrodynamic tests, or to complete the structure for some other use. Analysis of impacts from future construction activities is in chapter 5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 9	None required.

RESPONSE

The acreage and types of habitats that could be affected by direct or indirect impacts from construction and operation of DARHT are described in detail in chapter 4. Potential impacts are calculated across a broader area than for a localized habitat.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 10	Section 3.5.2

RESPONSE

The exclusion zones discussed in the DARHT EIS are safety features to provide protection to personnel and structures while testing takes place. During a test, the exclusion zone is the area which is cleared of any personnel before each shot. There are limitations on the types and designs of structures that can be built within exclusion zones. As mentioned in the DARHT EIS, section 3.3.6, the high explosives testing area at LANL comprises some 20 mi^2 (52 km^2), and includes several high explosive test facilities. Each test facility has a defined exclusion zone. The radius of each of these zones varies depending on the amounts of HE for which the facility is designed. The proposed DARHT facility would have an exclusion zone of 2,500 ft (750 m). This information will be included in EIS section 3.5.2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 11	Section 5.11 and appendix K

RESPONSE

The final EIS has been revised to now list all candidate species, including information provided by the USFWS letter dated January 23, 1995. The biological assessment for the DARHT site, which was completed in July 1995, includes mitigation measures that the USFWS has concurred with.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 12	Appendix K

RESPONSE

The biological assessment for the DARHT site was completed in July 1995. It concluded that there was a low potential for the occurrence of the peregrine falcon at the DARHT site. Informal consultation with the USFWS has been completed (see appendix K).

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 13	Appendix K

RESPONSE

The draft EIS provided then-current information related to potential impacts to threatened and endangered species. The DARHT final EIS has been updated to reflect the habitat for the Mexican spotted owl in the vicinity of the DARHT site and includes mitigation measures to reduce potential adverse impacts to wildlife species.

DOE completed its biological assessment that discussed impacts on threatened and endangered species habitat, among other things. DOE and LANL consulted with the USFWS in accordance with Section 7 of the Endangered Species Act, and DOE has considered USFWS's concerns in its determination of no adverse affect (see appendix K, exhibit 1). While this process is separate and distinct from the NEPA review process, an agency may document the results of its consultation with the USFWS in a NEPA document. DOE has done this (see appendix K).

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 14	None required.

RESPONSE

Computer modeling was used to determine the potential air, surface water, and ground water contamination. Appendixes C and D describe the methods used to model impacts to air quality and water resources, respectively.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 15	Section K.3.2

RESPONSE

See response to comment 2-6.

Also, the surface waters on LANL do not support fish (see section 4.5.3). Potential contamination in surface waters at the Rio Grande resulting from the DARHT Baseline Alternative (the highest concentrations modeled for surface water) would be more than an order-of-magnitude below drinking water standards for uranium and several orders-of-magnitude below the drinking water standard for beryllium and lead (see section 5.2.4.1).

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 16	Sections 5.1.11.2, 5.2.11.2, and 5.4.11.2

RESPONSE

Under any alternative analyzed, when construction activities are complete the DARHT site will be revegetated. As agreed to with the USFWS, native species will be used whenever possible (see appendix K). Dust suppression is used during construction primarily to minimize any air quality impacts. There are no known effects from construction-related dust on wildlife. Construction noise associated with the completion of the facility would be mitigated to minimize noise impacts on the surrounding environment as much as possible.

See DARHT EIS sections 4.2.6 and 4.3.4 for a discussion of noise and vibratory ground motion. Impacts from airwaves are insignificant although they do cause a secondary peak in the vibratory ground motion.

See response to comment 2-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 17	None required.

RESPONSE

DOE recognizes that secondary impacts may adversely affect resources that are not in the immediate vicinity of a proposed project. DOE has completed computer modeling to help assess impacts to surface water sections (see appendix E3).

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 18	Section 3.3.3

RESPONSE

The likelihood of a transportation accident involving a test assembly bound for DARHT or PHERMEX is considered to be an extremely unlikely (annual probability of occurrence of 10^{-4} to 10^{-6}) to incredible (annual probability of occurrence of less than 10^{-6}) based on related LANL safety studies. For the EIS, impacts of accidents were evaluated without considering this very low probability of occurrence. Evaluation of potential impacts to humans from transportation accidents are considered bounding for blast effects and are also likely to be bounding for radiological and toxicological impacts since human dose receptors are assumed to be located nearby, likely closer to human activities than biotic resources, particularly wildlife. Potential impacts from soil contamination have been examined under normal operational releases from DARHT and PHERMEX operations, which would result in greater releases than a transportation accident.

COMMENT CODE	LOCATION OF EIS REVISION(S)
2 - 19	None required.

RESPONSE

Table 5-19 in the final EIS indicates the amounts of materials that are estimated to be released to the environment on an annual basis for all alternatives analyzed. It has been estimated that all of the high explosives would be consumed in the experiments. Ten percent of the solid material would be aerosolized, and a majority of the remaining material would be deposited within 460 ft (140 m) of the firing point.

DOE does not believe that any alternative analyzed would result in increased human activity in the area due to facility operations, or expansion of development into previously undeveloped areas. The construction and operation of DARHT will occur within LANL's High Explosives Research and Development and Testing Area in which land use has remained essentially unchanged for 50 years and the level of human activity expected under any alternative would be expected to remain essentially unchanged from the existing situation. The area in the vicinity of the DARHT site (although not the DARHT site itself) and the alternative locations for the vessel cleanout facility was previously disturbed by agricultural activities prior to the location being part of LANL.

COMMENT CODE	LOCATION OF EIS REVISION(S)
3 - 1	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, and H.5.2

RESPONSE

DOE has prepared a revised Preferred Alternative, which is the Phased Containment Option of the Enhanced Containment Alternative, to address the concerns raised in this comment. See sections 3.7 and 5.4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
3 - 2	Section 4.9

RESPONSE

DOE agrees. See revised section 4.9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
3 - 3	Section H.3.2

RESPONSE

DOE agrees. The text has been revised to reflect the suggested change. See section H.3.2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
3 - 4	None required.

RESPONSE

DOE appreciates this comment. The EPA has a statutory requirement, under 42 U.S.C.7609, to review proposals of other Federal agencies to determine whether the environmental impacts of the proposal would be unsatisfactory from the standpoint of public health or welfare or environmental quality. The EPA has four rating categories: environmentally unsatisfactory; environmental objections; environmental concerns; and lack of objections. DOE notes that the EPA reviewed the draft classified supplement along with the draft DARHT EIS, and appreciates the assistance of the EPA in this regard.

COMMENT CODE	LOCATION OF EIS REVISION(S)
4 - 1	Section 4.6 Tables 4-14 and 4-15

RESPONSE

Upon hearing of the concerns from San Ildefonso and other pueblos, DOE has removed the maps of cultural resources in the vicinity of the DARHT and PHERMEX sites. The tables in section 4.6 have been revised after consultation with Indian tribes.

The maps were included in the DARHT draft EIS because a Federal land managing agency can release maps of cultural sites if in doing so the best interest of the cultural resources would be served. DOE included the maps in the draft EIS because it was thought that the best interests to serve the environmental analysis was to show the location of sites in relation to the DARHT and PHERMEX Facilities. Access controls to TA-15 were considered sufficient to ensure that the sites would be protected.

COMMENT CODE	LOCATION OF EIS REVISION(S)
4 - 2	None required.

RESPONSE

DOE notes that all of the cultural resource sites listed in the DARHT EIS, including the four mentioned in this comment, are within a fenced exclusion zone that is not accessible to the general public. One reason that archeological and cultural sites on LANL grounds tend to be better preserved than those on surrounding lands is the fact that access to LANL has been controlled for over 50 years. The Nake'muu site has been described in the open literature many times over the past 90 years, as have several of the other cultural resource sites near TA-15. DOE takes seriously its responsibilities as a federal land management agency to preserve the cultural resource entrusted to its care. After conversation with San Ildefonso and other tribes, DOE has developed additional mitigation means to assist in protecting cultural resources in the vicinity of TA-15. See section 5.2.11.2 of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
4 - 3	Sections 4.6.3 and 6.9

RESPONSE

DOE apologizes for any misunderstanding and has advised the Pueblo of San Ildefonso that there was no intent to violate the Tribe's privacy in regard to consultation under the American Indian Religious Freedom Act (AIRFA). Instead, DOE merely intended to note for the record in the DARHT EIS that it was pursuing its obligation to consult with the tribal governments under the AIRFA and other cultural resource laws, in accordance with its government–to–government relationship with San Ildefonso and other tribes. The text of the EIS has been revised in section 6.9 to indicate that consultation with the tribes is ongoing, and will be ongoing, for the life of the project.

COMMENT CODE	LOCATION OF EIS REVISION(S)
4 - 4	Section 4.6

RESPONSE

See response to comment 4-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
4 - 5	Section 4.6

RESPONSE

See response to comment 4-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
4 - 6	Section 4.6

RESPONSE

See response to comment 4-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 1	None required.

RESPONSE

The accelerator technology planned for DARHT is fundamentally different from that used at PHERMEX and FXR. These differences are necessary to move to the energy levels and pulse widths planned for DARHT. DARHT is considered to be a stepping stone to some of the technology for AHF when and if that facility is built. Thus, bypassing DARHT would not provide a shortcut to AHF. Schedule is another consideration; this proposed alternative would further delay the capabilities desired from DARHT. The AHF will be analyzed as part of the SS&M PEIS (see section 3.10.3).

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 2	None required.

RESPONSE

DOE agrees that more complete data are desirable, but the past environmental reports are the best available data for LANL. DOE continues to work with LANL to improve the quality of the environmental surveillance program and data and has also initiated a program with nearby pueblos to share in environmental surveillance data collection. Through means such as these DOE hopes to improves the representativeness and confidence of environmental surveillance data. DOE has not relied solely on the environmental surveillance data to draw conclusions but to present a picture of the potentially affected environment in the vicinity of DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 3	None required.

RESPONSE

See response to comment 5-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 4	None required.

RESPONSE

The EIS includes evaluation of potential impacts from releases of depleted uranium and other materials from DARHT (see section 5.1.2.1.2). DOE believes that the analyses presented in the EIS adequately represent the potential impacts of these releases on the environment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 5	None required.

RESPONSE

See response to comment 5-2 and response below.

Although the NEPA process includes a specific period for public comments on the draft EIS to ensure that they can be addressed in the final EIS, the process in no way inhibits the Pueblo's right to comment at any time. DOE notes that the LAAO office and LANL meet with San Ildefonso and other pueblos on a regular basis, and welcomes continuing dialogue with the Pueblo regarding these issues.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 6	Section 4.6

RESPONSE

See response to comment 4-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 7	None required.

RESPONSE

Section 5.1.6.1 indicates that measurements showed the air shock wave generated by a test event is of greater concern than vibrating ground motion in regard to the potential for damage to structures or cultural resource sites. In fact, ground motion caused by the air wave is stronger than seismically transmitted ground motion. DOE does not believe that further analysis of seismic ground motion is needed. The measured air wave is noted as being about one-tenth the value normally tabulated for window breakage. Based on these measurements, the 150-lb (68-kg) shots that would be fired at DARHT are calculated to be about one-half of the value normally tabulated for window breakage.

Standing walls, such as those at the Nake'muu ruins are slowly and continually weakened by natural processes, and they will eventually fall from natural forces. It should be noted that lightning strikes anywhere within a mile or two can produce an airwave at Nake'muu greater than that expected from DARHT testing. Damage at Nake'muu from DARHT air waves is not considered a reasonable expectation. In any event, to mitigate possible impacts, DOE has agreed to continue to work with San Ildefonso to protect Nake'muu and other cultural resource sites. See section 5.11 of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 8	None required.

RESPONSE

PHERMEX, and firing sites very close to it, have been used at various times in the past for shots considerably larger than any design shots for DARHT. Thus, the fragment distribution in the vicinity of PHERMEX is not a good model.

Modeling of fragment distribution has shown that there would be minimal amounts of test materials past a 800-ft (245-m) radius. Most of these materials would be sand size particles that have traveled in an upward trajectory and fall back to earth at the velocity of gravity. Section 3.3.1 of the EIS has been revised to reflect this information.

As noted in the EIS, the probability that any shrapnel would reach Nake'muu is small and could be reduced further by placing an additional barrier on top of the DARHT building see section 5.11 of the FEIS. Shrapnel for any shots larger than the design shots would be mitigated by temporary blast shields.

COMMENT CODE	LOCATION OF EIS REVISION(S)
5 - 9	None required.

RESPONSE

The American Indian Religious Freedom Act, August 1978, sets U.S. policy to "protect and preserve for American Indians . . . access to sites. . ." LANL policy has been to consult with local Pueblos (in particular the governments of the four Accord Tribes) and coordinate access to areas within LANL. If pueblo members were visiting the Nake'muu site, there would be no shots at DARHT during the visit and pueblo members would not experience any shot effects. A possible exception to site access might be special arrangements to observe actual effects.

COMMENT CODE	LOCATION OF EIS REVISION(S)
6 - 1	None required.

RESPONSE

DOE appreciates the State's review.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 1	Section 4.4.2

RESPONSE

The statement in section 4.4.2 has been modified. Similarly, surface water and spring sustain perched ground water within Pajarito Canyon near the western portion of LANL.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 2	Section 4.4.3

RESPONSE

This limitation is noted in the EIS text. See section 4.4.3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 3	None required.

RESPONSE

The DOE agrees that the screen lengths of the water supply wells limit their utility as water quality monitor wells. Data from these wells have been referenced in the draft EIS because there are no existing monitor wells in the area of TA-15. To eliminate this deficiency, DOE has suggested drilling a Laboratory-wide network of properly designed monitor wells under the Ground water Protection Management Program.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 4	None required.

RESPONSE

DOE has no intent to discharge DARHT-related materials to ground water. Analyses in section 5.2.4.2 indicate that, using conservative assumptions to maximize impact from infiltration of materials, there would be no impacts to ground water quality. Peak concentrations (which are well below applicable MCLs) calculated under these unfavorable conditions would be reached only after 20,000 to 40,000 years.

DOE has prepared the Ground Water Protection Management Program Plan and submitted it for review and comment to the New Mexico Environmental Department's Ground Water Remediation and Hazardous Waste Bureau. This document addresses ground water concerns LANL-wide and, in combination with the DARHT EIS, provides much more information than previous documents.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 5	None required.

RESPONSE

The DOE appreciates this assessment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 6	None required.

RESPONSE

In the event that DOE decides to implement an alternative involving the operation of DARHT, DOE and LANL will obtain all State permits necessary for operation of DARHT. Recognizing that appendix A values of AQCR 702 are screening values, DOE does not believe that these values provide a representative look at potential DARHT impacts because of the significant differences in operating parameters. Some of the unique DARHT parameters include periodic detonations rather than continuous stack or point-source releases, operation in an area closed to public access, and the fact that 90 percent or more of the depleted uranium that would be used in uncontained detonations remains on site as large and small metal fragments (section B.8), immediately reducing the amount of material available to 10 percent of the bounding amount of 1,543 lb (700 kg) annual usage. DOE is confident that calculation of impacts using EPA-approved methods would not exceed NMED permit requirements and in fact would be lower than impacts calculated in the draft EIS.

Hourly emission estimates for chemicals which react with heat to form varying chemical products should not be based entirely on yearly expenditure amounts. For instance, emissions of lithium hydride would be based on the aerosolized amount remaining after the combustion reaction with high explosives, not on the amount expended. Lithium hydride, in the presence of air, humidity, and heat will react immediately and completely to form lithium hydroxide, an unregulated form of lithium.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 7	None required.

RESPONSE

DOE does not believe that implementing the DARHT proposal to complete construction of the facility would meet the requirements for an AQCR 702 construction permit. DOE does not believe that the periodic emissions expected from DARHT, if implemented, would exceed appendix A levels, nor would any of the other criteria under AQCR 702 Part 3 C.2 apply.

See response to comment 7-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 8	None required.

RESPONSE

Amounts of metals and other materials assumed under all alternatives are the maximum amounts that have been projected for annual use at DARHT. Thus, the actual number of tests can vary from year to year and the amounts of materials released to the environment would remain within those levels discussed in the EIS. It is anticipated that actual usage will be significantly less. Use of hazardous materials is closely controlled at PHERMEX, and would be administratively limited at DARHT in a year when the maximum amounts of material were approached. One intent in this control is to prevent or strictly limit the potential for mixed-waste generation.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 9	None required.

RESPONSE

The solubility of uranium in LANL waters was assumed to be 300 mg/L (see appendix E2.2.1) and the proposed MCL value is 20 µg/L (see section 5.1.4.1). Thus, the solubility is 15,000 times the proposed MCL. One premise of the EIS calculations was that public access is limited by the present boundary of the LANL site which is approximately 0.75 mi (1 km) east of the DARHT site. A conservative modeling approach was adopted for runoff from the mesa top contributing water and sediment to the adjacent canyon bottoms. Using the curve number method, the volume of rainfall that becomes surface runoff was determined. This amount of water was assumed to carry contamination at the solubility limit to the canyon bottom. Thus, runoff from the firing site arrives in the canyon bottom and merges with water arriving from upstream in the watershed. The resulting solution concentration in the first segment or reach of the canyon was calculated to be above the proposed MCL, (i.e., 28 and 30 µg/L, see tables 5-3 and 5-7 of the DARHT final EIS); however, this location is within the boundary of LANL and not a point of public access. The quality of water discharging into the Rio Grande was shown to be well below the proposed MCL (see tables 5-2 and 5-6).

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 10	None required.

RESPONSE

The EIS evaluated potential radiological impacts from releases of uranium and tritium to the environment. See sections 5.1.8 and H.3. Tritium impacts were determined to be negligible because of the low quantity (3 Ci) and form (tritium gas) potentially released.

Analyses in the EIS conservatively assumed that 10 percent of all material released during uncontained detonations was respirable (see section 5.1.2.1.2 and figure B-1).

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 11	None required.

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
7 - 12	None required.

RESPONSE

The DOE appreciates this suggestion.

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 1	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, and H.5.2

RESPONSE

DOE appreciates this assessment. Mitigation will be addressed in the ROD according to the selected alternative.

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 2	None required.

RESPONSE

The 25 percent value is a hypothetical number used in this EIS to provide a bounding unit for analysis. The actual percentage under this alternative would be expected to be less. Some uncontained shots are necessary because the amount of high explosive needed would exceed containment capacity, special diagnostic equipment would not fit in the containment, or moving elements (such as a projectile) are involved. Other experiments might be done without containment because their small size would not justify the cost of containment or they would not include hazardous materials, where containment would mitigate adverse impacts from contamination by hazardous materials.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 3	None required.

RESPONSE

DOE recognizes that offsite discharge occasionally occur. Offsite surface water flow may occur seasonally in all of the drainages on the Pajarito Plateau depending upon the degree of snowmelt or intensity of summer thunderstorms. None of the drainages that cross DOE land, however, flow year long. Offsite flows typically are limited to a few days per year and flow may not be continuous from LANL contaminant source areas to the DOE boundary.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 4	None required.

RESPONSE

DOE agrees that more investigation is needed in the Cañon de Valle area. There is considerable debate between hydrogeologists as to the source of the springs and surface water. Please note that the DARHT draft EIS acknowledges the possibility that shallow perched ground water may exist in this area (section 4.4.3). DOE cannot verify the flow measurements cited in the comment but appreciates this information.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 5	Section 4.4.2

RESPONSE

Section 4.4.2 has been modified to include additional information on springs and drill holes in the canyons near DARHT and their implications concerning the presence of perched ground water.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 6	Section 4.4.2

RESPONSE

See response to comment 8-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 7	Section 4.4.2

RESPONSE

See response to comment 8-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 8	Section 4.4.2

RESPONSE

A comprehensive study has not been conducted in the Cañon de Valle area to determine the source of springs. Until such an investigation is performed, and the source is determined to be perched ground water, we cannot verify the NMED's interpretation.

See response to comment 8-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 9	Section 4.4.2

RESPONSE

See response to comment 8-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 10	None required.

RESPONSE

The hydrologic properties of the Discharge Sink in Potrillo Canyon located onsite at LANL have not been studied. Core from a borehole in the upstream portion of the Sink has been tested extensively for unsaturated hydraulic characteristics. From this data we are able to calculate hydraulic gradients within the Sink and make estimates of downward flux rates. Additional surface water flow characteristics were determined during a 5-year study.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 11	None required.

RESPONSE

DOE agrees that perched ground water in the alluvium is likely to exist in upper Cañon de Valle, sustained by spring flow and seasonal runoff. The dimensions of such a zone are unknown at present.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 12	Section 4.4.2

RESPONSE

It is possible a perched ground water body may exist in Water Canyon below Cañon de Valle. At present it is not known what the source of the water may be (e.g. effluent discharges, spring flow) nor is it known if this is a permanent water body. If a perched zone exists at this location, it cannot be very extensive, as wells WCO-1 and WCO-2 are dry just one-half mile below the WCM holes, which are located south of TA-15.

See response to comment 8-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 13	None required.

RESPONSE

Figure 4-12 shows contours on top of the main aquifer. Taking these contours as an approximation of the potentiometric surface, it appears that water in the aquifer moves eastward or southeastward across LANL. The only possible recharge area is in the Jemez Mountains immediately west of LANL, or areas further west. DOE asserts that these best available data support the statement cited in the comment regarding the aquifer recharge and flow locations.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 14	None required.

RESPONSE

The storm water monitoring stations near PHERMEX are recently installed and major storms are infrequent. As a result, the PHERMEX storm water quality data requested have not yet been obtained. DOE uses the best data available in its NEPA reviews but does not require that new data be collected in all cases. The runoff modeling described in appendix E computes the sediment load transported from LANL in the Rio Grande but currently doesn't provide details of sediment transport within LANL.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

8 - 15 None required.

RESPONSE

The calculations presented emphasize dissolved concentrations. Both the New Mexico General Stream Standards and the New Mexico Ground Water Standards are based on dissolved concentration limits. Nonetheless, sediment loading and associated concentrations are calculated at the Rio Grande.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

8 - 16 None required.

RESPONSE

The Ancho Canyon surface water station is located near the Rio Grande, a distance greater than one-half mile from Ancho Spring. While flow at the station is largely derived from Ancho Spring, it is considered to be a surface water station because it may be additionally affected by other surface features. Please note that the Laboratory Environmental Surveillance Reports (LANL 1993c and LANL 1994a) recognize that water collected directly from Ancho Spring is considered to be ground water.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

8 - 17 None required.

RESPONSE

DOE believes that the isotopic analyses are reliable. The question raised is whether the samples obtained from the wells are truly representative of the ground water horizons implied or contaminated by water from other horizons on the surface. The question of annular leakage and subsequent contamination of the main aquifer samples with water from the surface on shallow horizons probably cannot be answered without specially designed sampling techniques or entering the wells in question.

However, it should be noted that the effect of such contaminations, if it exists, is to produce conservative errors in the interpretation of results. The tritium and carbon-14 analyses are done to infer the presence of contaminations, if any, of the main aquifer by contaminants in shallow waters, and the rate at which surface water infiltrates through the unsaturated zone. In both cases, if the main aquifer samples are diluted by shallow water, the potential impacts on the main aquifer would be overestimated.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 18	Sections 4.4.2 and 4.4.3

RESPONSE

DOE agrees that additional monitoring wells in the alluvial material in the canyons opposite the PHERMEX and DARHT facilities would help identify and characterize any alluvial aquifer that may exist in the canyon alluvium. See the discussion in EIS section 4.4.2. Additional surface water monitoring stations would help isolate the impacts of PHERMEX or DARHT facilities operations on the water quality and sediment contamination.

LANL (i.e., DOE, LANL, and Foley Company, a facilities contractor for the DARHT construction) provided a Storm Water Pollution Prevention Plan (Foley Company, 1994) as required for construction of the DARHT Facility and has received a subsequent from U.S. Environmental Protection Agency permit for construction activities. If a storm water pollution prevention plan were needed for operation of the facility, it would likely become part of LANL's general storm water permit.

Environmental surveillance data, the Potrillo Canyon study, and computer simulations of uranium, beryllium, and lead migration have not revealed significant impacts due to storm water runoff from the PHERMEX or DARHT firing sites. Therefore, measures such as catchment basins to trap contaminated sediment from the firing site(s) are not anticipated.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 19	Section 4.5.4

RESPONSE

Since the draft EIS, a further biological survey has been done, resulting in identification of a nesting pair of Mexican spotted owls and a characterization of that specific habitat. The final EIS has been revised to incorporate this information, potential impacts to that habitat, and mitigation measures. See section 4.5.4, appendix K.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 20	Sections 4.5.4, 5.1.5.4, and 5.2.5.4

RESPONSE

Extensive field surveys for Mexican spotted owls have been performed concurrently with and following publication of the DARHT draft EIS. As a result of these surveys, it has been determined that suitable nesting habitat exists for the Mexican spotted owl near DARHT. Informal consultation with the USFWS has been completed, and USFWS has concurred in DOE's determination that the Mexican spotted owl would not be adversely affected by this project. Appropriate mitigative measures or operating restrictions will be implemented to limit any impacts to the Mexican spotted owl or the habitat (see section 5.11 and appendix K).

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 21	Section 5.8.1

RESPONSE

See response to comment 8-20.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 22	None required.

RESPONSE

Additional studies are planned to monitor the potential impacts of the proposed action on the Mexican spotted owl. See section 5.11 and appendix K. The scope of these studies will be determined over time and will be coordinated with the USFWS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 23	None required.

RESPONSE

The environmental impact analysis modeling in appendix H and the environmental consequences in sections 5.18 and 5.4.8 were based on calculated concentrations of uranium and other metals on foodstuffs, and accepted parameter values from the referenced professional literature for foodstuff uptake, translocation, and dose.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 24	Sections 4.5.4, 5.2.5.1.2, 5.2.5.4, and appendix K.

RESPONSE

DOE recognizes this fact; discussions in the DARHT draft EIS were written before field surveys were completed for the Mexican spotted owl in the vicinity of the DARHT site. Several sections in the EIS have been revised to properly reflect the protection of this species. See sections 4.5.4 , 5.2.5.4, and appendix K.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 25	Section 5.2.5.4

RESPONSE

DOE completed its biological assessment for the vicinity of the DARHT site in July 1995, after the draft DARHT EIS was issued. Consultation with the USFWS is now complete and in the event DOE proceeds with the DARHT proposal, DOE will take appropriate mitigation measures to protect biological resources.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 26	None required.

RESPONSE

DOE agrees with the presumption that the limits established under the NESHAPS permit would not limit testing under the Enhanced Containment Alternative, particularly since the NESHAPS limit is dose-based at 10 mrem/year from the air pathway. The anticipated dose impact from DARHT would be a small fraction of this value.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 27	None required.

RESPONSE

Since the prototype vessel has not been used before and is basically still a concept it is anticipated that there will be engineering problems encountered during operation. The testing limitations described in section 3.7 are considered reasonable at this point. These types of considerations provide part of the basis for the formulation of the Preferred Alternative, Phased Containment. DOE also anticipates being able to develop the vessel technology and provide increasing levels of containment, even beyond the proposed 75 percent in Phased Containment, if successful.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 28	None required.

RESPONSE

Three air sampling stations, two of which are located in TA-15, were put in place during 1993. However, analysis of LANL environmental surveillance data for 1993 has not yet been completed and is not available. Results available for other air monitoring stations, particularly the LANL perimeter stations for years before 1993, indicate very low to nondetectable concentrations of materials (mainly uranium) which could have originated at PHERMEX. Also, usage of these materials has decreased at PHERMEX over the years, so any detected concentrations would be expected to be less. Since the two stations in questions are onsite, in the middle of TA-15, they would be of limited use in estimating potential impacts offsite.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 29	Section 4.2.5

RESPONSE

The EIS has been corrected to read "downwind."

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 30	None required.

RESPONSE

EPA-prescribed methods are required for demonstration of compliance with 40 CFR 61 Subpart H. However, DOE Order 5400.5 "Radiation Protection of the Public and the Environment" directs the use of realistic assumptions in dose calculation methods in demonstrating that requirements of the Order have been met. Estimates using both methodologies are presented in section 4.8.1.1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 31	None required.

RESPONSE

Comparison to the EPA limit is presented in the final EIS (see second paragraph of section 4.8.1.1.) DOE believes comparison to the 100 mrem DOE standard contained in DOE Order 5400.5 is appropriate because it shows the radiological dose contribution from all LANL exposure pathways, rather than just the airborne pathway as required by EPA NESHAPS regulations at 40 CFR Part 61 Subpart H. It also provides some indication of the effect of using site-specific, realistic dose calculation methods.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 32	None required.

