

# UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Title: BRIEFING ON THE DEVELOPMENT OF LOW-LEVEL WASTE  
DISPOSAL CAPABILITY BY THE SOUTHWESTERN COMPACT

Location: ROCKVILLE, MARYLAND

Date: MARCH 12, 1990

Pages: 90 PAGES

**SECRETARIAT RECORD COPY**

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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BRIEFING ON THE DEVELOPMENT OF LOW-LEVEL WASTE  
DISPOSAL CAPABILITY BY THE SOUTHWESTERN COMPACT

- - - -

PUBLIC MEETING

Nuclear Regulatory Commission  
One White Flint North  
Rockville, Maryland

Monday, March 12, 1990

The Commission met in open session, pursuant  
to notice, at 2:00 p.m., Kenneth M. Carr, Chairman,  
presiding.

COMMISSIONERS PRESENT:

KENNETH M. CARR, Chairman of the Commission  
KENNETH C. ROGERS, Commissioner  
JAMES R. CURTISS, Commissioner  
FORREST J. REMICK, Commissioner

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STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

CARLTON KAMMERER, Director, Office of State Programs

RON GAYNOR, U.S. Ecology, Inc.

DON J. WOMELDORF, California Department of Health  
Services

REUBEN JUNKERT, California Department of Health  
Services

DAVID SIEFKEN, Roy F. Weston, Inc.

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

2:00 p.m.

CHAIRMAN CARR: Good afternoon, ladies and gentlemen.

The purpose of this meeting is for representatives of the California Department of Health Services to brief the Commission on the development of a low-level waste disposal facility for the Southwestern Compact. The Southwestern Compact consists of California, the host state, and the States of Arizona, North Dakota and South Dakota.

They have made considerable progress in developing the disposal facility in accordance with the provisions of the Low-Level Radioactive Waste Policy Amendments Act of 1985.

As the developer for the Southwestern Compacts disposal site, U.S. Ecology submitted in December 1989 the first complete application in the United States for the next generation of low-level waste disposal facilities.

I would like to welcome the representatives of the California Department of Health Services, U.S. Ecology, Incorporated, and Roy F. Weston, Incorporated. Under contract to the State of California, Weston is assisting the state in reviewing

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1 U.S. Ecology's license application.

2 The Commission appreciates your willingness  
3 to share your insights about the disposal facility  
4 siting, licensing and public communication.

5 Briefing slides are available at the  
6 entrance to the meeting room.

7 Commissioner Roberts will not be with us  
8 today due to illness.

9 Do any of my fellow Commissioners have any  
10 opening comments?

11 Mr. Kammerer?

12 MR. KAMMERER: Mr. Chairman, members of the  
13 Commission, it's a delight to introduce Don Womeldorf,  
14 who is the environmental manager for the Department of  
15 Health Services. He also wears another hat and that  
16 is the Executive Director for the low-level waste  
17 compact in which this falls.

18 So, Harold and I were recently out at the  
19 site and as the result of some discussions with them,  
20 they're in here this afternoon to give us a briefing  
21 on that.

22 Don?

23 CHAIRMAN CARR: Welcome. You may proceed.

24 MR. WOMELDORF: Well, thank you very much,  
25 Mr. Chairman, Commissioners. Really appreciate the

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1 opportunity to be here.

2 I'll start off with a little bit about the  
3 statutory framework within which we'll operate. Then  
4 we'll turn it over to U.S. Ecology's Vice President,  
5 Ron Gaynor, to discuss the site selection and  
6 characterization process, then over to Reuben Junkert,  
7 our project director, for discussion of the selected  
8 disposal technology and the license review process.  
9 In that latter, he will be assisted then by David  
10 Siefken.

11 (Slide) Okay. Let's begin with the first  
12 slide on the statutory framework, if we can.

13 We have a couple of bills that were passed  
14 in 1982 and 1983 in California that together comprised  
15 comprehensive low-level radioactive waste management  
16 statutes. They do a few things that are key. One is  
17 to identify the fact that the State of California  
18 would have a disposal facility whether or not we had  
19 compact partners. The decision was made by the  
20 legislature that we would have our own facility.

21 Another thing that was done was to name the  
22 Department of Health Services as lead agency. As you  
23 know, we're an agreement state, so it was an  
24 appropriate thing for the legislature to do.

25 And a third thing that we were told to do

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1 was to select by a competitive process a private firm  
2 to become license designee. Not a contractor, but  
3 license designee. It is the job of U.S. Ecology as  
4 that license designee to do the things that Ron Gaynor  
5 will be describing in a minute.

6 AB 1000, passed in 1987, was the first step  
7 in creating the Southwestern Compact. Identical  
8 legislation was passed in Arizona, North Dakota and  
9 South Dakota in 1988 and in 1989 and ratified by the  
10 Congress as Public Law 100-712 to bring the  
11 Southwestern Compact into being.

12 A little bit about the organization of our  
13 regulatory program.

14 (Slide) The next slide, please.

15 We have a very compact organization here and  
16 that is -- we're missing a slide here, Steve. Let's  
17 jump to the one that you have up there again, please.  
18 Back to the regulatory framework slide, please Steve.  
19 There we go.

20 In addition to the statutes, we do have a  
21 set of regulations that we operate under. 10 CFR 61  
22 was adopted by the State of California in reference to  
23 the federal regulations. We simply said whatever it  
24 says in the federal regulations it'll say in state  
25 regulations. It's administered by the Environmental

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1 Management Branch, of which I am chief.

2 We are supported by the Radiologic Health  
3 Branch, our sister organization that deals with the  
4 rest of state licensees and enforcement. They have a  
5 peripheral role in low-level radioactive waste  
6 management. For instance, any findings of BRC are  
7 done by the Radiologic Health Branch.

8 There is a group called the Regional Water  
9 Quality Control Board that has a very specific charge  
10 under California law to protect the waters of the  
11 state, ground water and surface water, and they will  
12 be part of the regulatory framework.

13 Okay. Now, onto the organization within our  
14 department.

15 (Slide) The next one there, Steve, please.

16 I serve as Program Manager and Reuben  
17 Junkert as Project Director. He is supported by a  
18 small staff of engineers and economists and health  
19 physicists, not all of whom are currently on board.  
20 It's a very small group of people dedicated to the  
21 low-level waste project.

22 The dashed line to the side shows Region  
23 III, which is Southern California, for us as the  
24 ultimate home of the low-level radioactive waste  
25 disposal activities. Once the site goes into

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1 operation, it will be under the administrative purview  
2 of our Southern California chief. But during the  
3 developmental phase, we're handling it out of  
4 headquarters by Reuben and myself.

5 You'll see arrayed across the bottom a list  
6 of consultants. We rely heavily upon consultants for  
7 a very good reason. We find that we have to have the  
8 technical expertise to do a whole lot of the things  
9 and we do not possess that within our own staff  
10 because we are limited and it is not a feasible thing  
11 to go out and hire a lot of folks for a very, very  
12 short period of time. So, we have chosen to use  
13 consultants and you'll be hearing more about them from  
14 Reuben as time goes on.

15 But to review them very briefly, the first  
16 one that was aboard was the site selection review  
17 consultant. That was Roy F. Weston, and they were  
18 hired to help us look at all U.S. Ecology's data  
19 during the site selection and characterization phase.

20 The enhanced technologies consultant was  
21 Ebasco Environmental and they were selected to give us  
22 some thoughts on what sort of disposal technology we  
23 should impose. QA/QC also is under Ebasco, a very,  
24 very key consultantship, of course.

25 Then, to the far left, is the environmental

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1 impact review, environmental impact statement  
2 consultant. That is Dames and Moore. We're doing a  
3 joint document to meet both California and federal  
4 environmental law requirements.

5 Finally, the license application review  
6 consultant is, again, Roy F. Weston. They won that  
7 contract as well as the site selection review work, so  
8 they have provided continuity. We'll get more into  
9 that as time goes on.

10 (Slide) We also rely very heavily on  
11 advisory groups, as shown in the next slide. First is  
12 a statutory low-level radioactive waste advisory  
13 committee. That is made up of a variety of  
14 disciplines who meet no more than usually once a year  
15 and are on our mailing list and our telephones reach  
16 them to give us guidance on the overall program as it  
17 develops.

18 Ad hoc groups are very important to us. You  
19 see listed proposal evaluation. We put together a  
20 small ad hoc group every time we issue a request for  
21 proposal. Environmental impact is under the purview  
22 of a steering group. The desert tortoise was a  
23 particular issue that had to be addressed and we had  
24 an ad hoc working group to give us some guidance on  
25 that. Mixed waste is being looked at by a multi-

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1 agency, multi-disciplinary team to help us unsnarl  
2 that thorny problem.

3 (Slide) And the next slide shows license  
4 review. That is also under the purview of an ad hoc  
5 group appointed from within state government,  
6 including our own staff, other state agencies and the  
7 Regional Water Quality Control Board to make sure that  
8 what Weston is doing as it reviews the license is  
9 indeed in accord with their judgment, particularly as  
10 it relates to the regulatory aspects of low-level  
11 radioactive waste management.

12 Fiscal review is another ad hoc committee  
13 that is just now being formed to give us some guidance  
14 on how to set up our rate setting mechanism because we  
15 will be rate setters as well as regulators.

16 The last two advisory committees were U.S.  
17 Ecology's own at the outset, but we found them to be  
18 so useful that we have tied ourselves in with them,  
19 particularly the local advisory committee that's  
20 currently set up to look at what's happening at the  
21 Ward Valley proposed site. Those are people who have  
22 become knowledgeable and know what they're talking  
23 about and it's been very, very helpful for us to go to  
24 them to see what their reactions are to the whole  
25 process that we're working with U.S. Ecology on

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1 bringing into being.

2 COMMISSIONER REMICK: To whom do these  
3 various groups report to, the same individual or does  
4 it depend upon the committee?

5 MR. WOMELDORF: In every case except for the  
6 citizens advisory committee and the local advisory  
7 committee, we set them up, we staff them, we chair  
8 them, we pick their brains.

9 COMMISSIONER REMICK: That's as program  
10 manager?

11 MR. WOMELDORF: That's correct.

12 I shall now turn it over to Ron Gaynor, Vice  
13 President of U.S. Ecology, unless you folks have  
14 questions of what I've said before I go on.

15 COMMISSIONER REMICK: I had one question.  
16 I'm not sure I understand. You said that U.S.  
17 Ecology, excuse me, is the license designee, not a  
18 contractor. I'm not sure I understand the  
19 designation.

20 MR. WOMELDORF: Yes. It's a very key point  
21 and something that is unique in California. Under our  
22 state law, we were to select the license designee.  
23 The license designee has a number of responsibilities  
24 which are different from that which a contractor would  
25 have. For one thing, they have to put up all the

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1 money up front. They pay the whole tab.

