Nevada Test Site Oral History Project
University of Nevada, Las Vegas

Interview with Linda Smith

October 6, 2006
Las Vegas, Nevada

Interview Conducted By
Mary Palevsky

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Mary Palevsky: *Linda Smith, thank you for meeting with me again. As I just said off-mike, I'd be interested for you to talk a little bit to me, because even though you're not a Las Vegas native you are a long-time Las Vegan, about your experience as a young person. You both saw atmospheric tests, experienced civil defense drills as all of us did from that era, but you were living in a place where some of that testing actually occurred. And then children in Las Vegas, I understand, did another kind of thing related to the testing, which was the blood testing.*

Linda Smith: Absolutely.

So why don't we talk a little bit about that and then we'll jump forward to '65 and your work at the [Nevada] test site.

OK. When I was in grade school, in a very small school in East Las Vegas, Nevada, at that time, it was Whitney, Nevada, and there were actually four grades in one class. It was the Duck Creek Grammar School, which is no longer in existence, of course. But definitely duck-and-cover, and it was done, as I recall, I couldn't say that it was done weekly but it was certainly done monthly. And that all of us definitely were typed and wore tags, literally had tags that identified your blood type, and do you know, I think that there wasn't a lot of concern about that. There never was, that I was aware of, that much concern as kids about the atmospheric testing program, other than it was an entertainment factor. You would brag about whether your family would take you to the Mount Charleston turnoff early in the morning to see the lights, if you will, the effects of the atmospheric tests when they did occur because they were well publicized.

So I don't sense that there was fear. I do think that there was a little humor in all of that, in that you would have these very complex instructions on what to do in case there was an atomic attack or an escape of radiation, that you would go to the local post office and file a form. And we would all say, now, sure, that's the first thing you're going to do is find your way to the post office. So there were a lot of sort of bizarre things that were associated with that that didn't make a lot of sense as a kid.

But I didn't lose any sleep, I don't think anybody that I knew lost any sleep over it. That whole era of nuclear fear which was manifested in the movies and television and in many arenas, you just lived with, I think, it became second nature. And I think more so here because we were so used to seeing it on the front page, so used to, if you will, it became very casual. I know [it] is probably not a good word to use in this day and age because I can't imagine that anybody would think it was casual. In fact, as I look back on it, it's rather unreal, if you will, that that could be the case.

Did you ever go with your family out to Mount Charleston?

I remember one occasion, and I couldn't even tell you when it was but I do remember one occasion when we actually did drive out early in the morning to see it closer, to be there closer to it when it happened, and it was, wow! Quite a sight to see.

Now when you're waiting, you know approximately when it's going to go off but did you—

Just in general terms because you don't know for sure if the wind conditions are going to be such that it would be delayed or whatever.

So what happens when you realize it's happening? What do you see? Do you recall?

I can remember seeing color and I can remember seeing a cloud. That I can remember, as best as I can recall, it was like quite a startling experience. But it wasn't frightening. Now that's the

interesting part of it, because it's almost as if you're watching fireworks on the Fourth of July, I don't know, when you're a kid. And it was so accepted. I can remember later in my career, many times going into Frenchman Flat and actually walking on ground zeros of **[00:05:00]** some of the balloon shots and thinking, you know, it's just almost surreal, thinking that you actually probably saw one of these explode, you know.

Yes. That's interesting, Linda. And we were talking before about context. I don't know how, as a child, you would be able to put that in context.

No, I don't either. No. And I don't know what the answer to that is. You couldn't because there wasn't much reality to it in terms of—certainly we knew about Nagasaki and Hiroshima, but there wasn't a connection there particularly. And it was for the good of the country. I mean it was a defense issue. Nevada was always very strong from a defense posture standpoint. There was no feeling or discussion about the fact that Nevada was being used in a negative way as a testing ground for this kind of technology, which is rather amazing. Now it may have existed but if it did, it was certainly not manifested in any public way, certainly not the way you would see it now. I mean, no way! And I would agree. I would be on the other side of the issue, for sure.

What do you mean?

Well, I mean if someone said to me that we were going to do atmospheric testing, which would never happen, in this state, I would be very, very much opposed to that.

Why?

Oh, because I can't even imagine. It wouldn't happen. Environmentally, it wouldn't happen. It's just not—underground testing is different, in my opinion, OK. And I will draw that, and I'm certainly on the other side of the fence on Yucca Mountain, which is the storage of highly radioactive waste from nuclear reactors. I feel very, very much that this is probably the best

temporary solution. But atmospheric testing is—I mean it was done without the knowledge perhaps of what the impact was on the environment, I can say that. But we know now that that can't happen again. But it may in North Korea. No, and that would be underground.

I'm sure that would be underground.

Of course it would.

That's why they're looking around like that. It's interesting, isn't it, how complex that is, that it's so hard for nations now to test, and that's why I want to get in with you in a little what happened at the test site that developed that science and technology. But one question about the blood typing. You say you wore—

We didn't—when I say occasionally would wear the dog tags, had dog tags, always had dog tags in the younger years, not in high school but in the younger years.

But would you have periodically blood drawn to see that the blood was OK or—

No. That was just typing. It was just the typing, which was a civil defense regime that just said we know your blood type and we know if anything happens that we would know your blood type.

Oh, because I thought that was a—OK, now I have to go back and look at my history, because I don't know if that was nationwide that that was done or if that was done in Nevada because of the test site.

I don't know the answer to that. Certainly it was done here. It very well could be that it was done nationwide, which might not have been an artifact of testing per se.

That's what I have to find out because I—

But if you're in a certain area—now we were not Downwinders, obviously. I was in Henderson, and Las Vegas and Henderson were not in the path of the so-called track of the cloud. If you

were in southern Utah, if you were in downwind areas, it could very well could be the case. Well, I know they were doing blood testing.

OK, that's a good distinction. So it was not happening generally—

In southern Nevada. When I say southern Nevada, certainly not in the Las Vegas valley, that I am aware of. At least we didn't experience it.

That's very interesting.

But Bruce Church would be a good one to ask, from the standpoint of being the same age category and having gone to grammar school in southern Utah, in Hurricane, so that would be a good person to find out.

[00:10:00] *I can ask him that. Well, thank you for that. So now we're going to fast-forward basically over a lot of the interview you gave me last time to '65 at the test site when underground testing is in its infancy. And one thing you said before we turned on the recorder was, for lack of a better word, you'll be able to say it better than I can, the legacy of the atmospheric testing days in the early-and-mid-sixties at the test site and how you interpret that.*

Tremendous. A tremendous sort of influence, if you will, of obviously the people who were involved in the atmospheric testing program, primarily in Albuquerque [AEC's Albuquerque Operations Office was responsible for NTS testing program prior to 1962]. Remember, the Nevada Operations Office [NVOO] had just come into existence in 1962 as an entity, that was a program entity for the Nevada Test Site programs, brought with it the Albuquerque people that were responsible for the atmospheric testing program. James Reeves, many, many of the so-called principal staff in the office just came from Albuquerque atmospheric testing program, and that influence prevailed until—well, to some degree probably still prevails; but it certainly prevailed until the late eighties, early nineties, when you saw a lot of changeover in the

leadership of the staff, people who grew up with underground nuclear weapons testing as opposed to having actually experienced the atmospheric testing program.

And of course it was also a very interesting time for the office because there was the peaceful use of nuclear weapons program, Plowshare program activities that were going on; and a lot of activity on sites outside of the Nevada Test Site, which is not generally well known. People tend to be somewhat surprised to find out that we were actually doing things in New Mexico and Alaska and in other areas, a lot of those related to Plowshare, some not related to Plowshare. When I went into the—I think during our last interview I told you that I was in a management analyst position with [AEC] Human Resources; when I moved into the manager's office as an administrative assistant, that gave me an opportunity that was pretty unique because I then was able to be involved in some of the actual support activities for these rather unique tests that were occurring at the time, one being Cannikin. You've probably got a lot of oral history now on Cannikin, I would imagine, but that was unique in many, many ways.

Well, I do have some, but why don't you talk to me about it from your point of view, and what year was Cannikin?

Well, Cannikin was in 1970. Actually it was detonated, I think, on November 6, 1970 after a long and arduous Supreme Court battle the decision as to whether it could be detonated happened on the day of the detonation, on November the sixth. I think that was a Saturday, even. I don't remember that for sure. I was asked by the manager, Bob Miller, to pack my bags and go to Alaska. And I was a little stunned and dumbfounded at the thought of this, but he said he needed a support base there to essentially make sure that the scientists and the consultants that were coming in from all over for this test were logistically coordinated, so that was quite a role, to say the least.

Well, let's talk about that a little more. So what phase of the project is this?