RESPONSE

The relative values are based on the mechanism of release. The EIS analyzes a hypothetical situation in which the effective release for unconfined tests would occur about 328 ft (100 m) above ground, depending somewhat on the size of the shot. The expanding ball of blast products would mix with the air and would be subjected to the winds at the higher elevation. For contained tests, the emission would occur near ground level as blast products are vented, comparatively slowly, following a test.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 33	None required.

RESPONSE

At the current time, too little information exists, and estimates of costs associated with soil cleanup are too nebulous to provide a detailed estimate of cost savings. DOE believes that the range from 25 to 90 percent (a factor of less than 4) is all that can be justified with the current information available.

COMMENT CODE	LOCATION OF EIS REVISION(S)
8 - 34	None required.

RESPONSE

The EIS analysis considers ground-level release for all criteria pollutants (section C1.3). The exception stated there is an area source rather than a point source; not an exception to gound-level release. Elevated release is used to analyze the effect for blast products, such as depleted uranium, beryllium, and lead (section 5.4.2.1 and H2.2). The height of release would depend somewhat on the size of the shot. Larger amounts of explosive would cause effective release at higher levels. As the release height increases, the FENII and MEPAS computer codes incorporate more dispersion and lesser resultant doses.

COMMENT CODE	LOCATION OF EIS REVISION(S)
9 - 1	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
9 - 2	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 1	None required.

RESPONSE

The DARHT EIS analyzes the environmental impacts that would be expected if five alternative ways to achieve enhanced radiographic capability were implemented, and compares these impacts with the current situation. DOE has stated, as part of the purpose and need for this proposal, that it needs to conduct dynamic experiments on plutonium. The EIS is prepared to aid in the DOE's decision-making process as to whether or not to provide enhance capability, but DOE is not facing a decision as to whether or not plutonium experiments are needed, and the DARHT EIS does not analyze whether or not these experiments are needed.

The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile, and have appropriated funds accordingly. The public is able to give input to this process through the election of public officials, involvement with public officials, and by participation in public hearings such as those held for the DARHT draft EIS. Plutonium is used in some stockpiled weapons. Although substitute materials are used whenever possible, some experiments to address stockpile issues cannot be done with a substitute material.

The Department prepared a classified supplement to the DARHT EIS that provides additional information and analysis. In general, the environmental impacts identified in the classified supplement have been incorporated into the unclassified portion of this EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 2	None required.

RESPONSE

Dynamic experiments involving plutonium would always be conducted inside double-walled steel containment vessels (sec. 3.3.2). Different designs could be used depending on the nature of the dynamic experiment and diagnostic tools used and would be developed in response to specific needs at the time such an experiment is designed.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 3	None required.

RESPONSE

The amount of material in any single dynamic experiment or set of experiments would vary according to test objectives. Different objectives could require different materials. In no case would the material be capable of providing a nuclear yield during the dynamic experiment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 4	None required.

RESPONSE

DOE conducts many types of tests and experiments on various isotopes, mixtures and alloys of plutonium. Dynamic experiments with plutonium, of the types proposed and discussed in the DARHT EIS, could involve various plutonium isotopes and alloys, which would be especially chosen for the purposes of the experiment. All experiments would be arranged and conducted in a manner such that a nuclear explosion could not result. In the past, DOE has conducted dynamic experiments at PHERMEX using weapons-grade and other forms of plutonium metal. See sections 2.3.3 and 3.3.2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 5	None required.

RESPONSE

Any experiment involving a containment vessel would require that some parts of the experimental assembly be put together before placement inside the containment vessel. Other parts of the experimental assembly, such as some diagnostic devices, would be attached after placement of the assembly inside the containment vessel.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 6	Sections 5.1.9, 5.1.9.1, 5.1.9.2, 5.1.9.3, 5.4.9, 5.7.2.2, and J.6.1

RESPONSE

As noted in the EIS, any experiments that would incorporate plutonium would be conducted in double-walled containment vessels. Using this approach in the past, there have been no failures of the containment. Based on its engineering experience, DOE and LANL believe that vessel failure with a subsequent release to the environment is not a reasonable scenario.

DOE prepared a classified supplement to the DARHT EIS which describes, among other things, possible "accident scenarios regarding dynamic experiments using plutonium." The environmental impacts from the classified supplement, including accident scenarios, have been included in the appropriate sections of the DARHT EIS. See sections 5.1.9, 5.4.9, and 5.7.2. Based on the analyses presented in the classified supplement, conducting experiments with plutonium would be expected to have minimal potential for environmental impacts under any of the alternatives analyzed.

After completing the experiment, the vessel would be taken to the Plutonium Handling Facility at LANL, at TA-55, for cleanup procedures. This discussion in the EIS has been revised for clarity. See section 3.3.8.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 7	Sections 3.3.8 and 5.4.10.3

RESPONSE

DOE would conduct any dynamic experiments using plutonium in a double-walled steel containment vessel. After completing the experiments the vessel would be taken to the Plutonium Handling Facility at LANL, at TA-55, for cleanup procedures. Discussion of waste volumes and composition of waste is contained in the EIS, sections 3.3.8 and 5.4.10.3.

Liquid plutonium waste streams would not be generated as a result of operations involving plutonium at DARHT or PHERMEX. Following completion of these operations the containment vessel would be moved to the LANL plutonium handling facility, TA-55, for cleanout and recovery. TA-55 waste streams will be addressed in the LANL Sitewide EIS. DOE has an excellent basis to estimate future waste streams, using past dynamic experiment, cleanout and recovery information.

COMMENT CODE	LOCATION OF EIS REVISION(S)
10 - 8	Section 3.8

RESPONSE

Part of DOE's purpose and need for enhanced radiographic capability specified in the DARHT EIS is to obtain information about plutonium through dynamic experiments (see section 2.3 of the DARHT EIS). Under the Plutonium Exclusion Alternative, DOE could not use the enhanced radiographic capability proposed for the DARHT Facility to obtain the needed information about plutonium, but instead would have to rely on its existing capability at PHERMEX or other facilities. This would have two immediate programmatic implications: first, DOE could not obtain the higher resolution information that is needed for dynamic experiments with plutonium; and second, DOE would have to continue to maintain and operate PHERMEX in addition to DARHT. Although the EIS is focused on environmental impacts, not programmatic impacts, DOE has summarized the programmatic consequences of the various alternatives in section 3.11. DOE expects to consider programmatic impacts when making its final decision on this project (see section 1.6).

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 1	None required.

RESPONSE

Section 106 of the National Historic Preservation Act (NHPA) requires that all properties (sites) that are determined eligible for the NRHP and which may be affected by a proposed Federal action be evaluated with respect to adverse effect. The NHPA requires that Federal agencies protect eligible resources through mitigation of adverse effects which can consist of protection data recovery or other actions. In the case of the Nake'muu site, mitigation of adverse effect would be accomplished by orienting the DARHT Facility such that the Nake'muu site would be in the "blast shadow," and other mitigation as addressed in section 5.11.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 2	None required.

RESPONSE

The draft EIS referenced past consultation with the SHPO and was prepared concurrently with additional field surveys and consultation with the New Mexico State Historic Preservation Officer. The archeological surveys were completed simultaneously with the draft EIS, and appropriate consultations have resulted. The DOE's actions in this area are consistent with the requirements of the CEQ 1502.25 (a).

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 3	None required.

RESPONSE

The NEPA regulations require consideration of impacts to cultural and historic resources among other aspects of the environment [40 CFR 1502.16]. The DARHT EIS identifies and assesses those impacts that might be expected from normal operations under any of the seven alternatives analyzed, and from various accident scenarios. DOE believes that the analyses in the DARHT EIS adequately disclose the environmental impacts expected and that the procedures established in correspondence between the New Mexico State Historic Preservation Officer and DOE would serve to minimize any potential impacts to important sites.

The EIS identifies and analyzes the impacts of each alternative on cultural resources in sections such as 5.1.6, 5.2.6, and 5.4.6.

See section 4.6.1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 4	None required.

RESPONSE

Following a NEPA review and completion of an environmental impact statement, an agency is required to document its decision in a formal document called a Record of Decision (ROD) (see inside back cover of EIS). By regulation, among other things a ROD must specify which alternative or alternatives were considered to be environmentally preferable [CEQ Regulation, 40 CFR 1505.2(b)]. An agency does not document this in the EIS (draft or final) because it is through the decision-making process (documented in the ROD) that the agency determines which alternatives were considered to be environmentally preferable. While an agency is required to identify and discuss in the ROD all factors that entered into its decision-making [40 CFR 1505.2(b)], an agency is not required to select the environmentally preferable alternative. As stated in section 1.6 of the EIS, DOE will identify in the DARHT ROD the environmentally preferable alternative, other decision factors, and how those considerations were balanced, in accordance with its regulatory responsibilities.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 5	Section 2.5

RESPONSE

DOE has revised the discussion in the DARHT EIS of nonproliferation and counter proliferation applications for enhanced radiographic hydrodynamic test capability (see section 2.5).

The concepts and capabilities of hydrodynamic testing have been well known to negotiating parties for the Nonproliferation Treaty, as noted in the response to comment 17-4. Currently, it is not considered sufficient to certify a completely new design without nuclear test data. Activities proposed for DARHT or PHERMEX do not include nuclear tests. A few years ago, DOE briefly studied containment for very low-yield nuclear tests (CONVEX, see comment 53-53), but these tests could not be done at DARHT or PHERMEX because the containment would be too large and would be buried underground.

The Nation's commitment to nonproliferation follows. The parties agree to not transfer nuclear weapons, other devices, or control over them, and to not assist, encourage, or induce nonnuclear states to acquire them. However, the treaty does not invoke stockpile reductions by nuclear states, and it does not address actions of nuclear states in maintaining their stockpile. Article VI obligates each of the parties to negotiate in good faith on the "cessation of the nuclear arms race at an early date and to nuclear disarmament..." The concept of hydrodynamic testing is known to all the signatories, and the capability exists with several of the nuclear states. Such capability is said to have been an important factor for the nuclear states to have entered into the treaty and to agree to further negotiate for a Comprehensive Test Ban Treaty. On May 11, 1995, 178 nations agreed to permanently extend the expiring nuclear Nonproliferation Treaty and accept a set of "principles and objectives" that include specific steps to turn back the nuclear arms race. The five nuclear states also agreed to work toward a comprehensive test ban by 1996 and rapid negotiation of a treaty to end production of nuclear bomb material.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 6	None required.

RESPONSE

The EIS addresses cumulative impacts of past, present, and reasonably foreseeable future actions as required by 40 CFR 1508.7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 7	None required.

RESPONSE

As discussed in section 1.1 of the EIS, DOE initiated construction of the DARHT firing site facility based on environmental reviews conducted in the 1980s. In 1984, in response to public concern, DOE began this DARHT EIS. In July of 1994, the Secretary of Energy instituted a Department-wide NEPA Policy that, among other things, requires that DOE complete its NEPA reviews more expeditiously than was done in the past. The 10-month schedule for completing, the DARHT EIS is consistent with both the letter and spirit of the Secretary's Policy.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 8	Sections 4.5, 4.5.1, 4.5.4, 5.1.5.4, 5.2.5.4, and Appendix K Table 4-12

RESPONSE

See response to comment 2-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 9	Sections 4.5.4, 5.1.5.4, and 5.2.5.4

RESPONSE

See response to comment 2-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 10	None required.

RESPONSE

The term "mitigation" as used in the NEPA process is defined by regulation [40 CFR 1508.20]. Mitigation includes all of the following:

- Avoiding an adverse impact by not taking a certain action
- Minimizing an adverse impact by limiting or modifying certain actions
- Rectifying an adverse impact by rehabilitation or restoring the affected aspect of the environment after the action has taken place
- Reducing or eliminating an adverse impact over time by taking preventative measures or modifying operating conditions
- Compensating for an adverse impact by replacing or providing substitute resources.

Federal agencies work together and with state agencies, such as the State Historic Preservation Officer, to develop mitigation measures to protect cultural resource sites and habitat for wildlife including threatened and endangered species.

A NEPA analysis may include "up front" mitigation, which are those measures incorporated into a proposed action or its alternatives, to determine what the overall environmental effects of mitigation measures might be. On the other hand, a Federal agency may decide on mitigation measures after determining the potential for adverse environmental impacts through the NEPA review process, and identify these in the Record of Decision following the NEPA analysis. Although there is no provision in NEPA or its implementing regulations for "rating" mitigation measures for their anticipated "effectiveness of actually achieving these protective measures," the regulations do provide for monitoring the mitigation measures over time [CEQ regulation 40 CFR 1505.2(c)]. DOE accomplishes this through developing a Mitigation Action Plan [DOE NEPA regulation, 10 CFR 1021.331]. See section 1.6 of the DARHT EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
11 - 11	None required.

RESPONSE

Mitigation and monitoring programs at LANL are discussed in full in the LANL annual Environmental Surveillance Reports. Only those operations connected with the proposed DARHT or PHERMEX facilities are discussed in this EIS. The EIS describes the potential impacts to soils and groundwater which would result from the alternatives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
12 - 1	None required.

RESPONSE

A Federal agency is obligated to include within the scope of analysis of an environmental impact statement the impacts of "connected actions." "Connected actions" are closely related actions which: might automatically trigger other actions that may require an EIS; would not proceed unless other actions are taken previously or simultaneously; or are interdependent parts of a larger action and depend on the larger action for their justification [CEQ regulations, 40 CFR 1508.25 (a)(1)]. DOE did not identify any "connected actions" relative to its proposal to obtain enhanced radiographic hydrodynamic test capability analyzed in the DARHT EIS.

See discussion in section 2.6 and volume 2, section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
12 - 2	None required.

RESPONSE

The geologic setting and geology near the site are described in section 4.3.2. Because the local geology does not vary greatly laterally, the nearby data are deemed sufficiently representative, so long as analyses do not indicate marginally acceptable results. The potential for migration of contaminants with ground water is discussed in appendixes D and E.

With regard to the transport of fissile materials, currently there are approximately 25 to 50 shipments per year to and from LANL. DOE considers this to be an ongoing aspect of the nuclear weapons programs. Thus, decisions on enhanced hydrodynamic capability are unrelated to the shipments of fissile materials to and from LANL.

COMMENT CODE	LOCATION OF EIS REVISION(S)
12 - 3	None required.

RESPONSE

DOE disagrees and knows of no evidence that a weapon system does not age. A weapon consists of electrical and mechanical parts that are made of metals and plastics; until a weapon is dismantled, it will age. The existing stockpile is considered to be safe and reliable, and has not yet experienced any post-design life aging problems since in the past, weapons have been retired soon enough that this has not occurred. The concern remains with the future stockpile since current U.S. policy requires that the existing stockpile remain active past its design life.

COMMENT CODE	LOCATION OF EIS REVISION(S)
12 - 4	None required.

RESPONSE

The purpose of NEPA is to bring about a complete examination of potential environmental impacts of proposed actions, such as DARHT, by Federal agencies.

COMMENT CODE	LOCATION OF EIS REVISION(S)
12 - 5	None required.

RESPONSE

Any known violation of permit standards or noncompliant situations are reported through the appropriate regulatory authority. Steps to bring LANL into compliance are negotiated with the regulatory authority. Citizen suits can be (and have been) brought against LANL or DOE if the public does not feel the spirit and intent of the laws are not being followed by LANL or DOE, or properly implemented by the regulatory authority. A violation at a single facility would not prevent other operations from being conducted at LANL.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 1	None required.

RESPONSE

DOE agrees that existing dynamic nuclear weapons remain safe and reliable. DOE disagrees that confidence in a weapon system "actually increases with age;" DOE believes that it is essential to continue to study aging effects on nuclear weapons systems, and the condition of nuclear weapons primaries.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 2	Section 2.1

RESPONSE

DOE has revised the text in chapter 2 to clarify the discussion of need. The text points out that stockpile problems have arisen in the past; DOE relied heavily on underground nuclear testing as a diagnostic tool to assist in correcting these problems. DOE expects that stockpile problems will arise in the future - no one can predict with certainty when problems might occur, or what part of a nuclear weapon might be affected. Particularly in an era without nuclear testing, hydrodynamic testing increase in importance as an analysis tool or for confirming other analyses. DOE does not believe it is prudent to wait for problems to develop before acquiring the tools to deal with them. The recently completed study by the three nuclear weapons laboratories entitled "Stockpile Surveillance: Past and Future" (Johnson, K, et al. 1995) notes that certain types of components in primaries do in fact age. The average age of weapons in the enduring stockpile is increasing and in a few years will exceed for the first time the design lives of the individual weapons. The study describes hydrodynamic testing as the principal tool to help understand the effects of aging processes and verify any fixes for such problems. The comment confuses reliability with performance; while primaries are designed to provide ample energy to set off the secondary, the problem is whether the primary can be relied upon to achieve this performance. This engineering margin is unrelated to the need to compensate for the effects of aging or other influences.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 3	Section 2.3.2

RESPONSE

The comment references the "Sandia Stockpile Life Study" for which viewgraphs and an interim summary were prepared in 1993. DOE understands from Sandia that these viewgraphs were used as part of an internal status briefing. The data used to develop these viewgraphs arose from a database which was recognized to be incomplete and inadequate, in that much data, particularly that relating to problems found through methods outside the DOE's formal Stockpile Evaluation Program, was incompletely or inconsistently documented in this database. In particular, findings and "actionable" findings associated with the nuclear package (including the weapons primary) were not completely documented.

The three weapons laboratories (LLNL, LANL, and SNL) have now conducted a joint study [Stockpile Surveillance: Past and Future] (Johnson et al. 1995) which has updated this data to provide a more accurate record. The "defects database" now has more than 2,400 entries. More than 370 cases resulted in action due to safety or reliability concerns. Approximately 110 problems since 1958 required action to the nuclear components, in 39 of the 50 weapon types covered by the report. Of these, more than 90 were related to the weapons primary. While the rate of findings decreases after a weapon is initially deployed, the study concludes that it is reasonable to expect that problems would continue to arise in the stockpile at the rate of one or two defects per year, as the stockpile ages beyond the original design expectations. DOE notes that of the weapon types introduced since 1970, nearly one-half required nuclear testing to verify, resolve, or certify the resolution of problems relating to safety and reliability. This and other information have now been included in the final EIS in section 2.3.2.

The comment mentions metallurgical data and equation of state measurements. Such data are valuable, but do not relieve the need for enhanced radiographic hydrotesting.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 4	None required.

RESPONSE

Regarding the implosion process, DOE needs the enhanced capability that would be provided by DARHT to assure collection of adequate data in support of fundamental questions about physics of nuclear weapons regardless of aging considerations. See section 2.3.1.

As noted in the EIS, section 2.3.2, DOE believes that evaluation of aging weapons is needed. Actions should begin as soon as possible to benchmark the condition of weapons and their expected performance characteristics as a baseline for future surveillance observations and performance tests. DOE believes that, by itself, weapons surveillance is not adequate to evaluate, predict, and resolve performance or reliability problems.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 5	None required.

RESPONSE

DOE agrees that the existing stockpile is safe and reliable. The concern lies with the future evolution of the stockpile, the ability to address and resolve issues as they arise, and to maintain a high level of confidence in safety and reliability as the stockpile ages.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 6	Section 2.3.1

RESPONSE

DOE appreciates the concern expressed by this comment, but believes that the EIS adequately explains the safety issues associated with the proposed action.

The discussions in chapter 2 of the DARHT final EIS have been revised to include additional information related to safety and reliability.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 7	Sections 2.1, 2.3.1 and 2.3.2

RESPONSE

See the responses to comments 13-2 and 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 8	None required.

RESPONSE

The purpose and need for enhanced radiography as proposed for DARHT is stewardship of the U.S. nuclear weapons stockpile pursuant to direction from the President and Congress. There is no requirement for new-design nuclear weapons at the present time.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 9	Section 2.3.2

RESPONSE

A discussion of the relevance of remanufacturing nuclear weapons to the DARHT proposal has been added to chapter 2. Chapter 2 has been revised in the final EIS to clarify the purpose and need. Additional information has been included in accordance with the SS&M Program Plan issued by the DOE in May 1995.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 10	Section 2.2.1

RESPONSE

While it is true that current national policy does not provide for the design of new nuclear weapons, the final EIS states that in the event that the U.S. decides it needs to design and manufacture new nuclear weapons it would use every tool necessary to accomplish this mission. This could include using enhanced radiographic hydrodynamic capability as proposed for DARHT (see section 2.3.4).

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 11	Section 2.5

RESPONSE

See response to comment 11-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 12	Section 2.5

RESPONSE

See response to comment 11-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 13	Sections 3.3.4 and 3.10.5

RESPONSE

The discussion in the EIS regarding the utility of FXR at LLNL compared to the proposed DARHT Facility has been revised. The DOE currently uses both FXR and PHERMEX to provide hydrodynamic test capability. However, DOE does not conduct dynamic experiments with plutonium at LLNL; DOE does not have the facility infrastructure at LLNL's site 300 to support these types of experiments, and it would be unreasonably expensive (several hundred million dollars) to provide the required plutonium handling capability at LLNL. Accordingly, the FXR facility, in current or upgraded mode, or with single- or dual- axis capability, would not provide the enhanced capability that the DOE needs to diagnose dynamic experiments with plutonium. As discussed in section 3.10.1.1, DOE believes it would be unreasonable to construct the requisite plutonium infrastructure at site 300 at LLNL, and this alternative is not analyzed in the DARHT EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 14	None required.

RESPONSE

With regard to the transport of fissile materials, currently there are approximately 25 to 50 shipments per year to and from LANL. DOE considers this to be an ongoing aspect of the nuclear weapons programs. Thus, decisions on enhanced hydrodynamic capability are unrelated to the shipments of fissile materials to and from LANL.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 15	Sections 3.3.2, 5.1.9, 5.1.9.1, 5.1.9.2, 5.1.9.3, 5.4.9, 5.7.2.2, and J.6.1

RESPONSE

For the DARHT EIS a breach of the double-walled containment vessel that would be used for dynamic experiments with plutonium was analyzed to determine potential health consequences from a hypothetical accidental release. DOE considers this to be an incredible event.

See response to comment 10-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 16	Section 5.4.10.3 Tables S-1 and 3-3

RESPONSE

Tables S-1 and 3.3 were revised to list the annual generation of various types wastes for each alternative. Table 3-1 reflects infrastructure needs for waste management and materials processing for single- and double-walled containment vessels. Section 3.3.8 and 5.4.10.3 were revised to address waste management issues raised in this comment.

Single-walled vessels would be used in support of hydrodynamic tests. Double-walled vessels would be used in containing plutonium.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 17	None required.

RESPONSE

This comment confuses the limited upgrades to PHERMEX which will occur in any case and are thus part of the No Action Alternative with the alternative of upgrading PHERMEX to provide the needed enhanced radiographic capability (Upgrade PHERMEX Alternative). As noted in the EIS (section 3.4), the No Action Alternative, which includes the continued operation of PHERMEX, is not static but includes the actions DOE might take to maintain or improve its current radiographic capability using its existing equipment. However, this limited upgrade to PHERMEX discussed in this comment would not provide the enhanced radiographic hydrodynamic testing capability that DOE now needs in the absence of nuclear testing. The addition of a double-pulsed capability to PHERMEX would not provide enhanced radiography. The second picture of the double-pulse would be of a noticeably reduced quality since the accelerator would not have time to generate the same power levels obtained for the first radiograph.

In contrast, the Upgrade PHERMEX Alternative would upgrade PHERMEX with the new high-resolution radiographic technology for DARHT. The intention for DARHT technology is not just to have two images late in the implosion process, as would be provided with the double-pulse capability, but to provide imaging through very thick, dense materials; take multiple, very brief, snapshots from two different lines of sight; and provide images of very high resolution. With completion and operation of both axes of DARHT, there would be a capability to obtain three-dimensional data as well as time-sequenced images.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 18	None required.

RESPONSE

On August 11, 1995, the President announced that the U.S. will no longer conduct the small-scale nuclear tests referred to by this commenter as hydronuclear tests. Accordingly, DOE will not conduct hydronuclear experiments at any existing or proposed facility at any site. DOE never intended to conduct hydronuclear tests at DARHT, and they were not proposed in the draft DARHT EIS. The DARHT facility was not designed to withstand the energy release that would be expected form this type of test, nor to protect workers or the general environment from the expected or potential accidental consequences from this type of test. The exact nuclear yield on hydronuclear experiments is difficult to predict and adds to the difficulty in designing facilities for hydronuclear tests. These possible effects mean that a facility such as DARHT would not be suitable for this type of test.

COMMENT CODE	LOCATION OF EIS REVISION(S)
13 - 19	Section 2.6 and volume 2, section 1.5.

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2 section 1.5 for information on the relationship of the DARHT EIS to other DOE EISs.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 1	None required.

RESPONSE

Up to 15 acres (6 ha) could have above-background concentrations of uranium under all of the alternatives developed in the DARHT EIS that would employ uncontained tests. This estimate was derived from the soil contamination analysis in appendix D. An estimate of measurable soil contamination, rather than a calculated estimate, would be 3 to 4 acres (1.2 to 1.6 ha) for the uncontained alternatives. This estimate was based on observed contamination at PHERMEX, which historically has used more depleted uranium and other materials than are planned for DARHT. Maximum use of material at the proposed DARHT facility is projected to be about 30 percent less than historical annual use at PHERMEX.

Appendix E used conservative modeling assumptions to estimate potential impacts to surface and ground water from DARHT operations. These evaluations showed there would be no impacts of DARHT operations.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 2	None required.

RESPONSE

Annual averages for the past several years have been the basis for materials that would be expended at the firing point. The number of detonations is not a good indicator because detonations may have different objectives (see table B-3) which can lead to great variability in characteristics among the detonations. To some extent, stockpile issues that arise will determine the shots required. However, there are also logistical constraints on how quickly the more sophisticated tests and experiments can be prepared and performed. Thus, the actual rates are not expected to be much different than past experience with PHERMEX.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 3	Sections 5.1.8, 5.1.8.1, 5.1.8.2, 5.1.8.3, 5.1.9, 5.1.9.1, 5.1.9.2, 5.1.9.3, 5.4.8, 5.4.9, 5.7.2.2, and J.6.1

RESPONSE

As noted in the DARHT draft EIS (see section 2.1), some aspects of the hydrodynamic testing and dynamic experiment program, and the related environmental assessment of alternatives, are classified as Secret Restricted Data under the provisions of the Atomic Energy Act of 1954, as amended, to protect national security. DOE prepared a classified supplement to the DARHT EIS that contains additional information and analysis. After review of this material, DOE determined in May 1995, that certain aspects of the impact analysis could be presented in an unclassified summary and made these available to the general public. DOE has revised the EIS in several places to incorporate this information. See chapters 3 and 5 and appendixes I and J.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 4	None required.

RESPONSE

Following a dynamic experiment using plutonium, the containment vessel would be moved to the LANL plutonium handling facility, TA-55, for cleanout and recovery. DOE expects that some small amount of total waste volume would become part of the TA-55 waste stream.

DOE does not expect WIPP to be either "problematic" or "without [sufficient] capacity" with regard to management of waste produced at DARHT or PHERMEX.

Characterization for WIPP would not be a problem because such characterization consists of certifying types, quantities, and forms of TRU in a waste package.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 5	None required.

RESPONSE

See response to comment 10-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 6	None required.

RESPONSE

See response to comment 13-14.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 7	None required.

RESPONSE

All alternatives analyzed in the DARHT final EIS are assumed to use the same maximum quantities of materials annually; for example, 1,540 lb (700 kg) of depleted uranium or 20 lb (9 kg) of beryllium. Table 3-3 shows releases to the environment, rather than use. Under all alternatives except the Enhanced Containment Alternative, 100 percent of the used material is assumed to be released to the environment so it is the same as usage. The amount of material released to the environment for the Enhanced Containment Alternative options varies by the particular pathway (e.g. water) examined. Water modeling assumes 460 lb (210 kg) of DU per year (30 percent of 1,540) is available for release. Seventy percent of the 1,540 lb (700 kg) DU used is deposited on or near the firing site as large and small fragments of metal, cleaned up during routine housekeeping activities, and disposed. Thus, there has not been an increase in usage of DU. The water modeling subtracts the 70 percent of DU that is cleaned up and disposed, i.e., 1,540 lb (700 kg) minus 70 percent equals 460 lb (210 kg).

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 8	None required.

RESPONSE

Waste material (mainly soil and detonation debris) removed from the PHERMEX firing site is low-level waste in most cases because of the presence of depleted uranium. Hazardous constituents potentially used at PHERMEX have not been detected in waste sampled; no mixed waste streams are generated from the PHERMEX firing site. DOE considers the evaluation of low-level waste disposal at LANL to be beyond the scope of the DARHT EIS or related actions. Waste management practices specifically associated with the alternatives analyzed are presented in Chapters 3 and 5 of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 9	None required.

