CHEMISTRY
METALLURGY
RESEARCH
REPLACEMENT

CMRR Public Meeting, September 20, 2011

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LA-UR 11-11-06849

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CMRR Public Meeting

Tuesday, September 20, 2011

Crossroads Bible Church, Los Alamos, NM

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II. Transcript

TRANSCRIPT
of
Public Meeting

Chemistry and Metallurgy Research Replacement (CMRR) Project

September 20, 2011

[The meeting was called to order at 6:30 p.m. in the Crossroads Bible Church, Los Alamos, NM, by Meeting Facilitator Bruce MacAllister.]

[LANL Slide 1]
[BRUCE MACALLISTER, FACILITATOR]
[Microphone not picking up sound at first] ..... important for us in this room, in order for people to hear one another, to give me the opportunity to get a mike to you. So let me kick the meeting off. Again, this is the fall meeting of the CMRR replacement project, project update meeting. These are bi-annual meetings which are called for by settlement agreement between the Lab and a number of parties. We'll review that in just a minute.

[LANL Slide 2]
[BRUCE MACALLISTER, FACILITATOR]
Here's the agenda for today's, tonight's meeting. Again, those of you who have known me, know that unless there's a compelling reason, otherwise, the agenda is strictly complied with. I try to keep us to hard landings, at least at the seven-thirty timeframe to give the interested parties their full time allotment to present. And we do end the meeting in a timely manner at 8:30.

[BRUCE MACALLISTER, FACILITATOR]
So, you'll see that we've got on the screen the presentations identified here. So we'll be moving into those in short order. Let me review a couple of the other preliminaries. As far as logistics and safety goes, [words away from mike] exits. There are four exits out the, either side of the room. There are a total of four exits, two on either side. There's two exits to the rear. Those of you needing water or the rest rooms, if you'll exit this door, either of the rear doors, and go to your right, down at the end of the hall there's some drinking fountains, and just to the right and then into a hallway [to the] immediate left, there are restroom facilities. All right, so, as far as other logistics, uh, the, I think the rest will be covered in the ground rules.

[LANL Slide 3]
[BRUCE MACALLISTER, FACILITATOR]
The purpose and background of this meeting, as we have explained before, stems from a settlement agreement between Los Alamos National Laboratory and its constituents and a number of interested parties which are identified here in the listing of the parties. The meeting is held every six months as an opportunity for interested citizens to receive an update on the status of the Chemistry and Metallurgical Replacement, Research Replacement facility. The CMRR, as it's called. And ah, so, these, this is the four or fifth year that these meetings have been going on for now, and I have facilitated the last three and a half years worth or so.

[LANL Slide 4]
[BRUCE MACALLISTER, FACILITATOR]
So, again, let me move into the ground rules here for the meeting. They have not changed substantially over the years. The idea of this meeting is to enable cordial, civil dialog and information exchange

between Los Alamos and its experts in their various fields relating to the project and interested parties and their experts and their other people that are involved and want to have questions. So, the idea is to keep these meetings moving, keep them civil, and keep them informational. If you'll please turn off your cell phones, uh, and +or have them on mute, and, if you will observe a ground rule of kindly stepping out of the room if you need to carry on a sidebar conversation so that people can hear. That will be very helpful. Again, the issues are really important, and it's easy when we feel strongly about an issue to end up personalizing that to a person who is presenting a different perspective. Let's keep our focus on the perspectives and on the issues, and let's not engage in any personal attacks. As far as civility goes, the track record with these meetings, with the various compliance meetings and hearings that the Lab has had, has been pretty solid. However, there are situations where people have taken it upon themselves to attempt to disrupt the meeting. If there is any disruption of a meeting, the standard practice, for the meetings at this point is, the meeting is adjourned at that point, and we'll reconvene and continue at the point that order is restored and the ground rules can be complied with. So, the ground rules are really important.

[BRUCE MACALLISTER, FACILITATOR]
As far as the transcriptions of the meeting goes, again, because this is a large room with a relatively small group of people, it will be important because of the acoustics and everything, to give me the opportunity to get a mike to you. Also understand that these meetings are recorded and if you don't give me the chance to get the mike to you, your comments will be lost in that process. Now about half way through, there is a new recording process being used to make sure that we get the information that's— we've gone from analog to digital, as scary as that is for some of us old analog guys. But I may need to call a halt to the meeting momentarily to allow for the technical folks to insert a new CD, recording process.

[BRUCE MACALLISTER, FACILITATOR]
Finally, Lorrie mentioned to me to let you all know that there's no government agents hiding behind the mirror back in the back of the room. That is a nursery for the children to watch their parents, uh, in church service. So, uh, those of you who want to inspect that and verify, feel free. But I take her word for that.

[BRUCE MACALLISTER, FACILITATOR]
So, without further ado, let me turn it over to our first speaker.

[Discussion with facilitator off mike for several minutes. Someone is pointing out an error in the agenda to the facilitator.]

[BRUCE MACALLISTER, FACILITATOR]
...Okay, so the comment had to do with a typo in the agenda which says that we've given you from 7:30 until 7:30 for questions after the Laboratory's presentation. I can't speak to whether that was a Freudian slip on anybody's part. I don't believe so. So, the, there have been adjustments made in the Lab's presentation to insure that there will be plenty of time for questions before the start of the Interested Parties' presentation, which will begin at 7:30. So there's no intention to cut into any other person's time. And thank you, Ms. Arends for pointing out the typo for me.

[LANL Slide 5]
[STEVE FONG, PROJECT MANAGER, LOS ALAMOS SITE OFFICE (LASO), NNSA, DOE]
Thanks everybody for coming out tonight in our new venue. This is quite exciting. It's got a lot of space for expansion, so, it's, uh, good crowd. I'm gonna go through some slides that are familiar to some because, uh, you've seen some of these slides. The story had not changed very much on the CMRR project. But I need to go through those for those that may be new to introduce the project. I'll be sharing the stage with Tom Whitacre [Thomas J., Project Manager, LASO, NNSA, DOE] and Larry Goen [LANL Office Director for Conduct of Engineering and CMRR Program Director for Seismology] here. And we

will look forward to time to respond to questions. But we are gonna try to go through my presentation, our presentations first, and then we'll hopefully have an ample amount of time to go through some questions. Again, [I'm] Steve, I'm part of the federal team. Responsible for the delivery of the CMRR project. So, I'm gonna be seeing, saying "CMRR." The acronym is up there. You can all read it. But it's become very familiar in my dialog to just say, "CMRR," and I ramble through it. But, uh, this is the project. This is all about the project, and we are gonna introduce the project to you.

[LANL Slide 6]
[STEVE FONG]
What is CMR? It is a chemistry laboratory. Again, for the missions that are conducted at Los Alamos, it's the heart of the Laboratory. This is where— It is a chemistry laboratory where science is done on the, the properties of the materials that we study here at Los Alamos. It is a laboratory. uh, it's a capability that we provide, and that capability can be used for many different programmatic operations that are listed above.

[LANL Slide 7]
[STEVE FONG]
And, on a daily basis, this, these capabilities, these operations are conducted at the CMR facility that is currently located in Technical Area 3, in the facility above. This is the, the facility of CMR. This is the facility that the project is intending to replace. It is an aged facility, uh, nearly 60 years old or so. It's seen its design life, uh, end of its design life, and we are intending to replace this capability further down the road, about a mile or so, in Technical Area 55. This facility is located in Technical Area 3, which is in the downtown area, or, I would say, the central part of the Laboratory, Technical Area 3. As you cross the Omega Bridge into the Laboratory itself.

[LANL Slide 8]
[STEVE FONG]
The CMRR facility replaces, uh, the CMR facility is replaced by two facilities. The first facility is the Radiological Laboratory Utility Office Building, or RLUOB. That facility, the shell of that facility, is complete. We are currently outfitting it. We know, that facility is called the RLUOB, and it will house radiological operations. It contains the office spaces for the workers; it has centralized utilities in the facility. It was, the total project cost for the shell of the facility, at $164 million. We did bring that in, about two years ago, now, I think, just about, a year plus, uhm, at it's TPC [total project cost], and again, as we are currently underway we are now outfitting that facility. Um, we were pretty successful, pretty pleased with the facility. And we are looking forward to turning that over here for operations and beneficial occupancy here very soon.

[STEVE FONG]
At this point I'm gonna turn it over to Tom [Thomas J., Project Manager, LASO, NNSA, DOE], and he'll go through the details on where we stand on the equipment of the facility itself.

[LANL Slide 9]
[THOMAS J. WHITACRE, PROJECT MANAGER, LASO, NNSA, DOE]
Thank you Steve. My name is Tom Whitacre. I'm also part of the federal project [some words off mike] construction oversight portion of the project. And I'll give you a status of where we're at on the Rad Lab portion as well the Rad Lab equipment installation, the REI portion.

[THOMAS J. WHITACRE]
Uh, let's see. Okay.

[UNIDENTIFIED PERSON]
Closer [to the microphone].

[THOMAS J. WHITACRE]
Let's do that. Okay. [Adjusting microphone]
Is that better? Okay. We're in concert here.

[THOMAS J. WHITACRE]
Uh, we're at right now, September 30th of this year, we plan to have conditional beneficial occupancy of the Rad Lab. Uh, essentially, what that means is, we'll be turning over the basement, the second floor, third floor, fourth floor, as well as the Central Utility Building portion of the facility to the institution [Los Alamos National Laboratory] for operation. So, the operational TA-55 folks will own the facility, do the maintenance on it. So the plan is to have that approved for conditional beneficial occupancy September 30th of this year.

[THOMAS J. WHITACRE]
[Indistinguishable words off mike] What will be following is beneficial occupancy, essentially in the spring of next year we will be completing all the work in the laboratory floors, commissioning those systems and turning the laboratory floors over to [Laboratory] Operations for radiological operations. So, the plan is, turn the office spaces and support systems over in the next few weeks, and then, next spring, summer timeframe, we'll turn the entire facility, including the operations over to the institution.

[LANL Slide 10]
[THOMAS J. WHITACRE]
This figure shows some of the key milestones for Rad Lab. I think the key point to make here, Steve [Fong] mentioned, we are approximately about a year ahead of schedule and running under budget. Uh, some of the key milestones of the project, we are right now just completing all the laboratory floor build-out. We are in the process of installing all the programmatic equipment, which is the specialized chemical equipment, monitors, ICP [inductively coupled plasma] mass spectrometers, those types of devices that the chemists use for material testing and sampling, as well as commissioning all those laboratory systems. So the plan is that there will be several laboratory management self-assessments to get ready for radiological operations. And the plan is, in the FY12 timeframe, the middle of the year, so when we will actually have the facility turned over to the institution for operation.

[LANL Slide 11]
[THOMAS J. WHITACRE]
A lot of you folks have seen this photo. This is kind of the Argus rendition of where we were in 2005. Uh, and like Steve [Fong] mentioned, we've completed the shell build-out. And kind of some photos to show that we are done.

[LANL Slide 12]
[THOMAS J. WHITACRE]
This is the operations center. Here are all the equipment for monitoring all the different building systems and functions. [Points to the upper left portion of the slide.] This will be manned 24/7 by operations groups that can monitor the building, any systems. If there's any issues or errors with equipment, they can monitor and control those from here. This is the actual atrium [points to the right portion of the slide] where the workers will be walking into the building. You can walk in on the second floor, third floor, and fourth floor. Second floor is office spaces. Third floor is office spaces. The fourth floor is a training complex [for] all the workers at TA-55 and CMR. This left side of the facility [points to the lower left side of the slide], when you walk through the double doors is the cleared side for people with security clearances. On this side is the uncleared personnel, their office spaces. And then, down below, below this floor is the laboratory floor. And so I have some photos here to kinda show you where we're at in progress with that.

[LANL Slide 13]
[THOMAS J. WHITACRE]
This is kind of a schematic of the layout of the laboratory floors, the first floor that the work is still occurring on right now. This area up here is the uncleared laboratory spaces. This is the cleared laboratory spaces. And these areas in blue are the different laboratory modules that we are in the process of building out. We have the radiochemistry lab. Trace elements two, trace elements three laboratory, and the mass spectrometry lab, along with the chemical preparation and chemical storage lab module. And on the uncleared side we have a chemical storage and chemical prep modules. Each of these modules, a typical module is about 12-1/2 feet wide by about 60 feet long. So the plan is, in the secured side we'll probably have about 70% of this floor space built out, and about 20% of it built out on the uncleared side.

[THOMAS J. WHITACRE]
The instruments that will be installed in the laboratories are over here, where they have— There'll be seven gloveboxes. We actually have those in place and installed. We've got nineteen open-front hoods, as well as ten chemical fume hoods. So I have some photos, and can show you some of those, some of those pictures here in a moment.

[THOMAS J. WHITACRE]
In each of the laboratories, this is the list of some of the analytical equipment, or instrumentation, programmatic equipment. Again, this is the type of equipment that the chemists will use to do their different types of work in the different laboratory modules.

[LANL Slide 14]
[THOMAS J. WHITACRE]
This is actually a picture of the, uh, one of the trace elements laboratories. This is one of the glovebox trains that we have. They are all made of reinforced stainless steel, about seven gage stainless steel, about 3/16ths of an inch thick. And it's coated with a product called Halar, which is kind of a super-duper Teflon, with chemical resistance, about a quarter-inch thick coating.

[THOMAS J. WHITACRE]
What we have here, and this is one of the chemical fume hoods where the programmatic equipment will be installed. In these gloveboxes we have a series of different services that are provided. We have a dry vacuum system, wet vacuum system, nitrogen, argon, a whole series of flavor[s] of gases and utilities that are supplied to the gloveboxes. Those utilities are inserted into the box, up through the front here; electrical service comes in back of the box. And see down below here, all this piping runs, these are a lot of the glovebox services, are, penetrate the floor from below and run up behind the gloveboxes and will be plumbed up into the boxes.

[THOMAS J. WHITACRE]
Up on top are some additional services: health physics monitoring, the dry vac system, some of the smaller services. [Pointing on slide.] Those are run down and plugged in here as well. These are actually enclosed gloveboxes. There's a, a leaded glass insert here that has been taken out, for construction right now, while the people that are working won't be damaging that. So those have been removed. And there are your typical glove rings that you can see down here along with these ports for maintenance up on top.

[THOMAS J. WHITACRE]
Ah, these are the exhaust. There's an inline HEPA filter. This is actually gonna be attached. Some of the work is left to be done. This will be attached to the exhaust system of the facility. So, they go through a HEPA scrub here. And inside the facility there's a two-stage HEPA that collects all the contaminated

process air [which] is scrubbed out, and then comes out through an exhaust stack on the south side of the facility.

[THOMAS J. WHITACRE]
Same thing here. We have services in, for this analytical equipment. There's ports on the side that provide different services. Gases that they need for the instruments, and the electrical supply is here as well.

[THOMAS J. WHITACRE]
Up on the walls here, there's a special coating here [points to the upper central part of the slide] that we use, an NDC coating, a nuclear decontaminatable coating. So if there's any kind of issues with releases of contamination, you just go ahead and wipe that down and dispose of that material, the, uh, the wipes. There's low-level waste versus ripping out drywall [inaudible words no on mike]. So we take a lot of lessons learned over the years at the laboratory, apply those to the design of these laboratory modules.

[THOMAS J. WHITACRE]
These glove stands, box stands, you can see are pretty beefy, pretty secure. These are all anchored down into the floor, to our PC-2 requirements for the facility from a seismic perspective. So they are anchored, and then these tabs are welded to the structure as well. So, again, this is one of the glovebox trains. You can just barely see, we have some gloveboxes that are not fully enclosed, they are just kinda mostly open-faced ones that I mentioned.

[LANL Slide 15]
[THOMAS J. WHITACRE]
This is one of the pictures of the programmatic equipment that we have installed. This is in a radiochemistry laboratory. There's no gloveboxes in here, but, again, this is where, I think, an ICP mass spectrometer will be installed. And here's the services that will come into this. This glass you can pull down. A glass door, and operators can have their hands underneath in there to work in the space here. And here's the power requirements.

[THOMAS J. WHITACRE]
One of the key features of the laboratory, of course, is, for all of our gloveboxes, we have a negative pressure inside that glovebox. So we are always drawing air inside those boxes so we never pressurize those boxes; we are always under negative pressure so our point seven inches of pressure in the zone one exhaust is what we call it, uh, the glove boxes have zone one. Zone two exhaust is the open boxes and the fume hoods, as well as the laboratory. That's about a half-inch pressure drop. So the idea is, the air is pressurized into the laboratory modules from up above. As it goes through the different processes or instrumentation or it's also drawn across the room, we are always having negative pressure drawing into the gloveboxes, drawing into the laboratories, never out into the corridors, never pressurized out into the facility.

[THOMAS J. WHITACRE]
For the monitoring, we have Magna-Hewlett [Hewlett Packard Magma] gages up here that can verify what the pressure is inside these structures and features.

[THOMAS J. WHITACRE]
Are here are typical storage benches. Right now the plywood is just sorta protective while we are doing construction activity. And you can see the same kind of modular design in these laboratories. We have our overhead, these glovebox services, the dry vac, and the health physics system, the nitrogen gas. And up above is all the electrical conduit running down behind and giving us power into the facility here. So it's a pretty standardized design.

[LANL Slide 16]
[THOMAS J. WHITACRE]
This is one of the typical room exhausts in one of the lab, chem prep labs. This is where the zone two exhausts where the air is pressurized into the lab modules. This is one of the areas where it is collected. This is a HEPA filter cartridge here that ties back up into the exhaust system, which goes to the dual-stage HEPA system. So we have multiple scrubbing capabilities for the HEPA system for the facility.

[LANL Slide 17]
[THOMAS J. WHITACRE]
This is one of the completed chemical prep labs. Right here is that air filter system we saw. You can see how this is ducted up and connected up into the, there's a duct up above in the ceiling area here. So that's where the exhaust duct is connected here. This is another open, this is another chemical fume hood right here, and you can see that it's ducted as well. So again, the is the most negative pressure zone in here. So the air from the lab is being drawn in, into these boxes and equipment and filtered through, and run through the exhaust system.

[THOMAS J. WHITACRE]
This has the special NDC coating I talked about, nuclear decontaminatable coating. What we're doing right here right now, in the ceiling up here, is we're putting in a stainless steel drop ceiling. So we have a soffit here. I've got some close-up photos showing the ceiling completion, so they are in the process of finishing that out. And we have a protective coating here on the floor as well, while we are moving the equipment in and building out the laboratory modules.

[LANL Slide 18]
[THOMAS J. WHITACRE]
This is another one of the views of that chemistry laboratory, showing the same type of services that we have. You can see down below here, the wet vacuum system, the argon, and the other services are supplied from below and are plumbed out behind the laboratory casework. And then the other services up above, and that goes into the different fume hoods and equipment and instrumentation. So you can see all the electrical power distribution the same kind of way, a modular floor. This, this is actually three modules, but this particular laboratory has three modules combined into a single one. One of the key requirements for the laboratory modules will [be to] maintain flexibility over the 50-year design life of the facility. So each of the modules— Right now the walls are essentially drywall with stainless, with metal studs. There's no load-bearing design in that wall, so in the future, mission need changes, people have a single module, wish to have two or three modules, to do some additional functions in the future, they can just demo out those walls and have those mod have those, and have a bigger laboratory space available. Or a mission changes, we'll have the big laboratory, a three- or four-module bay, and can break that down to a single module. And do the work activity in there.

[LANL Slide 19]
[THOMAS J. WHITACRE]
This is a ceiling shot of that same lab. This is the rad exhaust. This is the contaminated exhaust, this round duct. Up above is all the electrical supplies and way on top is a rectangular duct, that's the clean air duct coming into the room. And then this is where the stainless steel panels and the perforations are, the clean air is forced into the room and exhausted out through these stainless steel ducts or through the fume hoods or boxes. And then this is the secured telecommunication and computing requirement here that's, will be visible below the ceiling.

[LANL Slide 20]
[THOMAS J. WHITACRE]
Again, the build out of the ceilings. This is one of the un-built out labs. We are putting in the ceilings. So we have these drywall soffits, these metal panels. Here's some light panels. And you can see there we have fire protection cutouts going in here. So we have, these are fully sprinklered spaces available for use right now, although they are not being built out from a laboratory perspective as part of our project. But they are going to be built out as a shell for future program use.

[LANL Slide 21]
[THOMAS J. WHITACRE]
Again, just, this is the mass spectrometry laboratory here. Here is a glovebox attached to a fume hood. This is not a design feature here; this is actually for protection. There's actually a glass panel behind there, and that's plumbed in to this chemical fume hood here when the instrument will be installed. You can see these pieces of pipe laying down here. These are the sections that attach to the exhaust for the gloveboxes and the fume hoods that will attach into the overhead exhaust duct. So, some pretty intricate designs on the steel, all stainless steel. Ya' know, a lot of hand fabrication to make these, these bends and turns in here in order to make these up to the overhead services, the exhaust system that we have.

[LANL Slide 22]
[THOMAS J. WHITACRE]
This is a view down the main corridor of the laboratory. This is a cent— this is kind of a utility corridor. Up above is electrical distribution as well as, uh, all of our supply air and exhaust air in this round duct you can see above in the ceilings. This is looking from the, uh, uncleared side down to the cleared side. So these are the uncleared laboratory modules. Through that security door on either side, we have the cleared modules, laboratory, lab modules.

[LANL Slide 23]
[THOMAS J. WHITACRE]
These are just some photos. Last time we showed some of this. This is some of the exhaust duct where the, uh, the filtered out air comes through the, the two-stage HEPA units in the basement. These are all painted, corrosion resistant. We got our fire wrap and duct wrap, showing that that's all complete. This is a view on the mezzanine floor. It's got a very tight space. It counts as floor space, but it's really not useful for program. It's just for equipment maintenance. But those are kinda finishing up all the finishing touches on the different systems in the building.

[LANL Slide 24]
[THOMAS J. WHITACRE]
The facility is going to be going for a LEED [Leadership in Energy and Environmental Design], uh, silver certification. I think we are submitting the design package to the Green Building Council here in the next month or so. We are going for, silver's requirement, we potentially have enough points to go for gold. We'll see how the Green Building Council comes back on our package. And there's a series of points. We have, ah, 28 design points associated with the design and about 18 points associated with construction. So these next few slides are just kinda showing the LEED points, ya' know, erosion control, natural landscaping, those types of features on the outside of the facility.

[LANL Slide 25]
[THOMAS J. WHITACRE]
Inside here are special walkways to capture mud so people don't track mud and water into the facility, requiring a lot of clean-up, so there's some points there. We have a shade and temperature control lighting. Bike rack for commuters. Those types of things are all points that are available. Low flow

faucets and sensors in the showers, those types of things for water-saving measures. And as well as composition of the material used.

[THOMAS J. WHITACRE]
Ergonomics here for the work stations and the workers. Also along with motion sensors and temperature control to make sure we have efficient heat flow and cooling in the facility. So what's I had for status, just kinda quick.

[LANL Slide 28]
[STEVE FONG]
So, as I discussed, CMR is being replaced with two facilities. That was the first facility that is coming to completion within the next six months. We look forward to turning that over to [LANL] Operations. At that point, the project work is done. This is a radiological facility. Again, this is where, if you would, low inventory of materials, nuclear materials, are used and worked with, up to 8.4 grams of plutonium equivalent. So, that's the first part. The second part is the core operations, the core laboratory operations, the capabilities that we like to bring in, and that's the Nuclear Facility.

[STEVE FONG]
The Nuclear Facility, as we had planned, is described in a Supplemental Environmental Impact Statement that's out. And I know that most everybody is quite aware of that. And in that facility we have three alternatives that we are investigating. That has been published. And it's on-going. The Radiological Laboratory is here [pointing to mid-left portion of slide], this is Technical Area 55, this is Pajarito Road. As one of the alternatives planned, is to build a modified, or the Nuclear Facility right adjacent to the Radiological Laboratory. There would be a tunnel connecting it. And a tunnel connecting it to the existing PF-4 facility. Or the plutonium facility at the Laboratory.