This is actually, now remember, Cannikin was the proof test of the Spartan warhead, that was the W71, and that was during the whole antiballistic missile [ABM] period when a lot of money was being put into the ABM program. I think it was—at that time two hundred million dollars, quite a sum of money. But the W71, and of course there had been preliminary tests to **[00:15:00]** essentially calibrate the area because you're doing it on Amchitka Island, which is in the Aleutian chain, and in preparation for that there were two shots, Milrow and there was another one, Long Shot. It was Long Shot and then Milrow, which were essentially calibration tests. Drilling a hole nearly six thousand feet deep. This is just almost incredible. And it was, at the period that I was asked to go, it was within probably three weeks of the detonation. So I found myself on an airplane with Roger Ray, he was going up at the same time I was. I was just almost—it was a dreamlike setting, believe me, to go from Las Vegas, Nevada, and I had not been too many places in my life, and to wind up landing in Anchorage, Alaska, going to the sixth floor of the Royal Inn hotel in Anchorage, where we essentially had set up a command post for the coordination and detonation. Well actually, the shot was detonated on Amchitka Island, so you had essentially two centers of activity. But the national press, I mean the international press, this was just absolutely the focus, if you will, of not only this country but several others because this was the largest underground test ever conducted in the United States, five megatons. And of course you're in Anchorage in November, so there is no daylight; you're kind of fighting with that all the time. And we had I would guess in the Anchorage area probably, oh, fifty to seventy-five people—of course it was a [Lawrence] Livermore [National Laboratory] test. Phil Coyle was the test director. So we had a contingent from Livermore, we had the Los Alamos [National Laboratory] people who were supporting the test as well, and of course you had all of the normal

entities that support nuclear weapons testing. You had the [U.S.] Weather Service, you had USGS [U.S. Geological Survey], you had Sandia [National Laboratories]. And of course REECo [Reynolds Electrical and Engineering Company] was very prominent because they were the ones that had actually done the drilling through subcontractors, the drilling of the hole, which was no small feat because of the water issues. The [Atomic Energy Commission, AEC] chairman, Jim Schlesinger decided to come to the event and bring his family, and put them right on the island, which was another very startling event that we had to deal with from a public relations standpoint. And it was just a new twist and turn a minute.

So give me an idea. You arrive. You've been asked by Miller to coordinate things. What, you're a thirty-year-old woman, is that right?

Yes.

And the first question is, what was the ratio of men to women?

Oh, let me count the women out of that sixty—maybe three of us, three or four to know, yeah.

Did you know these other people?

Oh absolutely, because they were people that we had worked with. Bill [William] Ogle of course was there. Let me think. All of these people we had worked with in the testing program that were there. The deputy manager, Dr. Charles Williams, who had recently come to the Nevada office from Livermore, was really in charge of the Anchorage operations. Bob Thalgott who was the test manager at that time for all testing activities, the assistant manager for operations, was the man that was really going to be on the island and was on the island the day it was detonated. And then we had many of our internal people, scientists, we had just recently hired a Dr. Elwood M. Douthett to take care of health and safety or to **[00:20:00]** be the health and safety representative. Remember, this was the first test that was subject to NEPA, because NEPA was enacted in 1969.

Explain that to me.

National Environmental Policy Act. So that meant you had to develop an environmental impact statement [EIS] now. So this was the very first test that was subject to NEPA and had a specific environmental impact statement that was written about it.

So let me understand. This is something I didn't know about. For there on forward, at Nevada or anywhere, this had to be done, is that what you're saying?

Actually yes, and let me kind of qualify that. For the offsites, you would have to have a specific environmental impact statement or go through a NEPA process which could result in an environmental impact statement. When you go through a NEPA process, you make a decision as to whether an EIS is required or not. It may be that you only need an environmental assessment, which is a lot less demanding, if you will. Obviously when you're going to Amchitka Island and detonating a five-megaton bomb, you do an environmental impact statement. And all of that was what was being challenged in court. That was an interesting historical point because this was the first, it was challenged in court, it held up at the Supreme Court, and the decision came down the day of the detonation. Rather remarkable, because it wouldn't probably have happened at all that way today; I don't know.

But the test was detonated, of course. We could feel it. We were rocking and rolling on the sixth floor of the Royal Inn in Anchorage, and looking out a window and looking at the high rise across from us and it was just a very rolling motion, and thinking, ooh, and we've got Jim Schlesinger, his wife and child sitting on that island. And everything went just very well. It was a seven [7.0], I believe from an earthquake measurement standpoint, on the Richter scale.

When you're going back and forth like that, what are you thinking?

Ooh, is it going to stop? Which it always did. But every time I've gone through it, you think, ooh, boy, let's get this over with.

You said something interesting. I had this image, it just shows you how interesting it is to talk to people, so you're going up to Alaska as if you'd be in a new environment, but what you just described is that there's this community of people.

Oh, absolutely.

And so you're known and they know you.

Absolutely.

That's fascinating.

Now there was a lot of interaction with the community. Now that's interesting too because there was no major cultural issue in Anchorage or political issue. There were events with the community; for example, they had a reception for us, as I recall, in the hotel and it was a very wonderful affair and all of the local officials were there, and so there wasn't a feeling of it being a negative relationship, for sure. But you're right, you're very much encased, if you will, in the culture that you bring, and especially in this case because everything was so frantic, and you were getting communications things set up. You can imagine, people were at high stress levels. Certainly the manager of the office was at high stress levels, making sure everybody else was, too, which was understandable. And so there was a lot of internal tension that we were witnessing, for sure.

And what kinds of things did you actually end up doing daily? Were you putting out fires or were you actually—

Oh, all of that and arranging for a lot of logistical management things, making sure that there were government vehicles for whoever needed them. In **[00:25:00]** one case, a couple of the

scientists that were supposed to have been there two weeks before they didn't show up on time, so we were tracking them down to find out what circuitous route they had taken. And morning till night. Trying to get administrative support areas set up, and making sure that you had the equipment in place and that everybody was notified. Doing a lot of internal communications, writing memos, sending TWXs [Typewriter Exchanges] and all of that sort of thing.

TWXs?

Well, those are teletypes. We called them TWXs. And that's how we lived. We lived by the TWX.

Interesting.

Absolutely. And then a lot of fun with that, which was a tension-reliever. Everybody had a wonderful sense of humor. There was never any sense of hierarchy or rank, ever, in any of the activities that you participated in like this. Never. I mean everybody was an equal. The Bill Ogles, the scientists, the engineers. Henry Vermillion [sp] was our public information officer and he would have press briefings in the lobby of the Royal Inn and there would be hundreds of reporters, and he just stayed cool, calm, and collected. It was just a time when it was—it was very interesting.

Now what's your consciousness of what's going on in the Supreme Court, because you're there in these last weeks. Are you—

Oh, we're tracking it. Absolutely. Actually when I say it had gone to the Supreme Court, it went to a Supreme Court justice for a decision, so it wasn't the full-blown Supreme Court, as I recall. I would have to, as a point of accuracy on that, go back and check.

We'll look it up. But that makes sense. [In a 4 to 3 decision on November 6, 1971, the Supreme Court refused to halt the Cannikin test].

Yes. And the decision, as I said, was right down to the wire. It was almost like a dead man walking—you're thinking, either we're going or we're not, you just literally did not know.

So was it that you had that as your shot day and if he had said no—it would've been "he" in those days—everything would've stopped.

Absolutely.

It wasn't the converse or the reverse, which was he said OK and then you went.

No, no, no.

You were counting it down to the—

Absolutely. That's it.

Now once it happened, what was the response? In the immediate aftermath, people felt that it was a success or what happens right afterwards?

Oh yeah, very relieved, congratulatory. The word was coming back from the island that things were—now remember, you also had on that island incredibly high winds that day. I'm thinking, of course you're in the Aleutians, and this is November, but I think, there were 120-mile winds or something like this. It was an incredible weather pattern. So that was all at play. And decisions were made to just proceed. And you wait until there's a time when, and I think it was eleven o'clock that was the detonation time, and that would've been Bering Standard Time, I suppose.

I guess.

But yes, relief. Now, interestingly enough, Jim Schlesinger, who is a birdwatcher, decided that a day or two after the event he wanted to go to a nearby island because there was a rare bird that he wanted to view. So we were really struggling with that one. Do we put this man in a boat and take him to some island where he can birdwatch? And the feeling was we did not want to do that, but as it wound up that did happen.

Why didn't you want to?

Oh, because it was just, what if anything happened. You just say to yourself, my gosh, everybody's looking at you and you don't want anything like that to happen. So there was a lot of concern and a lot of internal strife about that, but he decided he would do that.

[00:30:00] *Because it was basically on your watch that that would happen. It wasn't like he was wandering around somewhere in Washington.*

Yes, absolutely. And we had been involved—remember, in 1969, the year that I went in the manager's office—we had a major, major plane crash that killed an AEC commissioner. It wasn't our plane; it was a [National] Park Service plane. I'm sure you've heard a little bit about this in some of the interviews that you've done.

Which was—the crash where?