2 They are functioning in a pre-licensing  
3 phase, and have been now for some nearly five years,  
4 under our oversight and purview. I find it to be  
5 very, very useful because rather than having to run  
6 them as an extension of ourselves, we can hold them at  
7 arm's length and we can say, "Okay, guys, you're being  
8 regulated even before you submit a license." So it's  
9 given us, I think, a measure of control that we  
10 wouldn't have to the same degree if they were a  
11 contractor of ours.

12 COMMISSIONER REMICK: So they're going to be  
13 the licensee and the operator of the facility  
14 presumably, or is that not decided yet?

15 MR. WOMELDORF: That's correct, they will  
16 be.

17 COMMISSIONER REMICK: Will be?

18 MR. WOMELDORF: Yes.

19 COMMISSIONER REMICK: Okay.

20 MR. WOMELDORF: Yes.

21 CHAIRMAN CARR: And that was a competed  
22 contract which they won to be the licensee?

23 MR. WOMELDORF: That's correct.

24 CHAIRMAN CARR: And so they're a licensee  
25 even before the site is picked.

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1 MR. WOMELDORF: Right. The term "license  
2 designee" may not be grammatically very good.

3 CHAIRMAN CARR: No, no, I understand.

4 MR. WOMELDORF: It should have been said  
5 "licensee designate," but it didn't come out that way.

6 CHAIRMAN CARR: Okay. I understand.

7 COMMISSIONER REMICK: But they're not  
8 contracting with you. They've been deemed to be the  
9 selected operator and licensee.

10 MR. WOMELDORF: That's correct. That is  
11 correct.

12 COMMISSIONER REMICK: Okay. I understand.  
13 Okay.

14 MR. WOMELDORF: Okay. With that then we'll  
15 ask Ron Gaynor to pick it up at that point.

16 MR. GAYNOR: Thank you, Don.

17 Mr. Chairman, Commissioners, we'd like to  
18 talk about site selection and characterization which  
19 when U.S. Ecology was selected in the end of 1985, we  
20 began as the only company that we were not competing  
21 for a site, we had already competed for the  
22 designation as license designee.

23 And so, I think one of the other advantages,  
24 if I may, was also that it allowed us to conduct a  
25 much more open public process than we might have been

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1 able to do if we were competing during the licensing  
2 process to find a site. We can be very open. We  
3 don't have to worry about keeping secrets from anyone  
4 because of the competition with another company. I  
5 think that was a key advantage to being selected.

6 COMMISSIONER REMICK: Excuse me, just  
7 another question. In going back to Roy F. Weston,  
8 they're a contractor to the state then to select a  
9 site and they have no --

10 MR. WOMELDORF: No.

11 COMMISSIONER REMICK: Oh, okay. Who has the  
12 site selection process?

13 MR. GAYNOR: U.S. Ecology is responsible for  
14 selecting the site.

15 COMMISSIONER REMICK: Okay. I missed that,  
16 I guess.

17 MR. GAYNOR: And preparing a license  
18 application and submitting it to the state.

19 COMMISSIONER REMICK: I see. I apparently  
20 misunderstood. I thought you said one of the  
21 advantages of being the designee, you do not have  
22 responsibility for --

23 MR. GAYNOR: We have the responsibility, but  
24 we're not in competition with another company who is  
25 also out trying to find a site.

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1 COMMISSIONER REMICK: I see.

2 MR. GAYNOR: So, it's -- it allowed us to be  
3 much more open during site selection --

4 COMMISSIONER REMICK: Okay.

5 MR. GAYNOR: -- because we did not have a  
6 business concern about keeping any secrets.

7 COMMISSIONER REMICK: Okay. And Roy Weston  
8 advises you on the adequacy of what U.S. Ecology has  
9 done?

10 MR. WOMELDORF: That's correct.

11 COMMISSIONER REMICK: Okay. Excuse me.

12 MR. GAYNOR: That's fine.

13 We began this with the goal of finding the  
14 technically excellent site that enjoyed the highest  
15 possible degree of public support. Our view of  
16 California when we began was that California, the  
17 geology and the climate, provided opportunity to have  
18 many technically suitable sites, but we recognized  
19 that the key was going to be finding a site that had a  
20 high degree of public support and allowing it to  
21 proceed. As it turned out, we found several  
22 technically acceptable sites that had a high degree of  
23 public support.

24 We also planned all of our activities with  
25 the vision of the requirements of 10 CRF Part 61,

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1 which the state has adopted, particularly 61.23 which  
2 are the summary of the licensing requirements. And in  
3 consultation with the state and the public, wherever  
4 there was an opportunity to eliminate or minimize a  
5 possible licensing debate through a change in the  
6 process, a change in the site selection activities or  
7 a change in the design, those changes were made so  
8 that we could streamline the licensing process.

9 (Slide) May I have the next slide, please?

10 In beginning the site selection process, we  
11 defined what we considered to be an optimum site so  
12 that we could go looking for that site within the  
13 State of California. That optimum site definition was  
14 based on the 10 CFR Part 61 site suitability  
15 requirements, state siting guidelines, which are  
16 similar but also add some other requirements, and our  
17 own experience in operating arid sites. We operate  
18 the two sites, ones in Nevada and Washington and have  
19 since the early '60s and have a very positive  
20 experience in operating those sites and use that to  
21 identify the desirable characteristics of a desert  
22 site in California.

23 The Department of Health Services, according  
24 to their legislative mandate, had performed a regional  
25 screening of the state. They had removed from

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1 consideration reserved lands that had been reserved  
2 for various reasons, populated areas, and had focused  
3 the effort on arid regions. That left U.S. Ecology  
4 with about 20,000 square miles of the state to work  
5 with as being potentially suitable. This stretched  
6 over the entire state, from the northern border to the  
7 southern border.

8 And based on our definition of an optimum  
9 site, we determined that topographically closed desert  
10 basins had the greatest potential for success,  
11 particularly as it relates to the first site  
12 suitability requirement of having a simple  
13 hydrogeologic regime that would lend itself to easy  
14 characterization modeling and monitoring, high  
15 confidence in a sites' performance. So we established  
16 basic criteria within those basins to define the  
17 locations that we would be looking for.

18 (Slide) Next slide.

19 CHAIRMAN CARR: Now, you're looking for an  
20 optimum site goes beyond our requirements to have a  
21 satisfactory site.

22 MR. GAYNOR: That's correct. We went well  
23 beyond, I think, the requirements to have a  
24 satisfactory site in the interest of having a site  
25 licensed in the shortest reasonable period of time.

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1 CHAIRMAN CARR: Okay.

2 MR. GAYNOR: Minimizing the conflicts along  
3 the way.

4 In so doing, we looked at all of the closed  
5 desert basins in California, of which there are about  
6 71, from the standpoint of review of the literature  
7 and --

8 CHAIRMAN CARR: By closed you mean  
9 surrounded by mountains?

10 MR. GAYNOR: Topographically, that's  
11 correct. All the drainage is internal. Surface water  
12 drainage goes to a central location where it  
13 evaporates. It's a feature that's common in  
14 California but not too many other places and it lent  
15 itself well to this type of study. Each of these  
16 basins ranged from a few square miles to several  
17 hundred square miles. There are some very large  
18 basins in the desert.

19 We identified from our comparison of those  
20 basins and evaluation with respect to the criteria 16  
21 basins that best satisfied the criteria of our optimum  
22 site. That's what we proposed to the public. In  
23 addition, however, due to public interest, there are a  
24 number of interest groups, individuals who had  
25 property or knew of property that they thought would

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1 make good sites, we also looked at anything anyone  
2 wanted to bring to us. So, we looked at about a dozen  
3 specific sites or areas that were proposed to us by  
4 various groups and ended up selecting two of those  
5 that actually met our criteria, which were included in  
6 the studies.

7 It was at this point that we began our  
8 official public and agency involvement program.

9 (Slide) Next slide, please.

10 The purpose of this program was to address  
11 as many licensing, permitting and public concerns as  
12 possible as early as possible in the site selection  
13 process so that they could be eliminated or minimized.  
14 Public groups and the agencies were informed about the  
15 project and their individual input was solicited. All  
16 their concerns and recommendations have been  
17 documented and have been addressed and implemented to  
18 the extent practicable.

19 There were four series of project review  
20 meetings with local, state and federal agencies. This  
21 included over 30 different agencies having potential  
22 interest or potential regulatory activity at that  
23 time, they weren't certain, which also included NRC's  
24 Regional Office of State Programs as an observer.

25 There were three rounds of public meetings

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1 in the summer of 1986. There were 23 total meetings  
2 and these were held throughout the interested areas  
3 prior to key decision points in the process. There  
4 was a citizens advisory committee established, and  
5 they held six meetings during this time, to advise  
6 U.S. Ecology on its approach, the communication with  
7 the public, and interpretation of public input.

8 We also had a number of Indian tribes,  
9 native American tribal consultations. There were  
10 about nine individual tribal groups that have an  
11 interest over the area that we were studying and so we  
12 held continuous consultations with those groups  
13 through our own contacts and those of our  
14 ethnographers.

15 Media briefings and service club  
16 presentations were part of the focused educational  
17 process and over this ten month period we participated  
18 in over 60 such presentations.

19 The last item on this slide is Beatty low-  
20 level radioactive waste disposal site tours and I  
21 believe this is probably the most effective  
22 educational activity that we have conducted. During  
23 this time, we were sponsoring tours of the site as was  
24 the Cal Rad Forum, the users group of radioactive  
25 materials in California, and over 300 people visited

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1 our site from these desert areas during that period of  
2 time.

3 (Slide) Next slide, please.

4 COMMISSIONER CURTISS: When you conducted  
5 your review of the 71 basins, was that strictly a  
6 literature review or were you on site?

7 MR. GAYNOR: No, the 71 basins were narrowed  
8 down through a literature review of published  
9 geologic, climatologic, hydrologic information. That  
10 got us down to the 16 specific basins which did  
11 involve specific field activities.

12 COMMISSIONER CURTISS: When you went through  
13 this process for public involvement at the end of this  
14 or after you've done most of this for all the sites,  
15 how many of the 16 would you characterize as  
16 supportive or favorable?

17 MR. GAYNOR: The 16 basins were over a  
18 fairly large area, about 7,000 square miles in only  
19 three counties, very large counties, relatively  
20 unpopulated counties, an area larger than New England.  
21 We were dealing with eight or nine specific  
22 communities and within those there were several  
23 communities that were supportive of a number of sites  
24 in their areas, as I'll cover in a moment.

25 COMMISSIONER CURTISS: Okay.

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1 MR. GAYNOR: There was -- we ended up with  
2 essentially three sites with a high degree of public  
3 support.