[STEVE FONG]
This is, this would all be enclosed in a security PIDAS [perimeter intrusion detection area security system] and would represent the core plutonium operations for the site and for the complex, the NNSA complex. There is an alternative also to stay and remain in the CMR, the old CMR facility that is being considered. The record of decision should be out, um, sometime in the future. It is a mandatory 30-day wait to, before that decision can be made. The earliest date that that could be made is in the early October timeframe. So any time after October, a decision could be made on what path we would like to take for the Nuclear Facility.

[STEVE FONG]
A lot of what we've seen in terms of comments received on the Nuclear Facility, in the Environmental Impact Statement, Supplemental Environmental Impact Statement, has dealt with the geology and the seismic condition at Los Alamos. So, tonight, I think, uh, we have a great opportunity that we, we've decided to embark on, and we've invited Larry Goen [LANL Office Director for Conduct of Engineering and CMRR Program Director for Seismology] to provide us some background of the geology at the site. Now Larry comes with some great, great expertise. We all look for Larry to bring us the answers, and general understanding of the site. And I would like to transition now to introduce Larry to come on up and, uh, provide his overview. And then we'll hopefully have time for entertaining some, some comments at that point. Larry.

[Goen Slide 1]
[LARRY GOEN, LANL OFFICE DIRECTOR FOR CONDUCT OF ENGINEERING AND CMRR PROGRAM DIRECTOR FOR SEISMOLOGY]
Good evening. I am Larry Goen. Um, I've been associated with the seismic program at the Lab for most of my career, mostly as a structural engineer. But I have served as the program manager for the activities

that deal both with the engineering as well as the seismic hazard. Um, I was asked to come in and provide an overview on the earthquake hazard at Los Alamos. This is a fairly high level presentation. I don't get into specifics on CMR[R], but try to give, or CMRR, but try to give you an overview of what the hazard is at the Laboratory and what creates that hazard.

[LARRY GOEN]
We're gonna talk a little bit about seismology, the seismic hazard across the state, and then we're gonna zoom in to Los Alamos and give a little bit of explanation of how we investigate, and what that seismic hazard is.

[Goen Slide 2]
[LARRY GOEN]
So, to start out, just to get everybody oriented, not that you don't know where we're at, but, um, Los Alamos is located here. We're on the side of the Valles Caldera, um a volcano, on the west side of what we are going to talk about mostly, the Rio Grande riff that runs down through the middle of the state.

[LARRY GOEN]
And then we've got Santa Fe. And we've got Sangre de Christos over on the east side of the state. Ahm, as we go through today, we're gonna talk about the faults. And you'll notice that there are faults on both sides of the, of the riff.

[Goen Slide 3]
[LARRY GOEN]
So, I started out and I said, the Rio Grande Riff. Uhm, what's basically happening at this location is the continent is trying to pull apart. Uhm, and when you get the earth pulling apart in an area, you've got an area of weakness in the crust. And, from that, you'll develop a weakness so that you could have earthquakes; you could have volcanoes. And that's basically what we are depicting here. Here you've got a picture of the Rio Grande. The Rio Grande basically goes down the middle of that rift. The rift really extends up into central Colorado. Goes all the way in to northern Mexico. It's been divided up into different basins. We've got the Española basin, is where we're located at. We're gonna see that the largest swarm of earthquakes that we have is down here around Socorro. But we do have seismic activity across the state.

[Goen Slide 4]
[LARRY GOEN]
So narrowing in to, uhm, Los Alamos again, Valles Caldera, we've got Los Alamos here [point to slide], Santa Fe down here. We've tried to indicate some of the major fault systems that are associated with the Rio Grande Rift. We're Los Alamos, we're dominated by the Pajarito fault system. And that's basically going along the west side of the town site and the west side of the Laboratory.

[Goen Slide 5]
[LARRY GOEN]
Looking at this kind of a cross section across, across our area, um, we do have the Valles Caldera up here. We've got the Pajarito fault zone. This is the western boundary of the Laboratory. We go down across the Pajarito Plateau. Basically, the materials that are on the top surface are ash flows from the volcano. So that is the Bandelier tuff. As you go further towards the Rio Grande, you get some erosion. You get some things carrying that away, and you get down to the bedrock.

[Goen Slide 6]
[LARRY GOEN]
Focusing in on the seismicity of New Mexico. Um, as you can see, we've got a lot of activity that goes up through the center of the state, although there are earthquakes that happen. The largest earthquake, and we'll talk a little bit more, is this swarm down in Socorro around 1906. Uhm, we do have one larger event up here near Santa Fe in 1918, the Cerrillos event. The largest that we have recorded in history is in this 5.0 to 5.9 magnitude range. So, I say in history, when we talk about history in terms of earthquake, it's what we've been able to record. So this is really a record that goes back to the late 1800s and goes to today. That's really a small snapshot in time compared to what geology is all about. But in recent history, we haven't seen large events on the Rio Grande Rift.

[Goen Slide 7]
[LARRY GOEN]
Again, the biggest earthquake that has been felt in the historic times is this event down in Socorro in 1906. This was a actually a series of earthquakes that went over a period of two years. The largest event, um, let's see, was in 1906. Ahm, this, this map that we have here has different magnitudes expressed in terms of a modified Mercalli event. And really, the modified Mercalli scale talks about damage states, if there's damage states, if people felt it, if they felt it, what kind of damage was associated with it? The seriousness of the damage, then the numbers would get larger. So, around Socorro itself, you can see that they had a modified Mercalli scale of about 8. Out around Santa Fe, our area, up to Gallup, into northern Mexico, into Texas, we're in the three range. Where people were feeling it. Not much in the way of damage.

[LARRY GOEN]
When this first was reported, these are articles that came out of *The New York Times*, I think. Uh, but they had a lot more damage or a lot more hysteria going on than what actually happened. There was structural damage in Socorro. But there were no fatalities. There were not a whole lot of major injuries associated with this.

[Goen Slide 8]
[LARRY GOEN]
Bringing this in a little tighter to Los Alamos: As I said, the Pajarito Fault zone, or, yeah, fault system, is really our big concern. Up here we have a picture taken from, actually around the TA-55 area looking back towards the west. You can see the Pajarito Fault scarp expressed in terms of a quick rise. And if you are familiar with Los Alamos and you went out towards the back gate, you'll notice that the, the topography changes fairly dramatically, very steep slopes. That's a depiction of, or an indication of the Pajarito Fault. Down below we have kind of a 3-D perspective of the area. Ahm, you can see where the town of Los Alamos is; you can see where Los Alamos National Laboratory is. The Pajarito Fault goes all along the western edge, as I said.

[LARRY GOEN]
There's a couple of other faults that are associated with the Pajarito Fault zone, and that's the Rendija Canyon Fault and the Guaje Mountain Fault. Um, I know it's difficult to see, but in this picture, we show locations where we've actually gone out and dug trenches across that fault. This is how we go and look at prehistoric earthquakes. We do paleoseismic investigations so that we can try to understand, "What are the sizes of the earthquakes that could affect our site?" And that's where we get a lot of the data for, coming up with ground motions, that we would be using to design our facilities.

[Goen Slide 9]
[LARRY GOEN]
Uh, again this is another depiction of, of the faults in the area of the Laboratory. In grey you can see the outline. You can see, again, the Guaje Mountain Fault, the Rendija Canyon Fault, and then Pajarito, and they predominantly are in the western half of the Laboratory.

[Goen Slide 10]
[LARRY GOEN]
As I said, we do a lot of investigations on the faults. In the late 1990s we spent considerable time doing trench excavations. There are a number across the Pajarito Fault. We have, um, a handful across the Guaje Mountain Fault and also the Rendija Canyon Fault. So we have done some detailed investigations of those faults. And, while our early efforts, we weren't able to uncover direct traces of the fault, we learned from, as we went, and we became much more successful in identifying the best places to place our trenches. So what we have here is a picture of one of the trenches. These are about three feet wide. They can vary anywhere from a meter deep to ten meters deep, twelve meters deep. As we get deeper, we have to place shoring in there to protect our personnel. It makes it a little bit harder to do the investigations, but we are able to get the data that we need.

[Goen Slide 11]
[LARRY GOEN]
What comes out of these faults, or out of these investigations, um, we do detailed examination of the trenches. We capture all that data and we develop trench logs. In these trench logs we capture the geographic strata that goes through these trenches, and we look for discontinuities, places where these things suddenly stop, or they become offset. So over here on the left side [of the slide] we've identified a couple of different locations where, uh, uh, an earthquake has actually ruptured the surface. We measure those offsets. We look for material that may have gotten into the opening. As these, uh, as these faults occur you'll get some spaces in there, and then through time you could have forest fires. Forest fires create charcoal. The charcoal washes into these things. And we use that as one method of dating when these earthquakes possibly could have happened. It's not an exact science because you are waiting for erosion, you are waiting for deposition. But it gives us a bounding case of, of when that earthquake may have occurred.

[LARRY GOEN]
Um, so through these paleoseismic investigations, we've been able to document when we think major earthquakes have occurred. And when I talk about major earthquakes, I'm talking about surface-rupturing events. These are events that are probably about magnitude six and a half to seven, is what's typical for our, our region based on the length of the faults and how much the displacement may be. Um, what we've seen, we've got events on the Pajarito Fault, shown in green here, on Guaje Mountain in purple, and Rendija Canyon in red. We believe that there's been two to three events on the Pajarito. We show two here. Um, but there's a possibility that one of these, where the dates are fairly close together, we either have bracketed one, or there's two in there. And there's discussion among experts as to whether it's two or three.

[LARRY GOEN]
We also see that the Guaje Mountain had an event that showed up in that, close to the same timeframe, as well as Rendija Canyon. And then, the next events out are looking like it's about a twenty-thousand-year time spread. But again, these are the major events. These are the ones that the shaking intensity could cause damage to buildings. They do rupture across the faults and we can measure that and we've seen that. So those are the ones that really control our design parameters for buildings at Los Alamos.

[Goen Slide 12]
[LARRY GOEN]
But I'll go back and close out this way: um, we do have a seismic network at Los Alamos. We have been recording the earthquakes for some time. This is a, um, kind of historical record from 1973 to 2007. We do have a number of events that are picked up by our, our seismograph stations. The different stations we have are shown with the blue triangles. We are in the process of updating those, making sure that we have up-to-date equipment. Um, the magnitudes that are generally felt are less than magnitude three. A lot of the earthquakes that we do record on our network locally, people don't feel. There's not that, that intensity.

[LARRY GOEN]
So, while we don't see major earthquakes on the fault in historic times, again going back to the late 1800s, we do see evidence through our paleoseismic investigations and what we've see with the offsets on the Pajarito Fault, that it is capable to get large events at the site. That's the overview that I had for you.

[BRUCE MACALLISTER, FACILITATOR]
Thank you. It looks like we have ten minutes for questions before the next presentation. So let me just start right up front here and we'll work through the room. Yes sir? When you ask your question, give your name so that we can make sure that it's properly recorded on the transcription. Thank you.

[MICHAEL DI ROSA, LANL POSTDOC]
Hi. Michael Di Rosa. This question is for Dr. Goen. Um, either in the historic seismic record, or paleoseismology, is there any evidence of what precedes major earthquakes. So for instance, do, cataclysmically or suddenly, on some geologic timescale, these things happen? Or are they preceded over a number of years or decades by, let's say, precursor tremors that lead up to a major seismic event? The reason I ask is that ultimately the CMRR design basis is built around, in fact, dug into the ground, based on what the perceived seismic risk is. And quite frankly, if you are designing for a magnitude 8 earthquake, but you know it's going to take years to build up to that crescendo, then perhaps you would need a, uh, not as sturdy a foundation as you would for a magnitude 8 earthquake that would happen without warning and all of a sudden. So, I guess all of that is to ask, is there is any consideration in the design of this nuclear facility of the dynamics of the earthquake rather than just plan for the plateau of, of earthquakes? And is there anything in the geologic record that would indicate how major earthquakes take place?

[LARRY GOEN]
Uh, first though, I want to make one quick correction: I'm mister Goen, I'm not Dr. Goen. Ah, if I understand the question, are there precursors to a major earthquake? And I think, [mike being changed, words missing] ... uh, are there precursors to major earthquakes? And, there aren't any known tried and true methods of predicting earthquakes. I think that you could probably go through and look at earthquakes and see that there's been some that have had some indications and then there's other that aren't. So, when we design for earthquakes, for buildings at Los Alamos, we design to a ground motion that's, that incorporates the earthquakes. And we look at a probabilistic type of event and we design for that ground motion. But not for a particular earthquake. It is a range of earthquakes.

[BRUCE MACALLISTER, FACILITATOR]
Okay. Thank you. Next question here, sir? Please give your name.

[WILLEM MALTEN, LOS ALAMOS STUDY GROUP]
My name is Willem Malten. Also for Mr. Goen. Um, you talk a little bit about historical earthquakes, but in the last few years there's been a lot of earth activity here. It seems like. We had a 5.3 earthquake not

quite right there, but a little bit further out, and just now, I forget where it was, Cuba? it was another one. I forget where it was exactly, but pretty close to Los Alamos too. And in the last few years, I've read more earthquake activity in this region than in, than you note until 2007 here. Can you mention anything about that? Is there more earth activity suddenly? Or what's happening?

[LARRY GOEN]
I'm not aware that it's any more frequent than what, what we showed on those maps. Uh, again, when we look at the earthquake hazard for Los Alamos, we take into account a broad range of earthquakes. We take take into account how they affect the site. So, earthquakes that are somewhat distant from the site may not affect our ground motion as strongly as one that is closer in. Uh, as I said, our earthquake hazard is really controlled by happens on the Pajarito Fault itself or the Pajarito Fault System.

[BRUCE MACALLISTER, FACILITATOR]
Okay. Sir?

[GREG MELLO, LOS ALAMOS STUDY GROUP]
Greg Mello. This is for Tom [Whitacre] or Steve [Fong]. Are you anticipating any independent engineering reports prior to CD-2 [Critical Decision 2] on CMRR Nuclear Facility? Or would you expect CD-2 or CD-2/3? That's about it.

[STEVE FONG]
I'm also going to recognize, in the back, uh, Rick Holmes [Richard A. Holmes, CMRR Division Leader, Los Alamos National Laboratory] will be assisting us, maybe, in these minutes. He's the project director for the Laboratory. Uh, independent reports: as we go through these critical decisions or critical decision gates, as we develop a project, yes, there are checks and balances that are independent of the project. So we have independent project reviews, engineering reviews that are done and conducted by groups outside of Los Alamos. And many occasions we bring in, seems like there's an independent review going on all the time. We bring those in as a federal project team, as the federal project director. We need to look at and investigate and independently take a check at where we stand. We bring in folks from the outside to give us an independent perspective. It's the way we do business. It's a healthy thing to do. Constant and always. These reports, Greg, aren't always public. These are things that we use as tools in delivery of projects such as our facility. Things on the Rad Lab, lower hazard, lower risk, typically not as many independent reviews. Those things such as the Nuclear Facilities,—

[UNIDENTIFIED PERSON]
.... of great interest.

[STEVE FONG, CONTINUING]
... and there is great interest from external groups such as Defense Nuclear Facility Safety Board. They are here. And actually they are gonna to be here this week, coming on and reviewing, and making sure that we are doing those things that we need to, to insure safety to the public. And to the environment. So, these checks go on continually, Greg, but there are things that are mandated, if you will, by our orders to make sure that we go through and conduct.

[BRUCE MACALLISTER, FACILITATOR]
Okay. Ma'am?

[SUSAN GORDON, ALLIANCE FOR NUCLEAR ACCOUNTABILITY]
Susan Gordon. Mr. Fong, once, if, ***if*** the CMRR building is built, what is the plan for the CMR building? Are you planning to close it? That seems to be the impression that many in [the U.S.] Congress have.

[STEVE FONG]
Thanks for asking the question. In our 2003 Environmental Impact Statement for CMR, and the 2004 Record of Decision, is, at that time, the decision maker, the administrator, declared that "yes, we will raze the facility once CMRR is built, or after the completion of the project." Once we move out. Depending upon which way we go after our EIS, and which way we build. Once we are operational, there is a commitment, and it's a federal, uh, I guess we call it a, uh, it's a federal binding requirement, that we stated, that we will raze the CMR facility. But that's after operations have started in the Nuclear Facility.

[BRUCE MACALLISTER, FACILITATOR]
And we have time for one last question before our next presentation.

[JAY COGHLAN, NUCLEAR WATCH NEW MEXICO]
I'll make sure it's a fun question, then. This is for Steve [Fong]. I'm Jay Coghlan with Nuke Watch New Mexico. So, I have a nest of questions around the Record of Decision, which you said might come out as early as the first half of October. And, as you know, the Supplemental EIS, like posited two options for shallow and deep excavation. So, will the Record of Decision make a decision on, between those two options? And then once you have the Record of Decision, how quickly does NNSA plan to go into site preparation? And then, related to that, Senate Energy and Water Appropriations limited site prep to $40 billion for Fiscal Year 2012, even though it's unlikely that we'll get authorization of bills passed. But would NNSA observe that limitation? And, if so, what can it do for $40 million anyway?

[STEVE FONG]
So the first question was the construction option. In the modified CMR Nuclear Facility, whether or not it's a deep embedded structure or is it raised up? At this time, it's still, we're still reviewing it. We are providing that information to the decision maker, which is Tom D'Agostino [Thomas P., Undersecretary for Nuclear Security and Administrator, National Nuclear Security Administration], the administrator for NNSA. We're looking at, we're constantly providing information on up, to say whether or not he feels that it's appropriate [at that time] to make that decision. We don't make that call here at the project. We only supply that information. I know that's been considered. But, no, I do not know whether or not we'll make the decision at this time to go forward on a deep or shallow option. And, again, if the Record of Decision is months and months and months away, we would have time to look at it at that point in time, ya' know, how far did our design progress, and what, what do we know now? So we are constantly looking and partly working with a lot of stakeholders to decide whether or not we've done enough analysis to make that decision at that time. But it depends on when the ROD comes out, how design information we have, and, and uh, it really becomes not our decision here at the project level, but at a Washington level.

[STEVE FONG]
The middle question you had was regarding what can we do for 40 million? Or was there one, early, there was—

[JAY COGHLAN, NUCLEAR WATCH NEW MEXICO]
Would you start site prep?

[STEVE FONG]
Would we start site prep? Now the— As you are well aware, the, uh the FY12 budget is still in discussion at this point. The [U.S.] House [of Representatives] has made their mark. The Senate has made theirs, and you had noted what the Senate had allotted for, and has directed the Laboratory to go do in budget discussions, uh, for FY12. Obviously, there needs to be a conference between the two, and then we'll know exactly what we need to do. But, yes, I mean, these are our law makers. We are providing this facility. Our mission is being assigned by the law makers. That's the way we do business. We don't do

things off in the site and how we would want to go, ya' know, perhaps me personally what we want to do. No, we follow, uh, this is a, this is a project that's, uh, seeded in government, that is, ya' know, everybody, uh, is discussing on where we should go. We're simply project guys. If they say, "forty million, that's what we stay with. That's, that's, those are limits that we abide by. Now we'll have discussions. And we'll have to see. But again, those are things are things that I don't take lightly. I mean those are, those are, that's the Senate. That's, uh, we uh, it's chaos otherwise, right? So we follow that line of business and how we operate the government. And so—

[STEVE FONG]
I think we're going to transition, right?

[BRUCE MACALLISTER, FACILITATOR]
It's time to shift gears and move into our Interested Party presentation. I want to make sure, as a matter of process that we have adequate disc space, because we don't want to interrupt the, so, all right.

[Pause in presentations as Interested Parties set up audiovisual aids.]

[Audio for first three Interested Party slides missing on CD.]

[Interested Party Slide 4]
[SCOTT KOVAC, NUCLEAR WATCH NEW MEXICO]
Um, since the last time we met, we had a fire, Las Conchas Fire. We need to appreciate the, um, the fact that no one was hurt and we hope that we can start the healing process. Uh, here's some numbers that maybe we spoke about just a minute ago. The [U.S.] Senate mark was $240 million total; $35 million to complete the installation of the, of the RLUOB. And $125 million for design activities to reach ninety percent of design maturity for the Nuclear Facility. Forty percent is for long-lead procurements and I have seen some requests for expressions of interest, for the Laboratory, have already been sent out. And $40 million is for site preparation.

[Interested Party Slide 5]
[SCOTT KOVAC]
This is a chart we've seen before. The cost of the Nuclear Facility and the CMRR project in total started at about six hundred, six hundred million or so estimate, back in 2004. It's now hovering just under six billion dollars.

[Interested Party Slide 6]
[SCOTT KOVAC]
That's about $10,000 a square foot for the total building. Um, I keep wondering [if] there's a maximum cost for the Nuclear Facility. And I also wonder how much of the increase in cost is due to the seismic hazard analysis. The taxpayers are paying a high, escalating, and unknown price for pit production at Los Alamos Laboratory.

[Interested Party Slide 7]
[SCOTT KOVAC]
Here's a chart we've also seen. The, uh, showing the top line is weapons activity at about 61% of LANL's annual budget for Fiscal Year 2012.

[Interested Party Slide 8]
[SCOTT KOVAC]
All right. So now we're getting into the, some sheets from the Final Sitewide, I mean the final Supplemental, Environmental Impact Statement. This is a general construction requirements sheet. It's kinda hard to leave.

[Inaudible off-mike words from unidentified person.]

[SCOTT KOVAC]
Thank you. Just wanted to point out a few things. This is, once again, this is out of the Final Supplemental Environmental Impact Statement. The, uh, this is a comparison of the deep option with the shallow option. And it shows they are remarkably similar in construction impacts. All the way down to the amount of electricity used. All I could figure out is—and maybe Mr. Fong can help us—I would have a question, is, why is the electricity used the same when the deep option has so much more concrete being poured using, I believe, electric batch plants, electric concrete batch plants. Showing, 19,000, uh, no, 31,000 megawatt hours per year. Also, the peak construction workers, here [pointing to slide] it says 790, and 790, same for both options. Ten, ten more average construction workers for a huge, uh, huge hole in the ground. And you can see that there, um, construction period nine years. Now this is also confusing: I mean, how can the construction period be the same for the deep and the shallow option. And, ya' know, they have the same end date.

[Interested Party Slide 9]
[SCOTT KOVAC]
This is a page from the draft Supplemental Environmental Impact Statement. This one, I could not find a matching page for it in the Final [Supplemental Environmental Impact Statement]. But it mentions peak direct workers, 790. And that number was on the previous chart. With indirect workers, 450 workers.

[Interested Party Slide 10]
[SCOTT KOVAC]
Um, this quote is from the Final Supplemental [Environmental] Impact Statement. Now we are down to 300 workers, peak construction workers, with the 852 direct jobs in the region. So, it's about the same number. Total, about 1100. Eleven or twelve hundred. Direct workers are the workers actually on the job. The indirect ones are, I guess, that'd be workers at the supply houses and other places that are supplying parts to the job. Um, but, the Final Supplemental Environmental Impact Statement says there'll be little or no noticeable impact on the socio—, the socioeconomic conditions.

[Interested Party Slide 11]
[SCOTT KOVAC]
This is also out of the Final SEIS, saying that 550 workers, after the facility is built, with an increase of about 340 workers. Um, if we go back to the draft Supplemental [Environmental Impact Statement], —

[Interested Party Slide 9]
[SCOTT KOVAC]
[continues] it's, uh, this one says 550 workers, has the same number, but it says that they would come from the CMR Building and other facilities, so the facility would not increase employment or change economic conditions of the region. So, it's, I have a question on "what's the discrepancy there?"

[Interested Party Slide 12]
[SCOTT KOVAC]
Here's a chart from the Final Supplemental Environmental Impact Statement, showing the infrastructure requirements. Um, the, a couple of things I'd like to look at is the, once again, the peak, the electric load.

They're over capacity. Actually it's less than zero because you are subtracting twenty-six from sixteen. It's actually a minus ten here, of megawatts. So we need to figure out what the Lab is going to do to conserve electricity for that. We also have a, a comparison for, I'd just like to mention that the extension of the plutonium bomb complex at the Lab will increase electric consumption by 160 million kilowatt hours per year.