This was the Tommy Thompson crash at Lake Mead.

Yes, OK.

I'm sure you've heard about that. So I mean there was kind of that, I think, in all of our psyches because we lived through that, and that was a terrible time, dragging Lake Mead to see if we could find the bodies. And then of course Baneberry in 1970. So we had some precursors to all of this.

And we'll go back and pick those two things up, but what is your consciousness of the challenges that are being voiced to Cannikin? On a day-to-day basis, do you have time to think about the political atmosphere?

No, not at all. Not at all. You had Greenpeace. Absolutely. But there is such a strong bias to get it done that overrides everything. Is there any profound discussion of should we-shouldn't we? Is this good for the country? Is it not? There's no question. You are there to get it done. And the

team, this incredibly seamless team, with all of these agencies you and I were talking about earlier, once again is supreme, and prevails. They do the technologically impossible. And we know that the W71 warhead works well. Ironically, it was dismantled the year after I retired, in 1995. The whole ABM concept was interesting. Of course that was well before Ronald Reagan, and Star Wars. So that was the first really large, large—and again, the largest we ever did, and to do it offsite.

What was the largest test on the test site, underground? I know I can look in the book [DOE/NV—209-REV 15 December 2000], *but while we're on that, I think, was it Boxcar?*

Boxcar, and it was on the Pahute Mesa, and it was 500, maybe? No, it was a megaton. It was at least a megaton. .

I'm just almost sure it was one-something [1.3 megatons].

But while I'm looking, so at what point do you leave Amchitka and come back? Shortly after?

It was within the next maybe four or five days because it took that long to get everything, in essence, dismantled and to do all of the reporting, to make sure that everything was pretty well cleaned up before we left, and then we came back to the real world.

One-point-three, according to the book.

One-point-three yield. I was going to say I knew it was under 1.5. Yeah, that was a large one.

The next one that I can remember I was involved in that was very unique was Rio Blanco, which is, it was essentially part of the peaceful.

Let's go back. I'm thinking of so many things to ask you about, Linda, but there are a couple of things. It'd be really interesting to hear again, because this is important, what was going on in your office with Baneberry when that happens, because I have that story from sort of various points of view out at the site.

[00:35:00] Oh, very interesting. Yes. Baneberry was an absolute shock to the system. There is no doubt about that. I don't think there was any sense that there would have been. Of course it went right through the—at that point we didn't have a formal Containment Evaluation Panel [CEP]. All of those things resulted from Baneberry. Bob Brownlee has given you that, I'm sure, in tortuous detail because he was one of the architects, if you will, of the reconstruction after Baneberry. He did a fine job because it never happened again.

But Baneberry, the day that it happened, I was in the manager's office, and it was a rather routine day and it was before lunch, probably, oh gosh, I would say 10:30 or eleven. It was close to noontime, as I recall. And the deputy manager [Charles Williams] who was the person that I worked directly for was in the back of the building on Highland Avenue, which is where we resided until the mid-1990s. And there were plate glass windows looking out north toward the test site. And he came back from that part of the building into the front office, came through those glass doors, and said, `This is the end of the test program.`

And I said, `What are you talking about?`

He said, `Go back there and take a look.`

And man, [snapping fingers] he was on the phone like that.

"Take a look," meaning?

Look at the—you could see it. You could see it. Now it wasn't an explosion, but it was a distinct—as I recall, it almost looked like something was burning, so it was dust, I'm sure.

So who was the deputy manager at the time?

It was Charles Williams, who actually wound up—he was the test controller, as a matter of fact, on several tests, not on this one. I'm almost sure it was Bob Thalgott that was the test manager on that one. But I think it was a 10,000-foot release, wasn't it? I forget the figures. But it was

substantial. And of course then the aerial tracking goes in, then all of the emergency systems that you have in place immediately.

Now when he says that, I'm just curious, has he had a call or has he just seen it out there?

Well, when he saw it, then all of a sudden everything broke loose.

All right. So then he's getting information from the test site.

Yes. And he said it was the end. He says, `We're done. We'll never test again.` Well, he was wrong. There was a cessation for at least six months. As long as it took the investigation team to—Bob Brownlee was either the chair or the co-chair of the investigation team because it was a Livermore shot, and Bob was Los Alamos and of course our containment expert. But he not only tells a wonderful story—I absolutely have seen it—that was the most stressful thing he has ever done, bar nothing, because he knew that the whole future of the program resided on his shoulders. And how did he relieve the stress? He hooked a rug. Now he designed and hooked, and it's hanging in his house, and it has all sorts of Egyptian math connotations that he can explain in great detail, being the brilliant person that he is, but it is beautiful. And he would go home and hook. He became a rug hooker. So isn't it funny how some people relieve stress?

This was interesting to me, you said it was a routine day, so there's a routine in a test day. I mean as an outsider you imagine that.

Oh absolutely. Well, oh, different, OK, different routine, because it was before Baneberry. Remember, much more "casual" is not the word I want here, but not nearly as rigid or procedural or—I will not use the word "casual" because I don't think it was ever casual, but a distinct difference in the two periods. Afterward, you have this very formal Containment Evaluation Panel, you have formalized procedures. And I was very much involved with the **[00:40:00]**

Containment Evaluation Panel as the administrative assistant to the deputy because he was a test controller or a test manager at that—actually he was a test controller. We changed the title.

And that's always confusing.

But I was always involved in the proceedings, and I would sit through the meetings.

Did you really?

Yes, and actually prepared the minutes and that was—

Really!

And I was not a person who could sit down and take courtroom shorthand, so I would have to try to get thoughts and piece them together and then I'd work them through the panel and make sure that everything was being phrased appropriately. So that was an education, to say the least.

I should say. But that's an interesting point. So you knew it was test day, there were certain things that happened.

Yes. Absolutely. And we weren't at the test site, but obviously, yes.

So how do you coordinate, then, with the test site as things go forward, because this is an emergency, how does decision-making happen?

You have a very structured emergency response process. Even then you did. I mean the notifications are all procedurally directed, the notifications are well known by the teams—and you exercise those. You definitely exercise those. You know at a certain time what controls are in place. Now remember, until Baneberry there were no forward area controls to the extent that there are now. Prior to Baneberry, you would have people actually in the forward areas when you would be detonating the test. Didn't happen afterward. You cleared all the forward areas except for the test execution party.

And give me a sense of the sort of community psyche at this point. What's going on?

Oh, community psyche. Well, this was a blow. Oh, gosh, it was a tremendous period of stress and, you know, Can this be resurrected? And of course you had a lot of involvement by the Atomic Energy Commission itself in Washington, the general manager was frequently at Nevada, and you had all of the political implications ongoing. So it was a political period, I think is a good way to say it. You were maintaining all of your programs and even maintaining your funding. And the laboratories were doing a lot of planning, each of the laboratories, they knew what they were going to be doing once we resumed testing, as they always do, because you plan many years ahead, and DNA [Defense Nuclear Agency] in some cases at that time—it wasn't DNA, it was DASA, Defense Atomic Support Agency. But they planned five years ahead of time, so all of those things probably were not—the execution was impacted, obviously, but you were still drilling, you drill holes, you put them in the inventory. You were still doing those things.

In preparation for specific tests?

Sure. Yes, any test that might happen.

OK. Drill holes in the inventory.

Right, we had a drill-hole inventory. Absolutely.

How interesting.

That is. Isn't it fascinating? And of course that was a critical part of the Containment Evaluation Panel. You were not only evaluating the soil, the stemming materials, the design, the depth of burial, the predicted range of the detonation, but you were looking at the drill hole to see how old it was; how much sloughing had occurred, and all of those things, if it was a hole out of the inventory, unless it was a hole that you had just newly dug. So yes, a whole different world.

Now you said something before about Brownlee. Do you think that—well, how do I want to phrase this? It sounds like—to what degree do you think that his own person was instrumental in not having what your boss predicted, which was that it was the end of the testing program?

Incredible influence, incredible influence, because there's the most knowledgeable person, I mean **[00:45:00]** the person who designed probably the first underground nuclear test, who understood this broad array of things that we just talked about that the Containment Evaluation Panel wound up evaluating in a very formal setting. So he was key to that. And determining the actual reason, the reason for it is because they just didn't have enough formality, in a sense, in predicting the geology. Clearly, and that was the bottom line. Plus he was so respected by both laboratories. I mean there's the key. You've got to have somebody that both—but you know there was this sense on both sides in the testing program, both laboratory cadres, if you will, that were so profoundly involved in this test program, had tremendous respect for each other. Occasionally you would see personality conflicts that just couldn't be overcome. But these people operated very seamlessly, to use an overused phrase.