4 COMMISSIONER CURTISS: Okay.

5 MR. GAYNOR: The agency meetings, the  
6 purpose was to familiarize the agencies with the  
7 project, identify and resolve issues early, identify  
8 any necessary permits that we were not aware of, and  
9 assure regulatory compliance throughout the process.  
10 These agency meetings were sponsored by the California  
11 Governors Office of Permit Assistance, which is their  
12 responsibility, and as we mentioned were attended by  
13 these other agencies.

14 (Slide) Slide 12, please.

15 Citizens Advisory Committee was established  
16 as an advisor to U.S. Ecology and the members were not  
17 selected to officially represent anyone in particular,  
18 but rather to reflect the attitudes prevalent in the  
19 interested or affected public of the area. These are  
20 the groups that were invited to nominate members to  
21 the Committee. County boards of supervisors of the  
22 three counties were asked to nominate two members  
23 each. The League of Women Voters from the three  
24 counties were asked to nominate one member each from  
25 the counties. Sierra Club appointed one member to

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1 represent environmental interests, Native American  
2 Heritage Commission, because of the large interest of  
3 various tribal groups, had a member, and the  
4 radioactive materials users group, for obvious  
5 regions.

6 (Slide) Slide 13, please.

7 The League of Women Voters agreed to provide  
8 clerical and logistical support to the committee and  
9 also provided a convener for the committee, which was  
10 an independent convener, to assure even-handed  
11 treatment of the committee members and an open  
12 exchange of their ideas. Resources that were  
13 available included the Department of Health Services,  
14 who provided technical input on the regulations, the  
15 statutory requirements and radiation protection.

16 The Bureau of Land Management, which is the  
17 largest property owner in the desert areas of  
18 California, provided input on the California Desert  
19 Conservation Area Plan, which is their management  
20 plan, to maintain consistency with their management  
21 goals.

22 The Nuclear Regulatory Commission provided  
23 background support. One of your own staff members,  
24 Kitty Dragonette, provided a tutorial to the advisory  
25 committee on Part 61 philosophy as part of their

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1 education in the project.

2 County environmental health agencies  
3 provided input on county policies and, of course, U.S.  
4 Ecology provided support.

5 (Slide) Next slide, please.

6 CHAIRMAN CARR: Did you have to fund the  
7 League of Women Voters for their clerical and  
8 logistical support?

9 MR. GAYNOR: We provided them with a block  
10 grant which was theirs to administer so that they  
11 could provide the necessary support without any  
12 interference.

13 The results of this, the first two rounds of  
14 public meetings, led to 16 candidate siting areas.  
15 These were specific sites within the basins that we  
16 discussed that reduced our area of interest to about  
17 2,000 square miles. These were proposed to the public  
18 in the third round of public meetings and they were  
19 based on refined technical criteria from the previous  
20 rounds of meetings and the advisory committee input  
21 and the agency input, discretionary criteria weighting  
22 which was provided by public and the advisory  
23 committee on areas of importance for non-exclusionary  
24 or licensing matters. We reserved licensing matters  
25 and exclusionary matters to ourselves, the applicant,

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1 and the regulatory because they're not discretionary  
2 items. But where there were items of choice that were  
3 in the discretion of either ourselves of the  
4 Department, we solicited input from the public on how  
5 those decisions should be made.

6 Field reconnaissance was done at all these  
7 sites, both on the ground and in the air, to make sure  
8 that we had a clear understanding of not only the  
9 specific sites but the surrounding areas.

10 (Slide) May I have the next slide, please?

11 From these findings and follow-on meetings  
12 of the advisory committee, we selected three candidate  
13 sites of four square miles each. These were within  
14 the -- actually within two counties, San Bernadino  
15 County and Inyo County, one near Needles, California,  
16 one near Baker and one near Bishop, California. All  
17 of these had a high degree of public support for those  
18 areas. Then we conducted a detailed analyses on those  
19 sites to identify any fatal flaws from a licensing  
20 standpoint to verify the information that we had  
21 collected to date on groundwater depth, bedrock depth,  
22 seismicity and flooding potential on the sites.

23 Based on the findings of these detailed  
24 studies, we reduced the areas to the preferred one  
25 square mile at each of these candidate sites and

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1 continued other studies, such as environmental and  
2 socioeconomic for comparison or rating of the three  
3 sites.

4 (Slide) Slide 16, please.

5 Beyond this, the public and agency input and  
6 involvement continued with more specific agencies,  
7 agencies interested or involved in only these  
8 particular site locations or issues that had arisen  
9 with these sites. We, at this point, created local  
10 advisory committees by asking representative interest  
11 groups in the local communities to appoint members to  
12 specific advisory committees for their local area.  
13 They provided input through two rounds of public  
14 meetings during this period. Our other advisory  
15 committee provided input and review through an  
16 additional set of meetings. We continued our tribal  
17 consultations with only those tribes that were  
18 interested in these specific sites and continued, of  
19 course, our normal public information process.

20 These types of activities also are  
21 continuing today and we expect will continue probably  
22 throughout the life of the site, but narrowing to more  
23 specificity. For instance, we are now only dealing  
24 with those agencies that are interested in  
25 specifically the Ward Valley site near Needles,

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1 California. We only have one local advisory committee  
2 remaining, in Needles, California, and our citizens  
3 advisory committee is kept informed of progress so  
4 that they can advise on an as-needed basis and they  
5 are also participating in the environmental review  
6 process. And we're now only dealing with two Indian  
7 tribal groups.

8 CHAIRMAN CARR: How much turnover did you  
9 get in your citizen advisory committee over the years?

10 MR. GAYNOR: We only lost one member and  
11 that was the native American who, for some reasons,  
12 was not able to continue and was replaced by the  
13 Native American Heritage Commission. All of the other  
14 original members remain to this day.

15 (Slide) Slide 17, please.

16 The proposed site was selected then in March  
17 of '88 based on this public and local advisory  
18 committee input. Further consultation with the  
19 agencies in California and the federal agencies  
20 relative to the desert tortoise. The desert tortoise  
21 is today listed as a threatened species in California.  
22 It is an endangered species on the federal list. We,  
23 from the standpoint of site selection and licensing  
24 and environmental review, have always treated the  
25 tortoise as if it were endangered because we expected

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1 that listing was going to occur. We believe that the  
2 issues have been addressed in the licensing and in the  
3 environmental documents and actually believe and there  
4 are a number of experts that agree with us that the  
5 project will result in a net benefit to the tortoise  
6 because of the habitat restoration that is planned,  
7 associated with some previously existing impacts.

8 The fact that we had three sites that had  
9 high levels of public support allowed us to do  
10 something we had not counted on early on. Originally  
11 we expected to have three sites that were essentially  
12 technically equivalent and we would pick the one that  
13 had the highest level of public support, all three  
14 being satisfactory. What we found out was we had  
15 three sites that had high degree of public support,  
16 which gave us the luxury of picking what we considered  
17 to be the technically superior site.

18 (Slide) May I have the next slide, please,  
19 page 18?

20 During the site selection and site  
21 characterization process, one of the key constructive  
22 activities, I think, that's happened has been pre-  
23 licensing consultation. During site characterization,  
24 we have our own contractors and project team key  
25 personnel within U.S. Ecology from our operating

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1 sites, from support services within the company. We  
2 also have technical contractors who are working with  
3 us to deal with specific issues that we don't have the  
4 expertise for.

5 We have a quality assurance program that  
6 fits with U.S. Ecology's commitment to quality,  
7 provides the overall umbrella for our contractors.  
8 Each of them in turn is required to have a quality  
9 assurance program in place which meshes with U.S.  
10 Ecology's project program. We audit our contractors  
11 and the Department of Health Services audits our  
12 program.

13 (Slide) May I have the next slide, please?

14 In the pre-licensing consultation, this is  
15 probably one of the very positive things that's  
16 occurred in this program, is dealing with issues  
17 before the initial license application has been  
18 prepared. This included such things as having general  
19 site characterization plans reviewed by the various  
20 agencies interested, including the NRC. Another of  
21 your staff members, Mike Weber, was helpful in  
22 coordinating consultation with the Commission staff in  
23 April of 1987 associated with characterization plans  
24 for the sites.

25 These other topics are other areas that have

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1 been discussed with various agencies, including USGS  
2 on the Vadose zone testing because of their recent I  
3 guess what we would call front state-of-the-art  
4 studies that have been performed at the Beatty, Nevada  
5 facility on Vadose zone testing.

6 (Slide) May I have the next slide, 20,  
7 please?

8 This is a general organization chart for our  
9 project. It shows the president of the company,  
10 leading down to the project management which is  
11 provided through corporate development. Our  
12 engineering consultants report to the project manager  
13 and the important thing on this slide, I guess, is the  
14 relationship of quality assurance. A quality  
15 assurance manager for the company reports through a  
16 different administrative line to the president of the  
17 company providing that independent review.

18 (Slide) May I have the next slide, please?

19 These just show the -- from our  
20 environmental report, which was published last spring  
21 and has been reviewed since then and will form the  
22 basis for the environmental impact report,  
23 environmental impact statement. It deals with these  
24 particular topics of impact and mitigation. I don't  
25 want to go into detail on those.

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1           What I'd like to do at this point is ask to  
2           switch to the 35 millimeter slides that show our  
3           specific site in Ward Valley near Needles, California.  
4           I think maybe there's a slide before this one, but  
5           this is a close-up view of the site that shows the  
6           desert vegetation.   This is a relatively lush  
7           vegetation for the desert areas in the Mojave area.  
8           As you can see, there are no trees.   All these bushes  
9           are no more than two or three feet high.   The coverage  
10          of the site by vegetation is about 15 to 20 percent.

11                 (Slide)   May I have the other slides,  
12          please?

13                 We have a slide showing an aerial view of  
14          the site which demonstrates the stability which we  
15          think is a key issue with the site is its natural  
16          stability.   The aerial view shows tank tracks that  
17          remain from General Patton's maneuvers in the desert  
18          in 1942.   They're quite evident.   The desert is a  
19          particularly fragile environment with respect to  
20          repair of any damage simply because of the lack of  
21          rainfall, the lack of surface erosional factors and  
22          the lack of increase in vegetation.

23                 Are there other slides?   There's also a  
24          slide that we would like to show you, and we may just  
25          need to go on, that shows the proposed layout for the

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1 facility.

2 (Slide) This is the site from another angle  
3 that shows part of our original protection of the  
4 desert tortoise as an endangered species. We had  
5 fenced our access road which goes to the center of the  
6 site. It was a highly traveled road during the  
7 characterization activities. In the background you  
8 can see a drilling rig and also our weather station,  
9 which at the center of the site. We had posted these  
10 signs mainly for employee education that this was a  
11 sensitive species and all moving vehicles at the time  
12 the tortoise was active required that someone walk in  
13 front of the vehicles to watch for juvenile tortoises.