[SCOTT KOVAC]
Um, including the, uh, producing the equivalent annual CO_2 emissions for almost 14,000 homes. So, the Lab must reduce its electricity and its consumption.

[Interested Party Slide 13]
[SCOTT KOVAC]
This is also from the Final Supplemental Environmental Impact Statement. The only thing of interest here is that, um, the Lab has backed out, the Environmental Impact Statement has backed out the production of 80 pits out of this waste number. So, um, this number of, like, uh, transuranic waste, um, is 88. The new Nuclear Facility is mentioning 88 cubic yards per year. That is, figure is based on the manufacture of 20 pits per year, when the, when the facility, the Nuclear Facility itself will be, will be able to expand production capacity up to 80 pits per year at the Laboratory.

[Interested Party Slide 14]
[SCOTT KOVAC]
This is a map out of the Environmental Impact Statement showing the effected areas of construction. Um, here's the new Nuclear Facility. This section right here, where the TA-50 is, is a Materials Disposal Area C. It's a chemical landfill where millions of gallons of solvents, tritium, and other chemicals have been dumped over the years. Ending in the, ya' know, not lately, but ending back in the 70s and 80s.

[Interested Party Slide 15]
[SCOTT KOVAC]
Here's another map of the planned construction of the area. This one actually shows MDAC right here. But it also shows, uh, construction trailers, parking, substation. This parking lot is kinda already here. There's uh, um, a batch plant, lay down yard, um, possibly new facility here all around this, this area.

[Interested Party Slide 16]
[SCOTT KOVAC]
This uh— What the Supplemental Environmental Impact Statement does not take seriously is the impacts, the possible impacts from MDAC, Materials Disposal Area C. Um, this is one little corner of the map. This is actually the corner of Pajarito Road and the RLUOB building is right here across the road from it. And these are uranium, mostly uranium, plutonium, um, different, all different, this is a list of radioactive, um, samples that were taken that exceed the, exceed the baseline limits.

[Interested Party Slide 17]
[SCOTT KOVAC]
This is a map of a plume, of the TCE [trichloroethene] plume. TCE is a solvent. Um, and, once again, this is Pajarito Road. This is the, PF-4, the RLUOB, the new building is here. The NF is right on the other side of that. This, this plume has exceeded the boundaries of, — This is MDAC here. It's kinda confusing. These lines are just some cross lines of sections they took through there. But the plume is definitely under the road, and under the parking lot area. There have been some high pore gas sample readings on this area over here. [Pointing at slide.] There have been no pore gas samples taken over here, or over here.

[Interested Party Slide 18]
[SCOTT KOVAC]
As mentioned earlier, we have two possible options. There's the shallow and the deep option. This top one is the shallow option, and, it's, um, this is out of the Supplemental Environmental Impact Statement. It shows it buried about sixty feet down or so, the base of it. The main problem all along has been this little section here called the QBTL3 layer. And, I have a quote here that says the, all these other units, the QBT4, which is up here, the QBTU, 3U, which is here, and the QBT2, are all classified as very weak rock. Um, the QBT, the QBTL, which is this one right here, basically unwelded or volcanic ash, is, uh, has been described as extremely weak. Um, not making it more appropriate to classify strength on the soil scale.

[Interested Party Slide 19]
[SCOTT KOVAC]
We uh, not only do we have a rift in New Mexico, the Rio Grande Rift, we also have a Jemez Lineament. This is a zone through here of two blocks of the earth's crust were pressed together. This is kind of a leaky, it has been leaky, or cracked, in the earth's crust here. And it crosses the Rio Grande Rift right at Los Alamos. Um, ya' know, volcanism in New Mexico is most likely related to the upwelling of abnormally hot mantel material. With the possible exception of the Jemez Mountains, all existing volcanoes are probably extinct. But that's not to say that new ones can't form in the future.

[Interested Party Slide 20]
[SCOTT KOVAC]
This is a map, handout, I got at a recent meeting stating that the Valles Caldera is a super volcano. [Pause] We're going to have some help here. We are going to be joined by Joni Arends.

[Voices off mike as Joni Arends comes up.]

[Interested Party Slide 21]
[JONI ARENDS, CONCERNED CITIZENS FOR NUCLEAR SAFETY]
Good evening. I'm Joni Arends. I'm with Concerned Citizens for Nuclear Safety. And I would like to recognize Bob Gilkeson, an independent registered geologist, for his assistance, and him, his work in, really digging into the complex seismic issues at LANL. And so, with all due respect, I'm gonna go ahead and present. I do want to say that our goal of our presentation is ensure that Los Alamos National Laboratory installs a system of weak motion seismic sensors similar to those that they installed at the Nevada Test Site that was paid for by DOE in order to gain accurate information, knowledge, data about the seismic hazard around the Laboratory. We're very concerned that the recommendations since 1995 have been to, for the Laboratory to improve the seismic network, to make sure that the seismic network of four, four sites, and you saw that on the blue, the little blue triangles,— that those four sites would be calibrated properly, and that, — we understand from the DNFSB that those four sites are for strong motions. So they might not have even detected the earthquakes in Raton and in Trinidad, the recent earthquakes.

[JONI ARENDS]
So our hope would be that we would be able to meet with the DNFSB staff and board if they are here this week, um, to continue our conversation with them. One of the problems that we've had is that many of the documents that the Board has been looking at, some of the trenching studies, some of the overflight information, has not been referenced properly in the, um, CMRR Supplemental EIS, either in the draft or in the final document. And we've actually had to contact Mr. Tegtmeier [John, NNSA Los Alamos Site Office, CMRR-NF SEIS Document Manager] in order to get copies of those documents in order to review. And one of the, probably one of the most important documents, was the 2009 update to the

Probabilistic Seismic Hazard Analysis that was done in 2007 by URS [Corporation], which is one of the main contractors under the Los Alamos National Security LLC.

[Interested Party Slide 21]
[JONI ARENDS]
So, with that, I would like to introduce these issues that we really became concerned about, the seismic issues when we learned that the LANL scientists had predicted in 2009 that the old CMR building had, — I believe it was a probabilistic risk to, of an earthquake in the next ten years, where there would be a release of plutonium.

[JONI ARENDS]
So, that's one reason that we really became concerned. And as many of you know, most of you know, the old building is so close to the new building, or the proposed new building, that we are very concerned about not only the old building and continued operations, but the new building, the new proposed building. So with that, I'll introduce these two figures. And first, on your left, is the complex seismic zone for the Jemez Mountains. And, specifically, there has been, as Mr. Goen pointed out, there has been some trenching studies for the Pajarito Fault System. But there hasn't been— and this DOE admitted in the Supplemental Environmental Impact Statement, that they haven't done the trenching, or they haven't done detailed studies of the Santa Clara Fault System, nor the Embudo Fault. And you can see the Embudo Fault runs to the northeast from where LANL is located.

[JONI ARENDS]
Secondly, we have a more site-specific figure from the Supplemental Environmental Impact Statement. And LANL admitted in the document, the draft, that they haven't done mapping north and east and south of LANL for the seismic hazard. So they don't know, this large region, they don't know. So the important part of this, and I guess I could use this, um, [pointer], so the real concern here, or one of the main concerns [is the battery out? Oh there. Okay.] So this is the Rendija Canyon Fault. And in a peer-reviewed document that was published in *Geosphere* in 2009—and please excuse me for having my back to you—That report said that, that these here may be splays from the Rendija Canyon Fault. They also said that this Guaje Mountain Fault may run parallel to the Rendija Canyon Fault, which may result in the fact that the Guaje Mountain Fault, uh, lengthens and becomes more powerful under the proposed site for the Nuclear Facility, which raises a lot of concern. But because there hasn't been trenching studies, which DOE admits, for this two and a half mile segment, um, there's no knowledge about what this piece right here, which is about a third of a mile. When we talked to the seismologist with the Defense Nuclear Facilities [Safety] Board, on Friday, he said it might be both part of the Guaje and part of the Rendija Canyon Fault.

[Interested Parties Slide 22]
[JONI ARENDS]
Okay. So, according to, for public health and worker safety issues, there's Department of Energy orders, there's presidential executive orders, there's the 1997 NRC Guidance for Seismic Hazard [Nuclear Regulatory Commission, *Guidance for Performing Probabilistic Seismic Hazard Analysis for a Nuclear Plant*], there's LANL's own requirements, that say that for safe and cost effective engineering design, um, it must include the buried active faults close to or below the proposed nuclear facility location. And, from our research, the Nuclear Facility should be designed for a minimum/maximum magnitude 8.0 earthquake, based on LANL's data. A minimum/maximum 8.0 earthquake. And in order to even design for that we need 90% of the design done, and not whatever it is right now. I don't know what it is. Tom, what is the design right now?

[TOM WHITACRE]
[Inaudible words off mike.]

[JONI ARENDS]
Okay, so there's no threshold of knowledge to be able to do early construction. Even if [the U.S.] Congress provides $40 million. There's no knowledge in order to meet their basic requirements of the DOE orders, the presidential executive orders, the NRC 1997 Guidance in the LANL's own requirements, to begin any kind of construction, early construction. So, if you're gonna do a safe and cost effective engineering design, you also need the site-specific velocity, and the volcanic layers down through the dacite, which is the reference rock, or the bedrock, to an approximate depth of 900 feet. And I'll go into that a little bit more. You also need to know the ground motions for both the single earthquakes, the simultaneous earthquakes, or the synchronous earthquakes. You also need to know what Kappa is, which is a key parameter for the calculation of the ground shaking. And from our research and from the documents that we've looked at, extensive research, they don't have any of this.

[Interested Parties Slide 23]
[JONI ARENDS]
Okay, so in 2004, a LANL scientist by the name of Kenneth Wohletz did actual field mapping out in the area. And you can see the location of the CMRR. So I won't use that. What he found, is he found areas, which are these brown areas, of the inferred locations of north-south trending buried active faults 800 feet to the west and 2,000 feet to the east of the proposed Nuclear Facility. So, the dashed lines right here— this is the Sawyer Canyon Fault. This is probably the Guaje Mountain Fault right here, which is 800 feet to the west of the proposed Nuclear Facility. This fault, the Sawyer Canyon Fault, is probably 2,000 feet away.

[JONI ARENDS]
So the draft Supplemental Environmental Impact Statement does not reference this. However, the 2007 Kleinfelder Report, which is a geochemical firm, recognized the Wohletz Report. And this is based on the best information that we have, based on our research.

[Interested Parties Slide 24]
[JONI ARENDS]
So, what we have, is we have buried active faults, as I said, 800 feet west of the proposed facility. And it may be an extension of the Guaje Mountain Fault, which may generate ground motions close to the proposed Nuclear Facility, but we don't know. And from the response to public comments of Gilkeson [Robert, registered geologist] and CCNS [Concerned Citizens for Nuclear Safety] in the Final Supplemental EIS, um, DOE stated, "The fault shown 800 west of the proposed nuclear facility is an inferred fault, meaning that the fault is interpreted to be present at some depth below the location at which it is mapped." But it is not considered in the seismic hazard analysis.

[JONI ARENDS]
Also, one of the requirements is to do deep borings below the, um, below the site. And so, there was a plan— and if I can just back up— So, when the volcanic eruptions took place, as Scott [Kovac] noted, 1.1 and 1.6 million years ago, um, there was, the dacite flowed across the landscape like taffy and it hardened. And then what happened was that the Bandelier Tuff, about 700 feet of Bandelier Tuff, flowed on top of that. And so, to get down to the bedrock or the reference rock, you have to drill through the Bandelier Tuff to get to the dacite. So there was a plan, that Kleinfelder had, to discover the dacite, to find it. And so they drilled down through the 700 feet of Bandelier Tuff. And they started drilling down forty-three and a half feet, and what they found was dacite that was extensively fractured, and they stopped. So they only drilled less than one hole. And they never finished, they never began the second hole. And so it's a serious omission that the multiple borings were not drilled deep into the dacite below the proposed location of the Nuclear Facility for accurate knowledge of the shear velocity of the dacite and the presence or absence of faults. Um, there's also concern, given the data that Scott [Kovac] just provided,

that they might have hit the TCE plume at that location and maybe they stopped doing that characterization.

[Interested Parties Slide 26]
[JONI ARENDS]
So then you need to know what the hazard is for simultaneous, which is one earthquake, versus a synchronous earthquake, which is when one earthquake goes off and then it makes another fault react. So, from the LANL 2007 Probabilistic Seismic Hazard Report, it said that the seismic hazard is higher for the synchronous rupture because the ground motions will be larger from seismic slip, involving two sub events versus more uniform slip in a single, albeit larger, simultaneous event. So, in the, this 2007 report, which is, you know, 1200 pages, URS again, one of the contractors for, in LANS, did not present ground motions for the synchronous ruptures. The report did present data for either ground motions for the combined synchronous sub events or the maximum magnitude, oh, did **not** provide this. And did not provide the maximum magnitude for the combined events.

[JONI ARENDS]
So, it's a serious mistake that the engineering design for the proposed NF is for ground motions from a single earthquake and not from the 75% greater ground motions from synchronous earthquakes. And that's all according to the US, URS computer modeling in the 2007 Probabilistic Seismic Hazard [Analysis]. And that's Figure 7-53. And it's important to know that what LANL is using right now for the ground motions are much— the ground motions— lemme see [looking at notes]. So, according to this 75% greater ground motions that are needed, the Fukushima earthquakes were at the level that they're designing the nuclear facility right now. It's for a 7.27-magnitude earthquake. Actually the ground motion is for a 0.52 g. So, it's a Fukushima; but actually it needs to be 75% higher, or for the horizontal, it should be 0.82 g, or for the vertical, it needs to be 0.89 g. And that's according to our best knowledge. So, it's a 75% increase for both the horizontal and for the vertical.

[Interested Parties Slide 27]
[JONI ARENDS]
So, there's incomplete knowledge of the seismic hazard parameter, which is Kappa. And it's essential for accurate calculation of the ground motions. For both the horizontal and the vertical ground motions. For the engineering design. And Kappa should be calculated from accurate records from seismographs. Unreliable values for Kappa are being used for the expensive, very expensive, very very expensive, seismic designs that are going on right now.

[Interested Parties Slide 28]
[JONI ARENDS]
And I hope that the LANL people can support this, that we need mo— weak motion seismographs are needed. And, Bob [Gilkeson] has spent a lot of time talking with the University of Nevada seismologists who were DOE-funded to set up a seismic monitoring network for the Yucca Mountain and the Nevada Test Site. And what they were able to do is, with the weak motion seismograph, is to collect hundreds of events over a period of a few months, that can be used to calculate Kappa. Now LANL has only, and maybe this contradicts what Mr. Goen said, but from our information, they've only, LANL has only recorded a few strong motion events, only nine events over the last twenty-five years. So, DOE and LANL— This is our recommendation: DOE and LANL should immediately install an extensive, properly installed, network of weak-motion seismographs around the proposed Nuclear Facility and, in order to improve the knowledge of Kappa and to monitor the increase in power of the youthful Pajarito Fault System.

[JONI ARENDS]
So, we really need to get the value of Kappa at the depth of the foundation of about 60 feet. And it's something that could be done right now. Ahm, that, ahm, it could be done right now. And one thing that is really important, as Kappa goes, it gets to be a lower number, the power of the seismic hazard increases.

[JONI ARENDS]
Okay, so LANL's own scientists or seismic hazard geology team described in this peer-reviewed paper in *Geosphere* in 2009 that a kinematic model was needed for the Pajarito Fault System. And they said, "Despite the importance of understanding the geometry of the fault system and potential linkage among faults for purposes of seismic hazard analysis, a robust kinematic model of the Pajarito fault system is lacking." So, but you need to have, you need to know the data from both the weak and the strong motion seismograph in order to input the data into the kinematic model.

[JONI ARENDS]
And I'd just like to repeat that since 1995, the seismic experts have recommended that the seismic network be improved, be calibrated, and be expanded in order to understand the seismic hazard at the Los Alamos National Laboratory.

[Interested Parties Slide 30]
[JONI ARENDS]
Okay, so in the response to comments to Bob Gilkeson and CCNS comments, DOE said that, [reading not exactly word-for-word from the slide] "This idea of a natural follow-on of the scenario model development of the LANL 2007 PSHA ... such a study could help refine the seismic source parameters .... It is prudent, prudent, *prudent* to consider whether interactive fault models, kinematic and dynamic, in the future for possible application to the Pajarito Fault System." Well, we don't think it should be done in the future. We think that it needs to be done before we invest six billion dollars in a super Wal*Mart-sized nuclear weapons facility for storage of six metric tons, or thirteen thousand two hundred and twenty-eight pounds, of plutonium.

[JONI ARENDS]
I note that in the recent Federal Register on Friday, September 2nd, there is a document out with regard to a Final Supplemental [EIS] to address new geologic information regarding seismic conditions at the site. The review period ends October 3rd, 2011. I had a conversation with John Tegtmeier [LASO-NSM] today about how the public can be involved in this process. But John isn't here tonight. He said he was going to bring me some documents. I'd like to learn more about that. It's a question that I have.

[JONI ARENDS]
Okay Scott [Kovac]. Thank you.

[Inaudible words off mike.]

[Interested Parties Slide 31]
[JONI ARENDS]
Oh, I can. Okay. So, um, here's our conclusion. CMRR: Continuous Money Down a Ruthless Rift. But actually, from CCNS' perspective, it's "continuous money down a ruthless rathole."

[JONI ARENDS]
Many, many of us feel very concerned that the Consent Order isn't going to be done on time. And that, um, there's resources available to build a nuclear facility that contradicts President Obama's vision for a nuclear-weapons-free world. We're very concerned that the Consent Order requirements are the priority and not building this new building.

[Interested Parties Slide 31]
[JONI ARENDS]
And, again, we reiterate, **Clean Up, Don't Build Up!** And we dedicate our presentation this evening to our colleague Peggy Prince, who passed on a few weeks ago.

[JONI ARENDS]
Thank you. Any questions?

[BRUCE MACALLISTER, FACILITATOR]
Sir?

[UNIDENTIFIED PERSON OFF MIKE]
[Inaudible words]

[BRUCE MACALLISTER, FACILITATOR]
Okay. Got ten.

[GREG MELLO, LOS ALAMOS STUDY GROUP]
Gather my thoughts. I thank you very much. Oh, Greg Mello. Yeah, uh. Thank you Scott [Kovac] and Joni [Arends]. Nice presentation. Lot of questions, but I guess I just wanted to make one or two comments. Ahm, an opinion: I don't think that we know all there is to know about where the faults are at Los Alamos, like you. So, there is a problem— the rock is very weak. And, if, and where it breaks is not fully clear. I think we see, um, I think that the seismic community is acquiring humility now. And, that when, ya' know, Allison McFarlane had an article in the Bulletin, *The Atomic Scientist*, [*Bulletin of the Atomic Scientists*] about this topic. That the people who want to build things come to the geologists, and they say, "Tell us the design basis earthquake." It's not fully clear that the geologists can come up with the answer. And, what I'm hearing from you is some very detailed work that basically says, "This is not clear." And, I don't think it really is clear. I think there's a false confidence that's based on looking in a few places. Can't dig under the town. Can't look off the site. Not enough money. Faults are where you find them. You have to look hard. And, at depth they are hard to find. And I think you've made a lot of really good points. Thank you.

[JONI ARENDS]
Thank you. And you can't change the geology. It's not something you can engineer around. I mean, that's one of the issues—how, how do you, how much is an 8.0 minimum magnitude design gonna cost?

[MICHAEL DI ROSA]
Oh, good evening again. Michael Di Rosa. Um, I have not read the Supplemental Environmental Impact Statement. But thanks for the information provided during these meetings organized by NNSA. A glance at those materials, I think, clearly show[s] there is an environmental impact. Certainly along the corridor of Pajarito Road, what with batch plants for cement mixing. Rather large potentially. Excavation to pour the foundation for CMRR in approximately 70 acres of, again, of what I understand are called "spoils piles" to put the rubble from that excavated pit down along the Pajarito Corridor. Again, I think the environmental impact is pretty undeniable. But what I ask either party in this debate, when reading through that environmental impact statement, is there any statement or sentiment that the Pajarito Plateau is on loan to the DOE, and that after this construction is made, there will be every effort, there will be a succinct provision, to clean it up and restore it ecologically to what it once was at such time the DOE abandons this? Thanks.

[BRUCE MACALLISTER, FACILITATOR]
Comments in response? Or— Joni? Steve?

[STEVE FONG]
Thanks for your comment. Yes, that's typical process for projects. Disturb an area, reseed, make sure storm water is taken care of, insure that, uh, as we no longer input use to that area to reseed and return to, whatever we can, to grade. In fact, a lot of the areas down the Corridor that we are gonna impact have been previously disturbed. And it doesn't look like it when you go there. There are piñons growing, etcetera, etcetera. That's why I would envision that we would leave, for that growth to come back in those areas. Some of the structures were, I'm thinking that, may be only available, like the warehousing, may be only available for a temporary basis. We would raze that facility, take it down, and then return. Obviously, you know, there's a long time frame between now and that time when it occurs. But that is in the budget to re-look at how to start phasing down and returning that Plateau. And, also, at that point we are looking at razing the CMR facility. So, as these new facilities come up, we're taking the old, reducing the footprint overall to Laboratory. So, that's a concerted effort, I think you'll see that consolidation of facilities [is] ongoing. That's in our plans. Not only for our project, but for all nuclear facilities at the Laboratory. What we're trying to do is consolidate, reduce the cost to operate, and to make secure, ya' know, if you have a spread, spread-out environment for operations, it's more costly. And, um, budgets now can't afford that. So what we're trying to do is consolidate as much as we can into a modern footprint for the future. So our design life is for fifty years. And that's what we are gonna pursue after this, so— Hope that answers your question.

[MACALLISTER, FACILITATOR]
Thank you.

[SCOTT KOVAC]
And I believe, uh, in my reading of the Supplemental Environmental Impact Statement, is that there's no real mention of what happens after fifty years. Uh, in answer to your question.

[GREG MELLO]
Just real quickly— I'm Greg Mello.

[Mello is handed the microphone.]
[GREG MELLO]
There you go. Area C, you mentioned chemical dump. Area C is a transuranic waste disposal site. Not just chemical. So, there are— ya' know, it was the main transuranic waste disposal site before Area G. And the standards for disposal were ten times weaker, so, at that time. So there's a lot of waste of various kinds at Area C.

[SCOTT KOVAC]
Thank you.

[MACALLISTER, FACILITATOR]
Other questions? Yes ma'am? Your name?

[JODY BENSON]
I'm Jody Benson. I have a question. The sociological impact of the project. There will be from three hundred to eleven hundred fifty temporary workers. Has anybody worked with the communities in Northern New Mexico with Los Alamos to try to find out about, um, temporary housing for these people? From this, from your slide, I think it was 300 to 1100, including the families. So, have there been

discussions, specifically— let's start with Los Alamos— about the impact to schools and impact to community? Have you negotiated with County Counsel, with the schools?

[STEVE FONG]
I guess that is a comment that I should address. Steve Fong. Um, well, first of all, we need to figure out which alternative we are gonna to pursue. Um, before we get everybody excited. I think there's a lot of conversations that we've had with the regional communities of the Los Alamos [area]. Everybody has interests. And we will pursue those once we understand which path we are gonna take. At this time, it's not clear. So we haven't made anything definite. But, yeah, we look forward to that conversation. That's a conversation, I think we're gonna find that, this project is gonna have a lot of positive benefit to a lot of the communities. To— What we try to do is see what we can do to, to not only bring in what we need to bring in as project, as our project, but we need to look at the surrounding areas. We've, we've had conversations with a number of, I think, a number of community leaders that expressed interest, as well as a lot of the trade unions, and saying, "What can we do to actually achieve some of the forecasted manpower that is in the future?" But again, it's a little premature at this time to go forward and have those discussions. And we must get through our NEPA [National Environmental Policy Act] process before we make any sort of commitments one way or another. But we look forward to that.

[MACALLISTER, FACILITATOR]
Sir?