That's an interesting point because I get different takes on that Livermore-Los Alamos competition. But you say you saw that mutual respect—

When it gets down to the wire. Now, on a day-to-day basis, I spent a lot of my time later as a manager and a deputy manager, trying to resolve petty conflicts, at least what I would call petty conflicts. Livermore put up a fence around, a chain-link fence around some area of the test site that cost $30,000 and the other lab complained `How could they get by with that, and we can't`—I mean that kind of bickering and concerns. But boy, when it got down to the wire, to preserve that test program, to make sure there was a success in the particular event that people were involved in, then of course they worked together. Even though you had a test controller for

Livermore, you had Los Alamos people involved doing experiments. Certainly that was true in the DNA tests, the Defense Nuclear Agency tests where you had people hanging experiments all over that [line of sight] pipe, from one end to the other. So you did not see T-shirts and ball caps who were organizationally specific. You saw Nevada Test Site, because they were there for the Nevada Test Site, for the test, I mean not say the Nevada Test Site, *for the test*. Well, and of course, both laboratories will still give you a profound argument as to why they should do things differently. I'm not sure that I ever truly bought that, and I don't know that others that I worked for did either. That is a whole debate that will continue ad infinitum. Did we need the competition between the two laboratories in order to develop the very best weapon? They know better than any of us people who were not nuclear scientists. But they certainly could have developed some commonalities that would have reduced the cost. Of course there was a big push to do that when I was the chair of the Planning Board and the Glenn Maras of the world, the younger people that came up in the system, were absolutely committed to finding those areas of common efficiencies that could be employed because resources were getting scarcer, folks, and he did a beautiful job with that. We had a very strong joint test organization operation that we put together, and of course they're doing a lot of that now. I see that Chuck Costa is, for instance, heading a dual laboratory organization that is focused on support that they can both share. Using different stemming materials, do they really need to use different stemming materials? Well, Los Alamos was sure that it had to have a certain recipe, and Livermore, too. Absolutely. So they **[00:50:00]** maintained their uniqueness. And was one better than the other? No. Los Alamos always did things the old way. Livermore was always more innovative and creative, I think. So you had kind of those cultural clashes as well.

We're moving—

Slowly.

No, it's great. But you have sort of naturally jumped to describing things that you learn as a more senior person.

Yes. Well, and the irony of it is when I went from the Organization and Personnel Division to the manager's office as an administrative assistant, then that period gave me a much broader perspective of the political piece from Washington [D.C.] as well.

So then I went back, in order to progress in the organization, I went into a management analyst position. We were in the Atomic Energy Commission, which wasn't a career Civil Service system. It was excepted service. And so the opportunities for promotion were much greater and the flexibilities were greater. We had a marvelous intern program, bringing young talent into the organization that were growing and then taking later in my career management positions throughout the organization.

OK, so let me understand this. So you're saying different from the regular Civil Service, this kind of development was more possible?

Oh definitely, because it was much more flexible and you didn't have the rigidity of the competitive system. In fact, you could even avoid competition if you had certain conditions present, which generally you can't do in the Civil Service system. I mean rarely if ever. Occasionally you can. So there was more flexibility.

"Certain conditions present" meaning?

Well, if you had a need for unique knowledge, skills, and abilities, or core competencies, you could reach out and get somebody and bring them into the system at higher grades. And the grade structure was much higher. We were at least, I would say, two grades higher than a normal, like the Department of Interior, which I did go into later, by the way, but—

Yes, that's right, you did.

So there was just a lot of freedom with it. And the simplicity and the beauty of the directive system that AEC had, Mary, I cannot tell you; it was clean, it was simple, you knew right where to go, you had an organization and management model that you could go to that would pretty much guide you through everything. That turned into total chaos when it became the Energy Research and Development Administration [ERDA] in 1977 when President Carter and that reorganization occurred. Then you were just thrown immediately into the competitive system and there was the trauma of all of that transition. So that was a big turning point for the program. It really was.

Speaking of special knowledge and things, I'm curious, you're with the Containment Evaluation Panel from its outset in this role. To what degree are you learning, becoming fluent, let's say, or at least conversational in the language of the technical stuff?

Oh, I think pretty much so. No, and let's don't say that I—no, did I turn into a scientist? Absolutely not, but no, absolutely invaluable for later progression.

That's my question.

Oh, understanding. Yes. And understanding the programmatic integration of the test site and how all of those organizations melded together, I mean we were just absolutely well versed in who to go to for what, eg. to Bill Twenhofel for USGS [U.S. Geological Survey] information or to the Weather Bureau. You knew their roles, you knew their responsibilities. It was absolutely part of your daily existence. And when you walked into a Containment Evaluation Panel meeting, you had a totally integrated group. By the way, we had many, **[00:55:00]** many integrated technical support groups like the Containment Evaluation Panel for the whole plethora of programs that we had. For integration, we had a Planning Committee that was multi-organizational. We lived

and breathed multi-organizational. And everybody knew what everybody else was supposed to do. And the integrative glue was the Atomic Energy Commission component at the Nevada Test Site called the Nevada Test Site Support Offices.

What's interesting is a whole bunch of interesting stuff that we can't go into here that have to do with organizational support for highly complex tasks.

Absolutely. Indeed. And wouldn't you love to do a book on that. Because this is the MBA model, and very few people know that. This was matrix before matrix was a word.

Right, and this is what you were making me think, so I'm glad you brought it up, I remember reading about Duane Sewell and matrix management. Stepping even back and I don't, you know, my caveat to my transcript, I'm not drawing any conclusions here, but it's interesting because you have Sewell talking about how E.O. Lawrence was just vehemently against organizational charts because he wanted, I'm misquoting him, to be able to take that best person from that place and bring them over to do this project for this period of time without being stuck in the bureaucracy running.

And guess what? That was the management model of that whole test program. That is so well put. That is the management model. And the thing is you have people who really get damaged in that kind of a system, too, because you don't tolerate mediocrity. And guess what? In any organization you're in, you have to do something with mediocrity. You can't just throw it by the wayside. You can, but you become a little brutal and you may run out of people. And I think there was a lot of brutality in a sense, and I don't mean that in a physical way, for sure. But an edict is made that the person down the hall who's involved in safety, who's trying to tell you all these things about safety, fire safety, blah, blah, blah, they're an impediment. Put them in the basement and give them a project until they go away. A lot of that [was] going on. And it was

just an accepted way of managing, I guess you might say. Certainly not in later years, but in the years up to ERDA, and then later, a couple of years later, DOE [Department of Energy].

And then this wouldn't necessarily have been in a normal Civil Service kind of—

No, you would have many more impediments, and you would have had a different regime of human resources people in that are steeped in the so-called Civil Service bureaucracy, which can be good and which can be also an impediment. So yes. It changed dramatically, and of course everybody was saying, oh, woe is me, this is the end of the planet Earth as we know it, called the Nevada Test Site. But it worked and we made it work.

For you as an individual, then, you're going from this administrative position—

Into a position that is more a professional career progression position, as a management analyst, which I loved.

What does that person do?

Well, we had a strong component of organization and management analysts that were actually doing organization studies, that were doing budget and staffing, that were doing reviews of organizations to see how we could improve efficiency. So there was that component that went away in the later years. But that was another hallmark of AEC, this thing called organization and management, and so that core expertise would—that was another wonderful training ground for people who wanted to be in management, because you would go to other offices. I was involved in a study where we went to Oak Ridge [National Laboratory], and that was during the period when they were trying to decide whether the gas centrifuge enrichment project should live or die, and there were a lot of organizational issues. Well, they get several of us together, **[01:00:00]** threw us in a room at Oak Ridge, and all of a sudden you're reorganizing Oak Ridge. And that was Roger Ray, I was involved with him on that, and Charles Williams and three or four or five

of us. So you were doing a lot of things with other offices as well, and we were trading out and interchanging.

Did you feel that you were being—well, probably not at the time, but in retrospect, do you think you were being mentored by certain people?

I think to a certain degree. I wouldn't have called it a formal mentoring process. Oh, absolutely.

I mean informal.

Yes, and I was always used to being sort of treated as if I was going to progress. It was almost recognized that I would progress. And then unfortunately I had to leave. I left in 1979, but I was in the process. By the time I had to leave, I was well on my way to being the deputy assistant manager for administration, which was the highest-graded female position that the office would have ever seen. And now, of course, I'm proud to say that is no longer the case. But I had reached that level, and then my husband was transferred to Phoenix, Arizona as a customer services manager for the airlines, so I was seeing my whole career go right down the drain. That was a scary time. But it worked well.

I didn't know that. Let's stop here.

OK.

[01:01:44] End Track 2, Disc 1.

[00:00:00] Begin Track 2, Disc 2.

[Resume recording discussing NTS work]

So you had actually a woman as the head of that branch that you moved to?

Yes, as a matter of fact she was the highest, at that time, as a GS-14, was the highest-graded woman in the office.

That's Betty Van Vliet.