14 (Slide) The next slide, please?

15 This is the facility layout which shows the  
16 preponderance of the site being dedicated to class A  
17 waste. Only one trench, which is not only a smaller  
18 trench, it's a shallower trench, a different design  
19 dedicated to classes B and C waste and waste which has  
20 greater than 30 rems per hour contact radiation level.  
21 It also shows the support area and the upper right-  
22 hand corner shows the buffer zone boundaries. The  
23 little light blue dashed lines to the left of the  
24 facility show some surface water diversion features.  
25 Actually not diversion features, but they are

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1 roughness to reduce the energy of any upstream down  
2 flow on the site.

3 CHAIRMAN CARR: And that's a mile square?

4 MR. GAYNOR: No, the entire disposal area,  
5 which is designed for 30 years capacity for the  
6 Southwestern Compact, is about 70 acres. The entire  
7 property that we're looking at is about 1,000 acres  
8 just from the standpoint of preventing anyone from  
9 conducting any activities near the site. But the  
10 actual active operations that will disturb any surface  
11 area is about 70 acres.

12 CHAIRMAN CARR: And are you intending to put  
13 the mixed waste in this general area?

14 MR. GAYNOR: We do not have plans for mixed  
15 waste at this facility at this time. Frankly, from  
16 our standpoint, we find it difficult to deal with the  
17 inconsistencies in the regulations and the ability to  
18 resolve those inconsistencies.

19 CHAIRMAN CARR: All right.

20 MR. GAYNOR: That's all I have.

21 COMMISSIONER CURTISS: Let me ask a quick  
22 question before you go on. In the process of working  
23 with the advisory committees and the local  
24 governments, did you find it necessary or useful to  
25 define the relationship of those local governments to

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1 the facility after it began operating or to employ  
2 what have been referred to as incentive packages or  
3 compensation for the benefit of hosting this facility  
4 or is that an issue that you came across with the  
5 three sites that were identified as preferred sites?

6 MR. GAYNOR: We have never done anything  
7 more than explain the economic benefits associated  
8 directly with the operation of this facility, which  
9 granted are small. This is a very small facility. It  
10 will only employ 20 to 30 people on a full-time basis.  
11 It does not represent a large economic in-flow. It is  
12 somewhat significant to the small communities where  
13 we're dealing that are only a few thousand people, but  
14 we have never proposed any special incentive packages.

15 COMMISSIONER CURTISS: Okay. Thank you.

16 CHAIRMAN CARR: Any other questions?

17 COMMISSIONER REMICK: A question, I assume  
18 you're the proper one to address it to. Getting to  
19 the operational stage, is there a plan for how  
20 materials would be handling? Now, I go back some  
21 years to having visited some early low-level waste  
22 burial sites where basically a truck pulled up and it  
23 dumped them down into the trench. I see pictures, I  
24 think, of Beatty. They're very organized. I don't  
25 know if those are promotional pictures or not. But

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1 what thinking has been given to the handling of the  
2 materials once they arrive and placement in the  
3 trenches?

4 MR. GAYNOR: Well, the handling at our  
5 existing facilities differ depending on the  
6 operational activities. For instance, at Beatty, they  
7 are very carefully stacked and very carefully back  
8 filled. They are not promotional pictures. That is  
9 the way the facility is operated.

10 At the Washington facility, if you see the  
11 trench and the waste, it looks like it's just been  
12 dumped into the trench, but that's not the case. They  
13 are placed into the trench one or two packages at a  
14 time. However, they are placed remotely by crane and  
15 allowed to rest in whatever position they end up in.  
16 They're not dropped but they are placed. That  
17 minimizes radioactive exposure to our employees. It's  
18 a very effective way of operating the disposal unit.

19 However, Part 61 has certain specific  
20 requirements. The Department of Health Services, as  
21 Mr. Junkert is going to describe, has given us  
22 specific guidance on the design and operation of the  
23 disposal units and the waste will be carefully  
24 stacked. There are limitations on the degree to which  
25 the levels and the amount of back fill that must be

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1 placed to -- in concert with Part 61 to make sure that  
2 all voids within the trench are being filled and that  
3 no packages are being damaged.

4 COMMISSIONER REMICK: All right. Thank you.

5 COMMISSIONER CURTISS: I do have one other  
6 question. You indicated that in the process of  
7 working with the states and the local governments that  
8 you found it helpful to go beyond what Part 61  
9 requires in terms of some of the siting requirements.  
10 I take it that from what you've described reflects  
11 particular sensitivities about particular issues that  
12 you addressed.

13 Can you give us a thumbnail sketch of what  
14 it was that in the process of working with the states  
15 you found in terms of the concerns that were being  
16 raised in the areas where you thought it was necessary  
17 in responding to those concerns to go beyond what Part  
18 61 requires?

19 MR. GAYNOR: Well, perhaps I didn't explain  
20 that correctly because we did not go beyond what Part  
21 61 requires to address any specific public concerns.  
22 There are only two areas where I would say that we  
23 went beyond what Part 61 requires and the first is  
24 related to our own desert operational experience.

25 We, for instance, have learned that

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1 relatively deep excavations with relatively steep side  
2 slopes have certain advantages and are possible in a  
3 desert location. So, we imposed the requirement that  
4 we have a minimum bedrock depth of 150 feet and  
5 that -- a minimum groundwater depth of 150 feet and  
6 that groundwater exist in the soil above bedrock. The  
7 first two were practical matters for construction of  
8 the site. The third one is to satisfy the site  
9 suitability requirement of Part 61 that you have a  
10 simple site that can be characterized and modeled and  
11 monitored.

12 The only other places where we have gone  
13 beyond, so to speak, would be where we had discretion  
14 in changing course either in site selection or in  
15 design or operations that would reduce the level of  
16 debate in the license application itself. If there's  
17 an issue to be discussed or argued or justified that  
18 you can get rid of that issue simply by making a  
19 simple change in course with respect to site selection  
20 or some other aspect, and we did that to reduce the  
21 conflict during the license application.

22 COMMISSIONER CURTISS: Did the recent  
23 seismic activity down there change your thinking at  
24 all?

25 MR. GAYNOR: No. One of the things that we

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1 have the benefit of is that this site is located in  
2 the most seismically stable area of the State of  
3 California, and the nearest potentially-active fault  
4 is tens of miles away.

5 COMMISSIONER CURTISS: Okay.

6 MR. GAYNOR: And so we really couldn't--  
7 from the standpoint of solely seismic stability, we  
8 could not have a better location in the state.

9 CHAIRMAN CARR: All right. Let's proceed.

10 MR. WOMELDORF: Our California statutes are  
11 silent on the matter of disposal technology, however  
12 we did decide that we wanted to make sure that we  
13 understood exactly what we were going to tell U.S.  
14 Ecology to do. So Reuben Junkert will now describe  
15 how we went about making our decision.

16 MR. JUNKERT: Mr. Chairman and members of  
17 the Commission, Ron Gaynor has already described the  
18 site selection process based on the Department's  
19 design guidance.

20 (Slide) Could I have the slide, please?

21 The design guidance focused on arid region  
22 characteristics, such as low precipitation, high  
23 evaporation, deep ground water, relatively permeable  
24 soils, and low seismic risk. The Department made an  
25 early commitment to evaluate alternatives to near

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1 surface disposal.

2           There were certain alternatives that were  
3 eliminated, were evaluated and subsequently  
4 eliminated. Those included above-ground and the  
5 below-ground vaults, earth-mounded concrete bunkers.  
6 These three alternatives were eliminated because of  
7 the focus on the arid region characteristics and the  
8 successful use of a shallow land burial facility in a  
9 desert environment. The additional concerns about  
10 above-ground facilities are long-term care issues,  
11 such as that they should become an attractive  
12 nuisance, erosion factors, and weathering cycles.

13           The study focused on alternatives or  
14 enhancements to near surface disposal to provide an  
15 increased margin of safety and address public  
16 concerns. The alternatives evaluated were the use of  
17 small annual trenches, compacted sand backfill,  
18 concrete backfill, clay liners, and deeper burial. In  
19 addition, we looked at concrete overpacks, improved  
20 covers, all waste being stabilized, and the separation  
21 of Class A from Class B and C waste, in addition to  
22 using lined or unlined auger holes.

23           The results of the study done by Ebasco is  
24 summarized in a fact sheet which is part of the hand-  
25 out. But the results also showed that all of these

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1 enhancements were technically feasible and met health  
2 and safety criteria.

3 The most expensive options, of course, were  
4 concrete backfill, concrete overpack, and the  
5 stabilization of all waste. But I might add that you  
6 could do all of the others for less than \$1.00 per  
7 cubic foot extra cost. As soon as you go to a  
8 concrete backfill or the overpack or the  
9 stabilization, you are adding dollars. I believe the  
10 most expensive option was the stabilization of all  
11 waste. The results are shown on a table in the hand-  
12 out, and they're all related to cost per millirem  
13 saved.

14 The results of this study, then, led to  
15 specific guidance to U.S. Ecology to the requirements  
16 for the facility and resulted in deeper burial for a  
17 five meter minimum cover, the separation of Class A  
18 from Class B and C waste and also those containers  
19 having greater than 30 rem per hour exposures at the  
20 surface. And this will be accomplished as shown  
21 already in the slide by having a separate trench for  
22 Class B and C material. The open trench will be kept  
23 as small as possible, and consolidation of waste and  
24 backfill will be accelerated with a soil surcharge.

25 MR. WOMELDORF: Okay. Any questions on that

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1 paper?

2 COMMISSIONER ROGERS: I wonder if you could  
3 just say a little bit more about that. I'm not sure I  
4 understand exactly how that works, that acceleration  
5 of consolidation with the soil surcharge. What do you  
6 have in mind there?

7 MR. JUNKERT: Consolidation of the natural  
8 ground or any fill that's put in place. Common  
9 practice is to put a surcharge on over a period of  
10 time. That's used in construction practice quite  
11 frequently.

12 And so the idea was here, since we have the  
13 excavated material available --

14 CHAIRMAN CARR: Just means stack --

15 MR. JUNKERT: -- you'd stack it up on top to  
16 the close portion of the trench and take advantage of  
17 that time and the extra weight to compress the  
18 material.

19 COMMISSIONER CURTISS: What's the capacity?

20 MR. JUNKERT: The capacity -- the site is  
21 about 70 acres. It's adequate for a minimum of 30  
22 years of material.

23 COMMISSIONER CURTISS: How much total waste  
24 can you accept there, in cubic feet?

25 MR. GAYNOR: I don't have that off the top

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1 of my head.