[ELIZABETH CHAVEZ, HONOR OUR PUEBLO EXISTENCE]
My name's Elizabeth. And I was going to ask this guy, Mr. Fong, a question. How would I be effected if there were an accident or catastrophe associated with six metric tons of plutonium?

[STEVE FONG]
That's a good question. Um, so what we are doing is, we try to take all the design inputs on, we look and consider, at, at all the risks, in terms of accident scenarios, what can happen? And that's what we are actively doing now is designing against all of those scenarios, that we,— whether they be manmade or natural phenomena accidents such as earthquakes. And that's exactly what the concern is now, in our design, is ensuring that we consider all those factors, all those risks in our design. And that we have a facility that depends upon itself to safety contain those, uh, safely addresses those, uh, those accidents that may occur, that may occur. So, it's a robust process that we do. It's an iterative process.

[STEVE FONG]
We look at things such as wind loading, snow loading, seismic, etcetera, etcetera, in our design of our facilities. And we have to assure ourselves that the facilities are safe in terms of its design. And that's not an easy process to do. So we're on-going. That will be an on-going review of, of, assuring that indeed the right safety sets, safety systems, safety components, engineered systems, are all complete before we start the design, no, excuse me, the construction of the facility. So that's an on-going process. It's something that we challenge ourselves with. It's something that we have, as Greg [Mello] was asking earlier, we have external reviews to assure ourselves, that, that not only, ya' know, that we are responsible to do it, but that we have outside checkers to take a look at, ensuring that we have addressed, uh, all of the engineered safety components that we need to ensure that the facility is safe, if indeed, an accident were to happen.

[UNIDENTIFIED PERSON]
[Inaudible words off mike.]

[MACALLISTER, FACILITATOR]
Okay. Hold on. Let me get the mike to you.

[ANOTHER UNIDENTIFIED PERSON]
[Inaudible words off mike.]

[ANOTHER UNIDENTIFIED PERSON]
Okay.

[ROBERT CHAVEZ, HONOR OUR PUEBLO EXISTENCE]
Say, like an accident was to occur. What would be, like, the results? Would we see an increase in cancer? Or such? Can you go into that a little bit more?

[UNIDENTIFIED PERSON]
[Comment or question off mike.]

[STEVE FONG]
Well, that's the design of the facility. Is exactly that. To make sure that we contain the accident within the facility. Okay, and there are standards in which we have to meet to ensure the public is protected. So. From the operations.

[UNIDENTIFIED PERSON]
[Comment or question off mike.]

[MACALLISTER, FACILITATOR]
Okay. Hold on.

[ROBERT CHAVEZ]
What would happen as a negative result of the operations?

[STEVE FONG]
Depends on the accident. It really does. And so there's a myriad of things that would happen. But again, we have to ensure that the facilities that we are designing will address all possible accidents that are, that are credible.

[UNIDENTIFIED PERSON]
[Comment or question off mike.]

[STEVE FONG]
Such as earthquakes.

[UNIDENTIFIED PERSON]
[Comment or question off mike.]

[MACALLISTER, FACILITATOR]
Okay. Let's move on. We've got another question waiting here, so—

[JAY COGHLAN, NUCLEAR WATCH NEW MEXICO]
Jay Coghlan, Nuke Watch New Mexico. This is for you Steve, before you sit down. Um, I want to understand what the mission need is for the nuclear facility. And, by way of background, ya' know, first of all, the NNSA submitted the CMRR project as a Congressional budget request line item in 2004, when the agency was still pushing new designs, the Reliable Replacement Warhead. And as you know, that got shot down. And RRW by definition required expanded plutonium pit production. But now the emphasis

have switched over to what I regard as the functional equivalent of new designs, that being life extension programs. Um, in the Senate Appropriations [Committee] recently admonished NNSA to take care of business and prioritize the life extension programs instead of being, uh, distracted, that's my word, by facilities. But to get to my point, by the time that the Nuclear Facility is scheduled to be operational, by the year 2024, at the earliest, every weapon type in the stockpile will have gone through a life extension program, with the exception of the W-88 cruise missile warhead. But even that might be left by that point in time. So, they've all either had their life extension programs completed, or those programs will be substantially underway. So, what is the mission requirement for the Nuclear Facility? And spending six billion dollars of taxpayers' money?

[STEVE FONG]
Sure. Thanks Jay. What we're trying to do is provide the capability, a nuclear capability, in terms of chemistry capability, for science. It could be research. But also, I think, fundamentally, with, go on and on and on, but there is a strong responsibility for stockpile stewardship. So there's a lot of, of chemistry that goes along with weapons, in, that are deployed, to ensure that they are safe. Ensuring that we can certify the function and operability of those weapons. So there's a—, that is a—, that's just one program of many that we're required, even if we are not manufacturing, or if, beyond the life extension. So that's an on-going, forever, as long as we have weapons, as long as there's weapons in the world, type of responsibility that we have to conduct. Is, is, having those capabilities, Jay. As well as providing that space for, again, a variety of all other type of, of operations, as in, I think it was in my second slide, that I've noted there. I mean it's from waste management, chemistry capabilities, to research and advanced fuels, etcetera, etcetera. It just goes on and on. Those things are all done in this facility. But there's a very important mission of stockpile stewardship, and that's something that we can't ever just let down, and let our guard down. We've gotta know. And it's the responsible thing to do, is understand, the, uh, and to understand the, and have the science to support, uh, stockpile stewardship, in the long term.

[MACALLISTER, FACILITATOR]
We have time for one last question, and then I do want to give people the opportunity to weigh in on items for the next meeting. So. Yes ma'am?

[SUSAN GORDON]
Mr. Fong, there is discussion in Washington, DC, in light of the Super Committee and the budget constraints, that perhaps NNSA should make a choice between moving forward with construction of the CMRR and moving forward with the uranium processing facility at Y-12 [DOE facility in Oak Ridge, Tennessee]. And I'm wondering how your team and LANL are preparing in case that decision is that the UPF [uranium processing facility] would go first?

[STEVE FONG]
Well, um, we, uh, we're provided direction from a Washington—, our Washington colleagues, and they have not provided us any direction otherwise. They asked us to pursue design and continue on with our design, to mature our design so we can understand, uh, again, to understand where we're at, before we baseline the facility and make a commitment to [the U.S.] Congress. So we have not been instructed to do anything otherwise than to continue on with design. Those decisions that will be made, whether it's UPF [Uranium Processing Facility at Y-12] first or CMRR, or combined jointly at the same time, that's not our decision here. We have not been instructed to do any other planning to the contrary. Our only instruction is to continue on with the design. To understand and reduce risks in our design and to prepare ourselves for eventual construction at some point.

[MACALLISTER, FACILITATOR]
Thank you. Uh, in the last minute or so of our allotted time, are there topics that you want to shout out to me? I will repeat them for future meetings. Suggestions or thoughts on that?

[JONI ARENDS]
The air permit.

[MACALLISTER, FACILITATOR]
The air permit.

[JONI ARENDS]
We asked about that in [our previously submitted] questions.

[MACALLISTER, FACILITATOR]
Other topics? Yes sir, Jay?

[JAY COGHLAN]
I'd like more a concrete demonstration of mission need [inaudible words off mike].

[MACALLISTER, FACILITATOR]
Concrete demonstration of mission need.

[UNIDENTIFIED PERSON]
Concrete and detailed.

[A SECOND UNIDENTIFIED PERSON]
Maybe there needs to be a higher pay grade here. People with authority that can actually answer.

[A THIRD UNIDENTIFIED PERSON]
Definition of safety.

[MACALLISTER, FACILITATOR]
Definition of safety.

[THE THIRD UNIDENTIFIED PERSON]
[Inaudible comment and question off mike suggesting that acronyms be left out completely.]

[MACALLISTER, FACILITATOR]
Okay, so that there's not an assumption that people understand acronyms. Okay.

[GREG MELLO]
I would like a more, [inaudible words], a better method to actually answer questions.

[MACALLISTER, FACILITATOR]
Tell me what that means to you Greg, what that looks like.

[GREG MELLO]
I mean, there's many vague answers that don't really answer the questions. And maybe it's, ya' know, maybe my question posing is not quite adequate. But I wanted to know when, when we expect the CD-2 and 3, and whether they was going to be formal, uh, review before that. I didn't wanna— I know there's generic reviews that go on all the time, but I guess maybe I just didn't put that question carefully enough. But I didn't really hear answers to Jay's questions.

[MACALLISTER, FACILITATOR]
Okay. Specific answers to specific questions. With adequate detail to address the question.

[MACALLISTER, FACILITATOR]
Yes. Jay, and then Steve.

[JAY COGHLAN]
Information, period, on the shallow versus deep option for excavation and construction. [There's] really no adequate information on [rest of question inaudible, off mike].

[GREG MELLO]
Another one is, the electricity and resource situation and, with the operations, as well as construction. [Inaudible words] ... new transmission line versus reconductoring.

[MACALLISTER, FACILITATOR]
And Steve, you had a—

[UNIDENTIFIED PERSON]
Just a general, [inaudible words] NF [inaudible words] RLUOB [inaudible words].

[UNIDENTIFIED PERSON]
[Inaudible words off mike.]

[MACALLISTER, FACILITATOR]
The comment was: more a focus on the Nuclear Facility versus the RLUOB. And pardon me if I misspell these acronyms myself. And one last, and then we are out of time. So, yes sir?

[MICHAEL DI ROSA]
[Inaudible question about an inaudible topic and about plans for supply chains for materials that will be brought in.]

[MACALLISTER, FACILITATOR]
Okay, so more information about the shallow versus the deep [options], and supply chains for the materials.

[JONI ARENDS]
I'd like to submit our questions that we submitted, and specifically that we asked that LANL's monitoring the lava below the Pajarito Plateau [inaudible words], we asked questions about the operations [inaudible words] ... RLUOB.

[MACALLISTER, FACILITATOR]
Okay, so we'll get these included with the, uh, materials, flip chart materials. We are out time. Thank you very much for your attendance, your civility, and your participation. I'll look forward to seeing you at a future meeting. Thank you very much.

[The meeting was adjourned at 8:30 p.m.]

CERTIFICATION

I hereby certify that the foregoing is a true and correct transcription of the audio recording of the public meeting on the Chemistry and Metallurgy Research Replacement project at the Crossroads Bible Church, Los Alamos, New Mexico, on September 20, 2011.

/s/ Morrison Bennett
Transcription completed November 7, 2011.

III. Presentation Slides – CMRR Project


UNCLASSIFIED
Chemistry and Metallurgy Research Replacement (CMRR) Project
Welcome
CMRR Project Update
Los Alamos, New Mexico
September 20, 2011
Bruce MacAllister, Meeting Facilitator
Los Alamos
NATIONAL LABORATORY
NNSA
UNCLASSIFIED
LA-UR 11-05332
CHEMISTRY & METALLURGY RESEARCH REPLACEMENT

Agenda

6:30 – 6:40	Welcome	B. MacAllister
6:40 –6:55	CMRR Project Presentation • Project Overview and Background • Project Update	S. Fong T. Whitacre
6:55 – 7:30	Seismic	L. Goen
7:30 – 7:30	Questions	B. MacAllister
7:30 – 8:00	Interested Parties Presentation	Interested Parties
8:00 – 8:25	Questions	B. MacAllister
8:25 – 8:30	Closure & Adjourn	B. MacAllister

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LA-UR 11-11-06849

Background and Purpose of Meeting

- Settlement allowed for air permitting to be tailored to match phased project-development and for public involvement
- Settlement required that public meetings be "single subject" meetings that will not be combined with other public meetings, including but not limited to the Sitewide Environmental Impact Statement for LANL (SWEIS)
- Parties include
  - New Mexico Environment Department
  - Department of Energy
  - University of California
  - Concerned Citizens for Nuclear Safety
  - Nuclear Watch of New Mexico
  - Peace Action New Mexico
  - Loretto Community
  - TEWA Women United
  - Embudo Valley Environmental Monitoring Group
  - New Mexico Environmental Law Center
- Meeting is held every six months to update the public on CMRR construction progress

Ground Rules

- Listen respectfully
- Share the conversation time with other participants
- Turn cell phones off or place on mute
- No personal attacks
- Remember civil discussions only; shouting, raised voices or repetitive disruption could result in termination of meeting
- Take side discussions outside
- Topic requests for future meetings can be left on the flip chart at any time
- Say your name each time you speak


UNCLASSIFIED
Chemistry and Metallurgy Research Replacement (CMRR) Project
CMRR Project Update
Los Alamos, New Mexico
September 20, 2011
Presented by
Steve Fong, NNSA
CMRR Federal Project Team
Tom Whitacre, NNSA
CMRR Federal Project Team
Los Alamos
NATIONAL LABORATORY
NNSA
CHEMISTRY & METALLURGY RESEARCH REPLACEMENT
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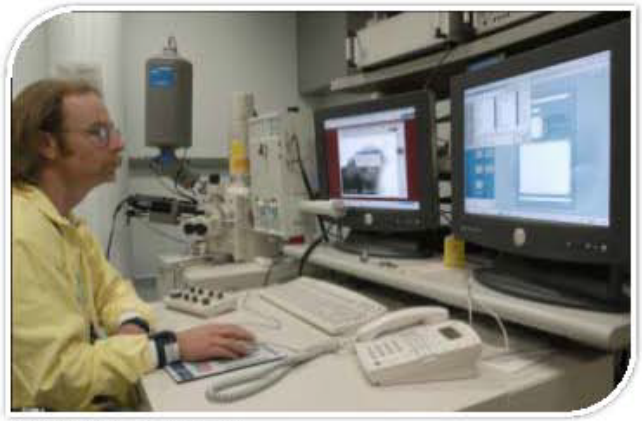
What is CMRR?

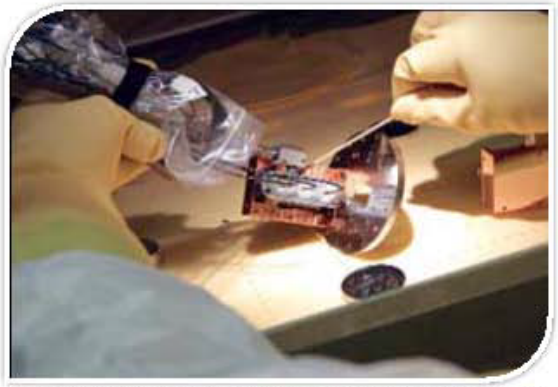
CMRR is essentially a chemistry laboratory where scientists will analyze the origin and purity of materials and understand the chemical and mechanical properties.

- Two-building project
  - Radiological Laboratory and Utility Office Building (RLUOB)
  - Nuclear Facility (NF) *
- Office and training space
- Nuclear materials storage
- Laboratory capabilities for:
  - Research
  - Nuclear Nonproliferation
  - Stockpile management (Nuclear Deterrent)
  - Space Missions
  - Waste Management

* Subject to outcome of the Supplemental EIS



Electron Microscopy



Pu Sample Loading for Z-machine Experiments

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CMRR Replaces a Nearly 60-Year Old Facility

- The original CMR building dates back to the early 1950's
- It is becoming ever more expensive and inefficient to maintain and it demands more resources to operate safely
- No other facility or site in the U.S. can fulfill its mission
- External safety oversight board has reported to Congress the critical need to replace

CMR construction in 1948

CMR Today

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Radiological Laboratory Utility Office Building (RLUOB) and RLUOB Equipment Installation (REI)

Radiological Laboratory Utility Office Building (RLUOB)

Building Shell

- Facility Performance Baseline ($164M TPC):
- 19,500 NSF radiological lab space (<8.4g Pu- 239 equivalent)
- Centralized utilities/services for all CMRR facility elements
- Office space for 350 workers
- Consolidated training facility
- Facility incident command; emergency response

Status: Construction Complete

Equipment

RLUOB Equipment and Installation (REI)

Procure and install equipment RLUOB

Status: Execution Start Approved – July 2009
TPC = $199.4M
Completion – 2013

Status

- **Building structure and major systems accepted**
  - Construction complete
  - Over 2 million craft hours with no lost-time accidents
  - Nuclear Quality Assurance (NQA-1)
  - Sustainable design features

RLUOB Equipment Installation

- Construction safety – highest priority

Milestones:

- Office turnover to operations – October 2011
- Lab space turnover to operations –forecasting approximately 1 year ahead of Schedule

- Under Cost

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RLUOB Road to Complete and Operational

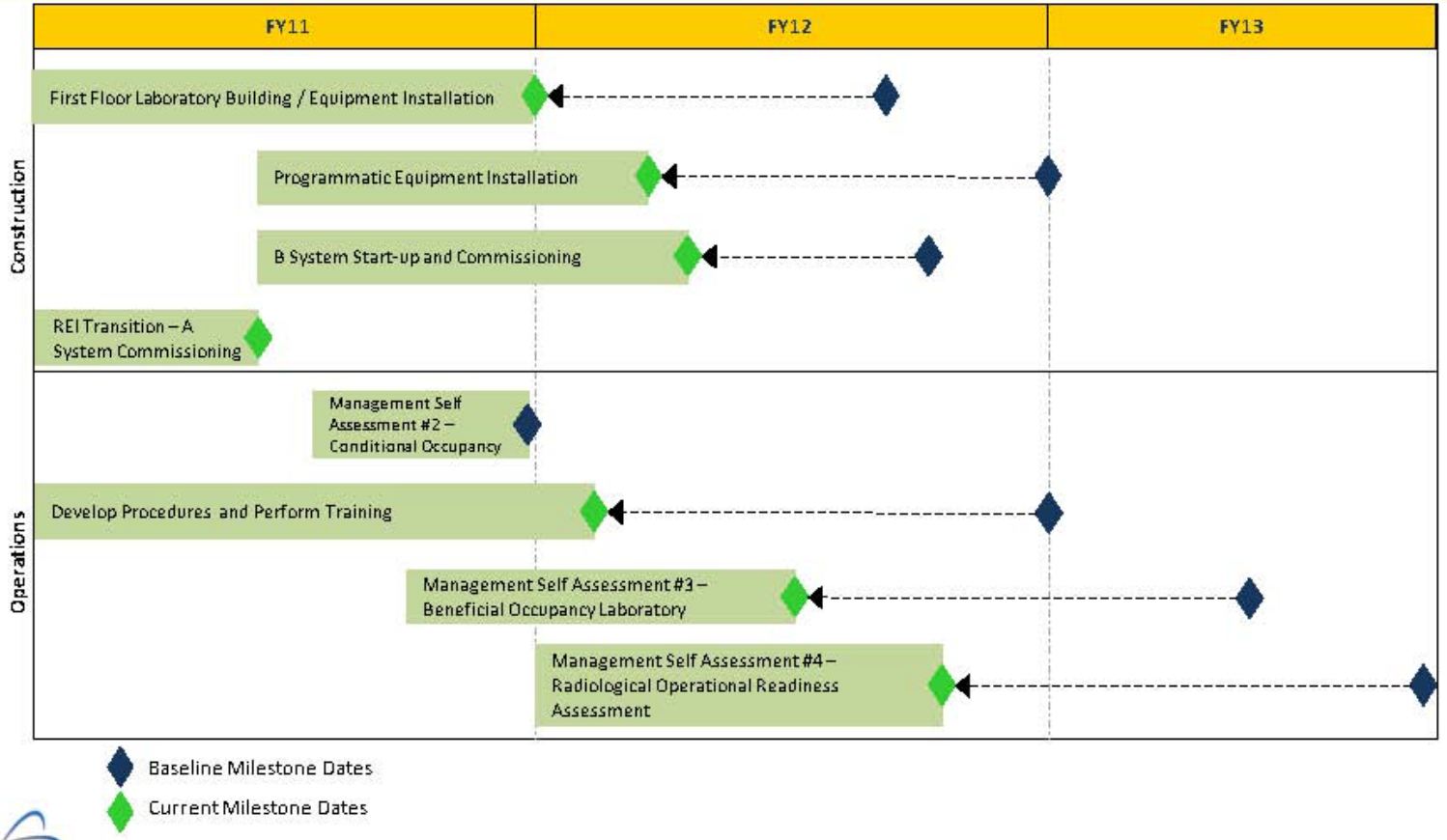
Conditional Beneficial Occupancy (CBO)

- Fire detection record of completion obtained
- Turnover the Central Utility Building (CUB), Basement, Mezzanine, 2nd, 3rd, and 4th floors of RLUOB to LANL Operations to safely operate and occupy the office space
- 22 Systems required for CBO are operational

Beneficial Occupancy

- Complete remaining construction of Rad Lab areas (1st floor), RLW, and Fuel Oil, and system turnover to LANL Operations for programmatic radiological work.

RLUOB Equipment Installation (REI) Ahead of Schedule and Under Budget



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RLUOB – Artist's Rendition, 2005

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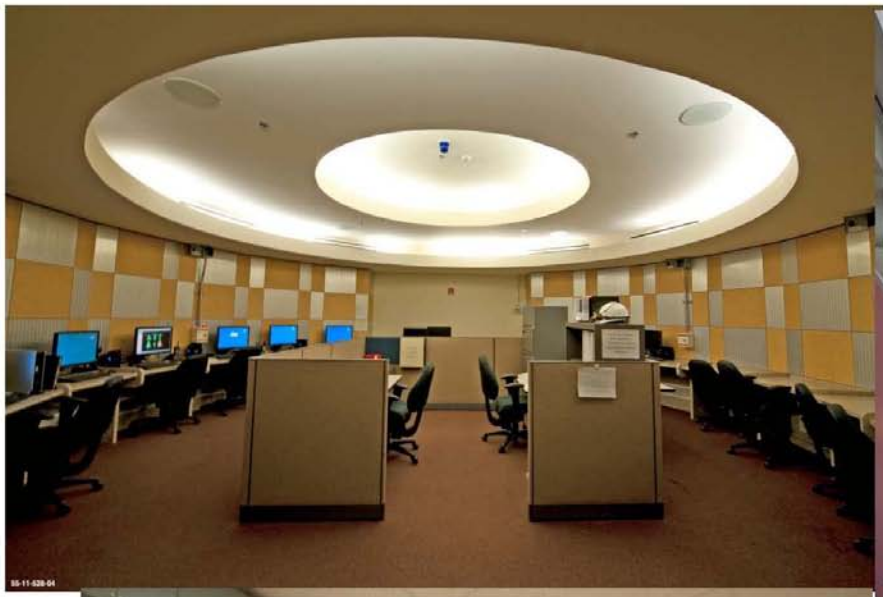

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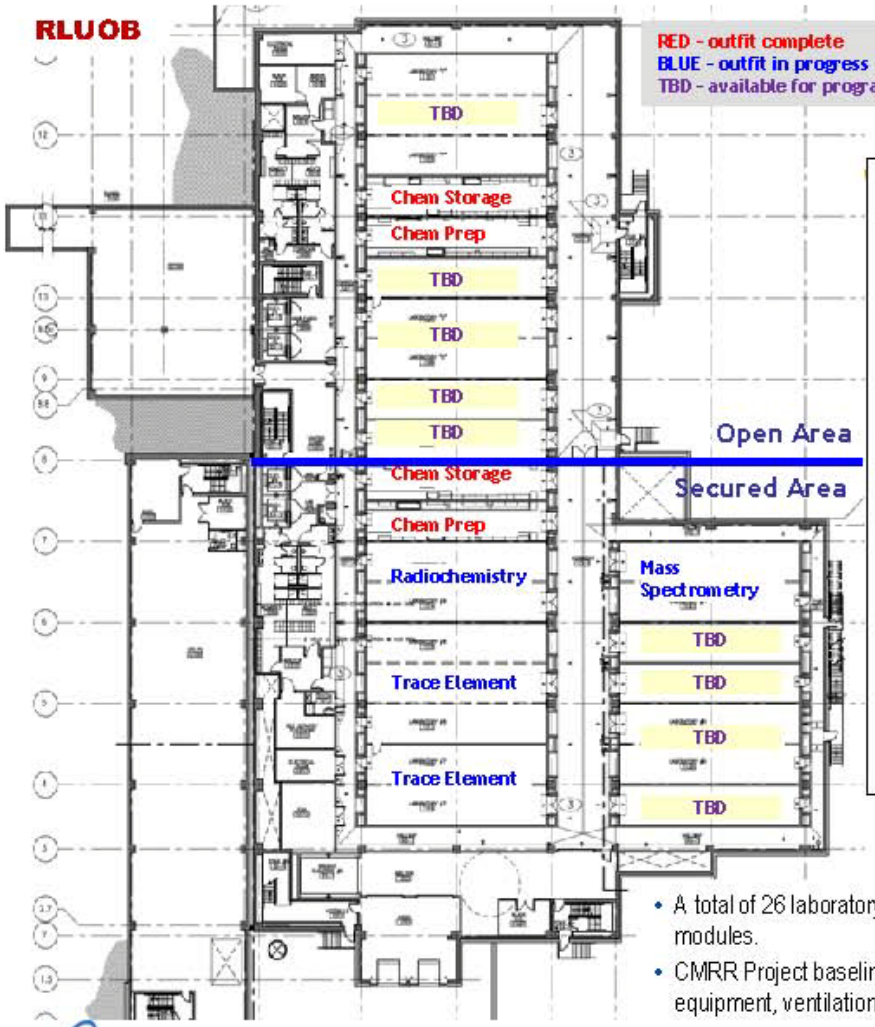

- Glovebox (7), open-front hood (19) and chemical fume hoods (10)
- Analytical instrumentation
  - 2 – thermal ionization mass spectrometers
  - 1 – magnetic sector gas mass spectrometer
  - 1 – high resolution inductively coupled plasma-mass spectrometer
  - 2 – inductively coupled plasma-mass spectrometer
  - 3 – inductively coupled plasma-atomic emission spectrometer
  - 1 – cold vapor atomic absorption
  - Complete nuclear counting systems (gross alpha/beta, alpha spec, gamma spec, liquid scintillation)
  - 10 – deionized water system

- A total of 26 laboratory module (12.5' x 60'); each lab room ranges from a single module up to 5 modules.
- CMRR Project baseline – will outfit 13 lab modules with analytical instrumentation and equipment, ventilation enclosures, lab benches, storage cabinets, rad monitors and lab utilities.