Betty Van Vliet. And she had started her career with the Atomic Energy Commission, actually she had started it in Richland. Betty was responsible for the organizational studies, reviews, the staffing, and was, as I said, one of the top female managers, and also for things like putting together all of our directives that would supplement AEC directives. Of course I thought it was a wonderful system, very simple, easy-to-understand system. But everything that came out of Washington, you had a local implementation that you would pull together. So that was basically where I was selected to be the up-and-coming management analyst. And of course the one thing that was hard about it for me is that I was no longer in the middle of all of the operational side. I wasn't going to the tests and seeing them. During that period, for example, the Russian satellite that crashed in Canada, that whole activity took place, and I would love to have been a part of that and gone with the group to Alaska, the NEST [Nuclear Emergency Search Team] team. The whole NEST team evolved right at the period before I left the manager's office and then went to the management side. But it was a good career decision, obviously, because then I was able to progress to a level that eventually brought me into a management position by 1979, and I was the deputy then. Well, actually I was the assistant to the administrative manager, but that would have turned into the deputy, so to speak. There would've been a great progression that would have made that happen and would have made that reality. But I had to leave in 1979, go to Phoenix with my husband. Fortunately I found a wonderful job at the same grade level with the Western Area Power Administration [WAPA], which was just created as a result of the Department of Energy because all of those activities from the [U.S.] Department of Interior [DOI] that had to do with public power and management had moved, then, into the new Department of Energy, which was a great, exciting time. And so all of a sudden I was in a public utility, and had a wonderful position there, and it was a small organization and just perfect for developing management skills

and abilities because I found myself in charge of the helicopter support team, I found myself in charge of the warehouse and all of these diverse support functions that were new and exciting.

From there, I went to the Bureau of Reclamation [BOR], where they were building a Central Arizona Project, in a very similar position for a grade promotion. And saw the Central Arizona Project go from the planning stage to almost—well, certainly the main stem canal was completed by the time I left. It was a very, very wonderful time.

But when you first had to leave, what was that like?

Oh, I was very traumatized because I thought there's just no way that I'm going to be able to retain what I have gained here. It just turned out that I was able—they had this position available at the same grade level, and it was actually even more of a management role than I was leaving, so it gave me that period of experience that was very valuable. And then when it turned out that we could go back to Las Vegas in 1985, my husband was being transferred, everything was just working toward coming back to Las Vegas. I didn't even think **[00:05:00]** about applying at the Nevada Operations Office because I just thought there's probably something different for me to do. Well, I got a call from a former colleague that said, `Do you know that there is a division director position open here that you would be ideal for? And it's the director of the Organization and Personnel Division`, which I had left. So this would've been going back into the position that was once occupied by my boss, and I thought, well, that's not going to happen easily. Well, there were probably fifty applicants from all over, a lot of them from the Department of Energy, that were truly HR [human resources] people. I mean they were raised as HR people. So I didn't give it much of a chance. I think I was in the top three when I was notified that I was coming here for an interview, and I came back in and was being interviewed by all these people I had worked with for so many years. Don Schueler. Actually he was the selecting official. John Wamsley [sp], whose name perhaps you've heard.

Jerry Truax [sp]. But it was a very warm welcome. The interview went well, but I knew that there were a couple of people, I knew one of the applicants and he is just an outstanding HR director out of Idaho, and I thought, Roger's going to get this job. And Roger called me and says, I think you're going to get this job. So we were kind of going back and forth like this, and I had sort of given up, and it was a long time before I heard. And then I was out in the field in Phoenix and I forget where we were, one of the pumping plants, and my boss came over and said, You've got a phone call from somebody in Phoenix.

And I said, In Phoenix? That's where we are.

He says, I know—take the phone call.

Actually we were out somewhere. But anyway, it was Don Schueler and he says, You want that job?

And I said, Yes, I want the job.

He says, I don't know why you want it. But, he says, you got it, and hung the phone up. GS-14, just like that.

Now was this the job, I'm understanding, is this the job that Betty Van Vliet had had?

No, this was actually the job that her boss had had, our boss, and actually the HR director was a gentleman by the name of Ray Uehara and he had retired. So I went back into the job of my boss. Walked into his office to take the job and the blackboard was filled with messages from people that had just walked in with chalk and written, "Welcome back." It was almost like, wow! And so there was a lot of really good feeling about it, because I wondered about that, too. And of course there again, it was the first time a woman had reached that level. The manager at that time was Tom Clark who you may have, I hope, had a chance to interview. He and I worked really well together and he said to me on two or three occasions, I think that you definitely will be in the SES [Senior Executive Service] soon.

And I said, I don't really have any aspirations to be in SES. I was very frank with him. I said, Look, that's a hard row to go.

But he said, It's going to happen.

But you know how you sort of write those things off. But sure enough, I was then selected for a position that was directly in line for the SES role, the assistant manager role, once again taking the job of one of my former bosses, and was sworn in as an SES by the head of Human Resources for the Department of Energy, who happened to be there when the promotion was announced.

So it was a whole new era, believe me. And then of course the whole programmatic arena had changed really dramatically. Everything was much more procedural, I think I could say that easily, although we were doing a lot of underground testing. Remember we had a billion-**[00:10:00]** dollar-a-year program if you looked at all of the components including, of course, the burgeoning Yucca Mountain, which was part of our responsibility at that point. It was before it split out. We were doing probably six to eight very complex tests a year. Certainly we were doing a tunnel test just about every year, either one or two. So it was a very big and thriving program. We were also much more into environmental monitoring and environment safety and health; [it] was just emerging as a very key part of everything that we were doing, and so you saw that whole series of issues evolve during that period. And then we were into, of course, the verification testing with the Soviet Union. So it was like coming into a different organization than the one I left.

That's very interesting. Because I'm curious about this, your husband was able to transfer back to Las Vegas. He was transferred back to Las Vegas?

No, he was, because there was a total reorganization in Phoenix and they dismantled essentially the Northwest base. He worked for, well, what is now Northwest Airlines. It's evolved over a period of years. So we made a joint decision that it was right for us to come back to Vegas, because of course that had been our home, so it was more a decision that we would come back here than the job brought him back here, because we could've been in Memphis or we could've been in a number of places where I didn't want to be particularly.

So give me a sense, Linda, of when you come back over, it seems to be at least three possible ways we could talk about this. You're coming in, having been away, and you've got this really amazing knowledge base, but the organization has changed, as you say, and you're also in a different level of management at this point. So I guess the simple way to ask it would be what kinds of things are you now doing there and how this sort of reflects these changes.

I think that probably that six years' distance between the time I left and the time I came back was a very good interval because I left a lot of biases with me. I was a different person. I had evolved to a much different person.

What kinds of biases?

From a management standpoint. I had been dealing in some very different things for six years. I was totally focused on developing the Central Arizona Project and we had again this very close-knit team that was very analogous to the kind of team you would've had at the test site, only we were doing things that were water delivery. I wasn't doing anything nuclear for that many years, so when I came back in, it was almost like, I've got to recalibrate here a little bit. And of course Don Schueler. the very first two weeks I was there, he says, `You're going to the test site.` And he said, `I want you to be at the Nevada Test Site Support Office for two weeks so you're totally steeped in how they are doing things out there,`

because I'm in charge of Personnel and he wanted his support people to be very programmatically aware. So that was a great way to start.

What kind of changes did you see?

Oh, much more structured. I think I had said before that it was seamless between the organizations. I think you were beginning to see emerge more organizational identification, although you still had the same contracting team. Remember, you still had the same management and operating contractors, but the imposition, if you will, of the environment safety and health culture tended to be a little bit divisive in a way. I think that you were seeing a lot more perhaps individual protection of self.

Interesting.

[00:15:00] Yes, and then of course, as long as you had REECo and EG&G [Edgerton, Germeshausen, and Grier] and Holmes and Narver—and then you brought in a new player, by the way, Holmes and Narver was replaced by Raytheon. Raytheon imposed a little bit of that new kind of "We are Raytheon" organization and indeed they had that on their T-shirts and ball caps; so you had a little of that emerging that really took off when Bechtel [Nevada] came in, which was much later. You were beginning to lose some of the cohesiveness, in my opinion.

I wonder what you think, from my standpoint of what I've learned since I've been her: It seems one could say you see really Holmes and Narver, EG&G, and REECo becoming what they are at the test site, how Raytheon has another identity there, and so that's interesting.

Indeed. It is. And so there, that's a very good way to put it, because they were not formed and born, if you will, at the test site, and the others indeed were, all of them.

Interesting. But you're also saying it has to do with some of the bureaucracy that's being imposed, so there's self-interest in drawing boundaries.

Indeed. Absolutely.

That's fascinating, actually.

Because it was becoming more and more a—the concerns, the political concerns were more manifest when I came back, absolutely. I mean then you had protesters. That was always something manageable. But then you're feeling some major political, major political force, saying, `why are we doing this?` And then the whole treaty verification process comes into play big time in the eighties. Big time. And then I guess I could say honestly that I was more politically aware. I was at a different level obviously, but more politically aware of some of these major forces than I certainly had been when I left. When you were doing budget allocations in the late seventies, the last thing on your list was environment safety and health. If you had a place to cut, well, cut the environmental program, or cut the safety program. Not that you didn't have them, but you weren't seeing the push that you saw in the later years.