RESPONSE

Any modeling technique is based on hypothetical conditions. Justification for using Gaussian plume models is discussed extensively in appendix H.2. Use of Gaussian plume models provides a conservative estimate (tends to underestimate actual dispersion, and therefore overestimate potential consequences) of atmospheric dispersion when applied to complex terrain such as that found at Los Alamos. No mixing height data are available for Los Alamos, so the nearest available data were used. Again, mixing height data for Albuquerque would be conservative and would tend to overestimate potential consequences. Further, air quality modeling for purposes of the EIS does not require site specific air monitors.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 10	None required.

RESPONSE

DOE feels the estimate of the percent of materials that is aerosolized (10 percent) is well substantiated. Approximately 70 percent of the material on the ground is collected for disposal. For water resource impact evaluation, the remaining material on the ground was assumed to be very mobile to provide a conservation estimate of potential impacts. The portion of the material that is available to water resource contamination is discussed in various sections of chapter 5 and appendix E.

Neither lithium nor lithium hydride are regulated materials in soils or water. There are no Maximum Contaminate Levels or guidelines for either of these materials. Evaluation of lithium hydride was included principally because it can be an inhalation hazard from airborne emissions. Similarly, there are no constituents of high explosives residues that are known to be regulated materials in soils or water.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 11	None required.

RESPONSE

The dose that could result from resuspension and offsite transport of depleted uranium deposited in the firing site vicinity would be a very small fraction of the potential impacts calculated from the uncontained detonation releases. LANL's air monitoring stations are the most effective tool for monitoring and estimating any offsite radiation dose that could occur from this diffuse, nonpoint source release.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 12	None required.

RESPONSE

While the northeast drainage (runoff) channel at the PHERMEX site exhibits total uranium concentrations in soil 31 times background (105 ppm versus 3.4 ppm), runoff is not highly accessible to the water supply of the region, especially at contaminant concentration levels observed in the runoff channels in the immediate vicinity of the firing site. In this analysis, modeling of runoff to the canyon bottom and infiltration into the soil profile at the mesa top used solubility concentrations for total uranium of 300 ppm (i.e., 300 mg/L). This solubility value is higher than any observed solution concentration. Thus, model results presented in the EIS are conservative with respect to the observed concentrations of total uranium contamination in drainage channel waters. Furthermore, the analysis does not take credit for sorption and dispersion that would occur along the runoff pathway from the mesa top to the canyon bottom.

Before runoff waters or infiltration originating from a firing site, either PHERMEX or DARHT, could reach regional water supplies, it would infiltrate the canyon bottom or mesa top to the main aquifer, or flow via ephemeral streams to the Rio Grande. Analyses presented in the DARHT EIS show that water quality from either source would be well below MCLs for uranium, beryllium, and lead. See sections 5.1.4, 5.2.4, and 5.4.4.

Two independent methods were used to determine the area of soil contamination: a soil sampling survey and an aerial radiological survey. The former method resulted in an estimate of a 422-ft (129-m) radius circle exhibiting depleted uranium contamination above background. The latter method resulted in an estimate of a 450-ft (137-m) radius circle. To be conservative, a radius of 460-ft (140-m) was employed in the analysis and describes an area of approximately 15 acres (6 ha). This is an example where data did exist to produce a good estimate. Thus, examining model sensitivity to land area exhibiting uranium concentrations above background is not as meaningful as it would be if the area were not relatively well known.

The extent of surface contamination at the firing site selected for surface water modeling allows the entire annual expenditure of depleted uranium to be input to the surface water and vadose zone pathways. Thus, doubling the contaminated area would not increase simulated peak depleted uranium concentrations in the ground water or canyon bottom. The lower solubilities of beryllium and lead would not allow the entire annual expenditures of these contaminants to be input to the surface water and vadose zone pathways. Doubling the area of contamination would produce no more than a two-fold increase in simulated beryllium and lead concentrations. Even with such an increase, simulated peak beryllium and lead concentrations would remain well below drinking water standards.

The relationship of the DARHT EIS to the SS&M PEIS is discussed in section 1.5 of volume 2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 13	None required.

RESPONSE

The wall near the firing point could intercept blast debris of all sizes leading to the observations of higher levels of contamination. Only certain sized fragments (a small range) could reach Nake'muu on a ballistic path, and only then if planned shielding were not in place. Any vertical wall could provide some concentration of small particles at its base if the conditions were right, however, the quantity of small particles of material reaching Nake'muu at a distance of approximately 2000 ft from DARHT is considered to be insignificant.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 14	Section B.8

RESPONSE

Approximately 90 percent of the DU that is brought to the firing site is estimated to remain within 490 ft (150 m) of the firing point as described in section 4.3.3. In all likelihood, an even greater percentage remains in this vicinity because radiation that specifically indicates uranium contamination is not distinguishable from naturally occurring background levels at distances of about 460 ft (140 m) from the firing point. About 70 percent of the depleted uranium brought to the firing point is collected in cleanup. The soil contamination in the vicinity of the firing point is the starting point for analyses modeling the potential transport of uranium. The other metals distribute in ways similar to the depleted uranium. The high explosives convert during detonation to mostly water, NO_2, and CO_2; any residues are extremely minor.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 15	None required.

RESPONSE

The presence of fractures could cause a faster drainage rate. However, the units of the Bandelier tuff at TA-15 have few penetrating fractures in the lower units (fig 4-10).

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 16	None required.

RESPONSE

DOE agrees that protection of its workers and the general public remains of highest priority. Depleted uranium does not become more radioactive over time, although it is true that decay of the uranium isotopes, of which uranium-238 is particularly important, results in the production of a series of radioactive progeny. Dose calculations in the EIS for depleted uranium include all of the radioactive progeny that have half lives greater than approximately 10 minutes. The very short-lived radon progeny which are not included are typically of concern only in spaces with poor air turnover which allow the progeny to come into equilibrium with the radon-226 parent. These types of conditions are not of concern for DARHT operations. Radon progeny produced from DU at TA-15 would be a very minor contributor to overall radon progeny in ground water, compared to the contribution from naturally occurring uranium-238 and its radon progeny.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 17	None required.

RESPONSE

The models presented in appendix E3 on surface water modeling include a simple partitioning of precipitation into runoff to the canyon bottoms and infiltration into the mesa. The movement of water and contaminants in the canyons adjacent to Threemile Mesa was modeled using an updated version of the Lane et al. (1985) one-dimensional event-based model (see appendix E3). Climate records from the LANL site were used to drive the model, and flood events carrying water from the upper watersheds to the Rio Grande were simulated using this model.

The model described above, which includes consideration of runoff, infiltration, and precipitation event-driven flooding was used to model the migration of depleted uranium. In the model, depleted uranium was removed from the firing site by runoff and infiltration at a relatively high solubility of 300 mg/L–a value higher than observed solution concentrations. The annual depleted uranium inventory was applied to the firing site soils during each of the 30 years of firing site operation. Because of the relatively high solubility assigned to uranium, the annual inventory was, for all practical purposes, removed from the site each year by the combination of runoff and infiltration.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 18	None required.

RESPONSE

The use of 460 lb (210 kg) of depleted uranium as an initial annual source loading for the water resource system analysis reflects the application of 70 percent cleanup levels to the original annual inventory of 1,540 lb (700 kg).

Soil analyses were run to detect residues of high explosives, and none were found. Consequently, no analyses of potential impacts to water quality were conducted for high-explosive residues.

Lithium hydride does not appear in high quantities in the inventory, is primarily an inhalation hazard, and is not regulated to an MCL or MCLG in drinking water. Consequently, no analyses of potential impacts to water quality were conducted for lithium hydride.

See response to comment 14-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 19	None required.

RESPONSE

The DARHT EIS states "... well extraction of dissolved contaminant mass from the regional aquifer, if transported to the aquifer, is a possible consideration" and "... it may be unnecessary to model the flow and transport of contaminants in the main aquifer depending on the results of vadose zone modeling" (see appendix E4). Appendix E4 is largely devoted to a description of the vadose zone flow and contaminant transport modeling performed. Sections 5.1.4.2, 5.2.4.2, and 5.4.4.2 of the EIS contain results of vadose zone and ground water pathway analyses for the alternatives considered. In the analysis, well extraction of dissolved contaminant mass from the regional aquifer is described as occurring through a municipal/industrial well similar in all aspects to those currently operated by Los Alamos County in the Pajarito Field. Some wells from this field are located on the mesa immediately north of Threemile Mesa and Potrillo Canyon.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 20	None required.

RESPONSE

Because of research conducted on Potrillo Canyon and reported by Becker (1993) in her dissertation, more is known about this canyon and the discharge sink than other pathways from the firing site to accessible water supplies. Her estimates of dissolved and suspended uranium contamination entering the discharge sink are based on field observations and show relatively low migration rates. The model applied in this EIS to examine longer-term events also showed relatively low quantities of uranium moving into the discharge sink. Because the water quality entering the discharge sink over the long term was shown to remain below MCL and MCLG values for drinking water, further investigation of the discharge sink to better understand the potential hydrologic connection between the discharge sink and main aquifer would not alter the evaluation of alternatives analyzed in the DARHT EIS. However, it may well be important to other programs at LANL to better understand and characterize the hydrologic connection between the land surface and the main aquifer. Certainly, if under the proposed ground water protection program it is discovered that relatively young water is recharging the aquifer at this location, it will be important to develop a better understanding and a more mechanistic model of the discharge sink and its communication with the main aquifer.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 21	None required.

RESPONSE

Operations such as those planned for DARHT have been ongoing at LANL for decades and have not adversely affected tourism at local sites. Visitation at Bandelier has continued to increase. Part of the northern portion of Bandelier National Monument was part of the original Laboratory site and was added to the National Monument in the 1960s; this has not impacted recent use of the National Monument.

Nake'muu and other sites in the firing area would not be accessible to the general public for tourism or any other use in the foreseeable future.

See response to comment 4-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 22	None required.

RESPONSE

DOE does not believe that piecemeal destruction of cultural resource sites at LANL is occurring. The vast majority of proposed cultural resource sites in the vicinity of TA-15 are not threatened by LANL activities. The few that might be adversely affected by any alternative analyzed in the DARHT EIS, such as by construction at the firing point, are protected or excavated in coordination with the affected Pueblos and the State Historic Preservation Office.

See response to comment 4-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 23	None required.

RESPONSE

The discussion is under cultural resources. DOE guidelines for the assessment of environmental justice require identification of adverse environmental impacts (identified in other sections of the EIS) that would disproportionately affect low income or minority populations. See sections 5.1.7.4, 5.2.7.4, and 5.4.7.4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 24	None required.

RESPONSE

In appendix B, PHERMEX Baseline, existing LANL accident evaluations were used to estimate potential accident frequencies for PHERMEX. Appendix I, Facility Accidents, represents a newer examination of potential accidents and postulated accident frequency that might be expected at DARHT. However, since consequences of accidents at DARHT are examined in appendix I on a "what if" basis without consideration of the accident frequency, DOE believes that slight discrepancies between the methods and results for the two facilities are not a concern.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 25	None required.

RESPONSE

Provisions of the Federal Clean Air Act, as enacted in 40 CFR Part 61 Subpart H for DOE facilities, apply only to routine emissions from a facility. Potential releases from accidents are excluded.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 26	None required.

RESPONSE

Since consequences of bounding case accidents at DARHT are calculated in appendix I on a "what if" basis without consideration of the accident frequency (i.e., probability of occurrence = 1) , DOE believes further consideration of accident probability is unwarranted.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 27	Sections 5.1.8, 5.1.9, 5.4.8, 5.4.9, 5.7.2.2, and J.6.1

RESPONSE

See response to comment 10-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 28	None required.

RESPONSE

The analysis in the EIS was conducted in a manner to overestimate the amount of materials to be used and, thus, overestimate the potential impacts from the No Action Alternative. It is felt that by being conservative in this manner will allow a demonstration of insignificant impacts. This demonstration is based on high material usage levels that are not likely to be encountered. Thus, the impacts that are evaluated in the EIS are higher than those that are currently encountered from PHERMEX operations.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 29	None required.

RESPONSE

NEPA evaluation must be based on available information. The best available data and estimates are appropriate for the process.

COMMENT CODE	LOCATION OF EIS REVISION(S)
14 - 30	None required.

RESPONSE

All facilities administered by the DOE are regulated by the same set of environmental standards as any other industry or Federal agency. The majority of the materials released from PHERMEX are in such a form as to inhibit release to the environment, thus allowing an opportunity to provide a certain level of short-term cleaning to be followed by post-facility-operation remediation.

COMMENT CODE	LOCATION OF EIS REVISION(S)
15 - 1	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
15 - 2	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, and H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
16 - 1	None required.

RESPONSE

The DOE appreciates this assessment.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

17 - 1 Section 2.6 and volume 2, section 1.5.

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2 section 1.5 to provide for information on the relationship of the DARHT EIS to other DOE EISs.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

17 - 2 Sections 2.2.2, 2.4, 2.6, 3.3.4, 3.10.5, and volume 2, section 1.5.

RESPONSE

Chapter 2 of the EIS has been revised to more clearly show how the need for enhanced hydrodynamic testing is derived from directives made by the President and Congress.

DOE believes that DARHT, while a part of the SS&M program, is independently justified (see sections 2.6 and EIS volume 2, section 1.5). As stated in sections 2.4 and 3.10.5, FXR is not a reasonable alternative for conducting dynamic experiments with plutonium (see response 13-13). The ongoing upgrades of PHERMEX and FXR are discussed in section 2.4 and 3.3.4. Upgrade of PHERMEX with the capability proposed for DARHT is analyzed as a reasonable alternative to provide enhanced radiographic capability. Additional discussions of PHERMEX upgrades are presented in the response 13-17.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

17 - 3 Section 2.6 and EIS volume 2 section 1.5

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2, section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 4	None required.

RESPONSE

The *Treaty on the Non-Proliferation of Nuclear Weapons (1968)* went into effect in March, 1970. The treaty is aimed at the cessation of the nuclear arms race and limiting the proliferation of nuclear weapons to nonnuclear states. Under the treaty, the parties agreed to not transfer nuclear weapons, other devices, or control over them, and to not assist, encourage, or induce nonnuclear states to acquire them. However, the treaty does not invoke stockpile reductions by nuclear states, and it does not address actions of nuclear states in maintaining their stockpiles.

The concept of hydrodynamic testing is known to all the signatories, and the capability exists with several of the nuclear states. Such capability is said to have been an important factor for the nuclear states to have entered into the treaty and to agree to further negotiate for a CTBT treaty. Thus, by developing an enhanced radiographic hydrodynamic test capability, the DARHT project does not introduce any new elements for the treaty parties.

Past practice was to continually replace weapons in the stockpile at regular intervals as different mission requirements were established. Concurrently, the new weapons were designed with the best available technology of their time. Thus, much of the data collected in the past relates to designs no longer in the stockpile, is of insufficient quality (particularly in the case of hydrodynamic test data) to allow a predictive capability without underground nuclear testing, and sheds virtually no light on potential aging problems of those weapons which will remain in the stockpile well beyond their originally projected lifetime.

France has independently committed to construct the AIRIX (Accelerator Induction Radiographic a la Image X-Ray) facility which is similar in design to DARHT and will be completed sooner than DARHT. France plans to build other stewardship facilities as well. Both China and France are pursuing nuclear testing in advance of a Comprehensive Test Ban agreement. France and China have decided to perform nuclear tests before a Comprehensive Test Ban is concluded.

There is little evidence that a Comprehensive Test Ban would be seriously affected by DARHT or AIRIX. In May, 1995, 178 nations agreed to extend permanently the expiring Nuclear Non-Proliferation Treaty and accept a set of principles and objectives that include specific steps to turn back the nuclear arms race. On August 11, 1995 the President committed to pursue a Comprehensive Test Ban Treaty premised on a strong and continuing stockpile stewardship program.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 5	None required.

RESPONSE

DOE is aware of Dr. Katz's essay and his position. However, the DOE believe that stockpile stewardship as described in its Stockpile Stewardship and Management Plan (DOE 1995) responds to Presidential Decision Directive and Congressional mandates (see chapter 2 of EIS). More recently, the President established the conduct of a science-based Stockpile Stewardship Program, including a broad range of experimental programs, as a condition of U.S. entry into a zero-yield CTBT (August 11, 1995).

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 6	Section 2.6 and volume 2, section 1.5.

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2 section 1.5 for information on the relationship of the DARHT EIS to other DOE EISs.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 7	Section 2.6 and volume 2, section 1.5.

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2, section 1.5. DOE believes that the need for enhanced radiographic hydrotesting capability is justified independently of other Stockpile Stewardship and Management issues.

The analogy of obtaining a CAT-scan baseline prior to the development of heart disease (as discussed in comment letter number 17) was used simply to convey an example of obtaining a three-dimensional image in a way that was easily recognizable for the general public. DOE is proposing to use DARHT to provide a safety and reliability baseline of the enduring stockpile with the use of enhanced radiography to obtain a three dimensional image.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 8	None required.

RESPONSE

The two views of DARHT will provide three-dimensional information. This will be the first facility to give such information in the U.S. and obtain deeply penetrating high-resolution images. Additional views will give more refined information and also more detailed analysis. The Department is considering a conceptual facility, called the Advanced Hydrotest Facility (AHF) that would be used to provide up to eight radiographic views and 20 or more images. This would require a significant advance in technological capability. Information obtained from DARHT would be used to evaluate aspects of the design of a AHF and provide experience important in optimizing the operations of an advanced facility. Additional information is included section 3.10.3 of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 9	None required.

RESPONSE

DOE acknowledges that there are some technical questions regarding the second axis of DARHT, as discussed in the HPAIC (as raised by this commenter). As noted in section 3.5, under the DARHT Baseline Alternative and any other alternative involving two axes, DOE would need to test and refine the accelerator technology proposed for the first axis before deciding on the technology to be used for the second axis.

Relative to current technology, the technology proposed for DARHT would provide higher-energy x-rays, which, in turn, could penetrate denser materials, and a shorter pulse time, which would provide a sharper image (better resolution) of materials moving at high speed.

PHERMEX and FXR accelerator technology is fundamentally different from that planned for DARHT and cannot be improved to match the same goals. The second axis proposed for DARHT would provide three-dimensional capability, which is in no way available for a single shot now. Several marginal improvements in technical specifications can result in important improvements in test data.

The EIS has discussed DOE's plans to upgrade its hydrodynamics facilities at PHERMEX and FXR (sections 2.4 and 3.3.4). However these upgrades would not provide the enhanced capability, as stated in the purpose and need, that would be provided by DARHT technology.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 10	None required.

RESPONSE

DOE does not agree that present radiographic hydrodynamic test capabilities are adequate for the type of stockpile stewardship directed by the President and Congress. The fact that certain levels of knowledge might be useful for design purposes does not preclude their usefulness in understanding stewardship issues.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 11	Section 2.6, 5.1.10 and volume 2, section 1.5.

RESPONSE

Please refer to the text in sections 2.6 and 5.1.10, and EIS volume 2 section 1.5 for information on the relationship of the DARHT EIS to other DOE EISs. Waste management impacts for DARHT were evaluated in chapter 5 of the draft EIS. These were inadvertently omitted from the summary table S-1 of the draft EIS and have been included in the final EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 12	None required.

RESPONSE

The DOE recognizes its responsibilities for waste management relative to the DARHT project. Under the Preferred Alternative the volume of LLW is projected to decrease significantly as the use of vessels increases.

Decisions regarding how to spend U.S. Treasury funds are made by the President and Congress. The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile and have appropriated funds accordingly. DOE recognizes that there are many demands for Federal dollars, but a portion of these dollars are needed for its mission assignment. Decisions on whether to request funds for DARHT construction are largely independent of decisions on funding provided for other activities, such as waste management or environmental restoration, within the overall envelope of DOE activities.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 13	Section 2.6 and volume 2, section 1.5.

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2 section 1.5 for information on the relationship of the DARHT EIS to other DOE EISs.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 14	Chapter 2.1

RESPONSE

See response to comment 13-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 15	Sections 2.2.1 and 2.3.4

RESPONSE

The commenter is correct. Physical security of the stockpile is not part of the purpose and need for DARHT, but it remains a part of DOE's stockpile mission. The EIS text has been changed in those places where these two mission elements are discussed in relation to DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 16	Section 2.1 and 2.3.3.

RESPONSE

DOE agrees that routine surveillance of the nuclear weapons in the enduring stockpile is one essential tool for ensuring the safety and reliability of the stockpile and DOE intends to continue this program. In the event that routine surveillance uncovers a problem, or a problem is brought to light by some other method, DOE would develop some means to address the problem, through replacing parts, repairing parts, or retrofitting new parts. DOE needs to have the capability to ensure that these "fixes" would not adversely affect the safety and reliability of the weapon in some unforeseen manner. The capability proposed for DARHT is essential in this regard. Sections 2.1 and 2.3.3 of the final EIS have been revised to clarify this point.

There are instances in the past where hydrodynamic testing was or would have been useful in proving a "fix" to weapons system. These are discussed in "Stockpile Surveillance: Past and Future," prepared by SNL, LLNL, and LANL.

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 17	None required.

RESPONSE

The enhanced capability proposed for DARHT would provide a significant role in the stewardship of the nuclear arsenal by helping DOE acquire a better understanding of the physical processes that occur in nuclear weapons, or that are intended to occur, during the prenuclear portion of a device's performance. Experiments to obtain data on these physical processes use test assemblies that mock the conditions of an actual nuclear weapon and are detonated using high explosives. The increased x-ray dose expected from DARHT, relative to PHERMEX and FXR, would provide images at later times during the implosion process. In addition, other tests may deal only with the properties of a material under a given set of physical conditions. This knowledge can then be used to assess whether anomalies related to the material constitute a safety or reliability problem.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 18	None required.

RESPONSE

DOE disagrees with the comment that DARHT was proposed as a "magnet" facility to bring other new nuclear weapons design facilities to LANL. The hydrodynamic testing facilities at LANL are funded and operated by the DOE as part of the laboratory's ongoing stockpile stewardship mission, and DOE proposes to complete and operate the DARHT facility at LANL in furtherance of that mission. The DARHT facility is needed at LANL for this mission regardless of any other facilities which may eventually be located or operated there. Only one of the specific facilities mentioned in this comment, the Contained Explosives Test Complex, is related to DARHT. It is analyzed in this EIS as the Vessel Cleanout Facility of the Vessel Containment and Phased Containment Options of the Enhanced Containment Alternative. Of the other facilities mentioned in this comment, some are only in the early planning stages (such as the Tritium Laboratory), some are already completed (such as the Weapons Component Testing Facility and the Radiographic Support Laboratory (RSL)), and some are unrelated to the nuclear weapons complex (such as the Advanced Neutron Source). Specifically, the RSL will be used regardless of alternative. DOE believes that the proposal for enhanced radiographic hydrotesting capability is independently justified and thus need not follow the SS&M PEIS and the LANL SWEIS (see section 2.6, volume 1, and section 1.5, volume 2).

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 19	None required.

RESPONSE

DARHT is sited at LANL because of the existing infrastructure as noted in the section 3.10.1 discussion of why other sites were not analyzed as alternatives in this EIS. Hydrodynamic testing has been conducted at LANL for 0ver 30 years. Thus, DARHT is not part of the overall reconsolidation of the DOE complex. Reconfiguration of the DOE weapons complex to reduce costs and consolidate functions necessarily causes the remaining functions to be consolidated at the remaining facilities.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 20	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, and H.5.2

RESPONSE

The final EIS contains an additional option, the Phased Containment Option (preferred alternative), within the Enhanced Containment Alternative. The selection of alternatives to be analyzed in the EIS from among a much broader range of possible alternatives is discussed in section 3.10. Each of the alternatives that were considered, but not analyzed in the EIS, were rejected for reasons such as failure to meet the purpose and need, infrastructure requirements, or cost. The DOE believes that their discussion in section 3.10 supports its choices for the range alternatives to be analyzed in the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 21	2.4

RESPONSE

See response to comment 13-17.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 22	Section 2.5

RESPONSE

DOE has revised the discussion in the DARHT EIS of nonproliferation and counter proliferation application for enhanced radiographic hydrodynamic test capability (section 2.5). The concerns raised by Congress for the National Ignition Facility are specific to that facility and not general to all new facilities in the DOE complex.

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 23	None required.

RESPONSE

The objective of the science-based stockpile stewardship program is to preserve the safety, performance, and reliability of the Nation's nuclear weapons stockpile. However, the existence of this program is a key element in the U.S. decision to enter into the nonproliferation treaty, as described in the President's statement of August 11, 1995 (see the first box in chapter 2). See also the response to comment 17-4 for a discussion that signatories to the nonproliferation treaty were knowledgeable about hydrodynamic testing.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 24	None required.

RESPONSE

The cited sentence (draft EIS, section 2.5 paragraph 4, lines 7-10) does not reference DARHT and says only that lack of testing, "would not change the status of the United States in terms of proliferation." As noted, FXR would not be closed under any of the DARHT alternatives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 25	Section I.3.2.

RESPONSE

The purpose of an EIS is to identify environmental impacts and compare them among the alternative courses of action analyzed. DOE has prepared a classified supplement to the DARHT EIS, and has incorporated the unclassified aspects of the classified impact analysis in the DARHT EIS. These include the impacts from routine operations regarding dynamic experiments with plutonium, and the consequences of accidents, in the event that they occurred, regarding dynamic experiments with plutonium. See section I.3.2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 26	None required.

RESPONSE

DOE indicated in the Notice of Intent, the Implementation Plan, and the draft DARHT EIS that a classified supplement would be prepared that would provide additional information and analysis. DOE made an unclassified summary of the classified analysis available to the general public and incorporated the impacts in this final EIS. DOE also invited review of the classified supplement (by appropriately cleared individuals with a need to know the information) from the State of New Mexico, the Environmental Protection Agency, and certain Indian tribes. DOE has made all unclassified information and analysis relevant to the DARHT EIS available for public review.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 27	None required.

RESPONSE

The Record of Decision will document the DOE's decision on DARHT. None of the alternatives under consideration would involve any activities that would compromise nonproliferation policy or conflict with the President's decision that the United States will not design or build new nuclear weapons. DOE is strictly adhering to this policy. Under current policy, DARHT will be used only for assessing the safety, performance, and reliability of existing weapons; it will not be used to design new weapons.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 28	Section I.3.1

RESPONSE

DOE agrees with this comment. Use of the 50th percentile meteorology is an assumption where it is equally likely that atmospheric conditions could be greater than or less than the conditions assumed. The final EIS text notes that this is a realistic, rather than conservative assumption.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 29	None required.

RESPONSE

As described in appendix H, potential release during routine operations must pass through multiple HEPA filters and are continuously monitored. No plutonium releases have ever been detected, therefore, it may be assumed that releases are zero. However, to provide a conservative estimate of potential impacts, it was assumed plutonium was released at the threshold of detection of the monitoring instrument. This would be the maximum quantity of plutonium that could conceivably be released.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 30	None required.

RESPONSE

The 50-year committed population dose described was actually the effective dose equivalent to the population. For purposes of this analysis there is no difference between the two dose terms. Evaluating the potential dose which could be received over 50 years is DOE's standard practice so that potential dose (and effects) will not be underestimated, for both populations and individuals. Maximally Exposed Individual (MEI) doses were also calculated for routine exposures and accidents, and estimates were made of the maximum probability of contracting a latent fatal cancer by these hypothetical individuals.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 31	None required.

RESPONSE

The resuspension pathway was included in these analyses.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 32	None required.

RESPONSE

The population of the La Tierra/Las Companos area was included in population dose calculations. The calculations used the latest available population data, from 1993, which are more up-to-date than those available from the 1990 U.S. Census. These data are shown in table H-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 33	None required.

RESPONSE

Because dynamic experiments with plutonium would be analyzed and conducted in such a way that a nuclear explosion physically could not occur, the accident scenario discussed in the EIS involves an accidental detonation of the high explosives and subsequent scattering of vaporized or particulate plutonium metal. The analysis indicates that at most, 12 additional latent cancer facilities might be projected to occur over a 50-year time frame. The dynamic experiments could not possibly result in an accidental detonation of a nuclear weapons primary since these components will not be tested in DARHT. The projected number of latent cancer fatalities (12) was arrived at using the modeling techniques and best available data described in appendix I. The approach in appendix I assumes a realistic scenario for public exposure.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 34	Sections 5.1.9.2 and I.3.2 Table I-7

RESPONSE

DOE agrees that the dose to an noninvolved worker from an uncontained detonation was inadvertently omitted from the unclassified discussion. This has been included in the final version of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 35	None required.