2 MR. JUNKERT: I don't either.

3 MR. GAYNOR: We can get it for you.

4 COMMISSIONER CURTISS: Okay.

5 COMMISSIONER REMICK: The average annual  
6 rainfall in this area?

7 MR. JUNKERT: About four inches per year.

8 COMMISSIONER REMICK: What happens if you do  
9 have the open trench and you do get a substantial  
10 rainfall? Does this percolate down through the  
11 material, or does it collect in the open trench?

12 MR. JUNKERT: The trench will be sloped and  
13 the down gradient parallel with the original grade, so  
14 the tendency would be for the water to collect in the  
15 low portion of the trench. They will also have  
16 emergency pumps available so they can withdraw any  
17 residual water as soon as possible in the event of a  
18 storm.

19 COMMISSIONER REMICK: Will that be standard  
20 practice to have some kind of a pump available?

21 MR. JUNKERT: They'll have that on site.

22 MR. GAYNOR: It's prevention of any water  
23 running into the trench as well.

24 COMMISSIONER REMICK: This goes back to some  
25 experience in the East with some of the early ones,

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1 where you could go visit and there was water in the  
2 trenches. Wastes were being dumped in. I realize  
3 you're in a different part of the country.

4 MR. WOMELDORF: All right. We're ready to  
5 move, then, into the next slide, number 27, and begin  
6 the discussion of the licensing process. As you've  
7 noted earlier, the complete license application was  
8 received and found to be complete by our Department in  
9 December of 1989. And under the management of Reuben  
10 Junkert, the license review is currently underway.

11 So, Reuben?

12 MR. JUNKERT: The licensing process has  
13 really been structured to have the department as the  
14 focal point, and it provides for department and  
15 contractor quality assurance programs. In addition,  
16 we've had a completeness review by the department  
17 staff and also by our support contractor, Roy F.  
18 Weston. The detailed technical review of the  
19 application is now in process, and we expect to have  
20 our first set of interrogatories in approximately a  
21 week.

22 As back-up for this review process, we've  
23 had a license review team visit at the site with the  
24 applicant. This was a one day formal presentation of  
25 topics on technical material, and the second day was

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1 spent out in the field. So everyone that's going to  
2 be looking at the application will have had a hands-on  
3 type of a feeling.

4 We expect U.S. Ecology, then, to respond to  
5 the first set of interrogatories in approximately 30  
6 days.

7 The licensing process also provides for  
8 public hearings and input, preparation of a draft  
9 safety evaluation report. And while in some cases  
10 there has been data submitted for the license  
11 application, U.S. Ecology is providing additional  
12 confirmatory data used for modeling purposes, and this  
13 we feel is a vital last step for confirmation.

14 COMMISSIONER CURTISS: What sort of public  
15 hearing do you hold?

16 MR. JUNKERT: We are currently planning to  
17 have four hearings. Now there's no statutory  
18 requirement that we have to have hearings, but we  
19 elected to have the hearings and combine it with the  
20 hearings for the environmental impact report, and then  
21 also give the participants an opportunity to comment  
22 on the application. They will be held in Southern  
23 California, one at the county seat of government, one  
24 at Baker, and one at Needles at the proposed site.

25 COMMISSIONER CURTISS: And do you chair

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1 those hearings?

2 MR. JUNKERT: The environmental impact  
3 report, which is a joint document with the Bureau of  
4 Land Management, they usually get an administrative  
5 law judge to chair that hearing. In our own case,  
6 we're thinking about asking the Office of Permit  
7 Assistance, who is part of the Governor's Office, to  
8 chair that function.

9 COMMISSIONER CURTISS: Will it be a formal  
10 type hearing with adjudicatory procedures, or is it  
11 more of an opportunity for people to come and  
12 informally share with you their comments and questions  
13 and answers?

14 MR. JUNKERT: Based on the fact that there  
15 are no regulatory requirements, it's more of an  
16 informal gathering. People can share their concerns.  
17 We treat them equally well, I would say.

18 COMMISSIONER CURTISS: Okay.

19 MR. JUNKERT: In other words, just as the  
20 public came to the scoping meetings for the EIS, those  
21 issues were addressed, so were the issues that were  
22 brought up at the public workshops.

23 The final product will, of course, be a  
24 safety evaluation report, and after the license review  
25 has been completed and that is being conducted

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1 parallel with the preparation of the environmental  
2 impact report, when the review is complete, a  
3 licensing decision can be made and remain on schedule.  
4 We will also have a certifiable EIR. And it will  
5 mean, then, that the land transfer can occur and a  
6 license can be issued.

7 CHAIRMAN CARR: And that will be from the  
8 BLM to the State of California?

9 MR. JUNKERT: The land transfer, that's  
10 correct. And those two events are expected to occur  
11 in early 1991.

12 (Slide) Next slide. As I've already said,  
13 the Environmental Management Branch is the licensing  
14 focal point for program management, quality assurance,  
15 and technical review integration. We're supported by  
16 an interagency technical support group that consists  
17 of members of other agencies.

18 (Slide) Next slide, please. Department  
19 staff. Some of the abbreviations we use there. EMB,  
20 of course, stands for Environmental Management Branch.  
21 Then we have the Regional Water Quality Control Board,  
22 and RHB being the Radiologic Health Branch.

23 What we have put together here is a team  
24 that focuses in on the guidance that was provided in  
25 1274 of all the various topics that would have to be

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1 looked at in review of the application, all the way  
2 from QA/QC requirements or guidance on that topic, to  
3 soils engineering, economics, health physics, and all  
4 the other disciplines that are needed for a complete  
5 review.

6 The technical contractor support is also  
7 given in the areas of quality assurance, and this has  
8 been done under contract. Ebasco Environmental  
9 Services developed a policy and implementation plan  
10 for the Department.

11 We have environmental impact support from  
12 Dames and Moore, who is now in the process of  
13 preparing a draft environmental impact report, and  
14 that will evolve into a final environmental impact  
15 report.

16 In addition, we have received assistance  
17 from DOE through the contractor EG&G, and specifically  
18 on issues related to the desert tortoise.

19 The detailed review of the application is  
20 being handled through our contractor, Roy F. Weston,  
21 and they have subbed out part of that task to Rogers &  
22 Associates.

23 COMMISSIONER REMICK: Mr. Womeldorf inferred  
24 that you were using consultants because of  
25 limitations, I assume, in resources, or legal reasons.

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1 I don't know. Realizing that you're kind of a lead  
2 for other states who will follow -- I'm sure Mr.  
3 Siefken will not kick you down there -- but if you had  
4 your druthers, which would you prefer, to have the  
5 staff capability to do this more by yourself or with  
6 consultants?

7 MR. WOMELDORF: Well, I have to say that  
8 that has become kind of a moot point. It just wasn't  
9 feasible to try to do it with our own staff.

10 If I were to say -- if I had my druthers, I  
11 think I'd druther do it the way we're doing it.  
12 Because as a program manager, I wouldn't want to try  
13 to find jobs for the dozen or 20 people a year from  
14 now when they had exhausted their need to work for us.  
15 That would be a heck of a thing to try to do.

16 CHAIRMAN CARR: It's a one-time shot.

17 MR. WOMELDORF: That's exactly the problem.  
18 That's exactly the problem.

19 MR. JUNKERT: I would like to add to that  
20 that since we're in the business now, and based on the  
21 results of the three years that we've had the  
22 contractors on board, I would agree with Don that this  
23 is the way to go. Because, I have no qualms about  
24 calling up the program manager with Roy Weston if I  
25 have a specific need that was unanticipated.

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1           And I think the firm or firms that we have  
2       picked through the request for proposal process has so  
3       much better response time to get to specific  
4       questions, that I find it very -- a useful way to do  
5       it. There's no way I could have talent available for  
6       all the areas that we've come across in the last two  
7       years. Highly impractical.

8           CHAIRMAN CARR: Are you the ultimate payee  
9       for him? I mean, does he bill you for his services?

10          MR. GAYNOR: The ultimate payee are the  
11       people who generate the waste.

12          CHAIRMAN CARR: Ultimate, okay.

13          MR. GAYNOR: We certainly are a conduit for  
14       a large portion of that, but the ultimate payee are  
15       the people who generate the waste.

16          CHAIRMAN CARR: But the cost to the state of  
17       hiring the contractors is not borne by the state?

18          MR. WOMELDORF: Okay. We have but two  
19       sources of money. There's no general fund tax money  
20       that goes into this project, except as --

21          CHAIRMAN CARR: Salaries.

22          MR. WOMELDORF: -- for instance, my time is  
23       contributed. We receive an annual \$250,000 license  
24       fee from U.S. Ecology, and that just about pays the  
25       salary of Reuben and three staff members, plus support

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1 for those four staff. All of the other money that we  
2 have, the only other money we have, is from surcharge  
3 rebates.

4 CHAIRMAN CARR: Okay. So it's -- so far,  
5 it's a self-supporting program?

6 MR. WOMELDORF: That's correct.

7 COMMISSIONER REMICK: The existing staffs in  
8 the various branch are adequate to cover the long-term  
9 monitoring that the state will need to do?

10 MR. WOMELDORF: Once the site goes into  
11 operation, then we will impose adequate surcharges on  
12 disposal to pay all of the regulatory costs and we'll  
13 be self-supported from that point forward.

14 COMMISSIONER REMICK: And that will not  
15 require additional staff? You have the technical  
16 expertise to do that, or don't you know that?

17 MR. WOMELDORF: We'll be gearing up to the  
18 tune of about -- what is it, 11 people total, I  
19 believe, which will include health physicists,  
20 engineers, data managers, clerical support,  
21 economists.

22 COMMISSIONER REMICK: But you would not have  
23 preferred to have those people on board at this stage?

24 MR. WOMELDORF: Some of them are on board  
25 now, and we're adding more. We have currently another

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1 five positions authorized. I forgot laboratory  
2 support. We're just now starting to get laboratory  
3 support people on board too. So the same core staff  
4 will be continued during the later part of the  
5 developmental phase and into the operational phase,  
6 but we're not going to have hydrologists, geologists,  
7 and so on and so forth to worry about placing.

8 MR. JUNKERT: That kind of talent will  
9 continue to be available through the function of the  
10 Regional Water Quality Control Board, as they issue a  
11 waste discharge requirement. They have staff of  
12 hydrologists and seismologists and soil chemistry and  
13 other expertise, because of their role to guard the  
14 state's surface and ground water supply. So they will  
15 have a continuing on-going program and a very great  
16 interest in the operation of the facility. The  
17 mechanism is there. It's being implemented now,  
18 specifically in the license review process.

19 (Slide) Next slide. At the very onset of  
20 the project, the Department recognized that it was  
21 necessary to have detailed QA/QC program. And with  
22 this in mind, then, had a policy statement  
23 implementation plan prepared.