So something that would take priority would be the test itself—

Oh, absolutely, absolutely. Get it done. Right. And that isn't that you're necessarily sacrificing safety, but you certainly aren't doing bells and whistles. But when I came back, it was no, no, no. You're moving more in the direction of greater funding for safety and health and environmental programs. The DRIs [Desert Research Institute] of the world are coming into their own a little bit more with the archaeological work that they're doing. That would've been way on the bottom of the list and certainly was, although there was funding for it. This poor little Janice Beatley who was a scientist for I believe UCLA who was doing some plant and vegetation work at the test site, oh, I mean she was really treated poorly and badly. She was protecting her little area where she was doing her experiments and oh, gosh, she's into some of our operational areas and we got to get rid of that, and she just was battered around.

So she has DOE funding to do this.

Yes, DOE funding, through the DBM program, for the Division of Biology and Medicine. So she had her little resource base, and she fought valiantly for her little plot, and watching her little plants. And of course then we did have DBM programs. We had, you know, the cattle programs that you're aware of.

But no, a whole different world. And testing was incredibly procedural. It took a long time to get a test through the system at that point.

And that's the Containment Evaluation Panel plus other—

[00:20:00] Plus others. And then you're seeing the emergence of the Defense Nuclear Facilities Safety Board [DNFSB], although they weren't ever that much involved. And in the Nevada Test Site the whole aura of having been involved at other field sites, and then you had Rocky Flats [RF] emerge as a major—that was really the major perturbation in the system, that whole thing. That's when our deputy manager, Bob Nelson, was named as the acting manager, and then I came in as the acting deputy when he went.

When he went. OK. So since you brought it up, how does that affect other—you're saying "in the system," how did that resonate in your system?

The fact that he went?

Yes. Oh, the fact that there were such problems at Rocky Flats.

Oh, gosh, very stunned. Unbelievable. How did this happen? We had the FBI raiding a Department of Energy facility, and how did that happen? That was absolutely a shocker. I think it took the breath from people that I knew. We couldn't figure out how it happened. And of course Admiral Watkins had just come in, and I think all of us had thought that he might have had something to do with having that occur, but he didn't, as it turned out.

He was the head of the DOE then?

He had just come in as the head of the Department of Energy, and then the raid occurred shortly thereafter. So I'm thinking, is he turning the FBI into—is he essentially giving them information that would lead to this kind of a raid, if you will? And he was absolutely briefed on it when he came in. It was already well under way. And so he didn't. He was not the genesis of it, so to speak. But when he came, of course, he just almost turned the place upside down. [He said that] the Feds were in bed with the contractors. All of the behaviors that we'd thought were appropriate for getting the job done, and that is working as a seamless team, became the wrong way to go. You had to essentially separate the contractors from the feds, contractors had too much responsibility and authority, we have to increase the federal presence. To some degree I think that was probably warranted, but it also really, really deteriorated the performance. And new ways of evaluating contractors, it became very procedural, very bureaucratic, very formula-ized: Where you were cost-plus award fees that were much more complex than we had done under a cost-plus fixed fee basis. Punishing contractors for things that they couldn't understand—like we had a terrible helicopter crash, and it was absolutely "pilot error." The pilot just did the wrong things. It was actually a security run at night and there were three Wackenhut guards with two EG&G, a pilot and co-pilot, and they were flying open-door because it was a security exercise, pitch black, and he was flying too low and hit a power line. Well, he was absolutely in error. Everything he did was wrong. Well, the EG&G organization took a huge hit on that because pilot error doesn't work. It's management error; it's not pilot error. That pilot erred because there was something that management didn't do to make it not happen.

So that was the whole kind of thrust of that era. And careers were ruined. Contractors walked out. EG&G walked out during that period.

Is that what that was?

Yes. It wasn't specifically for that but I mean for a whole plethora of those kinds of things, that continued when Hazel O'Leary came in, too. So it was just a steady downhill derogation of that whole system.

Interesting. Because I sometimes wonder, I don't know, you'll be able to guide me, I **[00:25:00]** *think it's interesting the way the contractor world came into being in relation to labs. I remember talking to Herb [Herbert F.] York at one point and he said, I'm misquoting him, but basically, We had the test site, or something that they were doing, and we didn't have people to build anything. We were scientists, so of course you go to the contractor to do all these things for you. And the whole culture, the seamless culture that you describe. But the contractor world is so prevalent now in all sorts of federal ways and it's very controversial, obviously, in small way. And I wonder the degree to which the test site itself and the nuclear community in general were the birthplace of these kinds of big contractor relationships with the government. I don't know. I always wondered.*

It's a good question. I think that probably DoD [Department of Defense] is, but very similar, very similar. And if you're looking at an analogy, I think in the federal system you look at NASA [National Aeronautics and Space Administration]. NASA is the classic example. Everything that we felt we somewhat pioneered really, in my opinion, had genesis in NASA.

Interesting. Great, Linda.

"Excepted service." "Go to the moon." "Get the job done." I think if you went and looked at that organizationally, it would be a wonderful study to do. But it would be AEC and NASA. And of course remember, AEC and NASA joined into SNPO to do the impossible: build a nuclear rocket to go into outer space. The Space Nuclear Propulsion Office. So there again, and was the same consortium of contractors. Well, of course, you had Aerojet in there, but I mean you basically

had, if you look at that contractor community, you had overlap all over. So yeah, that would be a good Ph.D. topic.

That's interesting and that's great. I'm so glad you brought that up because NASA is, I think, probably much more studied organizationally than the NTS has been, and I know some studies at NASA, so that's fascinating. That actually answers my question.

DoD certainly, but DoD was so different in many respects. Their contractual support was so different. Of course when DoD was DASA [Defense Atomic Support Agency, when we were working with DASA, which became DNA [Defense Nuclear Agency] and became DTRA [Defense Threat Reduction Agency], they were operating just like everybody at the test site operated because they were using our contractors. And of course those were the best, best events to be involved in.

Well, talk about that a little bit because I was going to ask you to describe actual on-the-ground involvement, so you're saying in that era with DASA?

Yes. Where they were building these, you know, let me take—

Yeah, give me an example.

Diamond Sculls. I like Diamond Sculls only because it was, boy, I'll have to go back and look. Diamond Sculls was like in seventy—

Do talk about Diamond Sculls because other people have and I love it when we can do—

Seventy-two or seventy-three, Mary.

I'm going to look while you talk. [Checking DOE/NV—209-Rev 15 December 2000*]*

And it'll say "less than 20 kt" [kilotons] but I believe the device in Diamond Sculls could have been as much as an estimated 25 kilotons, which is huge for a tunnel shot.

Is it?

Yes, very, very big. Now remember, 25 kilotons—how big was Hiroshima? Thirty—

They were both [Hiroshima and Nagasaki] around twenty, eighteen to twenty.

OK, so remember, in that tunnel, Diamond Sculls—

Seventy-two. July '72.

Seventy-two. OK. Yeah. So there's a good one.

And it says it's less than 20 kilotons but you were saying—

But I think the device could have been—it may have not gone twenty-five but I think it was twenty-five. It was a very large shot or device, if you will. But watching one of those things being built, this is just an incredible experience.

Now talk to me about that a little bit because as I said I did finally get to go in a tunnel, so I've actually got some visual—

Well, the reason I say Diamond Sculls because is if you ever get to go again into a tunnel, Diamond Sculls, the remnants of it are still there and you're looking at the end of the experiment that is the large end because it's a telescopic configuration.

[00:30:00] *They explained that. That was in T Tunnel. Is that right?*

Yes, it was in T.

OK, because we were in P.

And if you see it you just go, ah! Well, of course I was walking that tunnel from almost the beginning of the construction period, and I was there the day it was detonated, so I saw the whole thing over a period of a couple of years, from beginning to end.

So in your management role, at the level that you—no, you were in an administrative role then, in '72.

Yes. Because I was involved so much with the Test Evaluation Panel [TEP], the Containment Evaluation Panel, and I would have an opportunity, if you will, just to be very much on the ground and walking, and of course at that time you didn't see a lot of women walking in and out of some of these construction environments. But I was tolerated. And then I would be there for the shots on many occasions.

And what was that like for Diamond Sculls, do you recall?

You mean to be there for the detonation? Actually there's not much—with a tunnel shot, they're small, you know, of course there are occasional—there was one that caved in the mesa, but actually, the physical manifestation isn't as great as it would be as if it were an underground, a vertical underground.

But are you in the control point [CP] itself?

Yes. Absolutely. And you go in—the tradition is that you go to dinner at the Steakhouse, you've heard all of this, and then you have—

Well, you tell me what was happening.