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CHEMISTRY & METALLURGY RESEARCH REPLACEMENT

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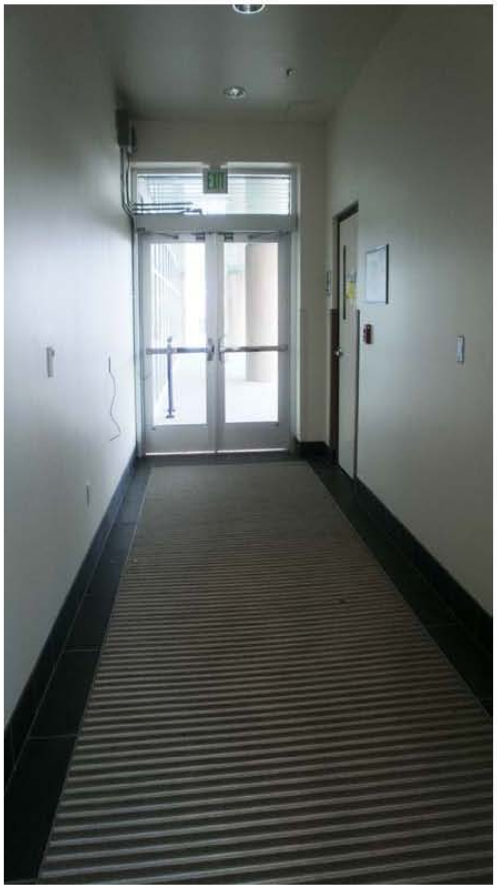

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CMRR at Technical Area 55

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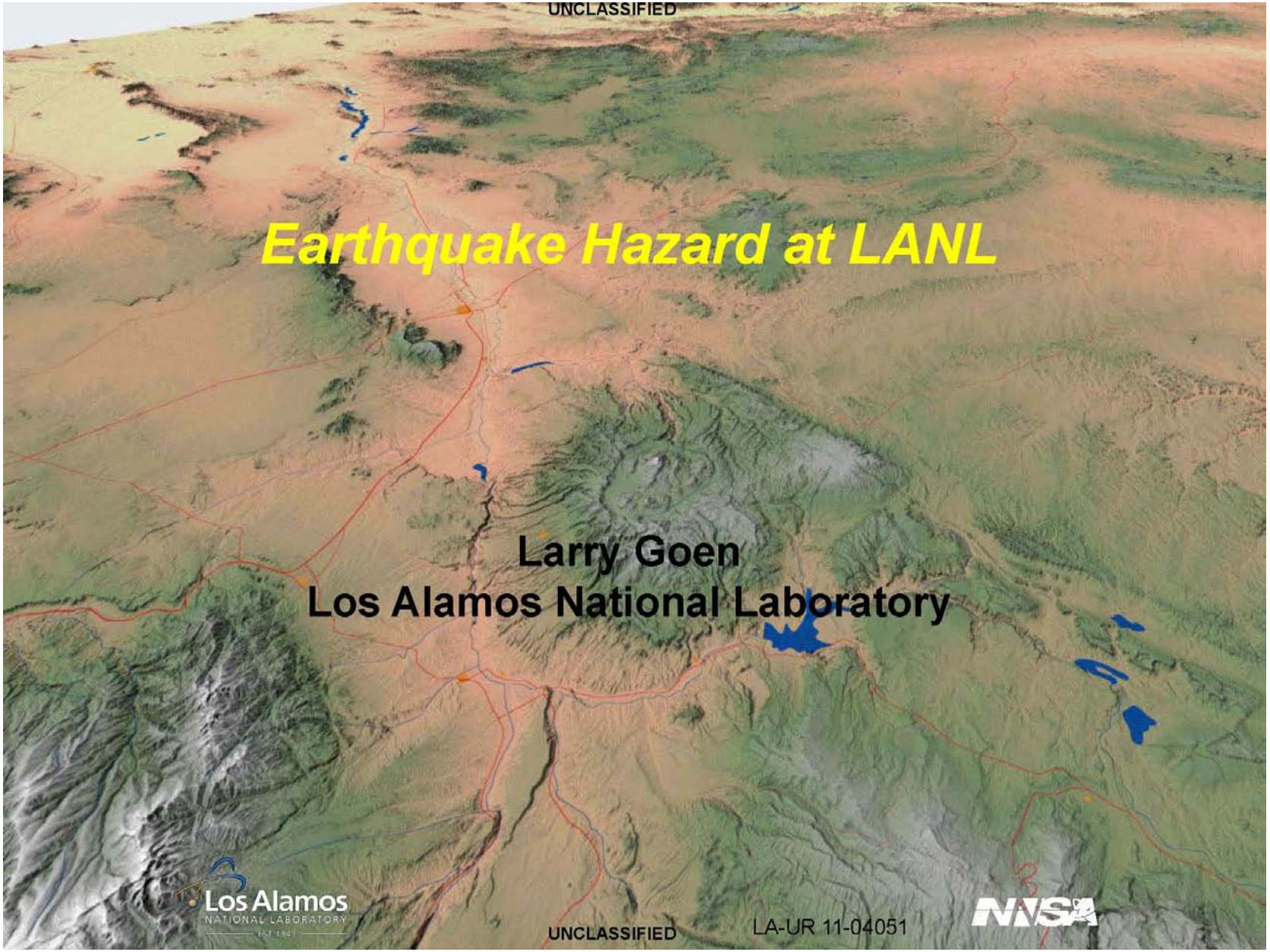
CHEMISTRY & METALLURGY RESEARCH REPLACEMENT

IV. Presentation Slides – Larry Goen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Earthquake Hazard at LANL
Larry Goen
Los Alamos National Laboratory
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Geologic Setting of Northern New Mexico

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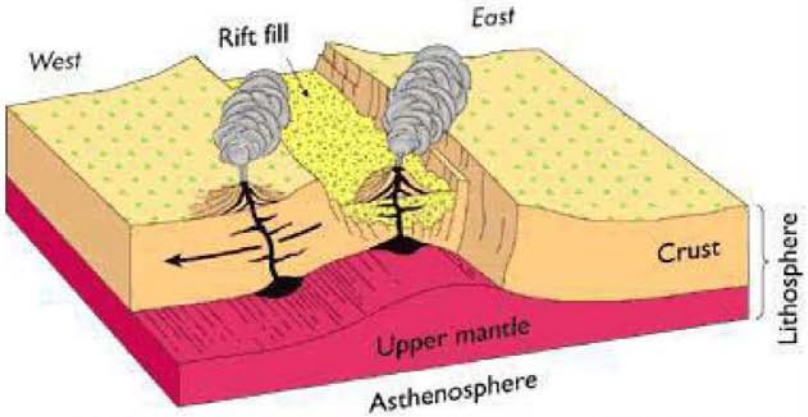
2

Rio Grande Rift

Evidence of a Continent "Stretched Like Taffy"



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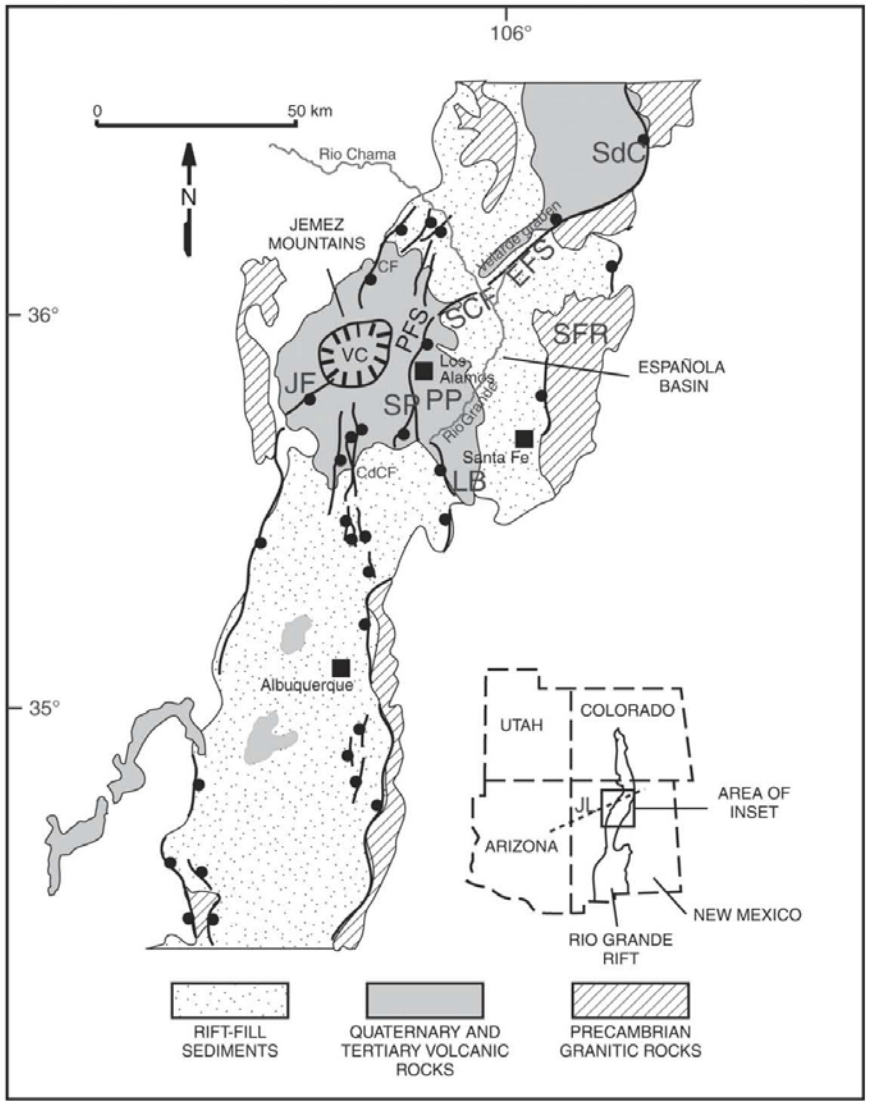
3

Geology of the Region



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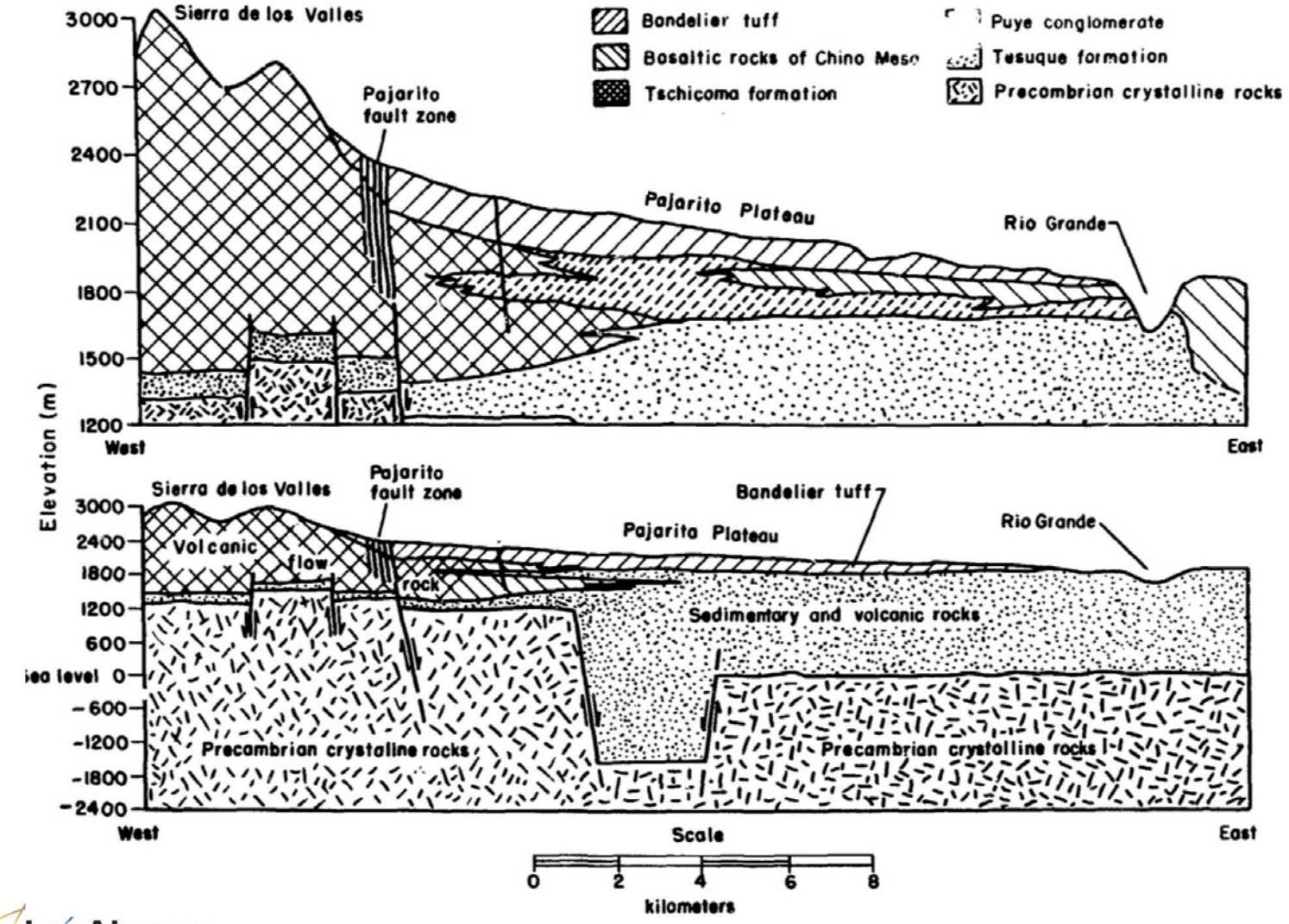
4

Stratigraphy of the Pajarito Plateau



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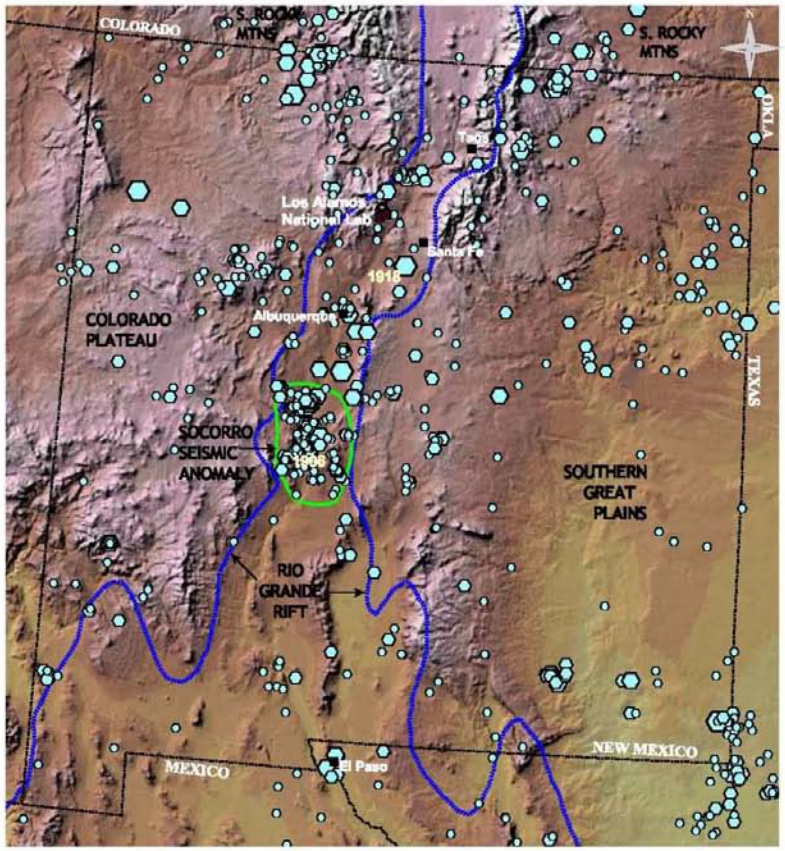
5

Seismicity in New Mexico



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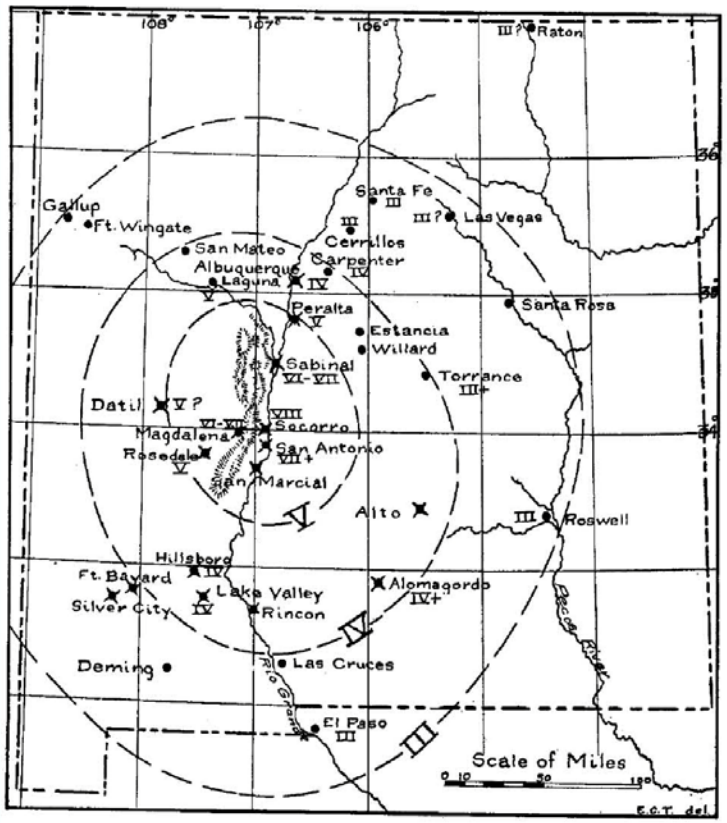
NNSA 6

1906 Earthquake Near Socorro

Biggest Earthquake in New Mexico: Socorro in 1906



TOWN BEING SHAKEN DOWN.

Almost Continuous Earthquake Shocks at Socorro.

EL PASO, Texas, July 18.—Shaken continually for two days by earthquake shocks, which were counted up to fifty-two, practically two-thirds of the town of Socorro is falling down. The Court House is in ruins and the people of the town are in terror. Monday the shocks began in earnest, and since then the town has hardly been three hours without a tembler of some sort. Walls are cracking and falling.

Women and children are being taken out of the town on box cars which have been sent by officials of the Santa Fé Road. The railroad service has been crippled, however, on account of the fact that abutments of bridges have been damaged and boulders from the mountains have been rolled down on to the tracks, and trains have been compelled to stop until the huge stones could be removed.

The water in the warm springs at Socorro has risen 10 degrees in temperature since the quake began. Near the town is a supposed extinct volcano.

Socorro is 160 miles north of El Paso and has a population of nearly 2,000.

SANTA FE, N. M., July 18.—All night long one tremor after another passed over the lower Rio Grande Valley, keeping the people at the highest tension. But few have slept in houses for the past three nights. Observers reported thin spirals of smoke in the lava fields in the direction of Alamo Gordo, probably from hot springs or other volcanic manifestations. A drenching rain pased over the valley during the night, adding to the discomfort of campers.

EARTHQUAKES IN TEXAS MAY GO ON FOR YEARS

Prof. F. A. Jones's View of Shocks at Socorro.

DAMAGE SLIGHT, MAYOR SAYS

Refugees Tell Different Story—Woman's Graphic Description of the Earthquakes.

EL PASO, Texas, July 19.—Earthquakes have continued at Socorro, although the town is quieting from the panic which has prevailed since Monday night. The people continue to live out of doors, very few spending the nights inside their homes. The inhabitants are largely of Indian blood and of the Catholic faith, and during the height of the earth shocks were seen in large groups on their knees in the streets, praying for life.

The Colorado Telephone Company's building is said to have suffered the most damage. The shocks have put almost every house in the town in a dangerous condition.

Prof. F. A. Jones of the New Mexico University at Albuquerque attributes the cause of the earthquakes to the slipping of a great mountain mass in the Magdalena range, resting upon a bed of slipping clay, and says the quakes may spread over the entire Rio Grande Valley and continue for several years.

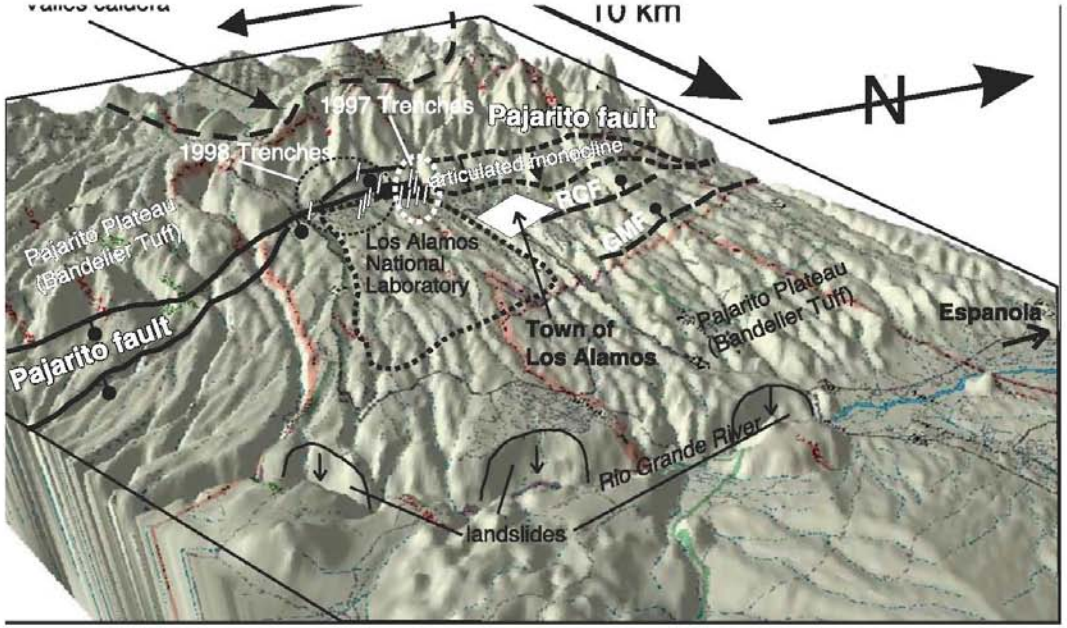
A Santa Fé train arriving four hours late, having been delayed by boulders thrown on the track by the earthquake near Socorro, to-day brought a number of refugees from that region.