RESPONSE

The hypothetical plutonium accident analyzed in the DARHT EIS involved dispersal of plutonium metal. Impacts to human health have been analyzed. The DOE considered radiological and toxicological impacts to plants and animals and did not identify a measurable impact. See appendix H for a discussion of impacts within the food chain. During the 50 years that the Laboratory has been in northern New Mexico, the region has experienced one of the largest increases in the country in tourism, population growth, and real estate values, even though dynamic experiments with plutonium were performed at LANL during this time. The accident upon which the comment is predicated is incredible.

See response to comment 10-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 36	None required.

RESPONSE

The DARHT EIS analyzes accident scenarios on a "what if" basis, in other words, does not include a projection of the probability that any given accident might occur. The environmental impacts of an accident as identified and analyzed as if the event had occurred. The purpose of a safety study is to determine how safe something (facility, equipment, procedure) would be in order to determine the probability that an accident might occur. While the results of the safety study are instructive to put into perspective the likelihood of occurrence of a postulated accident, the results of the safety study would not change the environmental consequences that would be expected if the accident occur. The purpose of an EIS is to identify possible environmental impacts and then compare them across alternatives to see if there would be any difference in impact if another course of action were to be implemented. Because, as stated in chapter 3.3.2, dynamic experiments with plutonium would be conducted in the same manner (in double-containment vessels) regardless of the alternative, the environmental impacts would not be expected to vary among alternatives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 37	None required.

RESPONSE

Decisions regarding whether or not to proceed with the DARHT Facility are unrelated to whether or not DOE would ever need to produce more plutonium. The text of section 3.3.3 has been revised to discuss facility requirements for dynamic experiments with plutonium.

Existing infrastructure at LANL would support any requirements for plutonium. Because this infrastructure exists independently of DARHT, its activities are not a "connected action" in the NEPA sense, and are not analyzed in this EIS. Waste handling and disposal are similarly part of the LANL infrastructure. As noted in the EIS decontamination and decommissioning (D&D) sections, such as section 5.1.12, most analysis of D&D activities must await determination of conditions when the facilities are designated for D&D.

See response to 18-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 38	Tables S-1 and 3-3, section 3.3.8.

RESPONSE

Waste management impacts for DARHT were evaluated in chapter 5 of the draft EIS. These were inadvertently omitted from the summary table S-1 and have been included in the final EIS. A discussion has also been added to chapter 3 regarding waste management.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 39	None required.

RESPONSE

The DARHT activities over the next 40 years would be known only in a general way. The details of D & D cannot be known until the time to close down DARHT. Appropriate NEPA reviews would be conducted at that time, as stated in the EIS section 3.3.9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 40	None required.

RESPONSE

Known available data is used wherever possible along with recognized, credible modeling codes to compute environmental impacts. When suitable data are not available, there calculations use conservative assumptions consistently for all alternatives. The NEPA process is to be followed using available data, rather than specifying a data acquisition program.

The allegations cited are primarily in the purpose and need chapter, and these are being clarified in text changes and other comment responses.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 41	None required.

RESPONSE

As noted in the EIS, any experiments that would incorporate plutonium would be conducted in double-walled containment vessels. Using this approach in the past, there have been no failures of the containment, not even of an inner wall. Based on this engineering experience, the LANL experimenters believe that vessel failure with a subsequent release to the environment is not a reasonable or credible (less than $1x10^{-6}$ probability of occurrence per year) scenario.

After a test, the vessel is moved to the LANL plutonium handling facility, TA-55, for cleanout and recovery. Most of the plutonium materials are recovered for recycling. The small amount not recovered becomes part of the TA-55 waste stream and loses its identity as DARHT waste.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 42	None required.

RESPONSE

The cited data in table 4-1 are all taken from a LANL publication in 1994. As such, these data are considered to be a complete inventory of emissions in significant amounts for materials likely to be used at a hydrodynamic testing facility. The source document has a more extensive list corresponding to other activities at LANL. These are the most recent data available. Within LANL, time is required to compile, check, and certify the data as well as conduct the review and approval process for publication.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 43	None required.

RESPONSE

DOE did not rely upon result of the LANL air monitoring program in evaluating potential environmental impacts from DARHT or PHERMEX. Rather, this information is presented in chapter 4 of the EIS to present a picture of the potentially affected environment at LANL and the nearby vicinity.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 44	Section 6.1.

RESPONSE

DOE has negotiated a Federal Facilities Compliance Agreement (FFCA) with the Environmental Protection Agency in order to come into compliance with the monitoring requirements of the Clean Air Act regulations governing hazardous air pollutants. This agreement provides for additional monitoring stations. Section 6.1 was revised to update the status of the FFCA.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 45	None required.

RESPONSE

See response to comment 8-28.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 46	None required.

RESPONSE

This table was reproduced from the 1992 Environmental Surveillance Report to provide general information regarding airborne releases from LANL as a whole. Since material usages and potential impacts of the dynamic experiments at PHERMEX and DARHT are dealt with extensively elsewhere in the EIS, both from past operations and for projected DARHT operations, DOE did not feel it was necessary to repeat impacts from dynamic experiments here.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 47	Section 4.8.1.1

RESPONSE

Text will be changed to indicate that LANL exceed the EPA annual standard for radionuclide emissions of 10 mrem in 1990 and was cited. This instance of noncompliance is discussed in greater detail in section 6.1. Operations at PHERMEX and those planned for DARHT are different from those which resulted in exceeding EPA standards.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 48	Table 4-22

RESPONSE

The term is left unchanged in the body of the table because the table is taken from published literature. However, the term is footnoted as follows: "This value includes a radon contribution on the order of 200 mrem, but such a value can vary considerably."

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 49	None required.

RESPONSE

Section 4.9 is descriptive of History of Accidents at LANL. Analysis of accidents is discussed in appendixes I and J.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 50	Section B.8

RESPONSE

Text in various places will be clarified to explain the fate of depleted uranium in the tests. The concept is illustrated in figure B-1, which has been modified to show 10 percent aerosolized (all assumed respirable).

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 51	None required.

RESPONSE

See response to comment 17-41.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 52	None required.

RESPONSE

The cited value is considered bounding and conservative, because transport of test assemblies in TA-15 and TA-16 occurs under much stricter regulations and with much better compliance with regulations than ordinary highway traffic.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 53	None required.

RESPONSE

The value, 10 percent, is derived from an empirically developed distribution of particle sizes produced in similar explosions. The analysis assumes that the empirical distribution accurately describes the particle distributions from tests that would be done at DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 54	None required.

RESPONSE

Rather than conducting analyses to determine if a transportation accident resulting in detonation of the high explosive might occur, the DARHT EIS calculates impacts if such a scenario were to occur. See section 5.7.2 and appendix I.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 55	Section 5.1.7.2

RESPONSE

The text in section 5.1.7.2 has been clarified. Under the No Action Alternative, the partially completed buildings at the DARHT site would be completed for some other purpose. No additional area would be disturbed. The capital costs in table 5-4 (formerly table 5-5) are for completing this construction.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 56	None required.

RESPONSE

The brief analysis for worker protection for noise impulses presented on page C-17 of the draft EIS shows that under no conditions could the threshold limit of 100 noise impulses per day at 140 dB be exceeded. The cycle time used here might apply to simple tests such as firing a series of projectiles against armor plate, but not to setting up hydrodynamic tests or dynamic experiments. The rate of 2 shots/month is used in analyzing the major activities that might occur and is based on previous experience at PHERMEX.

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 57	None required.

RESPONSE

Drilling the sites would provide a preferential path for water infiltration, a path that could be hard to seal. Because the local geology/stratigraphy does not vary much laterally, the nearby core data are deemed sufficiently representative so long as analyses do not indicate marginally acceptable results.

A Federal agency is not required to obtain field data for all conceivable environmental parameters for a given NEPA review; to do so would make the costs of NEPA reviews prohibitively expensive. The CEQ regulations provide for analysis with the best available information and acknowledges that there may be missing or incomplete information [40 CFR 1502.22.]

COMMENT CODE	LOCATION OF EIS REVISION(S)
17 - 58	None required.

RESPONSE

Since 1991, advanced laboratory techniques have been used to detect tritium at ultra-low levels and to determine that recent water (a few decades old) has recharged the main (i.e., deep) aquifer in several locations at LANL. In all instances, main aquifer contamination is located in the northern portion of the LANL site and is associated with a high tritium source concentration in a canyon bottom alluvial aquifer, and with older wells into the main aquifer (constructed with cable-tool drilling techniques and having questionable seals between well-bore and well-casing). In contrast, the Potrillo Canyon, Water Canyon, and Cañon de Valle locations in the southern portion of the LANL site do not exhibit alluvial aquifers and are not locations for wells that penetrate to the main or deep aquifer. Thus, the driving force provided by overlying saturated alluvial sediments, and the short-circuit pathway provided by imperfect seals in boreholes, are both absent in the canyons of interest to the DARHT EIS.

Water travel times from the surfaces of Threemile Mesa and Water Canyon (i.e., reach 12) to the main aquifer are reported in table E4-2 as 298 and 179 years, respectively. The comment that modeling for the EIS found "times for transport to the main aquifer to be in tens of thousands of years" refers to times reported as associated with the occurrence of peak concentrations of highly retarded metals (uranium, beryllium, and lead). Tritium, observed to have migrated into the main aquifer in the northern portion of the LANL site, is highly mobile and moves with the ground water. In the DARHT EIS, analysis has focused on highly retarded metals in an environmental setting that does not offer the same opportunity for rapid vertical migration.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 1	Section 2.1

RESPONSE

While an EIS specifies the purpose and need to which the agency is responding, the primary purpose of an EIS is to analyze the environmental impacts expected to occur if one of the alternatives were to be implemented. However, in response to this and other comments, the DARHT EIS has been revised to better explain the purpose and need. See section 2.1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 2	Sections 2.4 and 3.3.4

RESPONSE

PHERMEX accelerator technology is fundamentally different from that planned for DARHT, and cannot be improved to match the same goals. Neither PHERMEX, FXR, nor PHERMEX and FXR in cooperation (existing or upgraded) can achieve the enhanced radiographic hydrodynamic test capability specified in the EIS.

See response to comment 13-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 3	Section 2.1

RESPONSE

In the past, the DOE has discovered most problems in the stockpile through surveillance programs and has used nuclear testing to resolve them and/or certify the systems when fixed. Thus, there is no history of using hydrodynamic testing alone to either identify or resolve post-deployment problems. The current stockpile systems are certified safe and reliable based on this nuclear testing, among other things. However, new problems are likely to arise eventually as the systems age. For any such problems involving nuclear components, DOE would have to rely on hydrodynamic testing using test assemblies to address the problems and/or certify the fixes.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 4	None required.

RESPONSE

The references cited for chapter 2 are not intended to be an exhaustive list on the subject of the nuclear weapons stockpile. This section arises because the discussion in chapter 2 is meant to describe the purpose and need rather than present arguments for them. The purpose and need arise because the President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile. On August 11, 1995, the President committed to pursue a Comprehensive Test Ban Treaty provided a strong and continuing stockpile stewardship program is in place. Part of this mission is further defined by the NOI for the Stockpile Stewardship and Management PEIS which states that an enhanced radiographic hydrodynamic test capability will be part of that program.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 5	Section 2.1

RESPONSE

Enhanced hydrodynamic testing is clearly needed to improve the current testing capabilities and achieve DOE's mission goals for stockpile stewardship, as descried in chapter 2 of the EIS. However, sections 2.6 of the draft EIS called attention to the fact that DARHT is new technology and as such has uncertainties until the hardware is proven. Until testing is done, there is also some uncertainty in the amount of improvement in the testing results. Acknowledging such uncertainties is realistic engineering, but does not imply expected shortcomings.

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 6	None required.

RESPONSE

In the absence of underground nuclear testing, it is not fully known whether enhanced radiographic hydrodynamic testing will fully satisfy the need for stockpile assurance. However, the President has determined that the United States will not design or build new nuclear weapons, and the DOE is strictly adhering to this policy. Under current policy, DARHT would be used only for assessing the safety, performance, and reliability of existing weapons, and would not be used to design new weapons. The possibility exists that, without nuclear testing, the Nation could not ensure the continued viability of a nuclear deterrent based on the existing weapons in the nuclear weapons stockpile. If stockpile viability could not be ensured, it would be incumbent upon the President to determine whether or not to change the policy to allow the design and building of new nuclear weapons, as well as to evaluate the potential ramifications for nonproliferation policy. On August 11, 1995, the President committed to pursue a Comprehensive Test Ban Treaty provided a strong and continuing stockpile stewardship program is in place.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 7	None required.

RESPONSE

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 8	None required.

RESPONSE

See response to comment 13-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 9	None required.

RESPONSE

This assessment may be based on the Miller report or other unclassified appraisals of problems in the nuclear weapons stockpile. Any such unclassified report is likely to have the same limitations as the Miller report.

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 10	Section 2.3.2

RESPONSE

See response to comment 13-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 11	Section 2.2.1

RESPONSE

The parenthetical phrase presented on page 2-2 of the draft EIS has been changed to read "(even to replace those removed when past their useful life)." Useful life is not a defined engineering term; but as a practical matter, an engineering decision is made on the cost benefits of retaining a system. Design life is an estimate (or an objective) during the design stage of what the useful life will be.

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 12	None required.

RESPONSE

Certainly, regular maintenance will allow a measure of confidence in the stockpile; DOE does not dispute this fact. However, there will be a programmatic need for hydrodynamic testing at any level of stockpile stewardship activity whether at a level greater than currently envisioned in the "Stockpile Stewardship and Management Program" document released as part of the PEIS process or at the less scientifically active and more limiting role of custodial responsibility as outlined in this comment. See section 2.6 and EIS volume 2 section 1.5.

Specifically, under the above proposal hydrodynamic testing would still be needed for:

- Surveillance of existing stockpiled weapons and systems
- Final proof testing of rebuilt weapons (in the absence of underground nuclear testing)
- To support non- and counter-proliferation activities
- To keep expertise of a nuclear weapons cadre as high as possible should the DOE be directed to return to previous levels of nuclear weapons program activity to include design and certification of new weapons and weapons systems.

Given the above, DARHT is a prudent investment to replace an aging 35-year old existing facility (PHERMEX) at LANL since the only other radiographic capability in the United States, FXR at LLNL, would not allow the required level of hydrodynamic testing activity for the weapons program should PHERMEX become non-operational.

Regular maintenance, already done routinely, does not forestall aging problems. Periodic nonnuclear component replacement is already contemplated in order to keep abreast with relevant technological advances.

The remanufacturing approach is likely to be more costly in terms of up-front dollars and environmental burden for the following reasons:

- The restart of old facilities, particularly Rocky Flats, is not feasible.
- New facilities, with increased capacity, will be required to replace warheads at a rate sufficient to forestall potential aging problems; the stockpile will have to be fully remanufactured on a 20 to 30- year time scale, rather than on a 40 to 50-year time scale.

Exact replication, especially of older systems, is impossible. A focus on remanufacturing alone will reduce the technical resources needed to solve future problems in the stockpile.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 13	None required.

RESPONSE

Maintaining "core intellectual and technical competencies" (see box in EIS section 2.1) in nuclear weapons has much more immediate need than the ability to resume weapons design, if such activity is ever needed in the future. A program of certification of the systems in the enduring stockpile requires intelligent assessment of the surveillance results using facilities such as DARHT to better characterize physical phenomena. Intelligent assessment of stockpile issues to plan, execute, and interpret needed tests and experiments is the immediate role for the core intellectual and technical competency.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 14	Sections 2.3.1, 2.3.2, and 2.5

RESPONSE

Although fundamental scientific knowledge about physical processes can be used in a variety of ways, the DARHT capabilities are to be directed at understanding and resolving safety and reliability problems in the weapons stockpile. As time passes the nature of these problems is not necessarily the same as those addressed during design verification.

Chapter 2 has been modified in the final EIS to clarify and better support the purpose and need. The additional information presented is attributable in part to the Stockpile Stewardship and Management Program Plan issued by the DOE in May 1995 and also to clarify some potentially sensitive issues.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 15	Section 2.3.2

RESPONSE

See response to comment 13-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 16	Section 2.3.3

RESPONSE

The existing body of information regarding the intrinsic properties of plutonium is inadequate. For example, DOE needs more information regarding changes in plutonium properties as impurities build up inside the material due to radioactive decay. These changes may affect the ductility of the metal or its reaction to shock heating. In turn, this may affect the behavior of a weapons pit, which may affect the safety or reliability of the weapon. Section 2.3 has been revised to include more information on this subject.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 17	Section 2.3.4

RESPONSE

Chapter 2 has been revised to include additional discussion on the NPT. Section 2.3.4 points out that the U.S. needs to continue to meet international agreements and assist other nations in evaluating nuclear weapons. DOE does not believe that activities allowed under these agreements violate the NPT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 18	Section 2.4

RESPONSE

See response to comment 13-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 19	None required.

RESPONSE

See response to comment 17-4 and response below.

The science-based stockpile stewardship program is much broader than just the program to build and operate DARHT. It is the entire program, not just DARHT, that is offered as one basis for other nations' confidence in the United States nuclear deterrence.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 20	None required.

RESPONSE

See response to comment 10-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 21	Sections 3.3.8 and 5.4.10.3.

RESPONSE

See response to comment 13-16.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 22	None required.

RESPONSE

In the unclassified summary of the classified supplement to the EIS potential environmental consequences of an accidental breech are discussed. The classified supplement examines potential environment impacts of the accident on a "what if" basis, that is, assuming that the accident would occur without consideration of the probability or frequency of occurrence. The summary notes that related DOE safety studies suggests the probability of this accident is less than one-in-one-million per year.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 23	None required.

RESPONSE

The Plutonium Exclusion Alternative was analyzed to allow DOE to compare the environmental impacts of conducting to the impacts of operating the DARHT Facility without dynamic experiments with plutonium at DARHT. DOE needs to conduct dynamic experiments with plutonium (see section 2.3.3). Because of infrastructure consideration LANL is the only site where these could be conducted. In the event DOE would choose to exclude plutonium experiments at DARHT, DOE would need to conduct these dynamic experiments which require radiography at PHERMEX (as has been done in the past). To exclude all dynamic experiments with plutonium from all facilities at LANL would not respond to the DOE's needs.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 24	None required.

RESPONSE

As part of its mission to ensure the continued safety and reliability of the enduring stockpile, DOE needs to conduct dynamic experiments with plutonium. An integral part of DOE's need for the proposed enhanced radiographic capability is to diagnose the results of these dynamic experiments.

As noted by the commenter, DOE considered as unreasonable the alternative of upgrading the FXR facility to provide enhanced radiographic capability for conducting dynamic experiments with plutonium, because it would be too expensive to construct and operate the requisite plutonium handling infrastructure at site 300 at LANL (section 3.10.1.1). However, unless this were done, DOE could not meet its need for enhanced radiographic capability for plutonium experiments.

Although DOE analyzed the Plutonium Exclusion Alternative in order to identify and define the extent of environmental impacts that might be attributable to conducting dynamic experiments with plutonium at DARHT, the EIS points out that this alternative would not meet the DOE's need for enhanced capability to diagnose these experiments (section 3.8). DOE disagrees that including this alternative implies that a facility without plutonium capability would meet its purpose and need for enhanced radiography.

See response to comment 13-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 25	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1 and response below.

Uranium dissolution in surface water (rain) was assumed to be greater than any measured levels at or near the PHERMEX firing point (section E2.2.1). Subsequent modeling showed: uranium concentrations in waters released to nearly Water Canyon could be slightly above the proposed MCL; waters at the discharge sink in Potrillo Canyon an order of magnitude below the proposed MCL; and water at the nearest offsite access an order of magnitude below the drinking water standard (section 5.1.4.1).

Section 5.1.6.1 indicates that the expected air waves at Nake'muu would be a small fraction of the amount needed to cause window breakage (for comparison), and the site has continually stood up to similar airwaves. Nake'muu is considered by most recent scholarship to be an uncompleted structure of about the time of the Pueblo revolt, rather than associated with the Anasazi. The probability that any blast fragments would fall at Nake'muu is extremely small and can be reduced further with mitigation measures.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 26	None required.

RESPONSE

The internal size and configuration of the containment structure would require free-moving robotic devices to accomplish remote cleaning. A wide range of tasks would be required, such as inspection and removal of widely varying sizes and shapes of blast debris; and inspection, repair, and replacement of blast mats on the interior surfaces. A great deal of time and money would be needed to develop either a general purpose or a range of robotic devices, if indeed such is even possible with current and foreseeable technology.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 27	None required.

RESPONSE

A ball of hot gases and aerosolized blast products quickly rises because it is less dense than the surrounding air. As the gases rise, they cool by expansion and mix with surrounding air. In this manner, the effective height for dispersal by winds is about 330 ft (100 m) depending somewhat on the size of the shot.

An extensive discussion of this topic is provided in appendix H.2. The explosive dispersion of the uncontained detonations results in greater dispersion that allows these detonations to be modeled as elevated point-source Gaussian releases for atmospheric dispersion and airborne impact evaluation purposes.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 28	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, and H.5.2

RESPONSE

DOE believes that the revised Preferred Alternative, the Phased Containment Option of the Enhanced Containment Alternative, addresses the central issue of this comment.

DOE believes that it would be highly speculative to try to estimate costs associated with potential soil clean-up 30 years or more in the future. At the current time, too little information exists and estimates of are too nebulous to provide a detailed estimate of cost savings. DOE does believe that the Phased Containment Option of the Enhanced Containment Alternative would have lower associated clean-up costs (ranging from 25 to 90 percent less) than the uncontained alternatives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
18 - 29	Sections 2.3.2 and 2.5

RESPONSE

The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile, and have appropriated funds accordingly. Chapter 2 of the EIS has been revised to more clearly indicate that purpose and need for enhanced hydrodynamic testing capabilities arise from the directives from the President and Congress. It is currently against U.S. policy to design new nuclear weapons systems.

See responses to comments 13-9 and 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
19 - 1	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 1	Section 2.1

RESPONSE

See response to comment 13-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 2	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 3	Section 2.3.2

RESPONSE

See responses to comments 18-29 and 18-8.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 4	Section 2.3.2

RESPONSE

See response to comment 13-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 5	Section 2.5

RESPONSE

See response to comments 13-9, 17-4, and response below.

The EIS discussion of nonproliferation has been revised.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 6	None required.

RESPONSE

The DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 7	None required.

RESPONSE

The Phased Containment Option analyzed in the EIS would use vessels for most tests. Under this option, uncontained tests might be used for large tests, special diagnostics, or tests not involving hazardous materials such as depleted uranium, beryllium, or lead. DOE acknowledges that hydrodynamic tests are expensive and agrees that as much data as possible should be collected.

The cost of each shot, that is, hydrodynamic test or dynamic experiment, varies widely depending on the size of the experiment and its associated diagnostics. The cost may range from over a million dollars for a major hydrodynamic test representing a full system with simulated materials to a few thousand dollars for the simpler, smaller experiments that examine one specific physical property, such as high explosive detonation velocity. At PHERMEX, we conduct about 40 to 50 experiments yearly, 5 to 10 of which are considered major hydrodynamic tests.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 8	Section 4.2.6

RESPONSE

All of the relevant, available data on noise impacts are reported in the EIS (see section 4.2.6). The DOE agrees that additional tests would be of interest, but it does not appear that any additional data would change the analysis. The noise data available were acquired in March 1995 as part of air-wave tests for the Nake'muu site.

Normal conversation is often cited as an example of the 60-dBA sound level. This loudness example has been added to the EIS in section 4.2.6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 9	None required.

RESPONSE

For alternatives that produced identical results for criteria pollutants (DARHT Baseline, PHERMEX Upgrade, Plutonium Exclusion, and Single-Axis) results are discussed only once, under the DARHT Baseline Alternative. Tables S-1 and 3-3 present this information in summary form.

Depleted uranium emissions are the only type of uranium emissions from DARHT or PHERMEX.

Air Quality is less for the enhanced containment alternative than for other alternatives because of a combination of three major factors:

- Source Term. It is conservatively assumed that six percent of the material used annually in the containment is assumed to be released. These releases from containment would be ground-level < 328 ft (< 10 m high) releases occurring as part of normal operations (1 percent) or small failures (5 percent) of the containment structure (building or vessel), rather than elevated releases as for uncontained detonations (section 3.7)
- Atmospheric Dispersion. Less atmospheric dispersion results in greater contaminant concentrations in air. Dispersion of ground-level releases is considerably less than for elevated releases, particularly for nearby locations. In general, ground-level releases impact closer individuals much more than elevated releases, which have greater impact on distant individuals and populations because of the greater dispersion. Thus, even though less material is released via the enhanced containment alternative, the potential for exposure is greater because of the decreased dispersion of ground-level releases.
- Receptor Location. The point where a member of the public could receive the maximum offsite exposure is only 0.55 mi (0.9 km) from the firing point, southwest to State Road 4. This relatively short distance to the receptor and point of air quality determination tends to maximize the issues raised above.

It should be noted that conservative assumptions were made in these estimates of air quality. First, the released material was assumed to be wind-blown directly toward the point of maximum potential public exposure; second, an individual was assumed to be at this point for the full time of material passage, even though it is only a spot near State Road 4 and the LANL boundary and not a residence or business; finally, other parameters in the evaluation were selected to provide reasonable upper-limit (95 percent) estimates of potential impacts that could occur. In reality, it is expected that air quality values would be much smaller fractions of the applicable regulatory limits.

COMMENT CODE	LOCATION OF EIS REVISION(S)
20 - 10	Section 6.9

RESPONSE

Comments from neighboring pueblos have indicated their desire to have less discussion of Native American cultural resources in the DARHT EIS. In deference to these requests, discussion of these cultural resources has been decreased in the EIS. However, a list of consultations with outside agencies and Native American tribes has been added to the EIS. See section 6.9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
21 - 1	None required.

RESPONSE

The DOE recognizes that to acquire certain information additional tests may be required, relative to the Preferred Alternative. However the number of tests that would be conducted under any alternative are driven largely by scheduling and funding concerns; therefore, although to achieve the same amount of information more tests might be required under the Single Axis Alternative, in actual practice DOE would probably forego many additional tests. Note that most of the environmental impacts relevant to this alternative given on an annual basis. Because the time needed to set up a test is not strongly dependent on the use of one or two axes, the number of tests per year probably would be about the same.

COMMENT CODE	LOCATION OF EIS REVISION(S)
21 - 2	None required.

RESPONSE

DOE agrees that under the Upgrade PHERMEX Alternative, the facility would have to be shut down for a long time and there would be programmatic impacts due to such a delay. The shut-down period is noted in the EIS text.

COMMENT CODE	LOCATION OF EIS REVISION(S)
21 - 3	None required.

RESPONSE

The DOE appreciates this assessment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
21 - 4	None required.

RESPONSE

DOE has included in the EIS radiation exposure-to-risk conversion factors and made the conversions from radiation dose to risk of latent cancer fatalities for potentially exposed workers and members of the public. Of particular note is that no latent cancer fatalities are projected from radiation exposure under any of the DARHT activities under any of the proposed activities involving depleted uranium or tritium. DOE believes other sources are available that may serve as a radiation primer and provide information as to relative risk assessment and comparison.

COMMENT CODE	LOCATION OF EIS REVISION(S)
21 - 5	None required.

RESPONSE

See response to comment 20-7 and response below.

DOE appreciates this suggestion. Consideration can only be qualitative until specific tests and specific add-on experiments are identified.

COMMENT CODE	LOCATION OF EIS REVISION(S)
22 - 1	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
22 - 2	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 1	None required.

RESPONSE

The LANL sitewide EIS will address ultimate disposition of radioactive waste stored or disposed from all LANL activities, and the contributions from any alternatives analyzed in the DARHT EIS would be only a small percentage of that total; these contributions are discussed in the EIS. The DOE is preparing a PEIS on waste management at all of its sites [NOI 55 FR 42633] that will be used to help establish a Department-wide waste management policy. See section 3.3.3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 2	Section 5.1.10

RESPONSE

The typographical error has been corrected.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 3	None required.

RESPONSE

Fabrication of parts that would be used at DARHT is addressed in section 3.3.3 and table 3-1. DOE would conduct dynamic experiments with plutonium and hydrodynamic tests using hazardous or radioactive material under all alternatives analyzed in the DARHT EIS, including No Action. These activities would not bear on DOE's decisions regarding enhanced radiographic capability.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 4	None required.