24 The program requires all contractors to have  
25 quality assurance programs. Specifically, Weston

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1 developed a unique quality assurance program and  
2 implementation plan for the review of the license  
3 application. This, then, is tied into the system with  
4 Ebasco then on-line to do follow-up review of  
5 procedures and internal audit of Weston's procedures.  
6 So we feel we've closed the loop, come down to  
7 Weston's activities knowing what is going on and  
8 seeing that everything is done according to proper  
9 procedures.

10 At this time, I'd like to introduce David  
11 Siefken, from Roy F. Weston. David is the Technical  
12 Director for the detailed license review support.

13 David?

14 MR. SIEFKEN: Mr. Chairman, Commissioners,  
15 good afternoon.

16 Reuben has already mentioned that the Weston  
17 license application review team consists of Roy F.  
18 Weston and its subcontractor support, Rogers &  
19 Associates Engineering Company, from Salt Lake City,  
20 Utah. That's on the first slide.

21 (Slide) Skip to the second slide, then,  
22 Steve.

23 In terms of project organization, I'm the  
24 Project Technical Director, and I'm assisted by Pat  
25 Serie out of our Seattle office. I'm located in the

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1 Washington, D.C., office.

2 We have put together a license integration  
3 team, as well as individual section review teams. The  
4 review is being performed consistent with reg. guide  
5 1200, but we felt that in 1200 we would make a lot of  
6 individual findings. We felt that there had to be  
7 some group of people, experienced people with  
8 backgrounds in low-level waste disposal and nuclear  
9 regulatory work who could pull all the pieces together  
10 and make sure that the sum of the parts equalled the  
11 whole. So we have a licensing integration team to go  
12 from the 1200 in transition to the associated  
13 requirements for the licensing conditions in section  
14 61.23.

15 Also, the licensing integration team serves  
16 as essentially an in-house review of the product of  
17 the individual review teams. So within the individual  
18 review teams, there are ten corresponding to the  
19 sections of the application, anywhere from two to five  
20 technical people performing the review of each of the  
21 sections. Those reviews come together and they're  
22 integrated by the integration team.

23 We are, as Reuben mentioned earlier, in the  
24 process of completing the first round of  
25 interrogatories as we speak. They are being completed

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1 and will be Federal Expressed to the integration team  
2 for a second review tomorrow, and we should maintain  
3 the schedule for submittal of those interrogatories to  
4 DHS for their review within the week.

5 (Slide) If we could, go to the next slide.

6 The Weston team is, as NRC regulatory  
7 guidance would indicate, an integrated matrix of  
8 senior technical experts covering a wide diversity of  
9 disciplines.

10 The 10 CFR 61 is much more than a  
11 requirement which imposes siting requirements. As you  
12 are well aware, it has a waste classification, waste  
13 form, waste packaging requirements, design  
14 requirements. We're looking at trench cap designs.  
15 We're looking at specific siting issues. So we have a  
16 large matrix. We have about 15 lead people supported  
17 by an equal number of technical staff from about a  
18 half dozen of the Weston offices, and then the Rogers  
19 people from two of their offices as well.

20 (Slide) If we could, go to the next slide.

21 Relative to qualifications, of course, the  
22 Weston staff has been involved in working with Paul  
23 Lohaus and Kitty Dragonette in particular, the  
24 development of 10 CFR Part 61, working with Jim  
25 Shaffner in the review of the engineered alternative

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1 designs for near-surface low-level waste disposal  
2 facilities.

3 We have experience in the high-level waste  
4 program as well. We've worked supporting the uranium  
5 mill tailings program and experience in fuel cycle  
6 licenses. So we feel that we're highly qualified  
7 technically in the area of low-level waste disposal,  
8 and we're also very conversant with the nuclear  
9 regulatory area as well.

10 (Slide) If we could, skip to the next  
11 slide. The team, of course, is providing the  
12 technical support to a variety of states in low-level  
13 waste disposal facility design development and  
14 regulation. And I've listed the various phases that  
15 we're supporting and Rogers are supporting through a  
16 variety of other contracts.

17 (Slide) If we could, skip to the next  
18 slide. Coming back to the prelicensing support to DHS  
19 that we did before the license application was  
20 submitted, we were involved supporting the state in  
21 their review of the site selection process and the  
22 site data used to support that process. We  
23 participated in site visits to evaluate each of the  
24 sites as to their relative favorability, both against  
25 the criteria and with respect to each other.

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1           We supported the site characterization  
2 review, review of the site characterization plan and  
3 review of the types of tests that were proposed. We  
4 visited the site to look at some of the  
5 characterization under way, particularly the  
6 infiltrometer testing and the opening of the shallow  
7 trenches to look at the stability of the surface of  
8 the alluvial fan that the site is composed of.

9           We have reviewed the environmental  
10 monitoring plan, the pathways analysis working paper  
11 to look at the 23 different pathways I believe that  
12 came out of the NRC's guidance to look at which of  
13 those pathways would be applicable to the California  
14 low-level waste disposal site, which of course would  
15 be unapplicable.

16           For those that were determined to be  
17 applicable, we looked at the proposal by the applicant  
18 to do different levels of evaluation depending on the  
19 potential severity of the release that would occur  
20 along that pathway. Some were relatively simple  
21 analyses to show that the pathway would not constitute  
22 a threat to the public health and safety. Others,  
23 like the ground water pathway or the intruder  
24 scenarios, were more thorough analyses in order to  
25 show what would result from the potential impact of

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1 the pathway occurring.

2 Model documentation and validation,  
3 particularly in the area of the ground water, the  
4 unsaturated zone and saturated zone flow and  
5 transport, we did look at the documentation for the  
6 model. We looked at the validation that the applicant  
7 and their consultants provided for that.

8 We followed much the same process that the  
9 low-level waste staff had followed in the past when  
10 they developed their in-house ground water modeling  
11 capability and when they did their publications  
12 relative to models that they would find suitable for  
13 use in application for a low-level waste disposal  
14 site. We looked at comparing the results of the model  
15 to analytical solutions. We looked at comparing the  
16 results of the model to other models, including some  
17 of those that were proposed by the NRC staff as being  
18 suitable for low-level waste disposal.

19 So for the unsaturated zone flow and  
20 transport, we have done model documentation and  
21 validation, and we also assisted the Department in  
22 putting together a license review plan, which we are  
23 now working under that license review plan.

24 Reuben has gone over previously the license  
25 review process. As I indicated, we are in the process

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1 of putting together the interrogatories at this point  
2 in time. We have had the visit to the site, an  
3 opportunity for 15 of my staff people to meet with the  
4 applicant and with the DHS staff to discuss, after  
5 having read the application, any particular areas of  
6 clarification or any questions they had come up with  
7 early in their review.

8 So we think the process is well in hand. We  
9 are encouraged. We're very pleased with the effort of  
10 our staff and with DHS and the quality of the  
11 submittal of the applicant.

12 So with that, we go back to Don.

13 MR. WOMELDORF: Okay.

14 (Slide) The next slide shows the license  
15 review schedule in summary.

16 As noted, the complete license application  
17 was received in December.

18 The field review and conference, bringing  
19 together U.S. Ecology, our own people, and Reuben's  
20 review team was held last month.

21 The detailed interrogatory schedule you  
22 heard just now.

23 The environmental reviews, which are on a  
24 separate but parallel track, will be completed in  
25 November.

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1           We anticipate making a licensing decision  
2 just about the end of the year, Whether it will be  
3 late in December or early in January.

4           And if all goes well, then the land should  
5 be transferred and the license issued early 1991, with  
6 the facility going into operation toward the end of  
7 1991.

8           And, Mr. Chairman, we've got a couple of  
9 comments to make in wrap-up. Perhaps, if there are  
10 questions on license review, it would be appropriate  
11 to make them now.

12           CHAIRMAN CARR: Okay. Go ahead. We'll wait  
13 for the questions until the end.

14           MR. WOMELDORF: Okay.

15           (Slide) The next slide, number 41, shows  
16 some of the areas where we may want to ask for NRC's  
17 assistance. We certainly don't mean to put these  
18 before you, not right now, as a specific request for  
19 technical assistance, but these are the areas that  
20 we've been discussing with staff.

21           We may come to you with questions having to  
22 do with waste verification, which is exceedingly  
23 important, of course, to all of us; the uniform  
24 manifest, which we think should be imposed nationally.

25           Financial assurance mechanisms. We're just

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1 getting started on dealing with the fiscal aspects of  
2 this, and we could use some guidance there, perhaps.

3 And the long-term care. We know full well  
4 that we're at the front end of a process that's also  
5 going to have a back end, and we want to be ready for  
6 that time when it comes.

7 (Slide) And finally, to help us unsnarl  
8 some of the regulatory uncertainties, which are shown  
9 on the next slide. As, for example, mixed waste, some  
10 of the permit uncertainties, the fact that there are  
11 very, very low volumes of mixed wastes and the cost of  
12 developing a facility to dispose of a few hundreds of  
13 cubic feet per year are very, very disproportionate.

14 We know NESHAP is one particular area where  
15 we have concerns, but it's certainly not limited to  
16 the NESHAP. We're concerned about how EPA's  
17 standards, all of EPA's standards as they relate to  
18 low-level waste, are going to be imposed and how  
19 they're going to impact the operation and the  
20 regulation of the California facility.

21 (Slide) So in summary then, the last slide,  
22 we have told you about a very open site selection  
23 process, with detailed site characterization plans  
24 reviewed by public agencies.

25 We've talked to you about the prelicensing

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1 consultation, which we've provided to U.S. Ecology as  
2 our license designee. There is something on the order  
3 of 30 prelicensing consultations that have been given  
4 the company to make sure that they're always on the  
5 right track as we want them to be.

6 We've talked about the license review which  
7 is currently underway with a great deal of technical  
8 support, the fact that we hope to see that license  
9 issued just about a year from now.

10 And finally, we said that we'll be coming  
11 back to you with requests for your assistance.

12 And that, Mr. Chairman, wraps up our  
13 presentation.

14 CHAIRMAN CARR: Thank you.

15 Any questions?

16 COMMISSIONER REMICK: Early on, I think you  
17 indicated that the anticipated use of this facility  
18 would be 30 or 50 years. Am I correct?

19 MR. WOMELDORF: The Compact legislation says  
20 that California will provide a facility for a period  
21 of 30 years, unless it chooses to extend its  
22 obligation, in which case it could go on longer.

23 COMMISSIONER REMICK: I see. What kind of  
24 assumptions did you make in estimating the volume on  
25 decommissioning of either power plants or major

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1 material licensees? Any assumptions on relicensing or  
2 any assumptions on the possibility of an NRC below  
3 regulatory control rule or policy? What type of  
4 assumptions went into that?