SANTA FE, N. M., July 19.—Mayor Bureum of Socorro this afternoon issued the following signed statement:

"The reports regarding the earthquake at Socorro have been exaggerated, the damage to date being limited to the falling and toppling over of loose chimneys and shaking of some of the walls of buildings not of a substantial character. The Court House is not injured, except by the falling of plaster from the ceiling and the toppling over of old chimneys. The Winkler House, which is an old adobe building, has not been injured in the least.

The 1906 earthquakes near Socorro were the climax of a sequence of felt tremors from January of 1904 through November of 1906, with the strongest earthquakes occurring on July 12 and 16, and November 15. Although the quakes were very strongly felt and caused significant structural damage, initial reports in the eastern press (NY Times, July 19, p. 1, above) were highly sensationalistic. The mayor of Socorro quickly lead the charge to assure the nation that the city had not actually been destroyed (NY Times, July 20, p. 2, right). Remarkably, there were no reported fatalities or serious injuries.

Location of Faults



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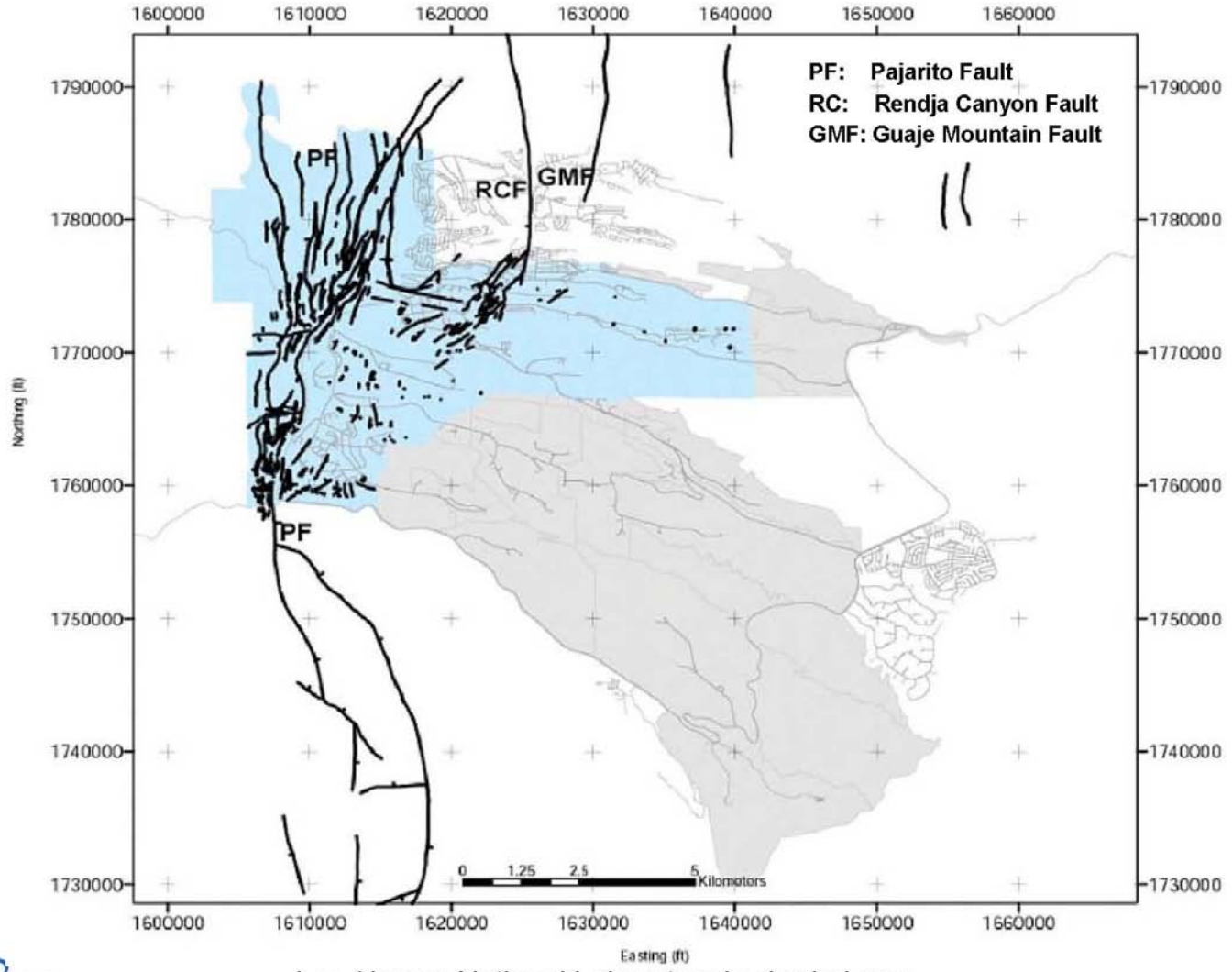
NNSA 8

Seismicity in the Los Alamos Area



Los Alamos National Laboratory is shaded grey.

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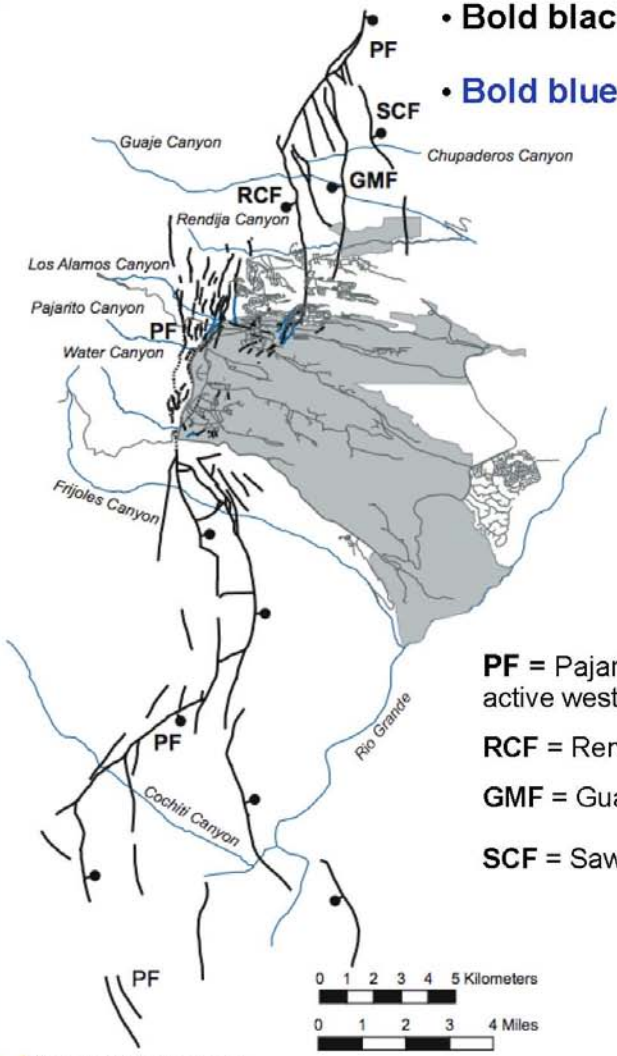
NNSA 9

Seismicity in the Los Alamos Area

- **Bold black lines** are faults, with ball and bar on downthrown block
- **Bold blue lines** are monoclinal hinges.



PF = Pajarito fault, master structure & local active western margin of Rio Grande rift

RCF = Rendija Canyon fault

GMF = Guaje Mountain fault

SCF = Sawyer Canyon fault

Scientists investigate the Guaje Mountain fault

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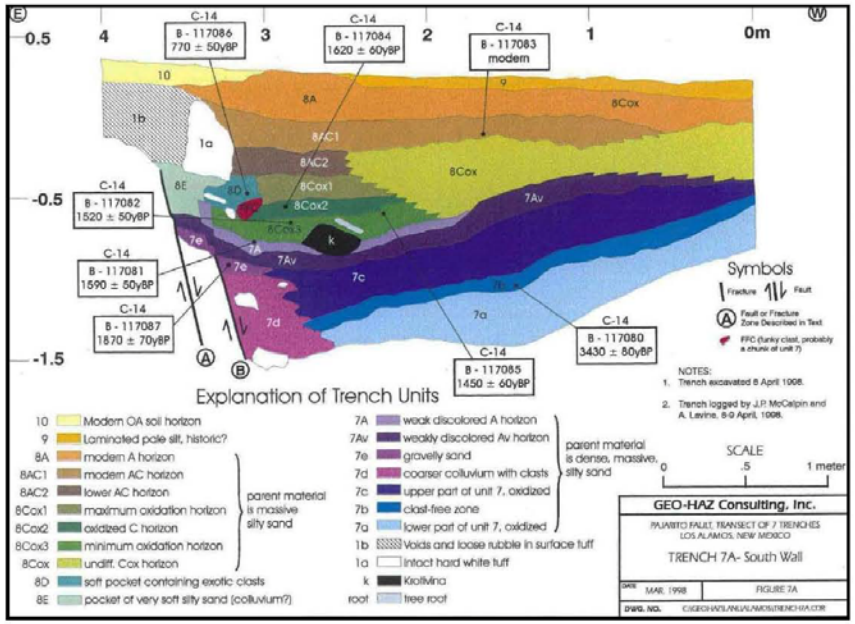
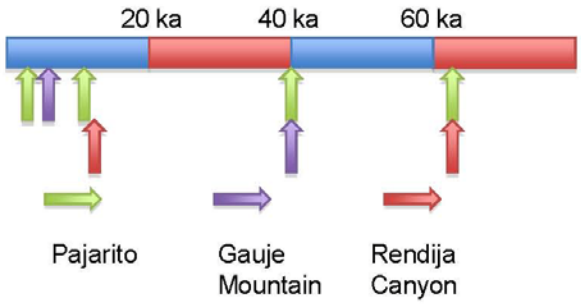
NNSA 10

Chronology of Seismic Events



Trench logs

Prehistoric earthquakes are identified by digging trenches across the fault and looking for evidence of offset strata. Once an offset stratum is located, the size of the prehistoric earthquake is estimated by the size of the offset. The date of the event is determined by radiogenic processing of organic material.



Chronology of Seismic Events

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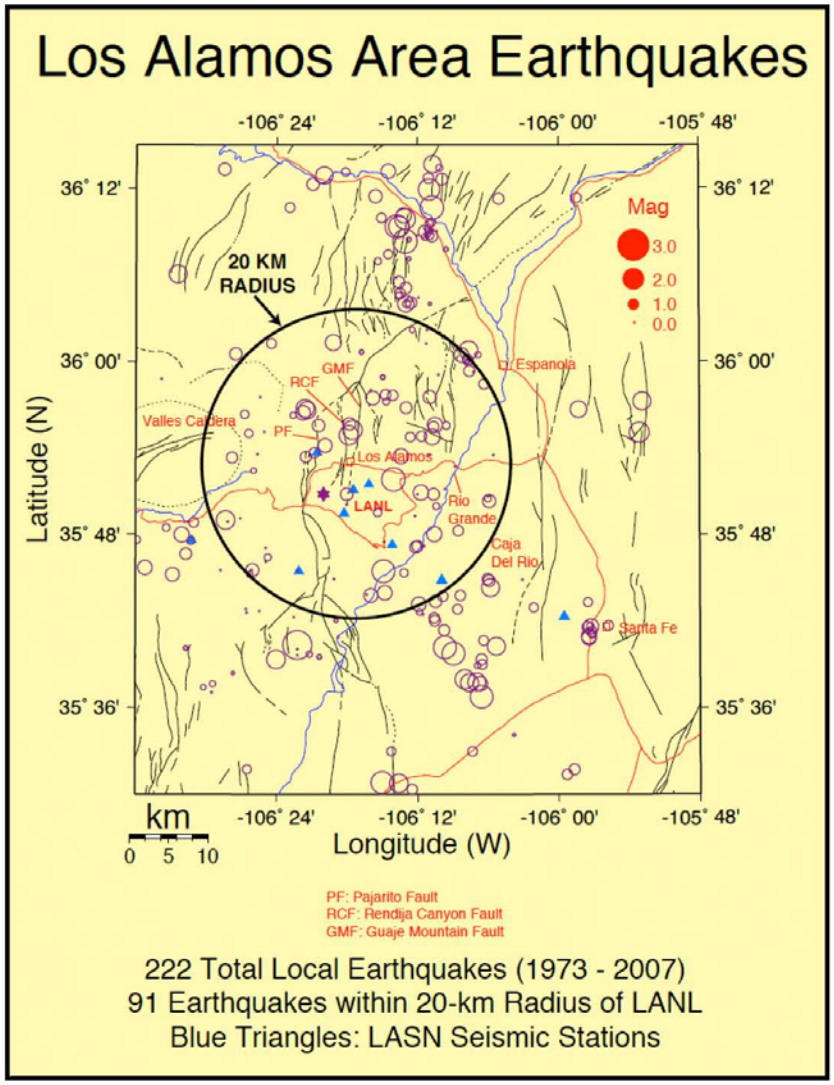
Earthquakes in Los Alamos



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NNSA 12

V. Presentation Slides – Interested Parties

Interested Parties CMRR Presentation September 20, 2011

LA-UR 11-11-06849

Welcome to our 12th Meeting!

This is the 12th semi-annual public meeting required as part of a 2005 settlement between DOE/LANL and an network of community groups:

- Concerned Citizens for Nuclear Safety
- Embudo Valley Environmental Monitoring Group
- Loretto Community
- New Mexico Environmental Law Center
- Nuclear Watch New Mexico
- Peace Action New Mexico
- Tewa Women United

LA-UR 11-11-06849

Welcome to our 12th Meeting!

Topics to be covered in this Chemistry and Metallurgy Research Replacement Project (CMRR) presentation:

1. Opening from Marian Naranjo
2. 2012 Budget
3. Costs
4. Lack of Economic Impact
5. Infrastructure Requirements
6. Waste Generation
7. Affected Areas
8. Seismic

LA-UR 11-11-06849

Senate Energy & Water Appropriations For FY2012

Chemistry and Metallurgy Facility Replacement Project, FY2012 proposed is $240,000,000 total. Within these funds:

- $35,000,000 is to complete equipment installation at the Radiological Laboratory,
- $125,000,000 is for design activities to reach 90 percent design maturity by the end of the fiscal year,
- $40,000,000 is for long-lead procurements, and
- $40,000,000 is for site preparation.

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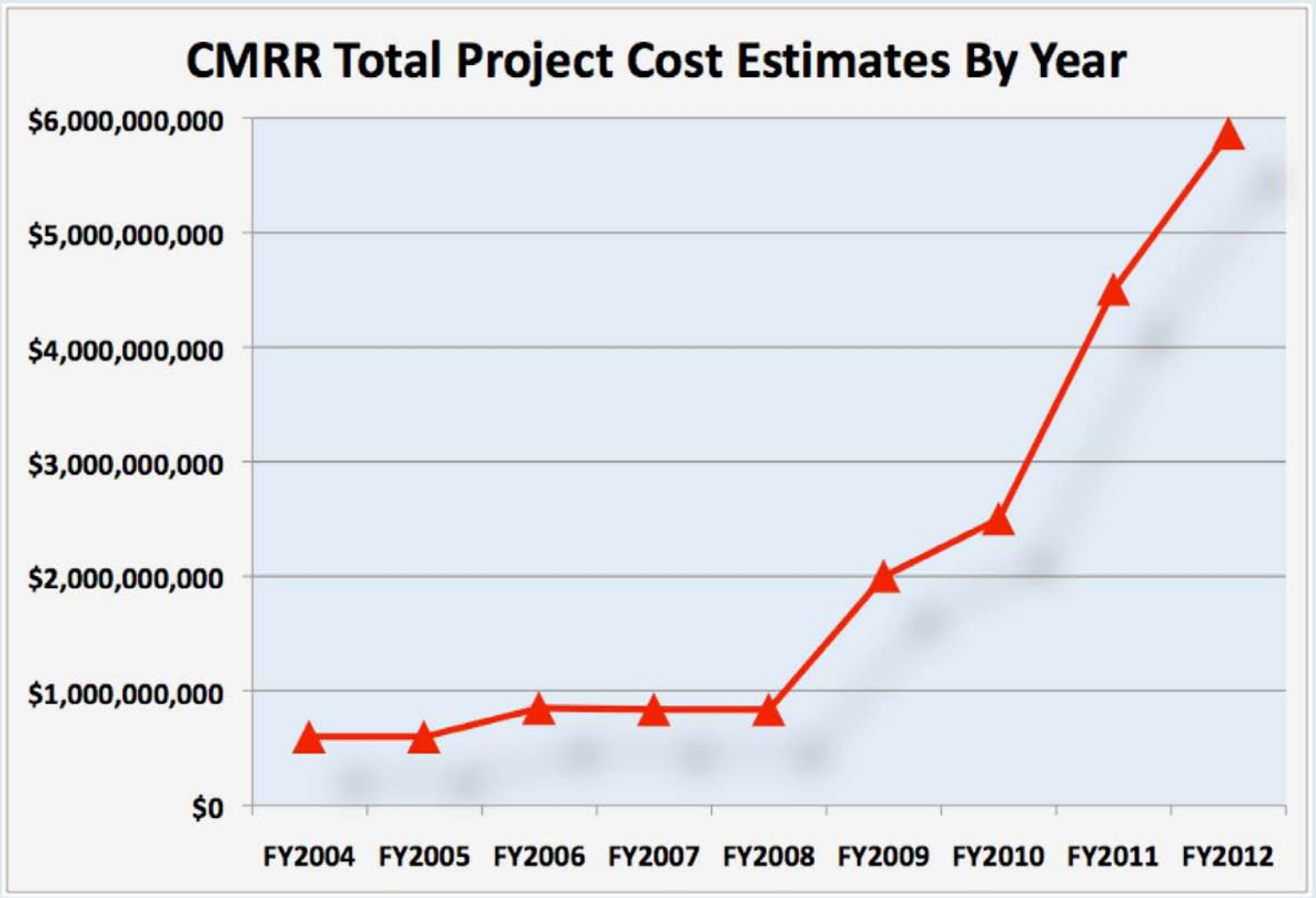

CMRR Total Project Cost Estimates By Year
$6,000,000,000
$5,000,000,000
$4,000,000,000
$3,000,000,000
$2,000,000,000
$1,000,000,000
$0
FY2004
FY2005
FY2006
FY2007
FY2008
FY2009
FY2010
FY2011
FY2012

CMRR NF Cost

The current cost range estimate based on 45 percent design is between $3,710,000,000 and $5,860,000,000.

$10,000+ square/foot

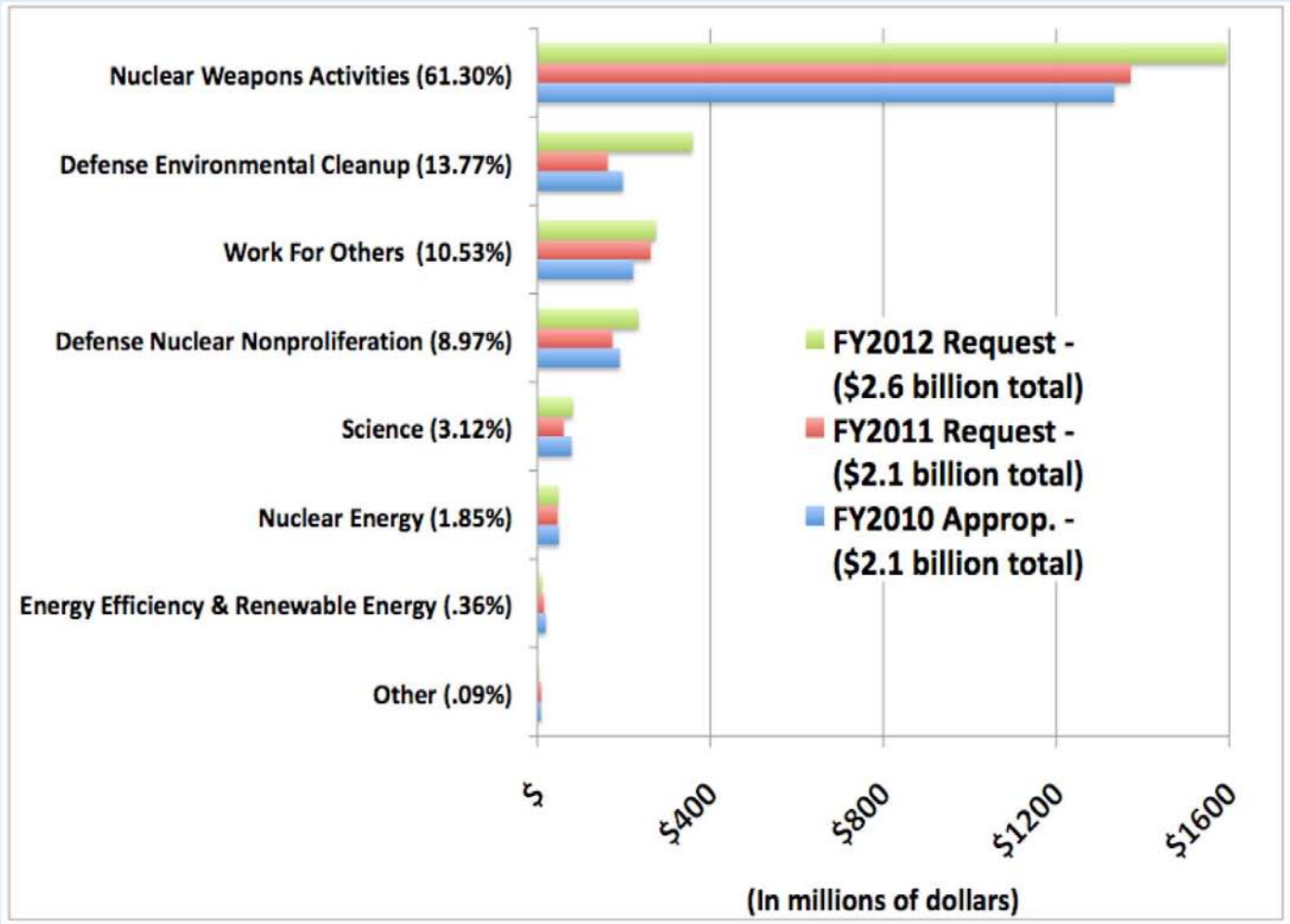
Is there a maximum cost for the Nuclear Facility?

How much of the increasing cost is due to seismic hazard requirements?

Taxpayers are paying a high, escalating, and unknown price for pit production to continue at Los Alamos National Laboratory.

LA-UR 11-11-06849

DOE/LANL Budget Priorities FY2012



LA-UR 11-11-06849

Table 2–1 Summary of Chemistry and Metallurgy Research Building Replacement Nuclear Facility Project Construction Requirements

Building/Material Usage	*Modified CMRR-NF Alternative Deep Excavation Option* [a]	*Modified CMRR-NF Alternative Shallow Excavation Option* [a]
Land – permanent changes (acres)	12	12
Land – temporary changes (acres)	116 to 135	96 to 115
Building – length by width (feet)	342 by 304	342 by 304
Building size (square feet) [b]	407,600	407,600
Nominal excavation depth (feet)	130	58
Remaining material to be excavated (cubic yards) [c]	545,000	236,000
Water (million gallons per year)	4.6	3.8
Electricity (megawatt-hours per year) [d]	31,000	31,000
Propane (gallons per year for 3 to 6 years)	19,200	19,200
Concrete (cubic yards)	150,000 (structural) 250,000 (low-slump)	150,000 (structural)
Steel (tons)	560 (structural) 18,000 (foundation & reinforcing)	560 (structural) 18,000 (foundation & reinforcing)
Peak construction workers	790	790
Average number of construction workers	420	410
Estimated number of offsite truck trips [e]	38,000	29,000
Nonhazardous waste (metric tons)	2,600	2,600
Construction period (years)	9	9
Transition from CMR Building complete	2023	2023

CMR = Chemistry and Metallurgy Research; CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility.