And you'd be with a grand group of people and of course there's a lot of culture there, too, and tradition because the test controller is at a reserved table with the key people that are involved at the test, and that was a reserved table at the Steakhouse. Everybody knew. You didn't go to that table. They're the people that are actually going to push the button are sitting there. And then afterward you stay in Mercury at the dorm and get up at like two or three a.m. because most of them are done very early in the morning for obvious weather reasons. And then you go through the checkpoint at Gate 100 and that's where they keep the roster of everybody that's going in and out at the test site, of the forward area. Then you drive on to the CP, and then the tradition was that you took your leftover lobster from the Steakhouse with you and then you had omelets in the

morning with your leftover lobster. So you're eating your lobster, your lobster omelet. Oh gosh. And then the support people are essentially in the blast-in area behind the pit. And then they all take their positions, everybody that's involved in the test, and then there are seats behind where you just are doing various things. Generally, the countdown doesn't start until maybe thirty minutes before the test, but they're checking weather, you're doing weather, you're listening to the weather reporting, you're listening to the Containment Evaluation Panel results, although obviously the CEP had met many, many times on these things. What they do is they present a summary. And then it's just an incredibly exciting time and everything's up being monitored, it's on the screen, you have the photos, you have the pictures of the ground zero area where it's going to occur. In the case of a tunnel, you're looking essentially at the potential detonation area and there are cameras that are surrounding all of that. And then when it happens, when it's actually detonated, you're generally looking for the light fixtures, and when you can see those sort of sway back and forth at the CP, then it's happened. And a lot of those were—if it was less than 20 kilotons, they wouldn't announce. That's why it was—and they won't even tell you what the yield was. But if it's over 20 kilotons, they would generally tell you specifically what the yield was.

What the yield was. When it goes off with those cameras that are in there, do you still keep getting visuals in there or is that—

[00:35:00] Well, you do, but it's fleeting. And of course if you're above ground, you see everything. You see the trailers and they're shock-mounted; and perhaps you're going to see the subsidence crater but, you know, it's kind of like you don't always see a subsidence crater. Sometimes you do, sometimes you don't, and you can never tell whether it's going to happen. And then of course if you don't, it stays fenced off until it actually occurs. It could be years.

Right. I've seen films of that, but what is that like to see that happen quickly?

Wow! It's just a mind-boggling experience. You're just actually watching. The dust. I think it's very emotionally impacting. Everybody kind of holds their breath. And then afterward it was like, ooh! Got that one done. We made it. Declare success. And then you're mostly focused on getting as much data as you can and getting the reports back as to what actually occurred underground and the detection system data is what you're looking for. And then of course when you later go in and do your drill-back, your slantward drilling drill-back, then that's when you—and you know the percent of data recovery is a very important element, and EG&G had an incredibly high percentage on data recovery, most times.

Yes, back to the—and as you said, it's an emotional experience. I think it's such an interesting thing for people who haven't been in this world to know, it seems to me that at some point, even with fireworks, I mean something so big that you kind of feel it in yourself—you get such a variety of responses. For some people that I've spoken to, it becomes routine, even with the atmospheric, and then some people will say—

Oh, I think it does. I think that is a true statement. I think a lot of people feel that way. I never did—"routine" would never have described the way I felt about it. It was always, my God, am I really sitting here watching this? That kind of a feeling. Even in the nineties when I was a deputy manager, and we would have a contingent downtown in our command post right near the manager's office, kind of a duplicate in a sense of what was going on at the test site. You would be hooked up both visually and certainly by telephone, and you're going through that countdown, and you're always somewhat breathless because you're thinking, what's going to happen? Well, one time something did happen, and that was on a mesa shot, a large mesa shot, when fifteen minutes before when the countdown had begun, and I don't know, we weren't too

far into the countdown, when we got a phone call that there were—and you could see people at the ground zero. We're talking human beings. That was an incredible experience, because protesters had somehow gotten up to that extremely remote area. And to even complicate that further, Admiral Watkins's executive assistant Polly Gault was at that shot, actually witnessing that shot at the test site, and she was with her executive assistant. And I'd thought, the first thing she's going to do is call the Admiral. And of course you go through a very, very rigid set of procedures when something like that happens. Stop everything immediately, call the security guards, helicopter comes, you try your best to—and they did. It took them two hours but they rounded everybody up and took them down to Mercury and then transported them by van into Tonopah. But Polly and Steve May did nothing. They sat there and watched this whole thing. And they basically congratulated Jim Magruder [the test controller] for his competence and the coolness with which he handled it. The shot was a couple of hours late, but it just went like clockwork, and they watched the whole thing.

[00:40:00] *Do you recall which test—which test was that? Someone was just talking to me about that the other day, too.*

I'll find out for you and let you know [Houston, November 14, 1990].

It'd be interesting to talk to those protesters, too.

Yeah, it would. And they were in, what magazine? There is a magazine article about that incursion, and I'll have to think about that, too. But yes, fascinating. Well, and listen, that is a tough area to get into. Good Lord! You are literally—I don't know how long that they were climbing in because literally you were crossing some very ugly terrain to get there.

When we drove up to P Tunnel, they were talking about it, so I don't know if there was a connection between where we were going through and where they were. People in the car were just chatting about it. But did they know they were at ground zero?

Oh heavens, yes. Oh yeah. Waving their T-shirts. They had made it. And they were heroes. They were absolutely heroes. I mean that was the first time. Because there's no way you can physically block any of that area off. You've just got to say the terrain is going to prevent anybody from getting in there. Wrong. They made it. And then of course there wasn't much ever done legally, to reprimand. They just gave them a slap on the hands and said go. But it could've been—if the timing had been a little different, that would've been a terrible thing. Terrible. So it would be interesting to know what their thought process was. Unless they had come up much earlier, and that's a possibility, too, and they were just waiting for the appropriate time, and they had communications equipment, so I mean that might make better sense, and I don't know whether that's the case or not.

It raises the question for me, do you know or could you talk to me about whether there were ever any other kinds of worries about incursions that weren't protesters, like spy kind of incursions?

I don't think so. I don't think—I'm just almost sure that there would never have been any of that. Although I guess you always sort of prepare for that. When you're doing your security, when you're developing your security procedures, you're certainly thinking about scenarios that could occur, and especially with a Device Assembly Facility. There it is and if you look at the design basis threat that we're looking at now, you make all sorts of kind of hypothetical assumptions about what could happen if you had a terrorist entry. We weren't thinking about that ten, twenty years ago. That wasn't—you just don't think—you think more about the insider threat, I think, in cases like that.

Really! Interesting.

And I think Sandia would tell you, and Sandia does wonderful risk assessment stuff, as you probably know, but the insider threat is the big deal in most of this. It isn't the external because it would be very hard to penetrate anything at the test site in a very visible, aggressive way.

That's so interesting because one, again as an outsider, when one goes there, one is aware always at all of these kinds of facilities that as a citizen you're a suspect as you go in. But it's also been a question of mine since the very beginning: how great was the actual external threat? It seems like most of the operations were against citizens protesting, so the actual spy threat—?

It's a true statement. No. Nobody every took that—spy threats weren't a big deal. You just didn't think about them, and I don't think that was ever very viable except, as I said, when you get to the sensitive—when you get to something like a Device Assembly Facility, which is now, if that isn't impenetrable, nothing is. But they do exercises, I'm sure you know. They do exercises where they set up terrorists coming in with guns and they're trying to penetrate and **[00:45:00]** the security guards are fending them off; but you've got a lot of physical—that's a hundred million bucks' worth of—let's build this as secure as we can with fencing and alarms that would blow your mind—state of the art.

I can only imagine, seeing it out there in the distance as we drive by.

It is. It's fun to go through.

When you go in, do you have to go through special security there, if you were to go in, someone like yourself who's an official?

Oh yeah, absolutely, because although I have a Q [clearance] and I'm badged, I would have to have a need to know to be in certain areas. You just can't—any cleared person can't go in. You've got to have a reason to go in.

Yeah. But you've been through there as a tour—just to see it.

Yes, well, I was there when it was being built and saw the plans, I was aware of the plans and would go out periodically and walk through it and do tours.

So you're the deputy, which is amazing that you get that, and so—

Now there again, I went into a position that had been occupied by my boss when I was in the manager's office early in my career. So in all cases—

Who was Bob Wilson?

Well, no, that was Charles Williams, when I was an administrative assistant.

Oh, I see what you're saying. What's that like for you as a woman in this era? What kinds of stuff goes through your mind?