RESPONSE

The measurable cumulative impacts are discussed in section 5.9. DOE acknowledges that LANL is an alternative site for many actions under the SS&M PEIS as described in the NOI for that PEIS. However, these potential activities are too speculated to be assessed in detail at the time. DOE believes that DARHT is justified independently of any SS&M decisions. See also, section 2.6 and volume 2, section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 5	Section 2.6 and volume 2, section 1.5.

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2 section 1.5 for information on the relationship of the DARHT EIS to other DOE EISs.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 6	None required.

RESPONSE

Direction by the President and Congress for DOE to ensure the safety, security, and reliability of the nuclear weapons stockpile create current responsibilities, not ones that are activated for each of these elements when an issue for that element arises. Some safety and reliability issues can perhaps be addressed to some extent with current technology, but DARHT technology would better elucidate the physical processes involved. Competence to address a fuller spectrum of issues will require the temporal and spatial resolution provided by DARHT. Because such a facility requires years to construct, equip, and bring up to full operational capability, DOE concludes a need to proceed now. Relevance of the PEIS does not necessarily preclude or terminate activities that will be discovered in the PEIS. Since the action is urgent but not an emergency, 40 CFR 1506.11 does not apply.

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 7	Section 2.3

RESPONSE

Chapter 2 of the DARHT EIS has been revised to provide more information on why enhanced radiographic testing cap[ability is needed to assure stockpile safety and reliability.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 8	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 9	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 10	None required.

RESPONSE

In February 1991, the DOE issued a Notice of Intent (NOI) to prepare the Reconfiguration PEIS to analyze its proposal to reconfigure the nuclear weapons complex to be smaller, less diverse, and more efficient [56 FR 5590]. In July 1993, the DOE revised the Notice to reflect the fact that the future nuclear weapons complex could be smaller and more integrated than previously envisioned [58 FR 39528]. The revised NOI included an alternative of upgrading existing facilities in place at existing sites rather than relocating them. In October 1994, the DOE separated the Reconfiguration PEIS into two separate reviews [59 FR 54175]: the "Tritium Supply and Recycling PEIS" (DOE/EIS-0161D) issued in draft in March 17, 1995, and the SS&M PEIS. Instead of pursuing the upgrade in-place alternative, as it was envisioned in July 1993, DOE has instead taken action to discontinue a weapons complex role at many of the sites formerly considered to be part of the nuclear weapons complex. The NOI for the SS&M PEIS, [59 FR 14433] lists eight nuclear weapons complex facilities, including facilities contained within larger sites with nondefense management (such as the tritium facilities at the Savannah River Site, which is considered overall to be an Environmental Management site rather than a weapons complex site). For comparison, in 1990, DOE listed 14 major sites that comprised the nuclear weapons complex.

DOE agrees that the SS&M PEIS is an evolution from the former Reconfiguration PEIS, but disagrees that the proposed scope of the SS&M PEIS falls within any one alternative discussed in the Notices for that PEIS. In any event, the scope of the DARHT EIS is different from the scope of the Reconfiguration PEIS or the SS&M PEIS.

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 11	None required.

RESPONSE

The No Action Alternative is a continuation of current activities and is not ruled out. DOE has continually worked to maintain and improve its hydrodynamic testing capability at LANL and LLNL. However, the need for enhance radiographic hydrodynamic capability cannot be met by continuing to use existing facilities at LANL and LLNL. Any discussions related to the SS&M mission and the LANL SWEIS will not alter the alternatives presented in the DARHT EIS. The No Action Alternative serves as a basis for comparison for the other alternatives analyzed in the DARHT EIS; if none of the other alternatives were pursued, that is, if no new course of action were taken, DOE would continue with its present program.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 12	None required.

RESPONSE

The DARHT Facility is intended to address issues arising from DOE's mission to ensure safety and reliability of the nuclear weapons stockpile. Although basic physics information could have some design significance, the information from DARHT would be quite inadequate to develop a new design in the absence of nuclear testing.

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 13	None required.

RESPONSE

Enhanced radiographic capability proposed for DARHT would be limited to hydrodynamic tests and dynamic experiments. The scope and context of a CTBT, including any references to hydrodynamic testing will result from negotiations by the signatory parties. The U.S. supports a CTBT, and DOE believes that its hydrodynamic testing program planned for the next several years provides a strong foundation for that support by allowing the Nation to maintain a means (hydrodynamic tests) other than underground nuclear tests to assure the future safety, performance, and reliability of the weapons stockpile.

See also response to comment 17-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
23 - 14	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
24 - 1	Sections 2.4, 3.3.4 and 3.10.5.

RESPONSE

See response to comment 13-13 and section 3.10.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
24 - 2	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
24 - 3	None required.

RESPONSE

DOE agrees that any of the waste products from its operations should not be allowed to "ruin" Pajarito Plateau or any of the adjacent areas. LANL has numerous programs that prescribe how the waste products are handled and a monitoring network that provides information on the levels of contaminants found in the environment. These programs are described to some degree in the DARHT EIS and in more detail in the LANL annual Environmental Surveillance Reports (LANL 1993c and LANL 1994a).

COMMENT CODE	LOCATION OF EIS REVISION(S)
24 - 4	None required.

RESPONSE

DOE and LANL are working to improve communication with the general public in a variety of ways. Processes such as this NEPA review afford an opportunity for the DOE and LANL to provide information on specific projects and explain the rationale for recommending that a certain course of action be taken or not be taken. One of the underlying purposes of NEPA is to open the Federal decision-making process to public scrutiny, and to invite public participation in the decision-making process.

COMMENT CODE	LOCATION OF EIS REVISION(S)
24 - 5	None required.

RESPONSE

DOE disagrees that there have been no technological benefits from nuclear weapons spending over the past 50 years. Many advances in technology that are in common use today, from satellite communications to electronics to plastics, have benefited from research and development funded by the government in response to the need for improving nuclear weapons.

COMMENT CODE	LOCATION OF EIS REVISION(S)
25 - 1	Table 5-19

RESPONSE

Table B-4 provides a definition of "other metals" for PHERMEX. The PHERMEX "other metals" are aluminum, boron, brass, iron, inconel, niobium, nickel, silver, tin, titanium, tantalum, tungsten, and vanadium. Plutonium is not listed in the "other metals" category. Table 5-19 (formerly table 5-20) will be revised to reflect the PHERMEX "other metals" list.

COMMENT CODE	LOCATION OF EIS REVISION(S)
25 - 2	Sections 5.1.8, 5.1.9, 5.1.9.1, 5.1.9.2, 5.1.9.3, 5.4.8, 5.4.9, and 5.7.2.2

RESPONSE

See response to comment 10-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
26 - 1	None required.

RESPONSE

A discussion of why additional alternatives that would end weapons research were not analyzed in the EIS is provided in section 3.10.

COMMENT CODE	LOCATION OF EIS REVISION(S)
26 - 2	Section 4.6 Tables 4-14 and 4-15

RESPONSE

DOE agrees that the Pajarito Plateau, including the lands comprising LANL, constitute a rich archeological heritage. The DARHT EIS, section 4.6, notes the archeological and historical sites in the vicinity of the DARHT and PHERMEX sites, and whether they are listed or would be eligible for the National Register of Historic Places under the provision of the National Historic Preservation Act. This section has been revised in response to public comments received and further consultation with the State and Indian tribes. DOE will continue to consult with the four Accord tribes on a government-to-government basis to ensure protection of traditional cultural properties.

COMMENT CODE	LOCATION OF EIS REVISION(S)
26 - 3	None required.

RESPONSE

As noted in section 5.9 paragraph 3, the value 239 person-rem is for the year 1993 and represents the total of all doses estimated for all 7,000 workers at LANL. The text also notes that the contributions from PHERMEX activities for 1993 was 0.3 person-rem, about a tenth of one percent of the total. For an individual basis, the average of all exposures would be about 0.34 rem (34 mrem). Clearly, different workers have different exposures; the cumulative dose is not a good way to consider individuals. Though not an impact from LANL operations, natural background, medical x-ray, etc., produce exposures estimated to be about 300 mrem/yr for persons living around LANL.

COMMENT CODE	LOCATION OF EIS REVISION(S)
26 - 4	None required.

RESPONSE

Over the past decade, the number of tests per year conducted at PHERMEX and DOE's other firing sites has varied from a few to a few dozen. Future testing could show as much variability. Sometimes one explosion is considered a test; other times a series of closely related explosions constitute a single test.

These tests are scientifically valid in that they are physical measurements of physical phenomena. The results are used to validate engineering and scientific predictions or analyses of the physical phenomena.

Because of the time and cost to set up each test, LANL staff try to minimize the number of tests and extract the maximum information from each test. Specific research objectives would depend on priorities among problems identified with stockpile items or other concerns.

COMMENT CODE	LOCATION OF EIS REVISION(S)
26 - 5	None required.

RESPONSE

The text states that the annual probability for earthquake occurrence is low. Section 4.3.4 indicates these probabilities are on the order of 10^{-4}. This means the average time between large earthquakes on nearby faults is about 10,000 years. The most recent large earthquakes on two of these faults are dated approximately at 4,000 to 6,000 and 8,000 to 9,000 years ago, respectively. Potential damage to facilities is mitigated by structural and equipment design. Damage that might occur is not deemed to result in environmental releases.

COMMENT CODE	LOCATION OF EIS REVISION(S)
27 - 1	None required.

RESPONSE

The DARHT EIS provides the level of information on the DARHT project and other alternatives analyzed sufficiently to support the "bounding analysis" of environmental impacts included in the EIS. The DOE's LAAO DARHT EIS Project Office and its parent AL EIS Program Office are responsible for providing information regarding the NEPA review and other aspects of the EIS process. However, those offices do not have the technical expertise for in-depth discussions of the hydrodynamic testing program or issues regarding nuclear weapons. The commenter was referred to LANL's Nuclear Weapons Technology Program Office; DOE apologizes for the confusion and miscommunication regarding the commenter's earlier request for information.

COMMENT CODE	LOCATION OF EIS REVISION(S)
28 - 1	None required.

RESPONSE

At each session of the public hearings on the draft EIS, DOE specifically noted that comments were invited on the adequacy and accuracy of the content of the entire EIS, as well as any other matter pertaining to the environmental review process (see public hearing transcripts). Comments on the purpose and need chapters are welcomed.

DOE recognizes that people who work at its offices or facilities have the same rights as other citizens to participate in the NEPA review process. DOE employees and contractors generally work and live in the communities affected by DOE proposals or alternatives. The DOE Los Alamos Area Office's "Policy Enhanced Opportunities for Stakeholder Involvement in the National Environmental Policy Act Review Process" dated August 3, 1994, specifically states that DOE and Los Alamos National Laboratory employees may participate in the public review process for NEPA, as long as they indicate whether they are speaking in an official capacity or as a private citizen. Public participation is invited in a NEPA review process to provide additional information or correct factual errors in a draft EIS. DOE weighs the content of each comment on its own merits, including those offered by its own employees and contractors.

COMMENT CODE	LOCATION OF EIS REVISION(S)
28 - 2	None required.

RESPONSE

The public hearings on the draft EIS were patterned after the public scoping meetings held in December on the DARHT EIS. At that time people with differing points of view indicated that the roundtable format was preferred over other formats for public meetings used in the past by DOE (see scoping meeting transcripts). As stated at the public hearings, DOE included three types of areas: a comment room, where people could provide formal comments in a private setting; an information area, where people could entertain informal discussions with knowledgeable laboratory and DOE personnel; and a roundtable discussion. DOE was amenable to providing a choice for the format of the roundtable to provide either an opportunity to present spoken or written material into the record without DOE or laboratory comment; an opportunity to ask questions of DOE and laboratory officials and receive answers; or an opportunity for a roundtable discussion among those of differing points of view. The format shifted several times during the sessions in response to requests from the people attending (see transcripts of scoping meetings and public hearings). Although some people stated that they were uncomfortable with the roundtable discussion, others indicated that they preferred it.

COMMENT CODE	LOCATION OF EIS REVISION(S)
28 - 3	None required.

RESPONSE

The DARHT EIS is a DOE document and represents the point of view of the DOE. It is prepared to provide DOE decision-makers with environmental information to assist them in making an informed decision. It is not intended as a document where either the DOE or its contractors employed at LANL "make a case" in support of a DOE proposal.

COMMENT CODE	LOCATION OF EIS REVISION(S)
29 - 1	None required.

RESPONSE

Although DOE does not develop U.S. policy it does believe the U.S. provides leadership for control, inspection, and reduction of nuclear materials/weapons, and is pleased to be a part of this effort.

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
29 - 2	None required.

RESPONSE

The size of the nuclear weapon stockpile is decided by the President and Congress. While the exact size of the stockpile remains classified, the size has decreased dramatically over the past few years and is expected to increase further over the next few years. DOE agrees that reliability of the stockpile is a concern, and this is addressed in the DARHT EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
29 - 3	None required.

RESPONSE

DOE agrees that all test ban treaties should be honored.

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
29 - 4	None required.

RESPONSE

If the ROD to be issued following the DARHT EIS includes further construction for the DARHT facility, DOE will work to finish the facility as quickly as possible within the constraints of legal action, sound construction practices, and mitigation measures identified in the ROD.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 1	Tables S-1, 5-1, 5-5, 5-10, C1-8, and C1-16.

RESPONSE

Data describing NO_2, PM_{10}, and SO_2 for the No Action and DARHT Baseline Alternatives are presented in tables 5-1, 5-5, C1-8, and C1-16. For other alternatives, these pollutants are compared in the text to the two alternatives mentioned above. Additional tabulated data are provided as appropriate, such as for the Enhanced Containment Alternative (see table 5-10).

The Air Quality sections and appendix C1 have been revised to better explain contributions to the NO_2, SO_2, and PM_{10} emissions. Air quality values in table S-1 have been revised to reflect the contribution from all applicable emissions sources for each alternative. All of the chapter 5 tables mentioned in the comment have been revised, and several have been moved to appendix C1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 2	None required.

RESPONSE

Table 5-5 (formerly table 5-6) presents emissions in terms of concentrations and compares these concentrations to regulatory limits. Table C1-3 presents emissions in terms of quantities per unit time.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 3	None required.

RESPONSE

Table C1-8 (formerly table 5-7) presents emissions in terms of concentrations and compares those concentrations to regulatory limits. Table C1-7 (formerly table C1-6) presents emissions in terms of quantities per unit time.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 4	Sections 5.1.2.1.1, 5.2.2.1.1, 5.3.2.1, 5.4.2.1.1, 5.4.2.1.2, 5.5.2, 5.6.2.1, and 5.6.2.2 Tables S-1 and 3-3

RESPONSE

DOE agrees that errors were made in preparing some of the air quality tables. A number of these errors were in changing from fraction to percent of applicable limits. The text has been revised to correct these errors.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 5	None required.

RESPONSE

The Preferred Alternative (complete the DARHT Facility) in the draft EIS is now called the DARHT Baseline Alternative in the final EIS, and a new preferred alternative has been selected. The new preferred alternative is the Phased Containment Option of the Enhanced Containment Alternative. The DARHT Baseline Alternative was modeled as 100 percent uncontained, elevated releases due to the explosive, buoyant dispersion of the detonated material. The Enhanced Containment Alternative consists of three options. The Building Containment Option assumes 100 percent contained detonations, with 6 percent of the material released as part of normal operations as ground-level releases, <30 ft (< 10 m). The Vessel Containment Option assumes that 25 percent of the annual usage of material is as open air detonations; of the remainder, detonated in containment, 6 percent are released as part of normal operations and minor vessel failures. The Phased Containment Option (now the preferred alternative) is similar to the Vessel Containment Option except the proportion of shots that are contained starts lower and increases in steps as time passes (see section 3.7.2.3 and figure 3-10). However, the distinction between, and possible dose consequences of, elevated versus ground-level releases is very important for all the options.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 6	Table C1-11

RESPONSE

The material used under each alternative on an annual basis is the same (for example, 1540 lb (700 kg) per year of depleted uranium). Quantities of materials released to the environment for each alternative are provided in table 3-4. Values in the draft EIS table for the Enhanced Containment Alternative (vessels) were incorrect. These values should have been increased by about a factor of 5 to 29.5 percent of the No Action and DARHT Baseline Alternative (which was called the Preferred Alternative in the draft EIS), using the fractions that depend on effective release height. Differences in dispersion that occur at ground level and elevated levels are very important. Table C1-11 (formerly C1-8) has been changed.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 7	Table C1-11

RESPONSE

Table C1-11 (formerly table C1-8) and dependent results have been revised to reflect a new analysis which includes use of the {X-bar/Q'} atmospheric dispersion; use of the 1-hour X/Q has been discontinued. Use of the E/Q dispersion factor is not appropriate in this situation because impacts on air quality are compared to long-term (30-days, calendar quarter) regulatory standard periods which assume continuous or chronic emissions, where {X-bar/Q'} is the appropriate factor. Use of the E/Q atmospheric dispersion is appropriate for situations up to 8 to 24 hours.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 8	None required.

RESPONSE

Although the starting point of the uncontained detonations is a table at essentially ground level, the subsequent detonation results in the debris being moved as a buoyant cloud to a much higher effective release height. The debris cloud is generally characterized as a "stem and cap." Appendix H, section H.2.2 describes an evaluation done to determine if simpler, Gaussian plume modeling techniques could be used to approximate the stem and cap model. It was determined that an elevated Gaussian plume release could be used to conservatively simulate the "stem and cap" model.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 9	None required.

RESPONSE

Alternatives that include uncontained detonations have lower nearby impacts [i.e., 0.9 mi (1.45 km) southwest] because of the greater dispersion of the elevated release.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 10	Tables S-1, 3-3, 5-1, and C1-11

RESPONSE

Table 5-1, and subsequent summaries in tables S-1 and 3-3, were revised to reflect the revised evaluation documented in table C1-11.

See response to comment 30-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 11	Tables S-1, 3-3, 5-1, 5-10, and C1-11

RESPONSE

Differences between table 5-10 (formerly table 5-12) and tables S-1 and 3-3 were the result of errors computing and/or converting between fraction and percentage of the applicable regulatory limit. Values for table C1-11 (formerly table C1-8) were reevaluated, and the resultant tables 5-10 (formerly table 5-12), S-1, and 3-3 were revised. Consistency among tables has been maintained in the final EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 12	Sections 5.1.2.1.1, 5.2.2.1.1, 5.3.2.1, 5.4.2.1.1, 5.4.2.1.2, 5.5.2, and 5.6.2 Tables S-1, 3-3, 5-10, and C1-11

RESPONSE

See response to comment 30-11.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

30 - 13 None required.

RESPONSE

The numbers in question are for the the 30-year lifetime of the project. An average dose (0.02 rem annually) per worker would be an average of 0.6 rem over the 30-year project lifetime. Assuming 100 workers over the 30-year lifetime, the collective worker dose would be 60 person-rem. Both values should remain as stated in the tables.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

30 - 14 None required.

RESPONSE

As shown in table 3-3, it is estimated that worker doses under the Enhanced Containment Alternative would be about twice that of the uncontained alternatives. The estimated number of involved workers is the same as that for the uncontained alternatives.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

30 - 15 Section "Measurements and Conversions"

RESPONSE

The text of the EIS has been revised to incorporate this comment.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

30 - 16 None required.

RESPONSE

DOE appreciates this comment.

DOE has revised chapters 2 and 3 to better explain the purpose and need of DARHT and to provide additional clarification among the alternatives, as well as present the new Preferred Alternative, the Phased Containment Option of the Enhanced Containment Alternative. DOE believes that it has presented DARHT's unclassified unique capabilities, however, certain capabilities remain classified and are addressed in the classified supplement.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

30 - 17 None required.

RESPONSE

DOE has employed a professional technical editor to integrate the work of the many authors listed, and strives to prepare this NEPA review in plain (nontechnical) language to reduce the length of the document and increase public understanding. However, DOE is aware that hydrodynamic testing and the nuclear weapons program in general are highly technical, complicated topics.

The appendixes are necessarily more technical in nature and are intended to provide supporting information for specialists.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 18	None required.

RESPONSE

DOE has reviewed this suggestion and feels that the adding references to the sources of information in other parts of the EIS would make the table too congested. However, the comment is appreciated.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 19	Sections 5.1.2.1.1, 5.2.2.1.1, 5.3.2.1, 5.4.2.1.1, 5.4.2.1.2, 5.5.2, 5.6.2.1, and 5.6.2.2 Tables S-1, 3-3, 5-10, and C1-11

RESPONSE

The text and tables in the air quality sections have been revised to provide a more detailed explanation of assumptions used in modeling and description of impacts. All calculations and data presented in the tables have been reviewed for accuracy and consistency.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 20	None required.

RESPONSE

A NEPA review provides a comparative analysis of the environmental impacts of a proposal, and reasonable alternative ways of responding to the specified purpose and need [CEQ Regulations, 40 CFR 1502.13]. The "No Action Alternative" serves as a basis for comparison regarding the environmental impacts of the other alternatives, including the proposed action.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 21	None required.

RESPONSE

DOE does not believe that the action and alternatives analyzed in the DARHT EIS are connected to actions proposed for other parts of the weapons complex; therefore, the DARHT EIS does not predict impacts, including socioeconomic impacts, on other parts of the complex.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 22	Tables 5-4, 5-8, 5-9, 5-13, 5-14, 5-15, G-1, and G-2

RESPONSE

DOE agrees. The columns have been added.

COMMENT CODE	LOCATION OF EIS REVISION(S)
30 - 23	Sections 3.3.2, 3.3.8, 5.1.9, 5.7.2.2, I.3.1, and J.6.1 Tables I-14 and I-15

RESPONSE

As noted in the DARHT draft EIS section 2.1, some aspects of the hydrodynamic testing and dynamic experiment program, and the related environmental assessment of alternatives, are classified as Secret Restricted Data under the provisions of the Atomic Energy Act of 1954 as amended to protect national security. DOE prepared a classified supplement to the DARHT EIS that contains additional information and analysis. After review of this material, DOE determined that certain aspects of the impact analysis could be presented in an unclassified summary and made the summary available to the general public in May 1995. DOE has revised the EIS in several places to incorporate this information. See chapters 3 and 5 and appendixes I and J.

COMMENT CODE	LOCATION OF EIS REVISION(S)
31 - 1	Sections 3.3.4 and 3.10.5

RESPONSE

See response to comment 13-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
31 - 2	Sections 3.3.3 and 3.10.1.2

RESPONSE

The DARHT draft EIS does discuss the required infrastructure that is necessary to support hydrodynamic testing operations; see section 3.3.3. Using multiple sites to perform the necessary testing would be highly inefficient with regard to time and costs as discussed in section 3.10.1.2. DOE has revised these sections of the EIS for clarity.

COMMENT CODE	LOCATION OF EIS REVISION(S)
31 - 3	None required.

RESPONSE

See EIS volume 2 section 1.5 and response below.

The Congress established the national laboratories, under DOE's predecessor agencies, as competitive organizations. The labs are charged with responsibility for solving technological problems encountered in the various areas of DOE's mission. Although the labs compete with each other to obtain work in various portions of a program, they generally work hand-in-hand in sharing data to solve pieces of the puzzle.

COMMENT CODE	LOCATION OF EIS REVISION(S)
32 - 1	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
32 - 2	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
33 - 1	Section 4.2.6 Table C2-4

RESPONSE

The test was focused on shock and noise effects at Nake'muu. Other data were acquired as possible, but the test was not set up specifically for noise measurements in communities. The data obtained in communities were consistent with expectations and an extended set of tests under various atmospheric conditions does not seem justified in terms of time and cost. The data in table C2-4 have been reviewed and corrected.

A sound level of 60 dBA is characteristic of normal conversation level.

COMMENT CODE	LOCATION OF EIS REVISION(S)
33 - 2	None required.

RESPONSE

The discussion of cumulative impacts in the EIS addresses the potential impacts that are insignificant when viewed separately but may become significant when viewed together. The contribution to overall LANL emissions of criteria pollutants under any of the alternatives analyzed in the DARHT EIS would be inconsequential in terms of cumulative impacts. DOE did not consider "heating" to be a potential environmental impact of concern; nor would DOE expect "heating" to vary among alternatives (that is, result in an environmental change or impact).

COMMENT CODE	LOCATION OF EIS REVISION(S)
33 - 3	None required.

RESPONSE

Table 4-4 was reproduced from the LANL 1992 Environmental Surveillance Report (LANL 1994a), which includes potential impacts from dynamic experiments separately from point source emissions. Since material usages and potential impacts of the dynamic experiments at PHERMEX and DARHT are dealt with extensively elsewhere in the EIS, both from past operations and for projected DARHT operations, DOE did not feel it was necessary to repeat impacts from dynamic experiments here.

Depleted uranium emissions are the only type of uranium emissions from DARHT or PHERMEX.

COMMENT CODE	LOCATION OF EIS REVISION(S)
33 - 4	Section 5.4.2.1.1, 5.4.2.1.2, and C1.3.3 Tables S-1 and 3-3

RESPONSE

The EIS has been revised to provide a clearer explanation of the modeling for the Enhanced Containment Alternative.

See response to comment 20-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
33 - 5	None required.

RESPONSE

See response to comment 18-27.

COMMENT CODE	LOCATION OF EIS REVISION(S)
34 - 1	None required.

RESPONSE

If the DOE were to select the PHERMEX Upgrade Alternative, it would not be necessary to prepare a separate EIS given that the PHERMEX Upgrade Alternative was fully evaluated in the DARHT EIS. DOE will provide the rationale for its final decision in the ROD, including the rationale to select the Upgrade PHERMEX Option if that was its final decision.

COMMENT CODE	LOCATION OF EIS REVISION(S)
34 - 2	None required.

RESPONSE

Enhanced containment could be implemented with vessels after DARHT becomes operational. The containment building also could be added later to the DARHT structure, but incremental costs would be higher and testing would be interrupted during its construction. The Plutonium Exclusion Alternative, as described in the EIS could be implemented later, but if implemented after closure of PHERMEX, would not meet the DOE's stated purpose and need to conduct dynamic experiments with plutonium.

COMMENT CODE	LOCATION OF EIS REVISION(S)
34 - 3	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
34 - 4	None required.

RESPONSE

During the major construction that would be needed to implement the upgrade, the PHERMEX Facility would not be available to conduct tests. If DOE decides to pursue this alternative, when the upgrade is complete, the use would be identical to that described for the DARHT Baseline Alternative.

COMMENT CODE	LOCATION OF EIS REVISION(S)
34 - 5	None required.

RESPONSE

A forest fire would impact surface water contaminant migration by increasing the amount of surface runoff available to mobilize and transport contaminants from the firing site to the canyon channels. The greater water volume in the channel system would increase flow rates, allow more contaminant mass in solution, and increase the erosion and transport of sediment-sorbed contaminants. As a result, the increased volume of water and contaminant mass would move through the channel system more rapidly. Recovery of grasses, forbs, and shrubs after a forest fire can be relatively rapid in comparison to the time required for conducting heavy metals away from a firing site.

However, the occurrence of forest fires and the recovery of the ecological system such that runoff returns to typical values can be problematical. The density of trees, the length of fire interval (and hence the density of fuel), and the type and porosity of soil all play a role in determining whether a burn is light or severe, and the depth to which roots are killed in the soil profile. The climatic conditions following a fire also play a significant role, especially precipitation and temperature. Drought conditions can delay recovery while daily thunderstorms, which provide a steady supply of soil moisture, can alleviate stress in trees and promote the germination of grasses, forbs, and shrubs. A study conducted in the wake of the La Mesa fire has shown that biomass production of grasses and forbs after two growing seasons was about 2.5 times that of a predominantly native grass cover of an open pine stand (Potter and Foxx 1992). This implies that runoff may return to typical values very quickly in response to regermination of grasses and forbs in impacted areas. Because release of heavy metals from firing sites is a long-term process, neglect of the potentially short-term impact of a forest fire seems reasonable.

Potter, L.D. and T. Foxx. 1981. *Postfire Recovery and Mortality of the Ponderosa Pine Forest after La Mesa Fire*, pages 39-55 in La Mesa Fire Symposium, held at Los Alamos, New Mexico, October 6-7, 1981. LA-9236-NERP. Los Alamos National Laboratory, Los Alamos, New Mexico.

COMMENT CODE	LOCATION OF EIS REVISION(S)
34 - 6	None required.

RESPONSE

There could be some limitations. The containment vessel planned would have optical ports as would the optional extension modules, so a test would have to be configured to use the optical access as it would be available.

COMMENT CODE	LOCATION OF EIS REVISION(S)
35 - 1	None required.

RESPONSE

See response to comment 28-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
35 - 2	None required.

RESPONSE

See response to comment 28-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
36 - 1	None required.