5 MR. WOMELDORF: Ron Gaynor will respond.

6 MR. GAYNOR: The volume projections for the  
7 facility have been based on the historic manifest  
8 records of particularly the period of '85 through '88,  
9 supplemented by surveys of all the generators in the  
10 Southwestern Compact, both with respect to their on-  
11 going waste production and their anticipations for  
12 their power facility shut-down or continued  
13 operations.

14 The facility has been designed on the basis  
15 of that continuing volume, which does not include  
16 decommissioning waste. It does include periodic  
17 decontamination waste, decontamination of facilities,  
18 but not decommissioning.

19 There are, I believe, 11 reactors within the  
20 Compact Commission, some small ones, which it is our  
21 belief that they are likely to remain in safe store  
22 condition for the life of this site, or in some cases  
23 are likely to be -- their operational lives are likely  
24 to be extended.

25 If I may go a little bit further, though, in

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1 any event the performance assessment which has been  
2 provided in the license application demonstrates that  
3 the facility is really not limited with respect to the  
4 source term. The performance assessment shows the  
5 facility meeting the performance standard by two  
6 orders of magnitude, and that's principally related to  
7 I-129 and carbon 14, which do not represent the major  
8 concern from decommissioning waste. Decommissioning  
9 wastes are really related to volume.

10 And with respect to capacity, you've seen  
11 the area. Capacity and volume are something were  
12 there's a fair amount of flexibility. The site is not  
13 really restricted with respect to the source term.

14 COMMISSIONER REMICK: Thank you. That's  
15 all.

16 CHAIRMAN CARR: Commissioner Rogers?

17 COMMISSIONER ROGERS: Are there any  
18 transportation issues here? I didn't hear anything  
19 about transportation. What sort of problems did you  
20 have to consider and deal with there?

21 MR. WOMELDORF: It certainly was an issue  
22 that came up many times in the public's questions and  
23 also public agency questions.

24 Ron, would you like to comment on that?

25 MR. GAYNOR: Sure. This is, I think, a

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1 perfect example of where the project, through the  
2 consultation with the agencies and the public, made  
3 adjustments in the site selection process or  
4 characterization associated with specific concerns.  
5 Transportation is not an issue in CFR Part 61. But  
6 obviously, it's a key issue in public concerns.

7 The Ward Valley site in particular was  
8 selected because of its -- one of the many reasons  
9 that the Ward Valley site was selected was because of  
10 its desirable transportation access. It is located  
11 one mile south of Interstate 40, and it's accessed by  
12 an existing private road. So there are no increased  
13 transportation over highly populated routes associated  
14 with this facility. So that was one of the issues  
15 that was easy to address during the site selection  
16 phase. We had a number of sites with similar  
17 characteristics, and it was a matter of weighing all  
18 of these various characteristics.

19 COMMISSIONER ROGERS: On the question of  
20 economics, what's the basis for the surcharge? Is  
21 that a volume or a curie basis?

22 MR. WOMELDORF: We have in current  
23 regulations a limitation to assessing charges that  
24 U.S. Ecology may impose solely on the basis of volume,  
25 through a glitch which we will eventually rectify.

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1 Surcharges are to be based on volume and activity. So  
2 we'll go back and we will deal with the basic disposal  
3 cost and we will have it fit within the framework of  
4 volume plus activity, so it and surcharges will be  
5 consistent.

6 COMMISSIONER ROGERS: So it will be a  
7 combination?

8 MR. WOMELDORF: That's correct.

9 COMMISSIONER ROGERS: You haven't worked the  
10 details out.

11 MR. WOMELDORF: That is also correct.

12 COMMISSIONER ROGERS: It will be interesting  
13 to hear what they turn out to be.

14 I didn't hear much on this question of the  
15 impact of below regulatory concern or exemption  
16 policy. Maybe I missed something there.

17 MR. WOMELDORF: I don't know that we said a  
18 whole lot about it. As you may know, California has  
19 been supportive of NRC's approach to BRC. We do  
20 think, though, that there are a couple of things that  
21 have to be considered.

22 One is anytime volumes that go into a site  
23 are reduced, it's inevitably going to drive up unit  
24 costs of other materials which have to be disposed of.  
25 And a singular situation in California has been

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1 finding a home for materials that, in our view, are  
2 indeed BRC. As you may know, a number of counties  
3 have ordained or resolved or in some cases both  
4 against accepting any radioactive wastes in sewers or  
5 landfills or whatever.

6 Well, not to argue the merits of that  
7 particular approach, but to be realistic about a  
8 finding of BRC for those materials which could  
9 otherwise be construed to be mixed wastes, we see very  
10 low activity to contaminated copper, for example. We  
11 say put it in a facility, but the facility operator,  
12 not a public agency but a private facility operator  
13 said, "I won't accept it, because it does have  
14 radioactivity," and he'll turn it away. So, we have  
15 difficulty finding a home for BRC even though, in our  
16 view, it is completely safe.

17 CHAIRMAN CARR: Have you had any difficulty  
18 yet finding homes for smoke detectors?

19 MR. WOMELDORF: That hasn't become an issue.

20 CHAIRMAN CARR: They're going to curb  
21 anybody's waste disposal.

22 MR. WOMELDORF: Yes.

23 COMMISSIONER CURTISS: Let me say on that  
24 issue that even if you were to establish a BRC level  
25 for mixed waste, that your RCRA-permitted facilities

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1 would not accept that waste because of the presence of  
2 radioactive material?

3 MR. WOMELDORF: Privately owned facilities  
4 have turned away what we would say would be BRC  
5 because it is indeed somewhat radioactive.

6 COMMISSIONER ROGERS: Do you have any  
7 comments on your experience with the NRC guidance that  
8 you perceive so far its usefulness or the need for it?

9 MR. WOMELDORF: Yes. I'll make comments and  
10 then I'll ask Reuben to comment as well.

11 If we had not been provided those guidance  
12 documents, we would have had to go back and develop  
13 something along those lines ourselves which would have  
14 been a tremendous waste of resources. So, I think, in  
15 my purview, they've been exceedingly valuable.

16 MR. JUNKERT: Specifically, we relied  
17 heavily on the use of the guidance on the  
18 environmental monitoring and then also the format and  
19 the review process for the license ap. Just am not  
20 inclined to reinvent the wheel and knowing full well  
21 that a lot of effort had gone into those documents and  
22 also being aware that perhaps there were some glitches  
23 in it that basically it was a format that I felt  
24 comfortable with and the decision was made that we  
25 would format the application per the guidance in NUREG

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1 1199 and do the review process as shown in 1200.

2 So, that's the process we're using and --

3 COMMISSIONER ROGERS: You didn't find any  
4 problems with them being an extension beyond the NRC  
5 requirements?

6 MR. JUNKERT: Well, there were some cases,  
7 but I just didn't pay any attention to specifically  
8 example. There was one I recall about describe the  
9 fuel loading process. Well, clearly it was a  
10 carryover from a facility and our process involves--  
11 U.S. Ecology has to either explain why they're  
12 deviating or go ahead and go with the what the  
13 guidance says. In a case like that, it's very obvious  
14 there is a simple answer and we go on to the next  
15 thing. I mean some of it doesn't apply. It's easy to  
16 make a simple statement as, "It doesn't apply at this  
17 kind of a site," and go on rather than belabor the  
18 issue.

19 COMMISSIONER ROGERS: Thank you.

20 CHAIRMAN CARR: Jim?

21 COMMISSIONER CURTISS: Just a handful of  
22 questions here. It looks to me like the big question  
23 mark is what are you going to do with mixed waste?  
24 Your facility design clearly doesn't contemplate  
25 handling mixed waste. You're going to have the

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1 responsibility of 1193 to provide disposal capacity.  
2 Are you looking to other regions or interregional  
3 arrangements? Do you have storage in mind as an  
4 option? What is it that you think at this point would  
5 be an appropriate solution for you on mixed waste?

6 MR. WOMELDORF: Well, we're, I think,  
7 perhaps doing all of the above, trying to get a handle  
8 on what we have. It's from the survey data that we've  
9 developed that to our surprise we find that we're  
10 dealing with a very, very small amount of mixed waste.  
11 We have put together -- one of our ad hoc groups is  
12 wrestling with the question. The company is there,  
13 we're there. We've got other regulatory agencies  
14 aboard and we have the users group, Cal Rad Forum,  
15 represented. Our own contract, Ebasco in this case,  
16 is part of that group, to see what sort of management  
17 alternatives there are that, one, are workable; two,  
18 are affordable; and three, fit the requirements under  
19 the Amendments Act deadlines.

20 We have indeed had a considerable amount of  
21 discussion with other states and with other regional  
22 compacts about the possibility of working a tradeoff.  
23 You take all of our whatever it is and we'll give you  
24 all of our whatever it is. I think that came out, so  
25 we won both ways.

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1 COMMISSIONER ROGERS: That's right.

2 CHAIRMAN CARR: That's all right.

3 COMMISSIONER CURTISS: That's a good opening  
4 position.

5 CHAIRMAN CARR: If you get that deal, buy  
6 it.

7 COMMISSIONER CURTISS: Well, let me take the  
8 options in turn because we've heard a lot, I guess,  
9 from California, hear a lot from a lot of the states,  
10 I guess, on mixed waste.

11 If you were to build a disposal facility,  
12 just in a hypothetical sense, is it clear to you what  
13 you would under the joint guidance? Could you do that  
14 aside from the wisdom of doing that from an economic  
15 standpoint? Is the regulatory guidance that the two  
16 agencies have formulated sufficiently clear and  
17 achievable to permit you, if you were starting out as  
18 maybe Illinois and Texas are, to design a facility  
19 that could handle this problem?

20 MR. WOMELDORF: I almost hate to get into  
21 that kind of a thing. I suppose the direct answer to  
22 your question is yes, we could do something. I'm not  
23 sure that it's clear to us exactly what we would have  
24 the company do to design this facility, but a broader  
25 answer to the question is do we want something that

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1 looks like that out where we're going to have  
2 everything else below grade and down out of site,  
3 covered up.

4 COMMISSIONER CURTISS: Yes, I understand  
5 that. There may be some states that want to pursue  
6 that option though and I guess the first question is  
7 can you, if you want to do that, design a facility in  
8 accordance with the guidance? I think somebody  
9 alluded earlier to inconsistencies between the  
10 requirements between the two agencies. Are there  
11 particular inconsistencies that at this point stand in  
12 the way of you designing that facility as technical  
13 people if a state should decide to pursue that option?

14 MR. WOMELDORF: Well, we'll entertain the  
15 license application from U.S. Ecology for mixed waste  
16 disposal. So, let me ask Ron Gaynor if he can  
17 respond.