It was absolutely—it was like, I can't believe this, because this is the same office. The same configuration. And the couple of times I saw my boss, Charles Williams, after that. When he came in, he walked into the office, he was—it was like, `I always knew you'd be here.`

And I said, `Well, you may have known that. I certainly didn't know that.`

`No`, he said, `I knew it.`

So it was. It was a very, very kind of, you know, "pinch me, I'm not sure I believe this." And also feeling very much like, it wasn't only the female thing, because at that time that was absolutely the highest-graded position in, I want to say in the field at that time, certainly not headquarters. There were SES females in headquarters, but not in the field. And of course now there are many. But it was the lack of the scientific pedigree that is always a concern, and remember, the manager of the office was Nick Aquilina at that time, who also didn't have a scientific pedigree. Normally what you do is you have a complement of scientist and administrator which makes sense.

In those two positions.

Yes, that makes very good sense. But Nick, even though he wasn't a scientist, had such a profound, absolute ground truth knowledge of everything that took place at the test site. He understood why we were there. He understood how the laboratories operate. He understood how the contractors support—and so he was literally raised at that test site from the time he was a T&A [Time and Attendance] clerk when he went to work there.

It's incredible.

But that wouldn't happen now. Not at all. It just would not happen.

So we've been talking almost two hours. And it's hard—there's so much more to talk about. But give me a sense, once you are there, and I already have a sense of this from several things that you've said, but what is your job like? What do you do on a daily basis in that kind of high position at the test site?

At the test site. First of all, certain things come with the job. You are in charge of the Planning Committee. You are in charge of kind of the coordination of all of the administrative aspects. You're looked to, to essentially run the internal office while the manager is more focused on the **[00:50:00]** external, the Washington aspect, although you do certainly have that role as well because, guess what? He tends to be gone quite a bit during that period. In fact, there was one period when he was assigned to Savannah River as the manager after the Savannah River manager was released from his position by the Admiral. I became the acting manager, and that was during the period shortly after the helicopter accident that I was telling you about. So I have the office and the investigation responsibility. I was the manager actually for several months. But I was dealing a lot with the contractors and kind of issues resolution with things that are happening among the M&Os [Management and Operating (Contractors)], keeping them

coordinated, making sure that you understand how their performance evaluations are being administered, meeting with them on a frequent basis to discuss problems, issues, concerns, and we did; we met with them at least twice a week, all of them. Attending meetings. Signing correspondence. Very busy. And again, dealing with Washington on a plethora of issues. And again, we were called out to go to other offices. All of us in the Department of Energy at that time that were in those management positions were on call at a moment's notice to go to another office and be on a review team, a study team. I led the Tiger Team at Ames Laboratory. Bruce Church led the Tiger Team at Argonne [National Laboratory]. So all of us were very mobile at that time.

So this sounds also like it's connected to this grand organizational change where, as DOE—I'm asking a question by making a statement—but DOE then has this, sounds like, this national agenda that maybe AEC and the test site didn't have?

Absolutely. I think that's true. AEC was much more bounded, and of course it wasn't a department; it was a commission. But much more bounded. And we knew. We knew our mission. We knew our interactions. We knew everything about that organization. No so with DOE.

You know, Linda, we should stop but I do have one more curiosity that you mentioned, and I just—tell me briefly, you said when you got back over there from Phoenix that there was much more of the verification regime things going on at that time.

Yes. Absolutely.

So this is for the—now are we talking about the Comprehensive Test Ban Treaty [CTBT] stuff here?

Yes. Right. Verification activities in the sense that we were working up to the—of course there was a lot of work going on overseas at that point, Defense programs' involvement in building up to the exchange of tests that resulted in the feeling that you could verify. What was going on? Should there be a Comprehensive Test Ban Treaty? And so there was a lot of preparation on that and a lot of activity and a lot of exciting new things that were happening. The Russians were coming to the test site, for gosh sakes, and all the kind of bizarre things that go on when they're running around your test site, and planting their flag on our GZ. And then of course going to Russia. Nick [Aquilina] went to Russia. I didn't go to Russia but they did. And he has a wonderful series of diary notes that are coming out. Have you seen those in the new issue, if you will, of our little newsletter?

Joan, who interviewed him, my student Joan Leavitt, told me about those diaries.

I'll bet she just loved them.

And those are really nice interviews that she got, so we have his story, but she told me about the diaries. What's your view of the Comprehensive Test Ban Treaty's status right now?

Well, I think it's kind of a moot point. I don't know. Don't you?

[00:55:00] *I don't know.*

Well, I just think we're fine. Just leave it like it is. And if we—I know with this North Korean announcement [of a nuclear test] that there's going to be some activity. You just know there's going to be some activity here that's going to sort of lead to the possibility of something. I don't think it'll happen, only because I think it's just politically going to be impossible to do it. I really do. But I think this administration—

To do what?

To actually do some kind of a test, maybe beyond what they're doing. I certainly don't—that's not inside information. That's just for you—

No, I just want just your opinion on it as an expert.

But I just think, you don't have enough time for that to occur before the administration changes and you're going in a different direction, in my opinion. You're going into a big-time different direction. If it did happen maybe three or four years ago, we might've been able to make a case. But I have to listen to the laboratory people who say we're fine. We don't need actual underground testing. There is a division of opinion on that, that's for sure, but I think now the standard rhetoric is we've got enough computer information and with the testing that we're now doing, we're fine.

One thing that struck me when we did go into the tunnel and look at that tunnel that's kept in readiness is that the technology that was in place then compared to the digital revolution that we've gone through, you have to wonder how would one actually return to testing in any of those environments.

Absolutely. Now, you wouldn't do it quickly and that is an excellent point and it really strikes you when you walk into the CP. Really strikes you. Wow!

I bet. Because I see the pictures. I haven't been but—

Yes! It is not digital technology. You have to ground-zero that baby, I think, and just—I know you do, and you're talking major investment, and there has not been enough money put into—. If they're serious about readiness to test, I think it's more lip service than serious. First of all, you've lost the core competencies pretty much. I mean that was a given. And you just haven't invested in infrastructure. So now the whole thrust is, well, we're moving more toward homeland security and we have the port security facility, we have a Device Assembly Facility which is

being used for different things. We're talking about a little different focus in missions. But Complex 2030 will bring NTS right into the middle. If that happens, and if they're funded in a way that's meaningful, the Nevada Test Site will be the core, if you will, of the nuclear weapons complex.

I don't know what that is, 2030.

Well, Complex 2030 is a study that was done by David Oversky and his group. Why don't I send you that? You'd be very interested in reading that because that is the future. You're focused on the past. This is the future.

Is this bringing the lab stuff down [to the NTS], is that what that is?

Yes. It's essentially moving a lot into a central area and really downsizing the physical complex, which they're going to have to face. There are so many things they can't do environmentally now, especially at Livermore, and certainly to a lesser degree at Los Alamos. And Pantex even, if you think about it. And the test site's a logical place to start moving some of that stuff. Politically very controversial, of course. The study has been at least given the impetus of some seed funding and some planning and you'll hear it, you'll be reading things about it and seeing it, a little bit about it. But it's going to take some consistency of leadership in the administration that you're not going to have, that's the thing. It's the old story. You're going in one direction for four or eight years and then you're going in another direction.

That's our democracy.

Yes. As it should be.

So you retired, you said, in ninety-what?

[01:00:00] Retired in August 1994.

And the reason for that was?

It seemed to me that I had an opportunity, we had an opportunity. Nick [Aquilina] was leaving, testing was essentially over, and a new contractor's coming in, and it was a beautiful opportunity, and I was eligible at the age of fifty-four. And it was the right decision. It really was. And of course with Nick leaving—actually the whole management team just about was eligible to retire. Bob Nelson left. And it kind of shocked the system a little bit, I think. It did. And then the competition for the new contractors began the following year essentially, and changed everything pretty much, some for the better, some for not the better. That's the whole thing. As all change can do.

Well listen, there's a lot of detail that we could go to but you've given me this really fabulous overview of the story. Is there anything that pops in your mind that you want to add? That's a terrible question to ask.

Terrible question. Well, no, except that the inception of this notion about pulling together a story about the history of the test site began in 1979, believe it or not. In other words, discussions were in play by Bruce Church. He came in to me one day and said, `I just have this wonderful idea about having a marriage, if you will, between the archives and having a museum and whatever.` And we talked about it and it was a very exciting idea.

And I said, `Bruce, it'll never work because we just aren't going to have the money to do it.`

And so it was with that that we sort of laid it to rest a little bit until all of us retired, and then we decided we would get together and talk about it. So that was sort of the genesis of the museum.

Interesting. Yes.

So those things start early.

They do.

And it was Bruce's dream.

Yes, I remember—I didn't interview Bruce, a student interviewed Bruce, and I'm trying to remember where we have, or maybe I heard someone talk about his ideas and his idea for the archive, now isn't that right?

Oh yes, he was—oh, he was absolutely the person who developed that idea. Developed that concept and found the funding for it. And that was great. And part of it was because he was so committed to getting the facts out.

That was it. Right.

Because we were going through so much trauma, if you will, with a lot of the litigation that was going on.

Right. OK, thank you so much, Linda.

Well, thank you.

[01:03:28] End of Track 2, Disc 2.

[End of interview]