RESPONSE

The costs associated with decommissioning and cleanup are not considered to be discriminating factors among the alternatives. All of the alternatives, except building containment, including the Phased Containment Option of the Enhanced Containment Alternative (the Preferred Alternative), would conduct some level of open air testing continually through the life of the project.

The initial costs of the Phased Containment Option would be about $30 million higher than implementing the DARHT Baseline Alternative. However, the projected cost over the life of the project would not be substantially different.

Although the EIS does not provide a cost-benefit analysis or a detailed discussion of life-cycle costs, costs of the various alternatives are summarized in table 3-4. DOE believes that the revised Preferred Alternative, the Phased Containment Option of the Enhanced Containment Alternative, would be cost effective over the lifetime of the project.

COMMENT CODE	LOCATION OF EIS REVISION(S)
36 - 2	None required.

RESPONSE

The bulk of increased cost for the Enhanced Containment Alternative is due mainly to increased construction and operating costs of the vessels (Vessel Option) and the associated Recycling Facility, or containment building (Building Option). There would be some cost associated with small quantities of mixed waste; however, one of the purposes of the Recycling Facility would be to minimize the quantity of potential mixed waste generated.

COMMENT CODE	LOCATION OF EIS REVISION(S)
36 - 3	None required.

RESPONSE

The intent of the EIS is to examine potential environmental impacts from the proposed action. To this end, the EIS assumes that potential accidents occur on a "what if" basis, to provide a reasonable upper limit on environmental impacts without consideration of the reliability or probability of occurrence. Overall safety and reliability of hydrodynamic testing operations would be addressed as part of the overall LANL Industrial Safety and Explosive Safety Programs.

COMMENT CODE	LOCATION OF EIS REVISION(S)
36 - 4	None required.

RESPONSE

Section 3.10.7 addresses an alternative not considered in the EIS, namely, relinquishing reliability of the nuclear stockpile. The only point made in the text is that the President and Congress have directed DOE to maintain a safe, secure, and reliable nuclear deterrent. The italicized reference to DARHT is part of the scoping comment from the public.

COMMENT CODE	LOCATION OF EIS REVISION(S)
36 - 5	None required.

RESPONSE

The uranium is not found on the hair, but incorporated in the hair. Thus the hair is being used as an indicator of possible uranium in the food supply for the elk. Regardless of how these levels and their standard deviations are interpreted, a hunter could not inhale this material as particulates, and is not likely to ingest very much hair, if any, while dressing out a carcass.

COMMENT CODE	LOCATION OF EIS REVISION(S)
37 - 1	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

The DARHT EIS, section 3.7, indicates that under enhanced containment, for the Building Containment Option all tests and experiments would be contained, and that under the Vessel Containment Option most tests and experiments would be contained.

DOE has prepared a revised Preferred Alternative, which is the Phased Containment Option of the Enhanced Containment Alternative, that addresses concerns raised in this comment. See section 3.7.2.3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
37 - 2	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

Both the Building Containment Option and Vessel Containment Option under the Enhanced Containment Alternative would require some limitations on size, type, and diagnostic techniques for tests and experiments. The Preferred Alternative, Phased Containment Option, would minimize such limitations but would still impose more limitations than the DARHT Baseline Alternative (formerly the preferred alternative in the draft EIS). It represents a commitment to continual improvement in environmental protection, and provides the practical basis for implementing full containment for succeeding generations of hydrodynamic test facilities.

COMMENT CODE	LOCATION OF EIS REVISION(S)
37 - 3	None required.

RESPONSE

See response to comment 20-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
37 - 4	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
38 - 1	None required.

RESPONSE

DOE agrees that the levels of contamination from PHERMEX operations are insignificant; however, DOE will continue to monitor all potential impacts associated with PHERMEX and DARHT. The actions taken to mitigate potential impacts from the course of action selected in the ROD following the DARHT EIS will be presented in the Mitigation Action Plan.

COMMENT CODE	LOCATION OF EIS REVISION(S)
38 - 2	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
39 - 1	None required.

RESPONSE

Construction of DARHT has ceased pending resolution of a court injunction issued in January, 1995.

COMMENT CODE	LOCATION OF EIS REVISION(S)
39 - 2	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
39 - 3	None required.

RESPONSE

See response to comment 17-12.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 1	None required.

RESPONSE

See response to comment 10-1 and chapter 2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 2	None required.

RESPONSE

Because tests and their objectives can vary, there is no unique value for a source term per shot. The EIS discussions are based on average annual rates for the most part. If plutonium were used in a test, the assembly would be enclosed in a double-walled vessel and no release would be expected at the firing point, as the commenter suggests. However, there would be small impacts to the waste stream from the facility where the vessels are cleaned and materials are recovered.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 3	Sections 5.1.9, 5.1.9.1, 5.1.9.2, 5.1.9.3, and I.3.1 Tables I-14 and I-15

RESPONSE

The DARHT EIS refers to two types of containment vessels: double-walled steel vessels which would be used for all dynamic experiments involving plutonium; and single-walled modular steel vessels used for hydrodynamic tests. For the single-walled modular containment vessels, DOE estimates that under normal operations there could be a release (a leak) along the joints of the vessels about 5 percent of the time. The 5-percent estimate was used as a "bounding analysis" to establish a very conservative estimate of the possibility of materials or contaminants being released to the outside environment and is not considered indicative of routine conditions. All accident scenarios in the DARHT EIS were done using a "what if" approach (see EIS appendix I.2). No attempt was made to ascribe probabilities to the likelihood of an accident, or to identify potential causes for an accident (e.g., fire, earthquake, or human error) or the probability for any given causal event to occur. Instead, the DARHT EIS looked at the environmental impacts that would be expected to occur if an accident occurred for any reason (regardless of probability or cause). The unclassified summary of the classified impact analysis indicates that the same "what if" approach was used for accident scenarios involving dynamic experiments with plutonium. Under one of the two accident scenarios analyzed, DOE looked at the environmental consequences expected to occur if the outer containment vessel were breached with a 1-in hole. The summary suggests that related DOE safety studies indicate that the probability of an accidental uncontained detonation of an experimental assembly containing plutonium would be less that 10^{-6} (less than one in a million) per year. The EIS has been revised to indicate the results of the classified impact analysis; see section 5.1.9 and appendix I. Also, there has not been a breach of a containment vessel (inner or outer wall) during the operating history of PHERMEX

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 4	None required.

RESPONSE

See response to comment 17-41 and response below.

The likelihood of an accident involving a test assembly containing plutonium at DARHT or PHERMEX is considered to be an extremely unlikely (annual probability of occurrence of 10^{-4} to 10^{-6}) to incredible (annual probability of occurrence of less than 10^{-6}) based on related LANL safety studies. For the EIS, impacts of accidents were evaluated without considering this very low probability of occurrence. DOE believes that an appropriate way to evaluate potential impacts of a hypothetical release of plutonium is to investigate postulated impacts to humans. It is very likely that any contamination from such a release would be subject of rigorous and immediate intervention and remediation activities to reduce potential impacts. The effect of these efforts would be difficult to quantify in a generic, prospective evaluation. Evaluation of impacts from postulated soil contamination from such a hypothetical release would have a great amount of uncertainty associated with it, would be extremely difficult to do in a credible manner, and would add little substantive information due to the low probability of occurrence.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 5	None required.

RESPONSE

DOE agrees that the cost of cleanup in the event of an accidental plutonium release could be expensive, however, the probability of occurrence of such a release is considered to be less than one in a million per year. However, the types of dynamic experiments that would be conducted in the future at DARHT or PHERMEX could not result in a nuclear explosion or nuclear yield; therefore, infrastructure damage or contamination in the event of an accident would be localized with the exception of airborne aerosolized particles.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 6	None required.

RESPONSE

Discussion of the recent fire is included in section 4.9 of the EIS. Procedures are being revised to prevent this kind of incident in the future. Potentially exposed response personnel, such as fire fighters, are trained and have appropriate equipment to respond to this type of incident in a safe manner. The change in procedures will mandate a more protective response mode.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 7	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 8	None required.

RESPONSE

See response to comment 20-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 9	None required.

RESPONSE

Each test at PHERMEX will result in one radiograph. Multiple pictures are possible with the use of a second axis as proposed with DARHT or with the use of double-pulse technology as with the FXR facility at LLNL, although at reduced power. PHERMEX cannot be used for multiple exposures through pulsed power. The x-ray film size is equal to or larger than the area to be imaged; the image is created by shadows of materials that partially or fully absorb the x-rays. Neither PHERMEX nor FXR can produce "dual-axis" results.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 10	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 11	Sections 2.2.2 and 2.6.

RESPONSE

See response to comment 13-19 and chapter 2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 12	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 13	None required.

RESPONSE

Under the No Action Alternative, DOE would continue to conduct hydrodynamic testing and dynamic experiments using the facilities at PHERMEX and FXR as appropriate to address stockpile issues. These capabilities fall short of those believed necessary by DOE and several review panels (see EIS section 2.1); therefore, the No Action Alternative could eventually impact national security. In turn, some as yet unidentified scenarios might cause socioeconomic impacts. Such a scenario is too speculative for this NEPA action. The decision to pursue DARHT technology comes not from analyses in this EIS but from the President and Congress.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 14	None required.

RESPONSE

DOE agrees. The current stockpile is approaching an age that has not been experienced before; thus, the risk of encountering problems is increased.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 15	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 16	None required.

RESPONSE

Aspects that would be affected by tests at the proposed DARHT Facility would be safety, performance, and reliability. "Security" refers to aspects of nuclear weapons such as mechanical or electronic means to thwart unauthorized use of the weapon, or aspects of physical security such as guards or secure storage facilities that are used to protect weapons from unauthorized access. Security of nuclear weapons is an issue that will not be evaluated by tests at the DARHT Facility.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 17	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 18	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 19	None required.

RESPONSE

DOE agrees with the comment. Although the need for DARHT is premised on the need for enhanced radiographic hydrodynamic testing capability, skilled personnel are necessary to utilize the DARHT equipment, conduct the tests, and interpret the results. Use of enhanced radiographic hydrodynamic testing is expected to play a key role in science-based stockpile stewardship; see section 2.2.2 of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 20	None required.

RESPONSE

See response to comment 36-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 21	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 22	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
40 - 23	None required.

RESPONSE

Bounding accidents for DARHT and PHERMEX operations were identified and selected for analysis in a Preliminary Hazards Analysis (appendix I, section I.1). Accident consequences were examined on a "what if" basis, that is, assuming that the accident does occur (probability = 1) and examining the consequences. The parameters of the hypothetical detonated assembly (i.e., mass of high explosive and depleted uranium) were selected to maximize the potential consequences. These assumptions resulted in bounding cases that encompass possible impacts from detonations of different types of assemblies.

COMMENT CODE	LOCATION OF EIS REVISION(S)
41 - 1	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
41 - 2	None required.

RESPONSE

DOE believes that chapters 1, 2, 3, and 4 provide adequate background information, and chapter 5 provides adequate information on potential impacts of the alternatives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
41 - 3	None required.

RESPONSE

An EIS provides a comparative analysis of environmental impacts that would be expected from the various alternatives. An EIS is not intended to analyze other types of impacts, such as mission or cost impacts. However, in table 3-4 DOE has provided a summary of these other types of considerations to assist the reader.

COMMENT CODE	LOCATION OF EIS REVISION(S)
41 - 4	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
41 - 5	None required.

RESPONSE

See response to comment 40-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
42 - 1	None required.

RESPONSE

DOE agrees. The current stockpile is approaching an age that has not been experienced before; thus, the risk of encountering problems is increased.

COMMENT CODE	LOCATION OF EIS REVISION(S)
42 - 2	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
42 - 3	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comments 13-9 and 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
43 - 1	None required.

RESPONSE

All comments received from the public are given equal consideration. DOE staff and management meet with members of interest groups, and meetings are encouraged if the stated concerns are credible.

COMMENT CODE	LOCATION OF EIS REVISION(S)
43 - 2	None required.

RESPONSE

DOE agrees that the operation of PHERMEX has provided a necessary component in the U.S. nuclear testing program. The level of environmental impact by 30 years of operation is considered to be negligible.

COMMENT CODE	LOCATION OF EIS REVISION(S)
43 - 3	None required.

RESPONSE

See response to comment 36-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 1	None required.

RESPONSE

The technology proposed for DARHT is still considered to be state of the art. As stated in the EIS, section 3.5.2, the DOE considers enhanced radiography to be the best currently available tool to obtain certain kinds of information regarding the effects of aging on the safety and reliability of weapon primaries.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 2	Section 2.3.2

RESPONSE

A problem similar to that of the W-68 system might be addressed using hydrodynamic testing in the absence of nuclear testing. The hydrodynamic tests would use replacement explosives and mock nuclear components to simulate the W-68 warhead. DARHT technology would be critical for this because of the performance issues concern the configurations of ultra-dense pit materials near the end of the implosion. See section 2.3.2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 3	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 4	None required.

RESPONSE

As discussed in the DARHT EIS, the need for DARHT is based on national policy. Nuclear weapons are not considered obsolete and remain a vital part the U.S. policy on deterrence. The number and type of weapons in the national arsenal, particularly in the nuclear weapons stockpile, are established annually by the President and Congress; DOE is required to provide the support required to ensure the nuclear weapons stockpile remains safe, secure, and reliable.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 5	None required.

RESPONSE

See response to comment 17-12.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 6	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 7	None required.

RESPONSE

See response to comment 17-1 and EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 8	None required.

RESPONSE

As discussed in the DARHT EIS (section 2.3.1), computer modeling and hydrodynamic testing are the key tools currently used to gather data regarding nuclear weapon primaries. These two tools had been used in the past in conjunction with the Nevada Test Site underground nuclear testing program. It would not be possible to provide sufficient predictive data of the certainty needed to provide a high confidence level in the safety and reliability of the stockpile if computer modeling were the only means of gathering data.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 9	None required.

RESPONSE

As stated in the EIS, section 2.2.1, nuclear deterrence remains a cornerstone U.S. policy, and the U.S. will continue to rely on DOE to maintain a safe, secure, and reliable nuclear weapons stockpile. DOE recognizes that individual citizens may disagree with this policy, and that is their right.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 10	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

The EIS examines the potential toxicological and radiological impacts from routine and accidental releases of depleted uranium, beryllium, and other materials from DARHT and PHERMEX. Results of these evaluations for the No Action (current program) and other alternatives analyzed in the DARHT EIS are presented in chapter 5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 11	None required.

RESPONSE

The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile. Thus, the actions discussed in the DARHT EIS remain tied to U.S. weapons policy regarding the safety and reliability of nuclear weapons, rather than the design or development of new weapons. The level of detail in this EIS is considered adequate for a project-specific analysis.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 12	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, 5.5.7.2, 5.5.7.3, 5.5.7.4, D.5, E3.5, and H.5.2

RESPONSE

The comment correctly points out an error in the costs shown for the Plutonium Exclusion Alternative; the text of the EIS has been revised accordingly. See section 5.5.7.2.

Although the EIS does not provide a cost-benefit analysis or a detailed discussion of life-cycle costs, costs of the various alternatives are summarized in table 3-4. DOE believes that the revised Preferred Alternative, the Phased Containment Option of the Enhanced Containment Alternative, would be cost effective over the lifetime of the project. The comment correctly notes that the initial cost of the Phased Containment Option would be about $30 million higher than DARHT alone. However, the projected cost over the life of the project would not be substantially different among alternatives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 13	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 14	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 15	None required.

RESPONSE

The NEPA review process is conducted in set stages, each stage tending to supersede the previous stages. For example, a Notice of Intent published in the *Federal Register* (FR) indicates the preliminary thinking of what the scope of an EIS would be, but the scope may change in either the draft or final EIS: [See CEQ regs. 40 CFR 1502.9, 1508.22, 1508.22, and 1508.25]. Under the DOE NEPA process, an Implementation Plan is provided to the public to, among other things, indicate the results of the public scoping process [10 CFR 1021.312]. Appendix A of the DARHT EIS Implementation Plan contains the text of the DOE's Notice of Intent to prepare the DARHT EIS. In the Notice DOE stated that it did not intend to analyze issues or alternatives in the DARHT EIS beyond the construction and operation of DARHT. Therefore, issues such as the Nation's nuclear weapons policies, the DOE stockpile stewardship mission, or continued operation of other (unrelated) facilities at LANL were not considered. See sections 2.6 and 3.10 of the DARHT EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 16	Section 3.6

RESPONSE

DOE agrees with this comment and, although this was mentioned in the draft EIS in table 3-5, DOE has revised the EIS to better explain the programmatic and cost implications of this alternative. See section 3.6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 17	Section 3.6

RESPONSE

DOE agrees; the text has been revised. See section 3.6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 18	Section 2.1

RESPONSE

See response to comment 11-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 19	None required.

RESPONSE

DOE agrees; these problems are currently being encountered at the PHERMEX Facility.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 20	None required.

RESPONSE

See response to comment 44-12.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 21	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 22	None required.

RESPONSE

DOE believes that the current stockpile is safe on the basis of surveillance and testing. The uncertainties of the stockpile do not pertain to the existing stockpile but rather center on the effects of aging on the stockpile and on the potential of new safety scenarios or issues. DOE needs to ensure that the stockpile remains safe in the future. The existing stockpile is still within its design life, but as time goes on the stockpile will have aged beyond a point that has not been proven to be safe or reliable.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 23	None required.

RESPONSE

The enhanced technology proposed for DARHT would use higher energies which would allow scientists to look more deeply into a surrogate weapons system. This approach would provide more information on the interactions that take place during at later times during a test and allows scientists to make better predictions regarding the effects of aging on actual weapons in the stockpile.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 24	Section 2.3.2

RESPONSE

The EIS has been revised to accommodate this comment. See section 2.3.2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 25	None required.

RESPONSE

Previously, nuclear tests (underground and above ground) and hydrodynamic tests were used to verify the computational codes, then the computer codes were used to predict what would be expected. Without underground testing the level of detail and amount of information available from hydrodynamic testing becomes more important. Models, calculations, and computer simulations need empirical data in order to build accurate models.

The enhanced capability proposed for DARHT would provide significantly increased levels of information over PHERMEX and FXR, information needed in this environment of no underground testing.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

44 - 26 Section 2.3.2

RESPONSE

Seeresponse to comments 18-29 and 18-8.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

44 - 27 None required.

RESPONSE

The number of tests and experiments planned for any given year depends more on cost and programmatic considerations than the technology used. Although scientists expect to obtain more information per test event if the enhanced technology planned for DARHT were used, the number of tests and experiments is expected to remain generally constant under any alternative analyzed in the DARHT EIS.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

44 - 28 Section 2.2.1

RESPONSE

See response to comment 13-9.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

44 - 29 None required.

RESPONSE

See response to comment 44-12.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

44 - 30 None required.

RESPONSE

DOE agrees that for some projects a higher cost is offset by environmental benefits.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

44 - 31 None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
44 - 32	Section 2.5

RESPONSE

Seeresponse to comment 11-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 1	Section 2.1

RESPONSE

See response to comment 13-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 2	None required.

RESPONSE

DOE considers the statements in the EIS of purpose and need for DARHT to be accurate. Enhanced radiography capability is essential to ensure the safety and reliability of the existing stockpile. If the comment is suggesting that DOE plans to use DARHT as a design facility, it must be pointed out that this is against current national policy. However, if national policy were to dictate the design of nuclear weapons, then DARHT would be used to assist those efforts.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 3	None required.

RESPONSE

If the presence of such a sensor affected the geometry of the pit or the high explosive around it, hydrodynamic testing might be needed to evaluate the way in which the altered geometry might affect the hydrodynamic phase of the weapon's action.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 4	None required.

RESPONSE

Neither FXR nor PHERMEX is adequate to provide the experimental data needed to ensure the continued safety, performance, and reliability of the stockpile in the absence of nuclear testing. The enhanced capability proposed for DARHT would be expected to provide significantly better resolution which is needed to resolve detailed implosion features necessary to address issues related to nuclear weapon primaries that will arise in the enduring stockpile. In addition, DARHT capability would provide this high-resolution data from two different angles giving information about asymmetries that may be especially important in assessing the possible results of an accident, or about time evolution of an implosion.

FXR and PHERMEX have been adequate for the design of new weapons in the past because they were used in conjunction with nuclear testing, that is, results from FXR or PHERMEX were used in the process that was finally validated with a nuclear test at DOE's Nevada Test Site. In the absence of nuclear testing, much better experimental data (higher resolution, more images) are needed to provide the required information. The JASON report on Science Based Stockpile Stewardship (JSR-94-345, November, 1994) strongly supports the need for advanced radiographic capabilities.

In an absolute sense, FXR by itself is inadequate to provide the needed data because no experiments involving plutonium are conducted there, and the capability to obtain additional data on plutonium is important.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 5	None required.

RESPONSE

DOE agrees that the existing stockpile remains safe, secure, and reliable. The existing stockpile is not considered to be at risk because of a program of continuous surveillance, repair, and replacement of components and subsystems [see O'Leary quote in box in chapter 2 of the EIS]. The concern lies with the future stockpile since current U.S. policy dictates that the existing stockpile remain active past its design life.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 6	None required.

RESPONSE

See response to comments 18-8, 18-9 and 18-29.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 7	None required.

RESPONSE

See response to comment 18-8.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 8	None required.

RESPONSE

Both LANL and LLNL have been doing experiments to improve resolution of existing radiographic and accelerator equipment. One technique is called "spot collimation." In this technique, LLNL uses a gamma-ray camera, and the radiographic spot is collimated with a small tungsten hole thereby reducing the spot size; however, the loss in x-ray quantity is significant, and the field of view available for radiography is also substantially reduced. It is true that by using this technique FXR can obtain a spot size as small as that anticipated from the enhanced techniques developed for DARHT. The performance parameters for these shots were approximately: a spot size of 0.05 in (1.2 mm) and an x-ray quantity of 50R at a distance of 3.28 ft (1 m). DARHT's parameters are a spot size of 0.05 in (1.2 mm) and an x-ray quantity of 350R at a distance of 3.28 ft (1 m). Resolution depends on both the x-ray quantity and the spot size. Consequently, DOE does not agree that the recent tests at FXR gave resolution as good as that which would be expected from DARHT. The enhanced techniques proposed for DARHT could also employ gamma-ray camera technology. Consequently, the images that could be produced using the enhanced techniques developed for DARHT would be expected to be of higher resolution than at FXR. For example, the quantum noise level would be expected to be about 2.6 times lower at DARHT. The dual-axis capability proposed to be employed at DARHT would also have two or more such images with a much wider field of view than the single image obtained at FXR. See: Watson, S., et. al. *A Figure of Merit for Dense Object Flash Radiographic Systems*, LANL- M-4:GR-93-02., and, Mueller, K., *Limiting Performance of Flash Radiographic Systems,* LANL-M-4:GR-92-13, for more information.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 9	None required.

RESPONSE

Dr. Sack was a member of the Hydrotest Program Assessment Independent Consultants (HPAIC) team that reviewed the technology proposed for DARHT in 1992. In that report, Dr. Sack includes a dissenting point of view regarding the need for two axis over one axis for enhanced hydrodynamic testing capability.

DOE and its predecessor agencies have maintained two weapons physics laboratories since the 1950s to promote peer review and healthy discussion among its researchers. DOE encourages a full and open technical discussion among scientists at the laboratories and recognizes that this approach leads to reasoned dissent rather than informed consensus in some cases. DOE acknowledges that Dr. Sack has made important contributions and is highly regarded. DOE has determined that the technology proposed for DARHT via the Enhanced Containment Alternative--Phased Containment Option--is its preferred approach to meeting its need for enhanced radiographic hydrodynamic capability, and respects the right of individual professionals within its laboratory complex to hold differing points of view.

Dr. Sack participated on the recent JASON panel regarding the need for nuclear testing (JASON 1995). That panel concluded that in order to maintain high confidence in the safety, reliability, and performance of the enduring stockpile under a CTBT, the U.S. must maintain an active stockpile stewardship program including the type of capabilities proposed for DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 10	None required.

RESPONSE

The draft interagency stockpile stewardship document, dated February 1995, is the rough draft of the "Stockpile Stewardship Program Plan for Fiscal Years 1995 through 1997." When issued, this document satisfies a requirement for the DOE and DOD to issue an annual report on stockpile stewardship activities to the National Security Council (NSC). The stockpile stewardship activities to be documented are defined in the November 1993 *Presidential Decision Directive.* The preliminary draft referred to was prepared as an unclassified working paper for the weapons laboratories (LANL, LLNL, and SNL) and the DOD to comment on and eventually to finalize as a joint DOE/DOD report. This draft contains no input from these organizations but does contain extracts from previous reports and from the initial FY 1996 laboratory budget request submitted in April of 1994 only as a means of soliciting the correct input for the 1995 report. Initial drafts of this report are written to be unclassified to facilitate the early stages of writing and review. Later drafts and the final report will be classified at the Secret Restricted Data (SRD) level because of the specificity with which weapons activities are discussed.

The Stockpile Stewardship Program Plan as described above should not be confused with the DOE's Office of Defense Programs "Stockpile Stewardship and Management Program" report, which was issued in May of 1995.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 11	None required.

RESPONSE

Technical work for the Phase II Study of a radio frequency weapon was completed in March 1995; a final report is currently in preparation.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 12	None required.

RESPONSE

See response to comment 24-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 13	None required.

RESPONSE

The President and Congress have directed the DOE to maintain the nuclear weapons complex and ensure the safety, security, and reliability of the nuclear weapons stockpile, and have appropriated funds accordingly.

The NOI for the programmatic EIS on Stockpile Stewardship and Management [60 FR 31291] states that the capability for enhanced radiographic hydrodynamic testing will remain an integral part of the program under all alternatives analyzed. The purpose of the DARHT EIS is to examine the potential environmental impacts of the various alternatives for accomplishing the DOE proposal to acquire enhanced radiographic hydrodynamic capability.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

45 - 14 None required.

RESPONSE

See response to comment 30-17.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

45 - 15 None required.

RESPONSE

See response to comments 17-12 and 44-4.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

45 - 16 None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

45 - 17 None required.

RESPONSE

See response to comment 18-23.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

45 - 18 None required.

RESPONSE

See response to comment 17-12.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

45 - 19 None required.

RESPONSE

The weapons mission of the DOE is established by law, and DOE and its predecessor agencies established LANL as a weapons research laboratory.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

45 - 20 None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 21	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 22	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 23	None required.

RESPONSE

DOE agrees that the alternatives analyzed present a range of reasonable ways to address the purpose and need, and that there are various pros and cons, such as cost, beyond the environmental impacts.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 24	None required.

RESPONSE

See response to comment 36-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 25	Sections 5.2.1 and 2.3.1

RESPONSE

Further clarification of the DARHT mission, purpose, and use are reflected in the revised chapter 2 of the final EIS.

An EIS is prepared to provide and analyze environmental information, not to justify the stated purpose and need for a proposal.

See responses to comments 3-1 and 30-17.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 26	None required.

RESPONSE

See response to comment 30-17.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 27	None required.

RESPONSE

The DOE believes that these quoted statements accurately indicate the positions of the President and Congress.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 28	None required.

RESPONSE

DOE believes that the EIS adequately evaluates potential environmental impacts from uses of depleted uranium at DARHT. Should any dynamic experiments be conducted at DARHT using plutonium, they would be done in containment; there would be no releases of plutonium to the environment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 29	None required.

RESPONSE

The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile, and have appropriated funds accordingly. LANL is not in a position to dictate national policy.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 30	None required.

RESPONSE

Under the direction of Secretary O'Leary, DOE has initiated numerous activities to make information on DOE sites more available to the public and to provide for more public involvement in the DOE decision-making process. DOE plans to continue its efforts for more public involvement.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 31	None required.

RESPONSE

DOE recognizes that exposure to high levels of uranium, radon, or radon progeny may result in a significant increase in the risk of cancer. DOE is committed to a thorough evaluation of potential environmental impacts from the use of depleted uranium at DARHT and the investigation and consideration of necessary mitigating measures to minimize such impacts.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 32	None required.

RESPONSE

Radon and its radioactive progeny generated in the outdoor environment would not be a concern because they would be subject to immediate atmospheric dispersion that would reduce potential environmental concentrations to insignificant levels. Naturally-occurring radon and radon progeny in indoor environments, such as unventilated basements, are of potentially far greater concern.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 33	None required.

RESPONSE

DOE is committed to keeping radiation exposure to members of the public and workers from DOE activities to As Low As Reasonably Achievable (ALARA) level, which is a standard radiation protection practice. Based on findings and recommendations of the International Commission for Radiological Protection (ICRP), and the National Council on Radiation Protection and Measurements (NCRP), DOE believes that there is an acceptable low level of risk for exposure to radiation. While improving technical capabilities and meeting operational goals are important, the potential environmental impacts must be carefully examined, and DOE is committed to identifying and examining potential impacts.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 34	None required.