[a] The Deep and Shallow Excavation Options refer to options to build the Modified CMRR-NF with a nominal 130-foot excavation or a nominal 58-foot excavation, respectively.

[b] Building size is expressed in gross square feet, including the width of the walls.

[c] Includes tuff remaining to be excavated for the CMRR-NF building and the tunnels that would connect the CMRR-NF to RLUOB and the TA-55 Plutonium Facility. Approximately 30 feet of material have already been excavated from the proposed CMRR-NF site in TA-55 as part of the previous geological investigation of the site.

[d] Annual site infrastructure estimates for electricity use round to 31,000 megawatt-hours for both the Deep and Shallow Excavation construction options. However, the Deep Excavation Option is expected to require more electricity over the life of the alternative to support the creation of additional concrete for the layer of low-slump concrete fill.

[e] Offsite truck trips include the delivery of construction equipment, construction materials, and building equipment and supplies to the building site over the estimated 9-year life of the construction project.

Note: To convert acres to hectares, multiply by 0.404685; feet to meters, by 0.3048; gallons to liters, by 3.7854; cubic yards to cubic meters, by 0.76455; tons to metric tons, by 0.9072.

Source: LANL 2011a:Data Call Tables, 002, 003, 026.

Construction Requirements

This chart from the Final SEIS is still not right. The requirements of the Deep and Shallow options can not be the same.

The electricity cannot be the same if electric concrete batch plants are to used.

Same construction period?

Lack Of Permanent New Jobs from **Draft** SEIS

Resource/Material Category	*No Action Alternative* [a]	*Modified CMRR-NF Alternative*	*Continued Use of CMR Building Alternative*
Socioeconomics			
Construction	Employment would have resulted in little socioeconomic effect.	Peak direct (790 workers) plus indirect (450 workers) employment would represent less than 1 percent of the regional workforce and would have little socioeconomic effect.	Not applicable
Operations	Approximately 550 workers would have been at the CMRR Facility (2004 CMRR-NF and RLUOB); they would have come from the CMR Building and other facilities at LANL so the facility would not have increased employment or changed socioeconomic conditions in the region.	Approximately 550 workers would be at the CMRR Facility (Modified CMRR-NF and RLUOB); they would come from the CMR Building and other facilities at LANL so the facility would not increase employment or change socio-economic conditions in the region.	Approximately 210 workers would continue work at the CMR Building, many of whom would be among the staff members whose offices would be relocated to RLUOB. Another 140 workers would work in RLUOB. Workers would come from the CMR Building and other facilities at LANL so there would not be an increase in employment or a change in socioeconomic conditions in the region.

CMR = Chemistry and Metallurgy Research; CMRR = Chemistry and Metallurgy Research Building Replacement; CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility; LANL = Los Alamos National Laboratory; RLUOB = Radiological Laboratory/Utility/Office Building.

[a] The impacts shown for the No Action Alternative reflect impacts as reported in the *CMRR EIS* for the purpose of comparison with the action alternatives, with the exception of the facility accident results, which were reanalyzed for this *CMRR-NF SEIS*, and transportation and traffic impacts and greenhouse gas emissions, which were not analyzed in the *CMRR EIS*. As stated in Section S.4, the 2004 CMRR-NF would not meet the current standards for a PC-3 facility, and a PC-3 facility is required to safely conduct all of the analytical chemistry and materials characterization work required to support DOE and NNSA mission work. Therefore, the No Action Alternative is not being evaluated in this *CMRR-NF SEIS* as an alternative that would meet NNSA's purpose and need.

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Construction Impacts

- "Construction of new buildings at TA-55 to house CMR activities would require a peak construction employment level of 300 workers. This level of employment would generate about 852 indirect jobs in the region around LANL. The potential total employment increase of 1,152 direct and indirect jobs represents an approximate 1.3 percent increase in the workforce and would occur over the proposed construction period.
- "This small increase would have ***little or no noticeable impact on the socioeconomic conditions*** of the region of influence." (final SEIS Pg. 4-12)

Operations Impacts

- "CMRR Facility operations would require a workforce of approximately 550 workers. As evaluated in the CMRR EIS, this would be an increase of about 340 workers over currently restricted CMR Building operational requirements.
- "Nevertheless, the increase in the number of workers in support of expanded CMRR Facility ***operations would have little or no noticeable impact on socioeconomic conditions*** in the LANL Region Of Influence."

  (final SEIS Pg. 4-12)

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CMRR Infrastructure Requirements

Table 4–54 Estimated Combined Infrastructure Requirements at Los Alamos (Operations)

Resource	*System Capacity* [a]	*Current LANL Requirement* [b]	*Current Los Alamos County Requirement* [b]	*Available System Capacity*	*Modified CMRR-NF Alternative* [c]	*Remaining Capacity*
Electricity						
Energy (megawatt-hours per year)	1,226,000 [d]	563,000	150,000	513,000	161,000	352,000
Peak load demand (megawatts)	140 [d]	101	23	16	26	0
Natural Gas (million cubic feet per year)	8,070	1,200	1,020	5,860	58	5,800
Water (million gallons per year)	1,807	412	1,241	153	16	137

CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility; LANL = Los Alamos National Laboratory.

[a] Data from 2008 *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (LANL SWEIS)*, Chapter 5, Table 5–83, for the No Action Alternative.

[b] Data from Tables 3.4.1-1, 3.4.2-1, 3.4.2-2, 3.4.3-1 of the *SWEIS Yearbook – 2008* (LA-UR-10-03439), with the exception of the Los Alamos County requirement for natural gas, which was calculated using the projected requirement for the No Action Alternative in the 2008 *LANL SWEIS* (Table 5–83) and data from Table 3.4.1-1 of the *SWEIS Yearbook – 2008*. In addition, adjustments were made to reflect higher usage associated with the Metropolis Complex and Material Disposal Area remediation activities as included in the Expanded Operations Alternative in the *LANL SWEIS* (selected in the associated Records of Decision) and exclusion of requirements associated with the 2003 CMRR Facility, as included in the No Action Alternative in the *LANL SWEIS*.

[c] Data from Table 4–17 of this *CMRR-NF SEIS*.

[d] Does not include addition of an electrical substation in TA-50 capable of providing up to another 40 megawatts peak load capacity.

Note: To convert gallons to liters, multiply by 3.7854; cubic feet to cubic meters, by 0.028317.

Sources: DOE 2008b; LANL 2011a:Infrastructure, 011, 012, 013.

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Table 4–57 Estimated Annual Cumulative Waste Generated at Los Alamos National Laboratory (cubic yards)

Waste Type	*LANL Operations* [a]	*CMRR-NF SEIS Modified CMRR-NF Alternative* [b]	*CMR Building DD&D* [c]	*Revised LANL Operations*
Expanded Operations Transuranic	530 to 3,300	88	38 to 75	570 to 1,030
Less Manufacturing of up to 80 Pits	0 to -250			
Less GNEP	0 to -900			
Less Consolidated Nuclear Facility	0 to -1,200			
Less earlier CMR Building Operations Estimate	-90			
Less earlier CMR Building DD&D Estimate	0			
Plus GTCC [d]	0			
Revised Total	440 to 870			
Low-level radioactive	27,700 to 141,400	2,640	9,500 to 19,000	33,000 to 137,000
Less Manufacturing of up to 80 Pits	0 to -410			
Less GNEP	0 to -3,400			
Less Consolidated Nuclear Facility	0 to -12,000			
Less earlier CMR Building Operations Estimate	-2,600			
Less earlier CMR Building DD&D Estimate	-4,000 to -8,000			
Plus GTCC [d]	5			
Revised Total	21,000 to 115,000			
Mixed low-level radioactive	390 to 18,300	26	70 to 140	420 to 18,300
Less Manufacturing of up to 80 Pits	0			
Less GNEP	0 to -4			
Less Consolidated Nuclear Facility	0 to -72			
Less earlier CMR Building Operations Estimate	-30			
Less earlier CMR Building DD&D Estimate	-38 to -75			
Plus GTCC [d]	0			
Revised Total	320 to 18,100			
Construction and Demolition Waste	64,000 to 72,000	2600	27,500 to 55,000	177,000 to 208,000
Less earlier CMR Building DD&D Estimate	-5,000 to -10,000			
Plus GTCC [d]	88,000			
Revised Total	147,000 to 150,000			
Chemical Waste (million pounds)	6.4 to 12.9	0.024	0.13	6.6 to 11.8
Less Consolidated Nuclear Facility	0 to -1.4			
Less earlier CMR Building Operations Estimate	-0.025			
Plus GTCC [d]	0.05			
Revised Total	6.4 to 11.5			

CMR = Chemistry and Metallurgy Research; CMRR-NF = Chemistry and Metallurgy Research Building Replacement Nuclear Facility; DD&D = decontamination, decommissioning, and demolition; GNEP = Global Nuclear Energy Partnership; GTCC = greater-than-Class C; LANL = Los Alamos National Laboratory.

[a] Data from Table 5–84 of the 2008 *LANL SWEIS* Expanded Operations Alternative divided by 10 to show annual rates, except GTCC.

[b] Data from Table 4–35 of this *CMRR-NF SEIS*, except GTCC.

[c] Data from Table 4–50 of this *CMRR-NF SEIS*, except GTCC. Work to be done over a 2- to 4-year period.

[d] Highest annual data computed from information in Table 5.3.11–1 of the *GTCC EIS* (DOE 2011b).

Note: To convert cubic yards to cubic meters, multiply by 0.76456.

Source: DOE 2008a; LANL 2011a:Data Call Tables, 004.

Waste Generation

Figures based on manufacture of 20 pits per year.

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CMRR Construction Affected Areas

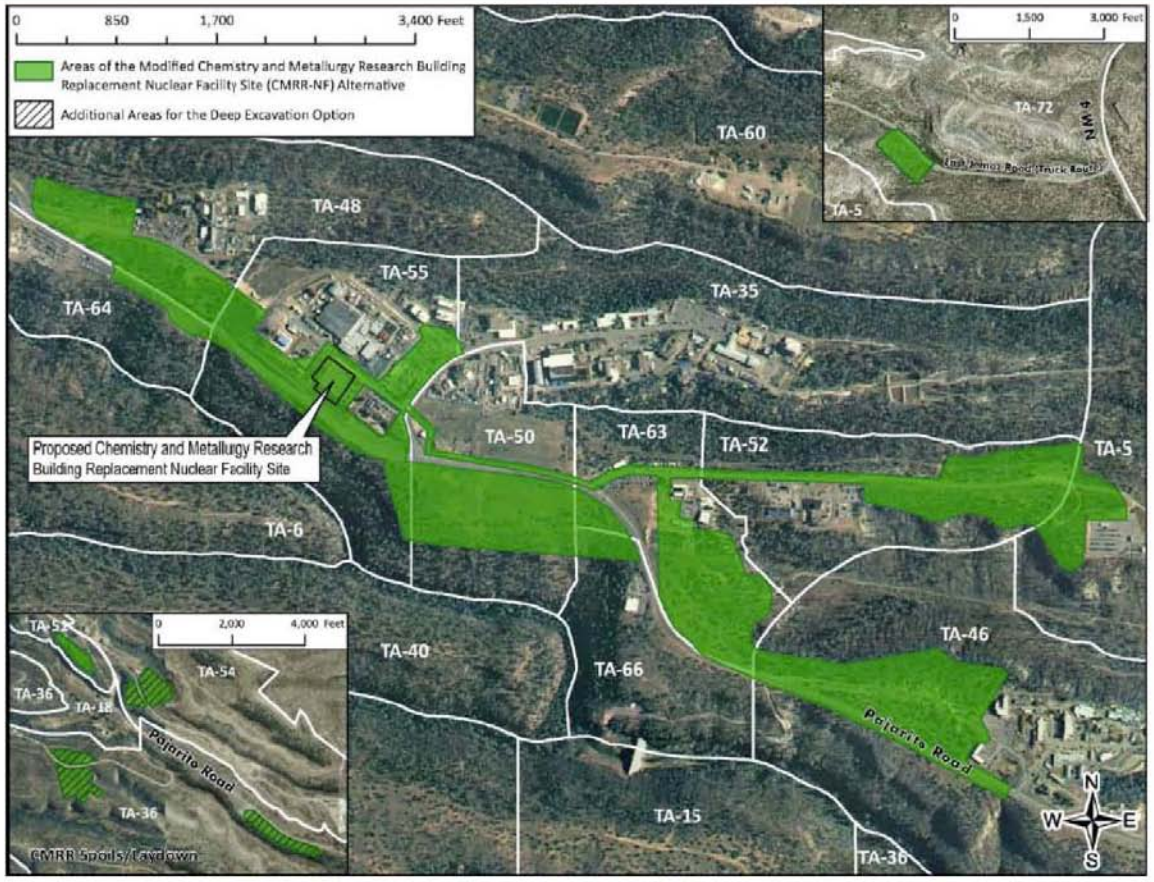
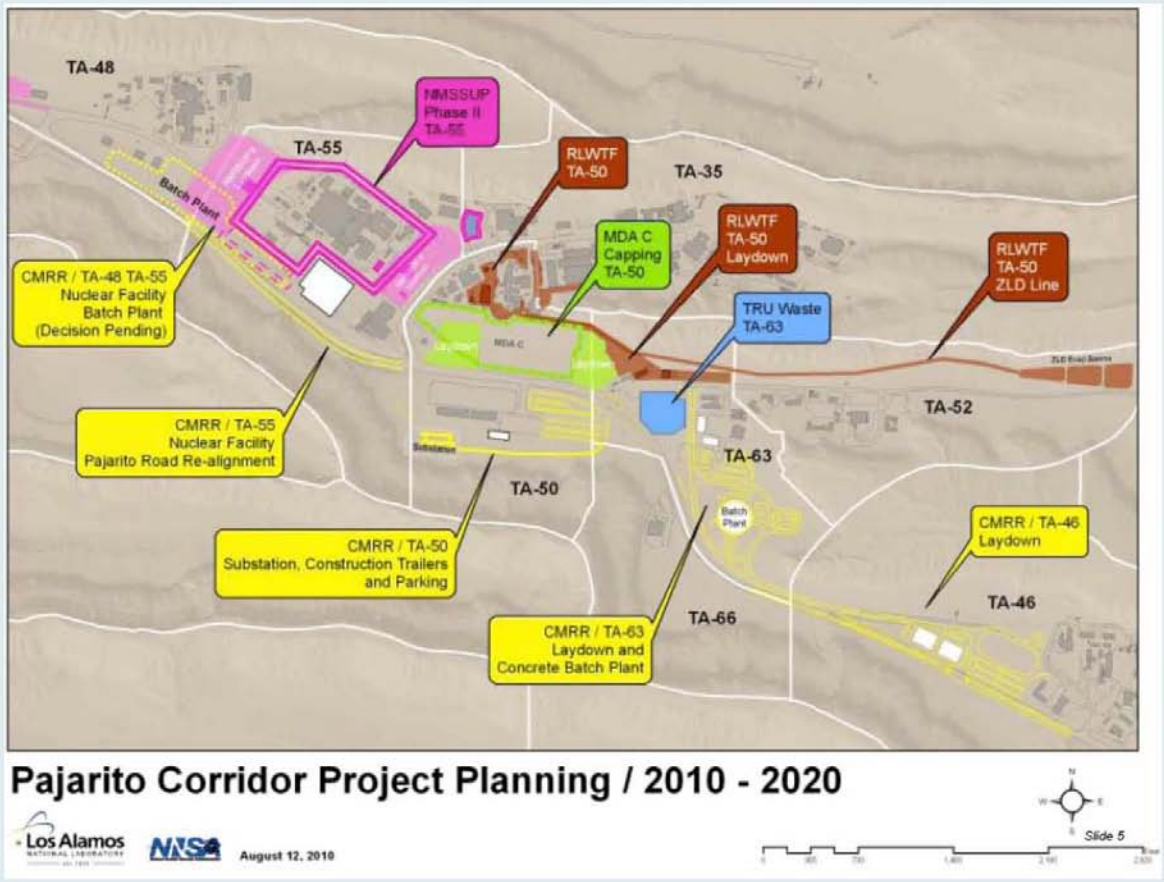


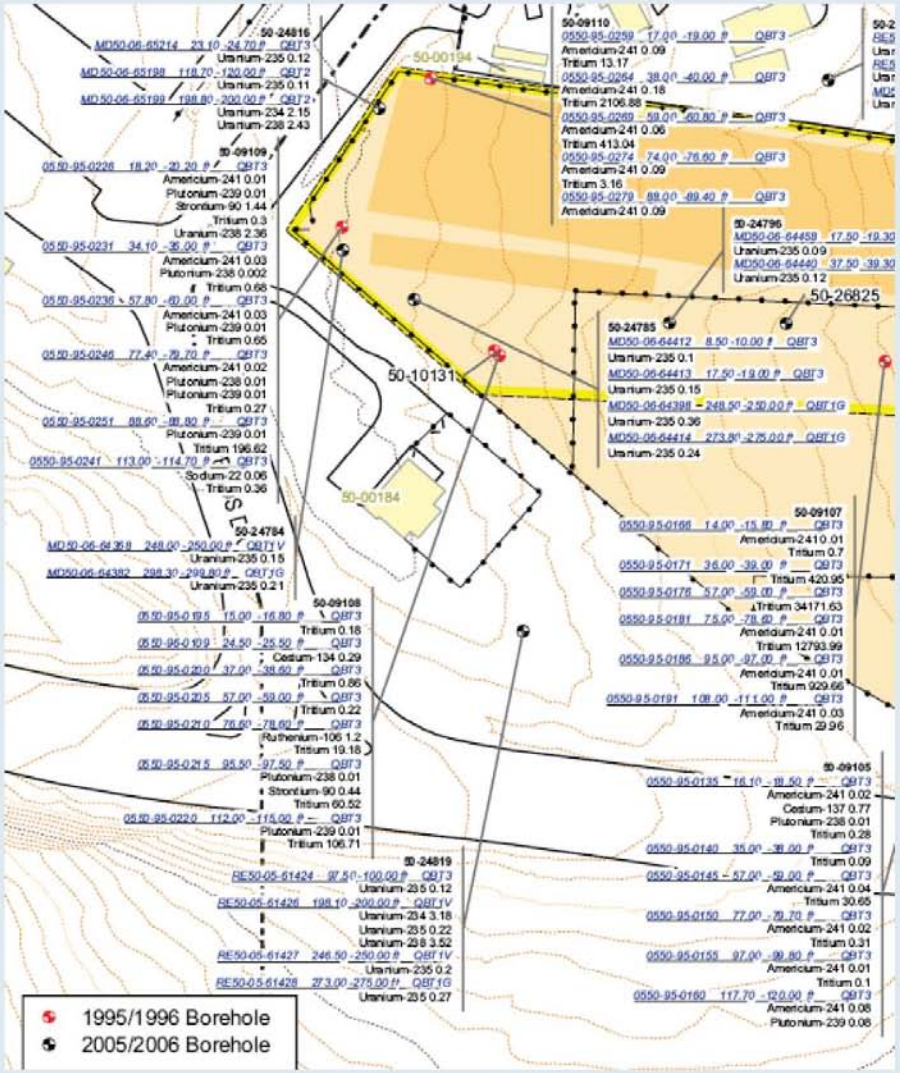
Figure 2–9 Potentially Affected Areas Under the Modified CMRR-NF Construction Plan

2-20

Draft Supplemental Environmental Impact Statement for the Nuclear Facility Portion of the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico

Pajarito Road Planned Construction



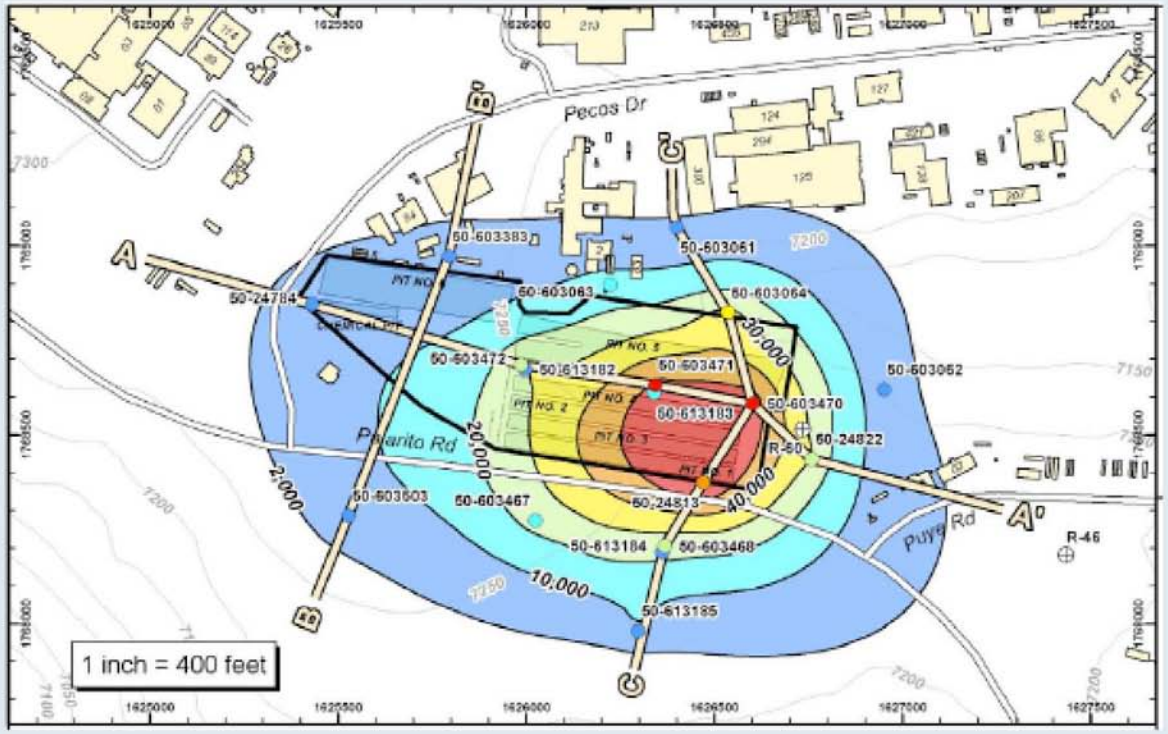


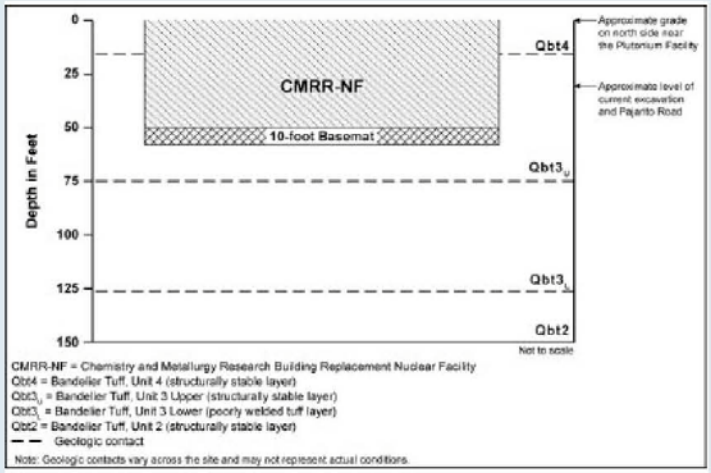
MDA C

The final SEIS states, "Surveys have been conducted to identify potential release sites (PRSs), and no unidentified or unexpected soil contamination or buried media have been encountered (LANL 2010d). There are, however, known PRSs located within the affected technical areas (for example, Material Disposal Area [MDA] C in TA-50)," (Pg. 4-67)