RESPONSE

DOE's proposal for enhanced radiographic capability responds to the direction of the President to ensure the safety, security, and reliability of the nuclear weapons stockpile. DOE is committed to environmental remediation of past DOE activities at LANL and all other DOE sites that may have resulted in unacceptable risks to the population and environment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 35	None required.

RESPONSE

Depleted or "spent" uranium is a mixture of isotopes of uranium that is depleted in the U-235 isoptope to some level less than the nominal 0.7 percent (by mass) occurring in natural uranium. The terms "depleted" or "spent" have been in common use for decades and have no implication regarding to the hazard evaluation of uranium except to describe the change in the relative mixture of isotopes (see Glossary in the EIS).

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 36	None required.

RESPONSE

The wording of the Comprehensive Test Ban Treaty (CTBT) remains to be negotiated and ratified by the treaty parties. DOE believes that means to ensure the safety and reliability of its enduring stockpile, such as its proposal to acquire enhanced radiographic hydrodynamic capability analyzed in the DARHT final EIS, will enable this Nation to pursue its goals of maintaining a comprehensive ban on nuclear testing, whether through a formal treaty such as the CTBT, or through a self-imposed moratorium as is now the case. As long as the United States retains nuclear weapons, it will be concerned with their safety and reliability. Without nuclear testing hydrodynamic tests and dynamic experiments are a vital means for assessing safety and reliability.

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 37	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 38	None required.

RESPONSE

See response to comment 12-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 39	None required.

RESPONSE

In a judgment filed in U.S. District Court, Albuquerque, New Mexico, on May 5, 1995, Judge Mechem ordered DOE to "prepare a comprehensive environmental impact statement of the [DARHT] facility at Los Alamos National Laboratories [sic], as announced in their Notice of Intent ..." The NOI stated, "DOE does not intend, in [the DARHT] EIS, to analyze alternatives or issues beyond the construction and operation of DARHT that relate to the Nation's nuclear weapons policies, the DOE mission of stockpile stewardship and management, the mission of LANL, or continued operation of other facilities at LANL [59 FR 60134]."

"Bomb production," whether at LANL or elsewhere, is not a "connected action" to providing enhanced hydrodynamic test capability, or the construction and operation of DARHT, as that term is defined by regulations [40 CFR 1508.25 (a)(1)]. Accordingly, the DARHT EIS does not consider the production of nuclear weapons.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 40	None required.

RESPONSE

Although the DOE issued its Notice of Intent to prepare the DARHT EIS on November 22, 1994, a Federal court on May 5, 1995, ordered the DOE to prepare an EIS on the DARHT proposal. The purpose of an EIS is to provide full and open discussion of significant environmental impacts, and to inform Federal decision-makers and the public of reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment while responding to the underlying purpose and need for agency action [CEQ regulations, 40 CFR 1502.1 and 1502.13]. An EIS may serve as a useful tool in a policy discussion, but it is not itself a forum for policy debate.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 41	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 42	None required.

RESPONSE

By regulation, DOE is required to state the underlying purpose and need to which the proposed action and other alternatives respond [CEQ Regulations 40 CFR 1502.13]. DOE believes that enhanced radiographic hydrodynamic testing is needed immediately, as stated in the EIS. The DOE appeared before the U.S. Court in December 1994 regarding whether or not construction of the DARHT facility should be stopped (enjoined) pending completion of this EIS. Although DOE stated that it felt that because DARHT's capability is urgently needed to help ensure the safety and reliability of the stockpile, construction should continue, the Court issued an injunction, and DOE stopped construction in January 1995. The court did not consider the purpose and need for the proposed activities as stated in the draft EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 43	None required.

RESPONSE

The comments in the LANL Institutional Plan are not directed at DARHT, but rather, are intended to be in support of the Advanced Hydrotest Facility. The ability for x-rays to penetrate a material depends approximately on the energy of the x-rays, the amount of x-rays available (dose), and the density of the material. Higher energies and higher doses are able to penetrate denser materials. DARHT would provide higher energy and greater dose in the brief flash of x-rays. However, pit materials can become extremely dense in the final moments of the implosion. So, although DARHT technology would provide a needed improvement in higher energies and doses, there may be some instances in which the pit materials are still too dense to be penetrated by the x-rays.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 44	None required.

RESPONSE

DOE acknowledges that the JASON Report is consistent with DOE's proposal. The JASON Report is an independent review and is not at issue; reasons for the development of the enhanced radiographic capability are discussed in the DARHT final EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 45	Section 3.10.3

RESPONSE

The Advanced Hydrotest Facility (AHF), discussed in the DARHT EIS in section 3.10.3, is a conceptual facility that would provide up to eight radiographic views and 20 or more images. It would be based on new and developing accelerator technology which is not yet ripe for implementation and is not yet a firm DOE proposal. The AHF could not provide enhanced radiographic capabilities in the near-term, and so is not considered to be a reasonable alternative to DARHT. In addition to the discussion in the DARHT EIS, the AHF is discussed on p. 15 of "The Stockpile Stewardship and Management Program: Maintaining Confidence in the Safety and Reliability of the Enduring U.S. Nuclear Weapon Stockpile," DOE 5/95. The Notice of Intent for the Stockpile Stewardship and Management Program Environmental Impact Statement [60 FR 25697] indicates that AHF, while under consideration, is not yet proposed but may be analyzed in that PEIS; LANL is listed as a preliminary alternative site to receive the facility. The draft PEIS is scheduled to be issued for public review in early 1996. The discussion in the DARHT EIS has been revised to include updated information regarding AHF planning.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 46	None required.

RESPONSE

See response to comment 30-17.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 47	Sections B.8 and C1.3.3 Figure B-1

RESPONSE

DOE recognizes that various descriptions of the respirable fraction was confusing. Figure B-1 shows the partitioning of depleted uranium into various fractions. The final EIS revises text in various places to represent the respirable fraction more clearly and accurately.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 48	None required.

RESPONSE

Two air sampling stations, onsite in TA-15, were put in place during 1993. See section 4.2.5. However, analysis of LANL environmental surveillance data for 1993 has not yet been completed by LANL and is not available. Results available for other air monitoring stations, particularly the LANL perimeter stations for years before 1993 indicate very low to nondetectable concentrations of materials (mainly uranium), which could have originated at PHERMEX. Also, usage of these materials has decreased at PHERMEX over the years, so any detected concentrations would be expected to be less. Since the two stations in question are onsite in the middle of TA-15 they would be of limited use in estimating potential impacts offsite.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 49	None required.

RESPONSE

Should DOE be restructured or merged with another Federal agency, both of which have happened in the past, DOE would not expect such an administrative change to affect this proposed action. Regardless of what agency administers the stewardship of the nuclear weapons stockpile, the Nation needs to ensure that the weapons in the stockpile remain safe, secure, and reliable. The DOE's proposal to obtain enhanced capability for radiographic hydrodynamic testing responds to a national need to ensure the safety, performance, and reliability of nuclear weapons; that need will persist regardless of administrative details.

The Department of Defense (DOD) has endorsed the need for the proposed DARHT facility in response to this EIS, as well as on numerous other occasions. See letter 1 from the Assistant to the Secretary of Defense for Atomic Energy, Dr. Harold P. Smith. Dr. Smith has testified several times before Congressional hearings regarding the need for enhanced hydrodynamic test capability as characterized by the DARHT proposal, the need and timing for the facility, and potential uses for the capability that DARHT would provide. In December 1994, then Deputy Secretary of Defense, John Deutch, formally declared that the Nation needs the high-resolution, three-dimensional radiographic capability that DARHT would provide. DOD has been consulted throughout the design and development of the DARHT facility and throughout this NEPA review. DOE has no reason to doubt that DOD would accept the proposal described in this EIS, and would endorse the DOE's decisions regarding whether or not to proceed with DARHT or one of the other alternatives analyzed in this EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 50	None required.

RESPONSE

See response to comment 44-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 51	None required.

RESPONSE

DOE recognizes that not all individual citizens agree with the course of action directed by the President and Congress, particularly in matters related to nuclear deterrence and stewardship of the enduring nuclear weapons stockpile. The design and certification of new weapons is not part of the current U.S. policy; however, if the President and Congress directed DOE to design weapons, then all available resources (including enhanced radiographic hydrodynamic capability, if implemented) would be used to meet that goal.

The use of hydrodynamic testing has gained importance in the United States because underground nuclear testing is no longer used and the nuclear weapons stockpile systems are not retired at any earlier ages than in the past.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 52	None required.

RESPONSE

See response to comment 44-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 53	None required.

RESPONSE

One mission of the DOE's nuclear weapons complex is to disassemble nuclear weapons being retired from the Nation's nuclear weapons stockpile. In this era of a rapidly shrinking stockpile, DOE is disassembling retired nuclear weapons at an unprecedented rate. This work is currently done at the Department's Pantex Plant in Amarillo, Texas. Nuclear weapons, on the average, have about 6,000 separate parts; less than 200 of these contain nuclear materials. After a weapon is disassembled, some parts are discarded, some are recycled, and others are stored for future use or for future disposal.

In addition, DOE is preparing a separate EIS on the disposition of surplus highly enriched uranium [60 FR 17344].

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 54	None required.

RESPONSE

See response to comment 13-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 55	None required.

RESPONSE

See response to comment 45-42.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 56	None required.

RESPONSE

An equally experienced group of nuclear weapons engineers feel that there can be important uncertainties in trying to replicate sophisticated manufacturing processes that have been shut down. Of these two viewpoints, the more conservative approach is to test (non-nuclear tests) the products of the replicated manufacturing processes to reduce uncertainties that the resulting products are sufficiently similar.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 57	None required.

RESPONSE

The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile, and have appropriated funds accordingly. It follows that the groups that have been associated with the development of the weapons would be the same groups to assist in ensuring the safety, security, and reliability.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 58	None required.

RESPONSE

Certain organizations within the DOD raised a proposal in June 1995 to conduct a series of underground low-yield tests at the DOE's Nevada Test Site. The administration has decided not to pursue that course of action at this time. Hydronuclear tests are those experiments involving high explosives and fissile materials which can achieve criticality and which can produce nuclear yields comparable to the energy release of the high explosive components. Hydronuclear experiments will not be done at DARHT nor are they analyzed in the DARHT EIS. Our ability to predict the exact nuclear yield from such experiments is inadequate to guarantee that the energy release could be sufficiently controlled to perform the experiments above ground.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 59	None required.

RESPONSE

The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 60	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
45 - 61	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
46 - 1	None required.

RESPONSE

In response to public and DOE concern regarding timeliness of its environmental reviews, in July 1994 the Secretary of Energy instituted a NEPA policy which directed the agency to reduce the median time for preparing an EIS from 33 months to 15 months. This means that half of all DOE EISs will be completed in less than 15 months. DOE felt that the DARHT EIS could be completed in less than 15 months and established a working schedule of 10 months, from Notice of Intent to Record of Decision. DOE is not in a position to speak to issues that may drive the schedules of NEPA reviews of other Federal agencies.

COMMENT CODE	LOCATION OF EIS REVISION(S)
46 - 2	None required.

RESPONSE

See response to comment 45-39.

COMMENT CODE	LOCATION OF EIS REVISION(S)
46 - 3	None required.

RESPONSE

Chapter 5 of the EIS addresses environmental impacts of DARHT operations. These evaluations reveal that no cancer deaths are expected from any action at DARHT involving depleted uranium or other materials. As noted in the unclassified supplement, there is a very small possibility of up to 12 latent cancer fatalities in the event of any accident breach of a double-walled containment vessel involving a dynamic experiment with plutonium.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 1	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 2	Index

RESPONSE

An index has been included in the final EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 3	Volume 2 section 1.5

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 4	None required.

RESPONSE

See response to comment 45-42.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 5	None required.

RESPONSE

See response to comment 45-39.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 6	None required.

RESPONSE

DOE notes that the DARHT EIS is of typical length for a single-subject EIS prepared by DOE.

See response to comment 30-17.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 7	None required.

RESPONSE

DOE believes that the need for DARHT's capabilities have become even more acute in recent years (since the moratorium on underground testing at the Nevada Test Site). In the past, both hydrodynamic and nuclear tests were used to assess nuclear weapon safety. Now, improved hydrodynamic tests are needed to verify computational models and to assess weapon safety, performance, and reliability.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 8	None required.

RESPONSE

As the nuclear weapons stockpile decreases to the lower levels established by the President and Congress, DOE is tasked with dismantling the weapons returning from the stockpile. Some of the components removed from returned weapons are discarded, some are destroyed, some are recycled, and some are stored. Some series of weapons had aged beyond their design life at the time they were retired and some had not. The hydrodynamic testing and dynamic experiment programs, and the resultant number of "shots" described in the DARHT EIS are considered to provide a "bounding analysis" for forecasting environmental impacts; the actual impacts from testing and experiment programs in any given year would be expected to fall within this boundary of impacts. However, these programs are not correlated to the number of weapons being retired from the stockpile.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 9	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 10	Section 2.5

RESPONSE

See response to comment 11-5 and response below.

DARHT technology is the potential issue to treaty participants, rather than the amount of money invested. As discussed in the response to comment 47-9, the treaty signatories are well aware of the technology and its implementation.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 11	None required.

RESPONSE

The core competencies are the essential knowledge and expertise, such as computing, scientific, engineering, and material property expertise required to design, engineer, test, and produce nuclear weapons. Such expertise is also essential to conduct safe dismantlement in the United States and elsewhere, to assess nuclear weapon proliferation activities, and to respond to nuclear incidents and devise counter-proliferation measures. See also the DOE's "*The Stockpile Stewardship and Management Program: Maintaining Confidence in the Safety and Reliability of the Enduring U.S. Nuclear Weapon Stockpile.*"

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 12	Section 2.1

RESPONSE

See response to comment 11-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 13	None required.

RESPONSE

The use of hydrodynamic testing by declared nuclear weapons states has no bearing on the ability to detect proliferation by other nations. Thresholds of detection by seismic means are a greater than the energy release of high explosives in a hydrodynamic test. Mining activities also routinely produce explosives at and considerably beyond the explosive energy of a hydrodynamic test. Nations acting outside the Non-Proliferation Treaty could conduct such experiments provided they were not detectable by other means, independent of the use of hydrodynamic testing by the declared nuclear weapons states.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 14	None required.

RESPONSE

DOE agrees, as stated in the EIS, that in the 1980s DARHT (as then proposed) was intended to assist in designing new nuclear weapons and replacement parts. Since then, the U.S. has determined that in an era of a reduced nuclear weapons stockpile there is no need in the foreseeable future for new-design nuclear weapons.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 15	None required.

RESPONSE

Typical examples of industrial uses might be explosive forming of complicated shapes or explosive welding. However, such details are not now known because such applications of DARHT are somewhat speculative and because much industrial research is proprietary. Industry might want to use DARHT capability to better understand how a metal flows under extreme conditions produced by explosives.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 16	None required.

RESPONSE

Before the nuclear testing moratorium imposed by the President in 1993, DOE used nuclear testing in conjunction with hydrodynamic testing to evaluate the safety, performance, and reliability of the nuclear weapons stockpile. Computational models were verified by observing the results of both hydrodynamic tests and nuclear tests. Since the testing moratorium, increased capabilities for hydrodynamic testing are even more important in verifying the stockpile characteristics and capabilities. DOE believes that increased hydrodynamic testing capabilities can go far in replacing the nuclear testing capabilities no longer available.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

47 - 17 None required.

RESPONSE

The stated 18 percent funding increase (actually 16.9 percent) referred to in the question is correct for the overall level of funding for the weapons program at Los Alamos but does not represent the level of support for the activities which include hydrodynamic testing at facilities like DARHT. These activities are referred to as the "Core" in the table below, including the Los Alamos Meson Physics Facility (LAMPF)/Los Alamos Neutron Scattering Center (LANSCE) funding and about half of the Advanced Strategic Computing Initiative (ASCI) funding represent the operating expense at Los Alamos devoted to stockpile stewardship activities. Based on the President's budget submission for FY 1996, Core funding, unadjusted for inflation, is actually scheduled to decrease in FY 1996 by about 3 percent relative to FY 1995 and by almost 11 percent relative to FY 1994. Including the relevant parts of ASCI and LAMPF/LANSCE (see notes below) within the definition of "Core" activities shows only a modest increase over FY 1995 and will result in an inflation-adjusted decrease in the level of activity. The hydrodynamic testing portion of the Core is undergoing a similar contraction, but not as severe because of the recognized utility of such testing to stockpile stewardship.

The DOE funding in research, development, and testing (RD&T) budget line (currently referred to as "Weapons Stockpile Stewardship" (WSS) for LANL are given below for FY 1994-1996 in thousands of dollars.

Category	FY 1994	FY 1995	FY 1996
Construction	35.5	21.9	39.9
Capital Equipment	25.4	19.9	19.2
Technology Transfer	34.1	35.5	43.6
Education	4.1	6.3	6.3
Inertial Confinement Fusion (ICF)	20.2	21.0	21.8
ASCI	0.0	0.0	15.0
LAMPF/LANSCE	3.5	7.0	24.8
Subtotal	122.8	111.6	170.6
Core	217.7	200.2	193.9
Total WSS	340.5	311.8	364.4

Notes: 1) A construction increase in FY 1996 is due to a commitment to fund Advanced Testing Line for Actinide Separation (ATLAS) construction: 2) about one-half of ASCI funding supports commercial hardware vendors; 3) an increase in LAMPF/LANSCE funding between FY 1995 and FY 1996 is due to DOE Defense Programs assuming responsibility for the operation of the LAMPF accelerator from DOE's Office of Energy Research.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

47 - 18 Section 3.3.4

RESPONSE

See response to comments 13-13 and 31-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
47 - 19	None required.

RESPONSE

The President and Congress have directed the DOE to maintain the nuclear weapons complex and to ensure the safety, security, and reliability of the nuclear weapons stockpile, and have appropriated funds accordingly. It is not the policy of the U.S. to just "limp along" because confidence in the nuclear weapons stockpile would be reduced. DOE believes it has clearly stated the need for the project.

See response to comment 13-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
48 - 1	None required.

RESPONSE

DOE agrees that the confidence in the U.S. nuclear weapons stockpile would be reduced if hydrodynamic testing proposed for DARHT were not performed.

COMMENT CODE	LOCATION OF EIS REVISION(S)
48 - 2	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
48 - 3	Sections 2.1 and 2.3.1

RESPONSE

Chapter 2 has been revised to provide additional information and clarity.

See response to comment 45-14.

COMMENT CODE	LOCATION OF EIS REVISION(S)
48 - 4	None required.

RESPONSE

See response to comment 44-12.

COMMENT CODE	LOCATION OF EIS REVISION(S)
49 - 1	None required.

RESPONSE

Based on findings and recommendations of the International Commission for Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurements (NCRP), DOE believes that there is an acceptable level of risk for exposure to radiation. DOE is committed to keeping radiation exposure to members of the public and workers from DOE activities to As Low As Reasonably Achievable (ALARA) levels.

COMMENT CODE	LOCATION OF EIS REVISION(S)
49 - 2	None required.

RESPONSE

The United States has decided, as a Nation, to maintain a nuclear deterrent as a cornerstone of its national defense. While DOE respects the right of individual citizens to hold a different point of view, DOE agrees with the President and the Congress that nuclear weapons have proven to be an effective deterrent over the past several decades.

COMMENT CODE	LOCATION OF EIS REVISION(S)
49 - 3	None required.

RESPONSE

DOE agrees that potential impacts from depleted uranium, which is simply uranium that is diminished in the U-235 isotope to levels below those of naturally-occurring uranium, need to be examined. The EIS includes a comprehensive examination of the potential impacts from use of depleted uranium at DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
49 - 4	None required.

RESPONSE

See response to comment 44-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
50 - 1	None required.

RESPONSE

DOE does not agree that a weapon system would become more reliable with age. In addition, nuclear deterrence remains a cornerstone of U.S. policy and has not lost any importance.

COMMENT CODE	LOCATION OF EIS REVISION(S)
50 - 2	Section 2.3.2

RESPONSE

The impediments are not so much in remanufacturing per se, but in reestablishing the manufacturing capability for processes that have been shut down, and in assuring that the products from replicated processes are sufficiently similar to the original products. Some processes, such as fabrication that occurred at Rocky Flats (now closed), would be quite expensive to replicate. For some remanufactured nuclear components, the only way to reduce uncertainty in their performance--short of nuclear testing--would be hydrodynamic testing.

COMMENT CODE	LOCATION OF EIS REVISION(S)
50 - 3	None required.

RESPONSE

The need to ensure the safety and reliability of the nuclear weapons stockpile deals with the future stockpile as it ages past its design life. The current stockpile is considered to be safe and reliable. See statements by Secretary O'Leary quoted in section 2.3.2 of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
50 - 4	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
51 - 1	None required.

RESPONSE

See response to comment 45-44.

COMMENT CODE	LOCATION OF EIS REVISION(S)
51 - 2	None required.

RESPONSE

Today, development of new-design nuclear weapons for introduction into the stockpile is counter to U.S. policy. However, it is also U.S. policy (see the DOD Nuclear Posture Review, EIS section 2.2.2) to maintain that capability. Because information on almost any aspect of weapons can be applied to design, it would be difficult to only study weapon safety and reliability without other possible uses for such data. DARHT is intended to aid in evaluating and certifying weapon safety, performance, and reliability, not to develop new weapons. Such development would be beyond the scope of current U.S. policy.

The function of the surveillance program is to maintain the status of systems and to identify any problems. If a problem is found in the future with nuclear components, hydrodynamic testing would be needed to address its performance. Enhanced hydrodynamic testing is judged to be a much more effective tool in the long run.

COMMENT CODE	LOCATION OF EIS REVISION(S)
51 - 3	None required.

RESPONSE

The Department does not consider the JASON Report to have a conflict of interest and respects the integrity of the report. The loss of underground testing certainly does leave a void that is necessary to fill. This is one of the objectives of the DARHT Facility.

COMMENT CODE	LOCATION OF EIS REVISION(S)
51 - 4	None required.

RESPONSE

The President has determined that the United States will not test or deploy new nuclear weapons, and the DOE is strictly adhering to this policy. Under current policy, DARHT will be used only for addressing the safety, performance, and reliability of existing weapons and will not be used to design new weapons.

COMMENT CODE	LOCATION OF EIS REVISION(S)
51 - 5	None required.

RESPONSE

DOE strongly disagrees. This is the very core of the justification for the DARHT Facility. The improved diagnostics are essential to obtaining data, especially with a moratorium on underground testing. Computational resources are used in conjunction with the hydrodynamic testing to continually provide a refinement of the computer modeling.

COMMENT CODE	LOCATION OF EIS REVISION(S)
51 - 6	None required.

RESPONSE

Even rebuilt weapons would have to be certified with respect to their safety and performance. In the absence of nuclear testing, an improved understanding for the physical processes during the late stages of an implosion would necessitate the use of hydrodynamic testing to certify systems.

COMMENT CODE	LOCATION OF EIS REVISION(S)
51 - 7	Section 2.3.2

RESPONSE

Chapter 2 is modified in the final EIS to clarify and better support the purpose and need. The additional information presented is attributable in part to the Stockpile Stewardship and Management Program Plan issued by the DOE in May 1995 and also to clarify some potentially sensitive issues.

See responses to comments 18-8, 18-9 and 18-29.

COMMENT CODE	LOCATION OF EIS REVISION(S)
52 - 1	None required.

RESPONSE

"Safe," in any practical use of the word, always carries with it a stated or implied level of acceptable risk. Safety of nuclear weapons implies a very low, but not unobtainably low, probability of accidental detonations.

COMMENT CODE	LOCATION OF EIS REVISION(S)
52 - 2	Section 2.3.2

RESPONSE

See response to comment 51-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
52 - 3	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
52 - 4	None required.

RESPONSE

DOE has examined the potential environmental impacts of all of the aspects noted in this comment; results of these evaluations for all alternatives are presented in chapter 5. DOE believes that construction and operations of DARHT will not degrade nuclear safety but, in fact, will result in improved nuclear weapons safety with no unacceptable impacts to the environment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 1	None required.

RESPONSE

The example given in section 2.3.2. of the DARHT EIS regarding weapons safety, the W68 high explosive aging, and the need to replace certain materials upon remanufacture, is drawn from the Miller Report.

See response to comments 18-29 and 18-8.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 2	Sections 3.3.2, 3.3.8, 5.1.8, 5.1.9, 5.4.8, 5.4.9, 5.4.10.3, 5.7.2.2, I.3.1, and J.6.1 Tables I-14 and I-5

RESPONSE

See response to comment 14-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 3	None required.

RESPONSE

See response to comment 13-5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 4	None required.

RESPONSE

See response to comment 44-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 5	None required.

RESPONSE

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 6	None required.

RESPONSE

The World Court, formally named the International Court of Justice, was established by charter of the United Nations and is the UN's principal judicial body. Jurisdiction of its 15 judges is limited to legal disputes among the UN parties, but the Court may choose to consider cases involving political questions. In 1993, the Court agreed to give an advisory opinion on the question: "In view of the health and environmental effects, would the use of nuclear weapons by a State in time of war or other armed conflict be a breach of its obligations under international law including the [World Health Organization] Constitution?" The Court invited written statements from appropriate entities and extended the deadline for submitting these until June 20, 1995. The Court has not yet released copies of any statements received and has not indicated when, if at all, it intends to issue its opinion. The opinion is expected to be limited to the actual use of nuclear weapons, not the threat of nuclear weapons or other policy issues regarding nuclear weapons, nuclear deterrence, or nonproliferation. Any opinion issued would be advisory only, and not binding on any member of the UN. DOE does not expect that such an advisory opinion, in and of itself, would result in a reversal of the U.S. policy that nuclear deterrence will remain a cornerstone of this Nation's defense.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 7	None required.

RESPONSE

It is against current U.S. policy to design and develop new nuclear weapons, thus, DARHT is not now intended for that role. Previously, when this country was designing new nuclear weapons, a combination of hydrodynamic testing, nuclear testing, and other tools were necessary. The nuclear weapons role for DARHT now is to address issues concerning stockpile safety and reliability.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 8	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 9	None required.

RESPONSE

See response to comment 17-18.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 10	None required.

RESPONSE

DOE does not agree that the completion and operation of the DARHT facility at LANL "would influence" any decisions regarding locating nuclear weapons manufacturing facilities at LANL. First, DOE and its predecessor agencies have maintained hydrodynamic testing capability at LANL for over 50 years. While DARHT, and most of the other alternatives analyzed in this EIS, would provide enhanced diagnostic capability, the proposal would not involve changing the existing mission assignments at LANL. Second, because this Nation does not anticipate the need for new-design nuclear weapons in the foreseeable future, DOE has no need to redevelop a large-capacity nuclear weapons production complex at any site, let alone LANL. Third, while DOE recognizes the need to maintain and repair existing nuclear weapons and is directed by DOD to maintain the capability to manufacture some number of new nuclear weapons (see Notice of Intent, Stockpile Stewardship and Management PEIS, 59 FR 54175), DOE does not consider the capability to fabricate weapons components, whether this capability resides at LANL or elsewhere, as a connected action to provide enhanced hydrodynamic testing capability or to the construction and operation of DARHT, as that term is defined by regulation [40 CFR 1508.25(a)(1)].

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 11	Section 2.6 and volume 2, section 1.5.

RESPONSE

Please refer to the text in section 2.6 and EIS volume 2 section 1.5 for information on the relationship of the DARHT EIS to other DOE EISs.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 12	None required.

RESPONSE

While the proposed facilities would be sited at an area (TA-15) without a deep borehole in the immediate proximity, to claim there is no information on the geology at the DARHT site is incorrect. The geology of the Los Alamos area is not random. It is entirely reasonable and appropriate to infer, based on continuity principles, that the layered, trending geologic structure that appears in the surrounding wells (e.g., DT-5A, DT-10, PM-2, and PM-4) will appear at the DARHT and PHERMEX locations also. Geologic inference based on interpolation of stratigraphies at various locations, coupled with an understanding of the formation processes of the geologic structures, provides a great deal of information. Furthermore, the modeling results for flow and transport in the vadose (unsaturated) zone are relatively insensitive to our uncertainty in the exact thickness of the various units, as the hydrologic properties of these units are not dramatically different.

The potential migration of heavy metals and radioactive materials into the ground water is presented in sections 5.1.4.2, 5.2.4.2, and 5.4.4.2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 13	None required.

RESPONSE

The DOE has issued the "Interim Management of Nuclear Materials draft EIS" [DOE EIS-0220D, March 1995], which looks at alternatives for the stabilization of various isotopes of nuclear materials at its Savannah River Site (SRS). Currently, the materials are temporarily stored in solution form in tanks at SRS. Due to safety concerns, DOE proposes to process the materials into different forms that would be more suitable for long-term storage. One of the many isotopes analyzed in the Interim Management draft EIS is plutonium-242. The Interim Management EIS discusses various options for processing solutions containing plutonium-242 and analyzes the environmental impacts of the various options. DOE decisions on how to meet its need for enhanced radiographic hydrodynamic testing, including construction and operation of DARHT, do not depend on the decisions it will make regarding its need to stabilize plutonium solutions at SRS. Accordingly, reprocessing SRS plutonium-242 material, and its transport, are not "connected actions" within the meaning of NEPA [40 CFR 1508.25(a)(1)] to the DOE hydrodynamic test proposal and are not discussed in the DARHT EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 14	Sections 3.3.2, 3.3.8, 5.1.9, 5.1.9.1, 5.1.9.2, 5.1.9.3, 5.4.9, 5.7.2.2, and I.3.1 Tables I-14 and I-15

RESPONSE

See response to comment 10-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 15	Section 3.4

RESPONSE

As stated in section 3.4, the DARHT EIS does include a consideration of simply upgrading PHERMEX in the No Action Alternative. The No Action Alternative is not static; under this alternative DOE would continue to use PHERMEX well into the next century to provide hydrodynamic test capability (but would not achieve the enhanced capability discussed in the DARHT EIS). This would include occasional maintenance and operating upgrades but would not include a major overhaul of the type of technology used at PHERMEX. The EIS has been revised to clarify this point. See section 3.4. The Upgrade PHERMEX Alternative, in contrast analyzes the environmental impacts that would be expected if DOE were to upgrade PHERMEX with the enhanced dual-axis radiographic capability proposed for DARHT (see Section 3.6), which could be characterized as "move DARHT to PHERMEX".

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 16	None required.

RESPONSE

See response to comment 45-8.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 17	Section 3.10.3

RESPONSE

See response to comment 45-45.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 18	None required.

RESPONSE

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 19	None required.

RESPONSE

The purpose of the EIS is to examine the potential environmental impacts for the various alternatives for accomplishing the proposed action.

There are no agreements at this time for international oversight of DARHT or other aspects of U.S. stockpile stewardship, other than existing verification agreements on nuclear testing and certain agreements related to the phased dismantlement for START I and II levels. Such measures would only be applied to DARHT pursuant to hypothetical international agreements, which would be carefully reviewed to assure consistency with U.S. national security.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 20	Section 3.3

RESPONSE

The EIS examines the environmental impacts from various alternative operating modes to conduct the needed hydrodynamic tests and dynamic experiments. Some of these alternatives could constrain certain types of experiments that might be needed; these programmatic constraints are noted in the EIS in table 3-4, section 3.11. The Plutonium Exclusion Alternative examined the expected environmental impacts if DOE imposed a programmatic constraint to not use the DARHT facility for dynamic experiments involving plutonium; the EIS provides a "bounding analysis" of environmental impacts expected from the largest testing and experiment program that DOE believed could be needed. DOE recognizes - and the text of the EIS has been revised to clarify - that the actual testing program may have programmatic constraints due to a variety of reasons, such as annual testing needs, funding considerations, or amelioration of potential environmental impacts.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 21	None required.

RESPONSE

See response to comment 53-7.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 22	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 23	None required.

RESPONSE

DOE policy is to comply with all applicable environmental laws and regulations, both in current practice and in correcting problems arising from past practice. Some compliance problems necessarily take time and funds to remediate; these should not be a barrier to the current DOE mission. Under current U.S. policy, the DARHT Facility would not be used to design and develop new weapons.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 24	None required.

RESPONSE

The DOE supports U.S. policy to enter a comprehensive test ban along with alternate means to provide assurance of stockpile safety, reliability, and performance. Enhanced radiographic hydrodynamic testing and the ability to understand and analyze the stockpile are essential to its stewardship.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 25	None required.

RESPONSE

The United States has decided, as a Nation, to maintain a nuclear deterrent as a cornerstone of its national defense. While DOE respects the right of individual citizens to hold a different point of view, DOE agrees with the President and the Congress that nuclear weapons have proven to be an effective deterrent over the past several decades.

See response to comment 17-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 26	None required.

RESPONSE

As stated in the EIS, section 2.2.1, nuclear deterrence remains a cornerstone of U.S. policy, and the U.S. will continue to rely on DOE to maintain a safe, secure, and reliable nuclear weapons stockpile. Reliability of the stockpile is a key component of effective nuclear deterrence. DOE recognizes that individual citizens may disagree with this policy, as is their right.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 27	None required.

RESPONSE

DOE believes that its facilities, including LANL, should be operated in accordance with all applicable laws and in a way that protects the environment. Like essentially all Federal agencies, DOE has compiled a set of rules, regulations, orders, and procedures in an attempt to ensure all relevant laws and other requirements are met. DOE is now reviewing its orders and other requirements, as part of the administration's initiatives to reinvent government, to eliminate unnecessary paperwork and oversight.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 28	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 29	None required.

RESPONSE

DOE agrees.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 30	None required.

RESPONSE

We do not foresee "undiscovered" problems with one-point safety. However, there is a continuing need to evaluate safety in a variety of accident scenarios that previously may not have been considered or were unable to be analyzed.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 31	None required.

RESPONSE

The DOE is aware of the value of the Miller report. See section 2.3.2 in the final EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 32	None required.

RESPONSE

Safety problems could also result from changes introduced in remanufacturing, or even aging, such as degradation of fire-resistant features. This aging example might not require enhanced radiographic hydrodynamic test capability to evaluate, but would need the enhanced capability to certify the reliability and performance of a remanufactured component.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 33	None required.

RESPONSE

DOE agrees that safety is a key concern regarding the future nuclear weapons stockpile. One-point safety is the assurance that if a weapon's high explosive is detonated at any one point, as could occur in an accident, there would be less than one-chance-in-a-million that more than four pounds (TNT equivalent) of nuclear yield could result. This is a key criterion for current U.S. weapons design. Four pounds of nuclear yield would be expected to cause localized dispersion of plutonium or other material, but would not release intense radiation. In the past, not all U.S. weapons were designed to be one-point safe.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 34	None required.

RESPONSE

DOE appreciates this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 35	None required.

RESPONSE

See response to comment 28-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 36	None required.

RESPONSE

See response to comment 28-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 37	Section 3.3

RESPONSE

Static radiographs in the parlance used in the nuclear weapons program are radiographs taken when the weapon or mock weapon is in its initial condition before an experiment or a test, i.e. before the high explosive charge is detonated. Static radiographs, for instance, were routinely taken at the Nevada Test Site of devices to be tested underground and are routinely taken of the test assemblies in the above-ground hydrodynamic testing program. Dynamic radiographs, on the other hand, are defined as radiographs taken of test assemblies shortly after the high explosive has been set off and are often taken at the time of simulated maximum criticality.

The purpose of a static radiograph prior to a hydrodynamic test is to assure the experimenter that the test assembly has been constructed properly and/or has not suffered an unacceptable or unknown change since assembly or that the test assembly is properly aligned. Thus a static radiograph provides a picture of the initial condition of the test assembly and, hence, defines the initial condition of an experiment. Dynamic radiographs are compared to the static radiograph to evaluate the degree of change during experiment.

Static radiographs can also be part of a surveillance program, but these radiographs can be done without using DARHT facilities.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 38	None required.

RESPONSE

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 39	None required.

RESPONSE

There have been numerous issues related to weapon primary design or engineering that required evaluation to assure continued weapon safety and reliability. Without nuclear testing, such problems would often require hydrodynamic testing along with computations and other data or experiments as a principal means for evaluation and resolution. Of the weapon systems that have entered the stockpile since 1970, almost half required post-deployment nuclear testing to address, verify, or resolve issues associated with the safety or reliability of the weapon primary design. See discussion in section 2.3.2 of the EIS. "The seven weapons that will be in the enduring START II stockpile have already been retrofitted to varying degrees and some have had major components of the nuclear system replaced" (Secretary of Energy O'Leary, April 1995).

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 40	Section 2.3.2

RESPONSE

See response to comment 13-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 41	None required.

RESPONSE

See response to comment 51-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 42	None required.

RESPONSE

As discussed in the EIS section 2.3, hydrodynamic testing is used to assess weapons safety, performance, and reliability; evaluate aging weapons; and increase understanding of weapons physics as well as other uses noted in section 2.3.4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 43	None required.

RESPONSE

It is against current U.S. policy to use DARHT or PHERMEX to design new nuclear weapons. The descriptions of average annual expenditures of materials, such as depleted uranium, beryllium, lead, etc., as given in tables 3-4 and B-4, provide a better basis for estimating impacts to the environment because of the variability among individual tests as shown in table B-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 44	None required.

RESPONSE

The environmental impact analysis in the DARHT EIS is based on a "bounding analysis," that is, an analysis of the greatest number of test shots that would be anticipated under the foreseeable testing program. This analysis identifies the resulting environmental impacts and represents the upper boundary of impacts; essentially all actual impacts would be expected to be less, or within the boundary of impacts analyzed. DOE points out in several places in the DARHT EIS that the Nation does not intend to pursue new-weapon designs in the foreseeable future, and that DOE does not intend to use DARHT for this purpose. In chapter 5, DOE indicates that the actual impacts of hydrodynamic testing would vary depending on the number and size of tests, materials, and facility design; not by the intended application of test results.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 45 None required.

RESPONSE

DOE recognizes that not all individual citizens agree with the course of action directed by the President and Congress, particularly in matters related to nuclear deterrence and stewardship of the enduring nuclear weapons stockpile. The DARHT EIS presents a course of action that would meet the needs of the nuclear weapons stockpile. The suggested approach is not considered viable.

See response to comment 13-3.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 46 None required.

RESPONSE

While DOE agrees that the likelihood of all the weapons in the stockpile experiencing problems at the same time is extremely low, DOE would like to point out that this is not at issue. What is at issue is the safety and reliability that the nuclear weapons stockpile will be facing in the form of post-design life aging problems not previously encountered. This does not mean, however, that all weapons will fail at once.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 47 None required.

RESPONSE

See response to comment 13-3.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 48 None required.

RESPONSE

Although fundamental scientific knowledge about physical processes can be used for a variety of purposes, the DARHT capabilities are to be directed at understanding and resolving safety and reliability problems in the weapons stockpile. Hydrodynamic test capabilities were a known factor for parties to the nonproliferation treaty.

See response to comment 17-4.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 49 None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 50	None required.

RESPONSE

U.S. policy affirms that while reducing nuclear stockpiles, nuclear weapons remain a vital element of national security strategy. It is also U.S. policy (Nuclear Posture Review) to reduce the stockpile while maintaining a capability to develop and produce nuclear weapons if necessary.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 51	None required.

RESPONSE

DOE agrees with this comment. PHERMEX was not designed to perform at the level expected from the enhanced capability proposed for DARHT. Although over the last 30 years, LANL personnel have been able to operate PHERMEX to provide images that have exceeded the original design specifications, it is not possible to simultaneously obtain the small spot, fast frame rate, or optimum energy proposed for DARHT at PHERMEX. This is, in fact, the reason that induction linear accelerator technology was chosen over the RF linear accelerator technology now used at PHERMEX.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 52	None required.

RESPONSE

Relative to the No Action Alternative this comment is correct. DOE knows of no data from FXR that would be considered superior to that which would be obtained from DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 53	None required.

RESPONSE

Hydronuclear tests are those experiments involving high explosives and fissile materials which can achieve criticality and which can produce nuclear yields comparable to the energy release of the high explosive components. Such tests will not be done at DARHT nor are they analyzed in the DARHT EIS. Our ability to predict the exact nuclear yield from such experiments is inadequate to guarantee that the energy release could be sufficiently controlled to perform the experiments above ground.

The DOE conducted a study with participation of several organizations, including LANL, to determine the feasibility of conducting very low yield nuclear explosions contained in large vessels. It was always intended to encase the CONVEX vessels in concrete and bury them underground. There has been no further work on the program, and it was never related to plans for DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 54	None required.

RESPONSE

See response to comment 13-18.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 55	None required.

RESPONSE

See response to comment 18-8.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 56	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 57	None required.

RESPONSE

DOE agrees that the existing stockpile is not considered to be at risk and it is certainly not experiencing any post-design life aging problems since the weapons are retired prior to this occurrence. The concern remains with the future stockpile since current U.S. policy dictates that the existing stockpile will remain active past its design life.

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 58	Section 2.3.2

RESPONSE

See response to comment 13-3.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 59	None required.

RESPONSE

DOE believes that decisions regarding the DARHT proposal may proceed independently of the programmatic review to be provided in the Stockpile Stewardship and Management PEIS (see section 2.6). As stated in the NOI for the PEIS, under any alternative analyzed in that PEIS DOE would need to obtain enhanced hydrodynamic testing capability; therefore, decisions from the DARHT ROD would not prejudice the outcome of the SS&M PEIS.

DOE's agrees that there is no current crisis in safety and reliability, but believes that problems could arise within the stockpile as time passes. DOE is responsible for the stewardship of the enduring nuclear weapons stockpile and believes that it is prudent to deal with stockpile issues using adequate technology and tools before any crises develop.

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 60	None required.

RESPONSE

DOE believes that the DARHT EIS adequately identifies and analyzes the reasonably foreseeable connected actions as defined in 40 CFR 1508.25 (a) (1).

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 61	Sections 3.3.4 and 3.10.5

RESPONSE

See response to comment 13-13.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 62	None required.

RESPONSE

DARHT is expected to require some re-engineering as the accelerator is brought on line. Considerable refinement is expected to occur, and the achievement of the design goals would be a phased process. This process is one reason the second axis is planned on a delayed schedule.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 63	None required.

RESPONSE

Under all alternatives and options, LANL would be able to use significantly larger shots than FXR, if needed. In addition, FXR is currently subjected to more restrictive environmental limits because of its proximity to developed areas, including other LLNL facilities. These restrictions are expected to tighten in the future. Sandia does not have a significant hydrodynamic radiographic capability. Because LLNL and LANL are both DOE laboratories, they are unlikely to sustain a race for the same objective under expected DOE budgets.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 64	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 65	None required.

RESPONSE

See response to comment 40-6.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 66 None required.

RESPONSE

A climate model simulates both clear and rainy days. Contaminants at the firing site are presumed to dissolve in rain water at their solubility limit (maximum possible). The amount of rain water that becomes runoff is determined by a technique called the curve-number method. This runoff enters Potrillo canyon in reach 1 and water canyon in reach 12 (see EIS figure E3-1). With this method, larger rain storms would mobilize more contaminant, generate more surface runoff, and course more contaminant loading in the canyon channels.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 67 None required.

RESPONSE

Since 1991, advanced laboratory techniques have been used to detect tritium at ultra-low levels and to determine that recent water (a few decades old) has recharged the main (i.e., deep) aquifer in several locations at LANL. In all instances, main aquifer contamination is associated with a high tritium source concentration in a canyon bottom alluvial aquifer and with older wells into the main aquifer constructed with cable-tool drilling techniques and having questionable seals between well-bore and well-casing. In contrast, mesa top migration is relatively slow, and all indicators are that mesa-top facility locations offer significant, if not complete, isolation from the main aquifer.

LANL and the State of New Mexico are currently engaged in development of a ground water protection plan for the laboratory. As part of this plan, it is proposed that site-wide monitoring of the main aquifer be expanded and improved with the development of 23 new main aquifer wells and with the initiation of process-related research focused on developing a greater understanding of the existing examples of main aquifer contamination.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 68 None required.

RESPONSE

The DARHT EIS does not assert that the PHERMEX facility has not contaminated the environment. Existing soils contamination in the vicinity of the PHERMEX facility is described in appendix D of the DARHT EIS. A site-specific study of depleted-uranium transport in Potrillo Canyon (Becker 1993) coupled with the earlier study by Lane et al. (1985) forms the basis for the conceptual model of heavy- metal migration in canyon bottoms applied in the EIS. All available information has been used to characterize the environmental impact of the existing PHERMEX and proposed DARHT facilities. Environmental surveillance data and long-term consequence modeling have shown that no significant soil contamination or water resource problem should arise from the development of any of the proposed options.

See response to comment 53-67.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 69 None required.

RESPONSE

See response to comment 17-12.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 70	Section 4.6 Tables 4-14 and 4-15

RESPONSE

See response to comment 26-2 and response below.

The environmental impacts to cultural and historic sites that could happen from any of the alternatives analyzed are discussed in chapter 5. DOE believes that one reason that archeological and cultural sites in LANL tend to be better preserved than those in surrounding lands is the fact that access to LANL has been controlled for over 50 years.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 71	None required.

RESPONSE

Archeologists do not always excavate cultural resource sites to extract research information. The preferred approach is to leave cultural resource sites undisturbed unless there is a need, such as new construction or because of the research value of a given site. The impact analysis indicates that surface contamination from DU or other expended material, while measurable, would not be sufficient to cause a hazard to people or wildlife that may be in the vicinity for any reason (including archeological field studies).

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 72	None required.

RESPONSE

See response to comment 53-6.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 73	None required.

RESPONSE

See response to comment 28-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 74	Section 2.3.2

RESPONSE

See response to comment 13-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 75	Section 2.3.2

RESPONSE

See response to comment 13-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 76	None required.

RESPONSE

See response to comment 13-4.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 77	None required.

RESPONSE

Past results are important mainly as a basis for specifying the design and objectives of new tests. The requirements to be satisfied by new tests will depend on the particular stockpile issues to be addressed. For this reason, the details of past results are not needed to evaluate the potential environmental impacts from the various alternatives.

See response to comment 18-8.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 78	None required.

RESPONSE

A weapon system is considered to begin aging once it is assembled. A weapon that is designed to be available in the nuclear weapons stockpile for 25 years will reach the end of its design life after the 25-year period. If the weapon is to remain in the stockpile after the 25-year period, then confidence in the factors of safety built into each of the hundreds of components is reduced. At some unknown point, various systems will fail.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 79	None required.

RESPONSE

The DOE is currently pursuing an archiving program to capture and store all relevant data from underground nuclear testing, including engineering drawings, relevant computer simulation files, actual test data and procedures, and anecdotal data. This program is ongoing at all three weapons laboratories and at the Nevada Test Site. Due to the immense amount of data from almost 50 years of nuclear testing and programmatic constraints, it is uncertain when this task will be finished.

Regarding the second half of the comment, as a matter of policy, the United States has generally chosen to incorporate the most current technology when designing the nuclear and nonnuclear components of a new weapon system. This has resulted in a stockpile that currently is judged to be highly reliable, safe, and efficient, as well as a stockpile that allows the Nation to minimize the cost of the very expensive delivery systems and platforms, such as Trident submarines. Heretofore, our computer simulations were not adequate to predict the complex physical phenomena that take place during a nuclear explosion because of limitations in the computers, software, and understanding of the underlying physical science of such complex phenomena. Underground nuclear testing was used empirically to fix certain parameters and approximations. Analyzing the effects of aging within the stockpile or new changes due to remanufacturing requires analysis beyond empirical analysis.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 80	None required.

RESPONSE

Nothing happens to the unchecked items unless some unacceptable statistic is determined. Statistical sampling is based on the premise that the sample is representative of the total group, within a stated level of uncertainty.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 81	Sections 2.2.2 and 2.3.1

RESPONSE

The DARHT EIS has been revised to better explain the purpose and need for DOE's proposal for enhanced hydrodynamic test capability and the DARHT facility.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 82	None required.

RESPONSE

As a weapon ages, changes take place in a number of materials, including the high explosives, various stress cushions and plastics, as well as the plutonium in the pit. Hydrodynamic tests would be used to assess the effects of aging of materials such as the high explosives and stress cushions, and their effects on the hydrodynamics when the high explosives compress the mock pit. Aged weapons' plutonium cannot be used in these experiments because it would result in a nuclear explosion. We are exploring techniques to take aged systems from the stockpile and replace the fissile pit with a mock material so that aging experiments can be done. Next year, DOE is planning to conduct a hydrodynamic test using aged high explosives removed from a stockpiled unit. Another method to test aging effects is to accelerate the aging of test assemblies to determine the effects of aged nonfissile components on the pit implosion.

The effects of aging plutonium will be done in separate but complementary experiments that will focus on changes in plutonium's material strength, spall, equation-of-state, breakup, and other properties that can change with aging. These data will then be combined with information from full hydrodynamic tests using simulated materials to assess the effect of aging plutonium on weapon performance.

In the past year, no high explosives experiments were done to study the aging characteristics of plutonium. However, other laboratory experiments were conducted to look at how the properties of plutonium change with aging.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 83	None required.

RESPONSE

DOE conducted underground nuclear tests at its Nevada Test Site until September, 1992. In general, about one test per year was done on stockpiled systems. Sometimes, these tests were done to verify production techniques for a new warhead; sometimes the tests were done on aged weapons taken from the stockpile. Nuclear tests not specifically connected to a specific system also gave general, important information that could be applied to the behavior of stockpiled systems.

Nearly one-half of weapon types introduced into the stockpile since 1970 have required post-development nuclear testing to verify and fix problems or resolve questions of the weapon's safety, reliability, or nuclear performance. Nuclear weapons contain materials that are chemically reactive (e.g., chemical high explosives) and radioactive. Over time, these materials will interact with one another producing changes that can affect nuclear performance.

Although in DOE's routine surveillance program nuclear warheads are withdrawn from the stockpile, disassembled and the components examined for changes that may affect nuclear performance, it has not been possible to quantify through computer modeling and non-nuclear testing how these changes would affect nuclear performance. In the past, nuclear testing has been essential to make such determinations. Reliability concerns can be expected to increase in significance as the average age of the weapons in our stockpile increases. Ten years from now, many of our weapon systems in the enduring stockpile will have exceeded their design lives. We have almost no data on the performance of weapons that have exceeded their design lives. In the past, such weapons were routinely replaced with newer ones.

Although DARHT was originally proposed as an important adjunct to underground nuclear testing, now a key purpose of DARHT - and other advanced capabilities - is to try to make up for the loss of nuclear testing in evaluating issues that will arise in the weapons and to evaluate fixes that may needed. Current facilities are not adequate to do this demanding job in the absence of nuclear testing.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 84	None required.

RESPONSE

DOE agrees that the weapons stockpile is aging and that continued evaluations to ensure safety, performance, and reliability will become increasingly more important.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 85	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 86	None required.

RESPONSE

DOE is aware of the Galvin Commission recommendations.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 87	None required.

RESPONSE

DOE notes that this comment presents an example of evolving capabilities and need for the nuclear weapons stockpile.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 88	Section 2.3.2

RESPONSE

DOE appreciates this assessment. The problems of materials availability or partially documented processes have been noted in the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 89	Section 2.2.2

RESPONSE

DOE is aware of the Nuclear Posture Review and has included a brief summary of pertinent points in section 2.2.2 of the EIS.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 90	None required.

RESPONSE

See EIS volume 2 section 1.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 91	None required.

RESPONSE

DOE acknowledges this article and its conclusions.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 92	None required.

RESPONSE

See response to comment 28-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 93	None required.

RESPONSE

See response to comment 28-1.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 94	None required.

RESPONSE

See response to comment 45-42.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 95	None required.

RESPONSE

See response to comment 18-23.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 96	None required.

RESPONSE

See response to comment 28-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 97	None required.

RESPONSE

See response to comment 28-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 98	None required.

RESPONSE

DOE agrees that a great deal of effort is expended at LANL for environmental surveillance and believes that emissions from its operations at LANL do not pose a threat to the health and safety of workers or surrounding communities.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 99	Section 6.9

RESPONSE

DOE's Assistant Secretary for Environment, Safety and Health sent letters to Cochiti, Jemez, Santa Clara and San Ildefonso Pueblos inviting them to participate in this process, and sent copies of the EIS to these and many other tribal governments in the general region. In addition, DOE and LANL have held a series of meetings and tours with representatives from various tribal organizations. These are listed in the DARHT EIS in section 6.9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 100	Section 4.6 Tables 4-14 and 4-15

RESPONSE

See response to comments 26-2 and 53-70.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 101	None required.

RESPONSE

See response to comment 28-2.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 102	None required.

RESPONSE

See response to comment 20-9.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 103	None required.

RESPONSE

Sampling of uranium, beryllium, and lead in the soil around the PHERMEX firing site is described in appendix D, section D.2. Concentrations of beryllium and lead drop to background at about 200 ft (60 m) from the firing point; uranium does not. Using regression analysis, it was estimated that above-background concentrations of uranium would extend to about 280 ft (85 m); the 95-percent upper confidence level of this estimate was about 430 ft (130 m). It is estimated that about 70 percent of the depleted uranium and other materials within 200 ft (60 m) of the firing site are removed and disposed of during routine housekeeping. See section D.5.

COMMENT CODE	LOCATION OF EIS REVISION(S)
53 - 104	Sections Executive Summary, 1.3, 3.7, 5 Intro, 5.4.1.1, 5.4.1.3, 5.4.2.1.2, 5.4.3.3, 5.4.4.1, 5.4.4.2, 5.4.3.3, 5.4.5.1.1, 5.4.6.1.1, 5.4.7.2, 5.4.8.2, 5.4.9.2, 5.4.10, 5.4.10.3, 5.4.11.2, D.5, E3.5, H.5.2

RESPONSE

See response to comment 3-1.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

53 - 105 None required.

RESPONSE

See response to comment 28-2.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

54 - 1 None required.

RESPONSE

DOE agrees.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

54 - 2 None required.

RESPONSE

DOE agrees.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

54 - 3 None required.

RESPONSE

The DOE is aware of Dr. Kidder's testimony.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

54 - 4 None required.

RESPONSE

The DOE is aware of the Miller report.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

54 - 5 None required.

RESPONSE

The DOE is aware of the JASON report's assessments.

COMMENT CODE **LOCATION OF EIS REVISION(S)**

54 - 6 None required.

RESPONSE

DOE agrees with this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
54 - 7	None required.

RESPONSE

DOE agrees with this comment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
54 - 8	None required.

RESPONSE

These assertions are factually accurate regarding the expected performance of the capability proposed for DARHT.

COMMENT CODE	LOCATION OF EIS REVISION(S)
54 - 9	None required.

RESPONSE

The DOE appreciates this assessment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
54 - 10	None required.

RESPONSE

The DOE appreciates this assessment.

COMMENT CODE	LOCATION OF EIS REVISION(S)
54 - 11	None required.

RESPONSE

The comment is essentially correct. Enhanced capability proposed for DARHT would be extremely important to diagnosing the effects of changes in stockpile nuclear weapons and certifying the components. Currently, it is not considered sufficient to certify a new design without nuclear test data.

COMMENT CODE	LOCATION OF EIS REVISION(S)
55 - 1	None required.

RESPONSE

See response to comment 17-12

About NEPA

The National Environmental Policy Act (NEPA) was enacted to ensure that Federal decision-makers consider the effects of proposed actions on the human environment and to lay their decision-making process open for public scrutiny. NEPA also created the President's Council on Environmental Quality (CEQ) to establish a NEPA review process. DOE's NEPA regulations (10 CFR 1021) augment the CEQ regulations (40 CFR 1500).

An environmental impact statement (EIS) documents a Federal agency's analysis of the environmental consequences that might be caused by major Federal actions, defined as those proposed actions that might result in a significant impact to the environment. An EIS:

- Explains the purpose and need for the agency to take action
- Describes the proposed action and the reasonable alternative courses of action that the agency could take to meet the need
- Describes what would happen if the proposed action were not implemented – the "No Action" (or Status Quo) Alternative
- Describes what aspects of the human environment would be affected if the proposed action or any alternative were done
- Analyzes the changes, or impacts, to the environment that would be expected to take place if the proposed action or an alternative were implemented, compared to the expected condition of the environment if no action were taken

The DOE EIS process follows these steps:

- Notice of Intent, published in the *Federal Register*, identifies potential EIS issues and alternatives and asks for public comment on the scope of the analysis
- Public scoping period, with at least one public meeting
- Implementation Plan, which gives the results of public scoping and provides a "roadmap" of how the EIS will be prepared
- Draft EIS, issued for public review and comment, with at least one public hearing
- Final EIS, which incorporates the results of the public comment period on the draft EIS
- Record of Decision, which states:
  - The decision
  - The alternatives that were considered in the EIS and the environmentally preferable alternative
  - All decision factors, such as cost and technical considerations, that were considered by the agency along with environmental consequences
  - Mitigation measures designed to alleviate adverse environmental impacts
- Mitigation Action Plan, which explains how the mitigation measures will be implemented and monitored.

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