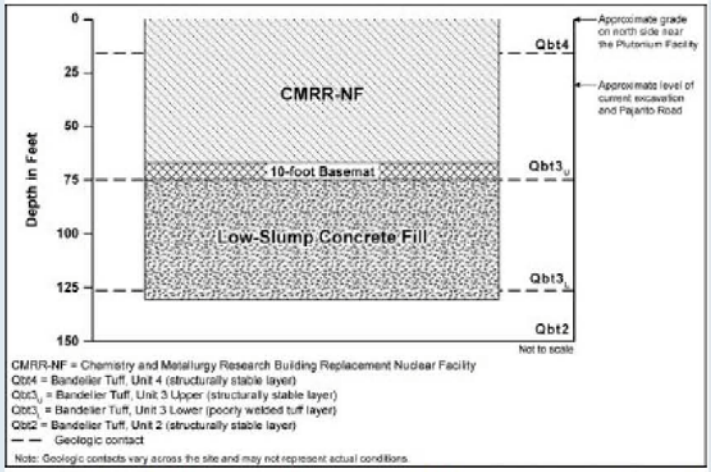
MDA C

"[I]nvestigation for MDA C, for example, concluded that, although further investigation activities were required, MDA C did not pose an unacceptable present-day risk to human health under the industrial and residential scenarios" (FSEIS Pg. 2-7) Below: MDA C TCE plume, MDA C Investigative Report, June 2011, Pg. 2-7





Modified CMRR-NF, Shallow Excavation Option Relative to Geographic Stratigraphy

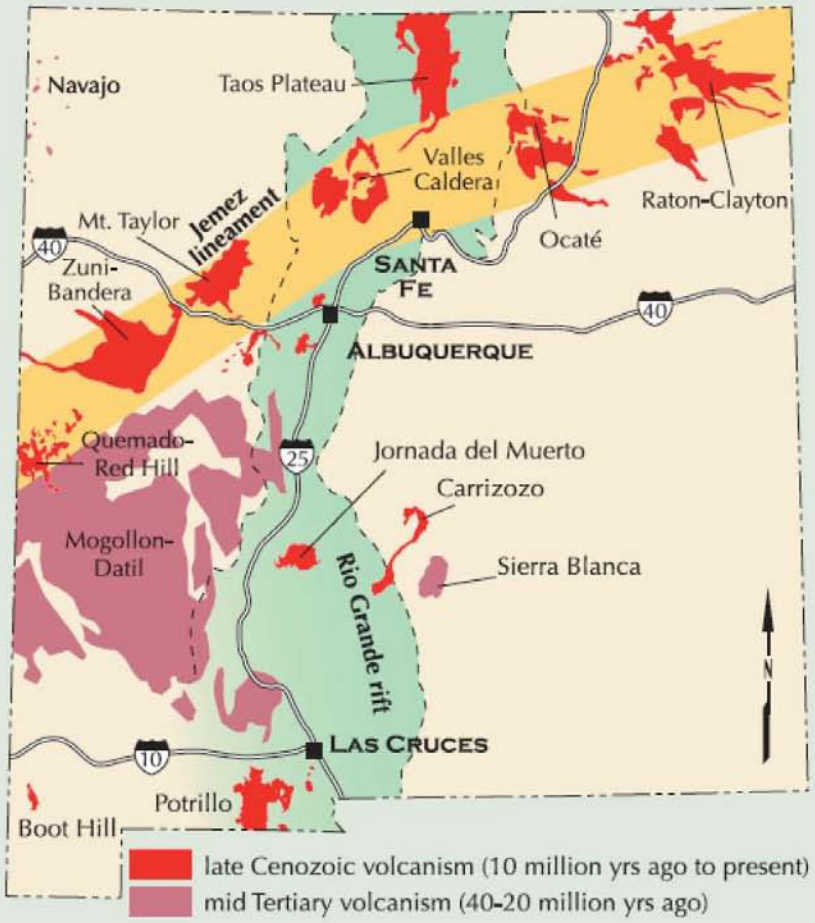


Modified CMRR-NF, Deep Excavation Option Relative to Geographic Stratigraphy

Shallow and Deep Weak and Extremely Weak

"Units Qbt4, Qbt3U, and Qbt2 are classified as "very weak" rock based on criteria established by Brown, ISRM (1981). Transitional units Qbt3L-t and Qbt2-t are classified as "extremely weak" to "very weak" rock. Unit Qbt3L exhibits average unconfined compressive strength below the lower threshold of 36 psi for "extremely weak" rock, making it more appropriate to classify its strength on the soil scale."

(Pg. 51) Geotechnical Engineering Report DCN 19435.10528.5-ALB06RP002 Chemistry and Metallurgy Research Facility Replacement Project No. 19435 Los Alamos National Laboratory Rev. 0 Copyright 2007, Kleinfelder 5/25/07 *19435.10528.5-ALB06RP002, Rev. 0 – Page 51 of 300*



The major volcanic fields in New Mexico tend to follow two major zones of weakness in the crust and underlying mantle, the Jemez lineament and the Rio Grande rift.

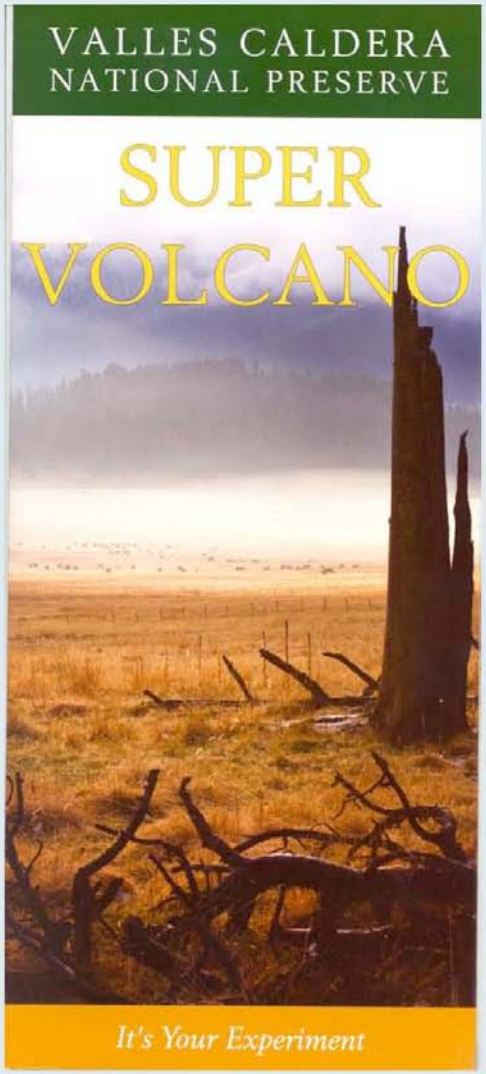
http://geoinfo.nmt.edu/publications/periodicals/earthmatters/6/EMV6N1.pdf

Where the Jemez Lineament Crosses the Rio Grande Rift

This zone may be the weakness formed where two very old blocks of the earth's crust were pressed together.

In addition to crustal weakness, volcanism in New Mexico is also likely related to upwelling of abnormally hot mantle material.

With the possible exception of the Jemez Mountains, all existing volcanoes in New Mexico are probably extinct.



Super Volcano

The collapsed caldera is 14.5 miles in diameter and is the result of two explosive super eruptions 1.6 and 1.1 million years ago (i.e., 500,000 years apart).

These eruptions formed the Pajarito Plateau. They laid down a 700 ft thick layer of volcanic ash, called the Bandelier Tuff, at the proposed CMRR-NF location.

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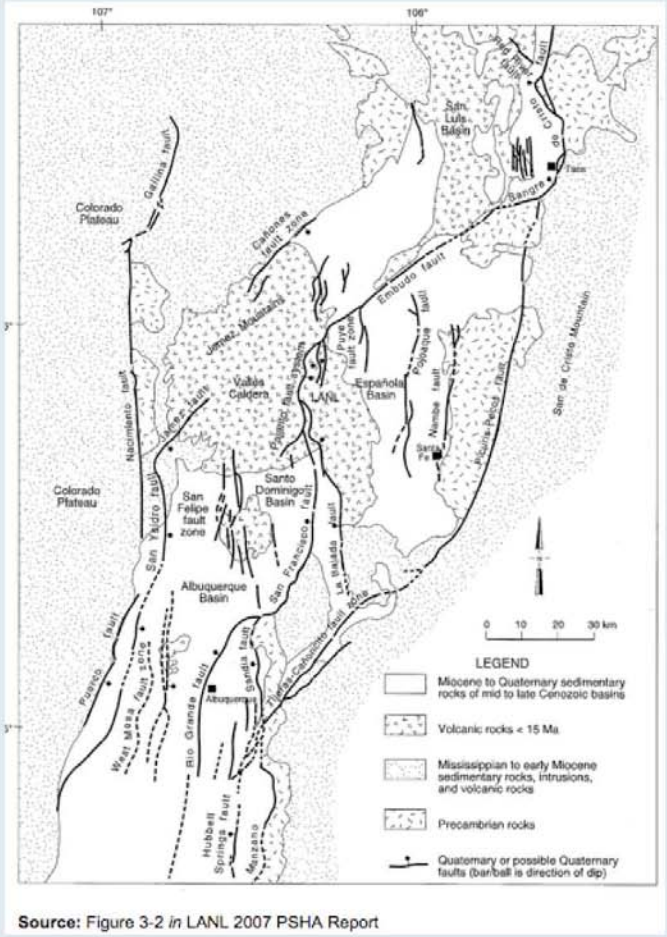
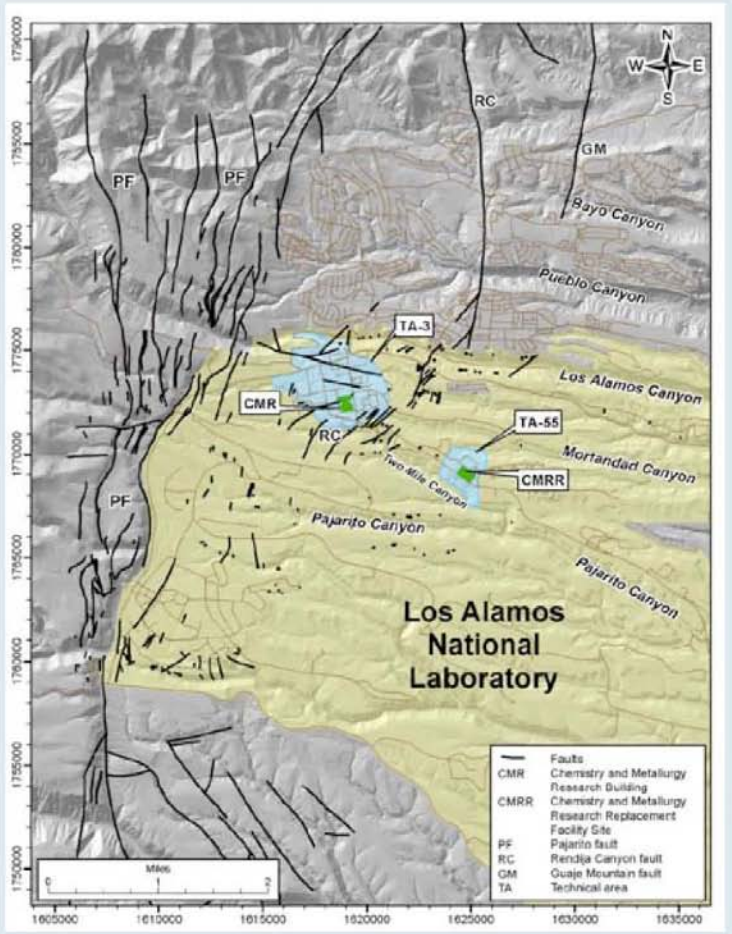
Complex Seismic Zone



Source: Figure 3-2 *in* LANL 2007 PSHA Report



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A Safe and Cost Effective Engineering Design for the Proposed CMRR-NF Must Include

- buried active faults close to or below the proposed NF location
- site-specific velocity in volcanic layers down through the dacite to an approximate depth of 900 ft
- ground motions – single earthquakes and synchronous earthquakes
- kappa – a key parameter for calculation of ground shaking

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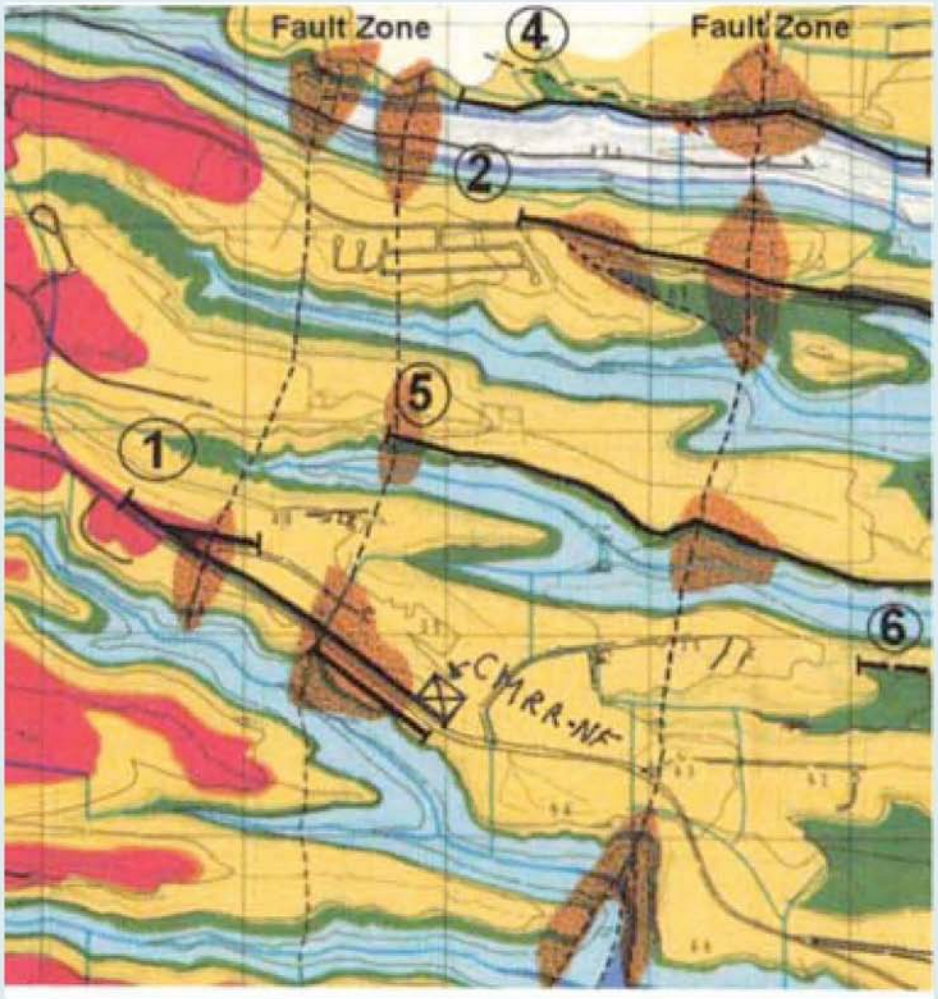

Inferred Faults Nearby

Map in 2004 LANL Report by Wohletz showing the inferred locations of the north-south trending buried active faults 800 feet west and 2,000 feet east of the proposed CMRR-NF.

Source: Figure 14 in Wohletz, 2004 (LA-UR-04-8337).

- Dashed black lines show trend of inferred faults - - - - - - - - -
- Brown patches along dashed black lines are zones of intense fractures
- Circled numbers 1 to 6 have no relation to zones of intense fracture

Buried Active Faults Nearby

- The buried active fault located 800 ft west of the proposed CMRR-NF may be an extension of the Guaje Mountain Fault, which may generate ground motions close to the proposed NF site
- From the final CMRR SEIS – Response to Public Comments:

  "The fault shown 800 feet (244 meters) west of the proposed CMRR-NF is an inferred fault, meaning that the fault is interpreted to be present at some depth below the location at which it is mapped."

Deep Borings Did Not Characterize The Geologic Column Down To Bedrock

- The only boring drilled a short distance into the dacite below the proposed NF location discovered the dacite was extensively fractured.
- It is a serious omission that multiple borings were not drilled deep into the dacite below the proposed CMRR-NF for accurate knowledge of the shear velocity of the dacite and the presence or absence of faults.

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Hazard Is Higher For Synchronous Rupture

- **FROM THE LANL 2007 PSHA REPORT:**

  "The [seismic] hazard is higher for synchronous rupture because the ground motions will be larger from seismic slip involving two subevents versus more uniform slip in a single albeit larger simultaneous event."

- It is a serious mistake that the engineering design of the proposed CMRR-NF is for ground motions from a single earthquake and not for the 75% greater ground motions from synchronous earthquakes

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Incomplete Knowledge Of The Seismic Hazard Parameter Kappa

- Accurate knowledge of kappa is essential for accurate calculation of ground motions for the engineering design.
- Kappa should be calculated from accurate records from seismographs.
- Unreliable values for kappa are being used for very expensive seismic designs.

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Weak Motion Seismographs Are Needed

- LANL has only a few strong motion seismographs that recorded only nine events over 25 years. The University of Nevada has determined that weak motion seismographs collect hundreds of events over a period of a few months that can be used to calculate kappa.

- LANL should immediately install a network of weak motion seismographs to improve knowledge of kappa and to monitor the increase in power of the youthful Pajarito Fault System.

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Kinematic Model Needed For The Pajarito Fault System

- The LANL seismic hazards geology team described the need for a robust kinematic model in a paper published in a peer reviewed journal in 2009:

  "Despite the importance of understanding the geometry of the fault system and potential linkage among faults for purposes of seismic hazard analysis, a robust kinematic model of the [Pajarito] fault system is lacking."

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THE DOE RESPONSE TO COMMENTS ON THE 2011 DRAFT SEIS DESCRIBED THE IMPORTANCE OF A KINEMATIC MODEL FOR THE PAJARITO FAULT SYSTEM AS FOLLOWS:

- "This idea is a natural follow-on of the scenario model development of the LANL 2007 PSHA … such a study could help refine seismic source parameters. . . It is nevertheless prudent to consider such interactive fault models (kinematic and dynamic) in the future for possible application to the Pajarito fault system."

- It is a serious omission that the very important robust kinematic model is not provided now for the engineering design of the proposed $6 billion super Walmart sized nuclear weapons facility for storage of six metric tons (13,228 pounds) of plutonium.

CMRR - Continuous Money down a Ruthless Rift

- Many feel that the completion of the Consent Order is at risk.
- DOE/LANL/LANS should put construction of new projects, including CMRR, on hold until all the requirements of the Consent Order are funded first.

Clean Up, Don't Build Up!

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In Memory of Peggy Prince

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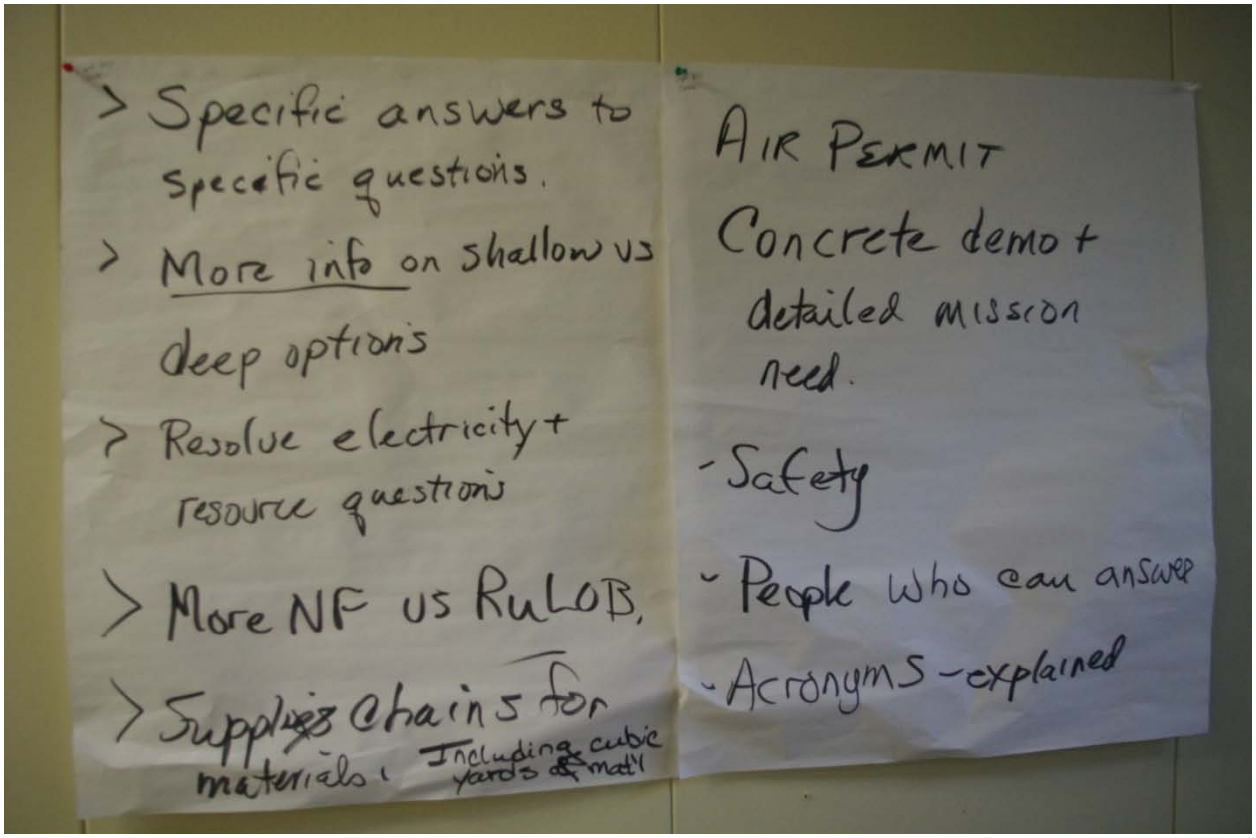
VI. Meeting Flip Chart Notes


> Specific answers to specific questions.
> More info on shallow vs deep options
> Resolve electricity + resource questions
> More NF vs RuLOB.
> Supplies Chains for materials, Including cubic yards of matl
AIR PERMIT
Concrete demo + detailed mission need.
- Safety
- People who can answer
- Acronyms - explained

VII. Acronym List

Some Acronyms for the CMRR Project

CCNS	Concerned Citizens for Nuclear Safety (organization)
CD	critical decision, as in CD-1 for Critical Decision 1.
CMR	Chemical and Metallurgy Research (Building)
CMRR	Chemical and Metallurgy Research Replacement (Project)
CUB	Central Utility Building
DNFSB	Defense Nuclear Facility Safety Board
DOE	Department of Energy (of the US government)
EIS	environmental impact statement
EPA	Environmental Protection Agency (of the US government)
ESH&Q	Environment, Safety, Health, &Quality (Division of LANL)
FY	fiscal year
GAO	Government Accounting Office (of the US government)
GMF	Guaje Mountain fault
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC (the entity that operates LANL for the DOE)
LASO	Los Alamos Site Office (of the NNSA)
LEED	Leadership in Energy and Environmental Design
MDAC	Materials Disposal Area C
MGA	Area G
NEPA	National Environmental Policy Act
NF	Nuclear Facility
NMED	New Mexico Environment Department
NMSSUP	Nuclear Materials Safeguards and Security Upgrades Project
NNSA	National Nuclear Security Administration (of the DOE)
NQA	nuclear quality assurance (level), as in NQA-1
NRC	Nuclear Regulatory Commission
NSR	new source review
PIDAS	perimeter intrusion detection area security system
PSHA	probabilistic seismic hazard analysis
RCF	Rendija Canyon fault
RCRA	Resource Conservation and Recovery Act
REI	RLUOB equipment installation; or Rad Lab equipment installation
RFP	request for proposal
RLUOB	Rad Lab Utility Office Building
RLW	radiation liquid waste
ROD	Record of Decision (by a federal government agency)
RRW	Reliable Replacement Warhead
SEIS	supplemental environmental impact statement
SWEIS	sitewide environmental impact statement
TA	technical area, as in TA-55 for Technical Area 55
TOTB	Think Outside the Bomb (organization)
TPC	total project cost

Some Acronyms for the CMRR Project

UPF	uranium processing facility
Y-12	Y-12 National Security Complex (DOE facility in Oak Ridge, Tennessee)