18 COMMISSIONER CURTISS: Okay.

19 MR. GAYNOR: You're referring specifically  
20 to the design guidance.

21 COMMISSIONER CURTISS: Right.

22 MR. GAYNOR: I guess U.S. Ecology's position  
23 is that some of the guidance has been very useful in  
24 clearing up some issues such as the identification of  
25 mixed waste. We believe that there are some problems

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1 with the design guidance. First of all, as Don  
2 mentioned, the specific guidance does not apply very  
3 well to a desert facility in California.

4 But the general guidance associated with  
5 design, based on our experience in dealing with both  
6 NRC and agreement states and EPA and authorized states  
7 is that it's not something U.S. Ecology would be  
8 willing to bet on. There are too many conflicts in  
9 the philosophical approaches between the agencies in  
10 their approach to disposal, in their approach to  
11 permitting and licensing and that if U.S. Ecology were  
12 to proceed, it would have to be funded by someone  
13 else. U.S. Ecology is not willing to take that  
14 financial risk. U.S. Ecology is not in a position to  
15 mediate between the agencies and frankly so far we've  
16 not identified anyone who is.

17 COMMISSIONER CURTISS: What's your answer to  
18 the problem? Would we be better off providing that  
19 one agency has that responsibility or getting back to  
20 the table and identifying the specific inconsistencies  
21 between the two sets of technical requirements? Is it  
22 a procedural question or a technical question and how  
23 would you approach it?

24 MR. GAYNOR: Well, I would expect that  
25 either of those approaches potentially could succeed.

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1 Certainly, it's my personal opinion that this  
2 represents a duplicative regulatory scheme that  
3 creates a great deal of additional cost, additional  
4 uncertainty and provides no benefit to public health  
5 and safety. So, it would make sense to me to have it  
6 one agency rather than two agencies. That goes beyond  
7 mixed waste to the NESHAP proposal which is before us  
8 right now.

9 COMMISSIONER CURTISS: I was going to get to  
10 that question next, but let me ask you one other  
11 question on mixed waste. In your dealings in other  
12 states, and I take it U.S. Ecology has other  
13 facilities or under initiatives underway, has it  
14 proven to be an easier problem to resolve, the mixed  
15 waste problem, where you have a RCRA state that is  
16 authorized, where both the authority for RCRA and the  
17 Atomic Energy Act are vested in the state as opposed  
18 to split between the federal government and the state?

19 MR. GAYNOR: Well, we're working on only one  
20 other project of this nature and that's in Nebraska.  
21 Nebraska is in that position. However, Nebraska is  
22 not as far along as the State of California is and  
23 they are close approaching it because they recognize  
24 the same problems. They have deferred their efforts  
25 toward a mixed waste permit for a year beyond the low-

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1 level waste license application to see if some of  
2 these things can be resolved. However, in that  
3 particular situation, U.S. Ecology is not risking its  
4 money. It's being funded by the Compact Commission.

5 COMMISSIONER CURTISS: Right. Okay. All  
6 right. Let me raise two questions on the pending EPA  
7 initiatives because you talked about one of them and  
8 the second one, of course, is the pending low-level  
9 waste standard that EPA has under consideration. The  
10 first, of course, is the NESHAPs under the Clean Air  
11 Act.

12 I wonder if you could give me your  
13 assessment since the NESHAPs have now been promulgated  
14 and they apply to low-level waste facilities and since  
15 I take it you're familiar with the general framework  
16 of the EPA proposed general standard, what impact do  
17 you think those initiatives will have on you since  
18 you're fairly far along in the siting process and with  
19 the operation schedule in late '91? As a practical  
20 matter, out there in the trenches, if you will, what  
21 impact will those two initiatives have if they go  
22 forward in their current form?

23 MR. GAYNOR: The NESHAP standard, we don't  
24 believe was ever really intended to apply to this type  
25 of facility, a land disposal facility or whatever,

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1 near surface disposal facility for low-level  
2 radioactive waste in particular. And based on our  
3 review of the standard, the guidance documents on the  
4 application of the standard, we believe that these  
5 facilities will be found exempt from the two  
6 provisions of the rule which is exempt from the  
7 requirement to apply for a construction permit and an  
8 exemption from the reporting. However, that depends  
9 on whether or not we're applying EPA's guidance on  
10 calculating these exemptions correctly. I'm not sure  
11 that they know the answer to that. We are meeting  
12 with them tomorrow to discuss that particular issue.

13 COMMISSIONER CURTISS: Okay. Do you have  
14 any comments on the general standard?

15 MR. GAYNOR: On the general standard with  
16 respect to the four millirem dose limit for a  
17 performance, with respect to licensing, we don't  
18 believe that that will affect either the facility in  
19 California or the facility in Nebraska. The  
20 performance assessment that has been presented in  
21 California and the preliminary performance assessment  
22 done in Nebraska both satisfy that requirement by an  
23 order of magnitude.

24 However, there is, I think, a significant  
25 problem associated with it that we won't see for a

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1 long time and that is associated with decommissioning  
2 of these facilities. As you know, these facilities  
3 have to be owned by the state or federal government  
4 and someone in the institution has to have the  
5 institutional control for 100 years after the facility  
6 is closed. They must accept transfer of the license.  
7 That transfer -- the conditions for transfer under  
8 Part 61 are that if the facility during an operational  
9 period and during the post-operational monitoring and  
10 maintenance period has performed to within the  
11 standard and continues to perform within the standard,  
12 then the license may be transferred.

13 The four millirem standard is within the  
14 normal fluctuations of background anywhere in the  
15 United States and you will not be able to -- you will  
16 be at least subject to not being able to demonstrate  
17 that the facility is performing. I would expect that  
18 there may be some difficulties in that license  
19 transfer at decommissioning. It's going to be  
20 difficult enough with the 25 millirems.

21 COMMISSIONER CURTISS: Okay. One final  
22 question. There's been a lot of discussion about  
23 potential liability concerns. I wonder if you might  
24 address what it is that you've done in the State of  
25 California to -- aside from financial assurance, to

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1 address any potential liability concerns that exist.

2 MR. WOMELDORF: Talk about your requirements  
3 first.

4 MR. GAYNOR: I can talk about that.

5 The requirements on us, which are in the  
6 regulations in California, are that from the nuclear  
7 liability issue we are required to carry a nuclear  
8 facility liability insurance policy, minimum face  
9 value of \$10 million. Of course that's subject to  
10 change by regulation periodically. We've been assured  
11 by our administrator of facility insurers who carry  
12 policies on our existing facilities that they  
13 anticipate that that policy will be available for this  
14 facility and also for the Nebraska facility.

15 COMMISSIONER CURTISS: Is that through  
16 American Nuclear Insurers?

17 MR. GAYNOR: Yes, it is.

18 MR. WOMELDORF: And the second part of it is  
19 under the compact legislation we are to set up a third  
20 party liability fund. The details of that remain to  
21 be worked out.

22 COMMISSIONER CURTISS: Is that insurance  
23 generally available for third party liability?

24 MR. WOMELDORF: It is not specified that we  
25 will have a third party insurance policy. It says we

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1 will set up a third party liability fund.

2 CHAIRMAN CARR: So you may self-insure, in  
3 other words?

4 MR. WOMELDORF: That's correct. That's a  
5 possibility.

6 COMMISSIONER CURTISS: Collected through the  
7 surcharges during the operation of the facility?

8 MR. WOMELDORF: That's correct. Right.

9 COMMISSIONER CURTISS: Maybe I missed this  
10 question in response to Commissioner Rogers' point.  
11 Do you have an estimate of what your base cost per  
12 disposal -- for disposal per cubic foot will be?

13 MR. WOMELDORF: You have your own data as  
14 developed so far.

15 MR. GAYNOR: Based on the current  
16 projections for volume, which is the most sensitive  
17 factor in these facilities, the average dollar per  
18 cubic foot cost would be about \$140.00 a cubic foot.

19 COMMISSIONER CURTISS: All right. That's  
20 all I have. Thanks.

21 CHAIRMAN CARR: How about, if you could,  
22 summarize your -- the important lessons you learned in  
23 communicating with the public and soliciting their  
24 comments on the project for our benefit? We seem to  
25 have a little trouble communicating with the public

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1 and maybe we can learn something from the way you did  
2 it.

3 MR. WOMELDORF: Yes. I'll ask Ron to  
4 respond to that one. I think that one thing that we  
5 found to be very, very impressive and very, very good  
6 was how the public was involved. They weren't simply  
7 informed, but they were involved. And I think I went  
8 to almost every one of the public meetings. Reuben  
9 attended the ones that I didn't get to.

10 And in the first round the company told the  
11 folks what was going to happen and asked for comments.  
12 Then they went back for the second round. They told  
13 folks, "This is what we did in response to what you  
14 told us the first time," and when they went back again  
15 to the third round people began to say, "Hey, they  
16 folks are here to find out from us what we think."  
17 That I found to be an exceedingly effective  
18 involvement aspect.

19 Ron?

20 MR. GAYNOR: I think Don has hit on probably  
21 the key thing that we've learned. It's almost like  
22 the makings of a speech. You tell them what you're  
23 going to tell them and then tell them and then tell  
24 them what you told them. You're developing a rapport,  
25 some confidence, a record that -- I think that was

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1       probably the most important thing.

2               Certainly the things that we've learned  
3       hopefully that are beneficial could fill a book.  
4       There have been a lot of things. At one of those  
5       meetings, I stepped up to introduce the meeting and  
6       introduce myself and before I could get my name out in  
7       front of these 400 people with all the signs and the  
8       babies and such things, some lady in the background  
9       got up and said, "Get out of our town, you SOB," and  
10      so on and so on and set the tone for the meeting.

11             CHAIRMAN CARR: I remember meetings like  
12      that.

13             MR. GAYNOR: So hopefully we learned quite a  
14      bit. I don't know that I ever want to apply it  
15      somewhere else, but I do think that what Don has said  
16      is the most important thing for a project of this  
17      nature, is openness and, as I mentioned at the  
18      beginning of what I had to say, that the way this  
19      project was set up with U.S. Ecology being the only  
20      company in the State of California looking for a low-  
21      level radioactive waste disposal facility allowed us  
22      to be totally open with everyone. We didn't have to  
23      keep anything from --

24             CHAIRMAN CARR: You weren't worried about  
25      proprietary information then?

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1 MR. GAYNOR: That's correct, we weren't in  
2 competition with any other business. So, we could be  
3 totally open and between that and what Don mentioned,  
4 I think those were the two principal lessons.

5 COMMISSIONER CURTISS: Are you in that same  
6 posture in Nebraska, operating the same way pretty  
7 much?

8 MR. GAYNOR: Yes. Yes.

9 COMMISSIONER CURTISS: Okay.

10 CHAIRMAN CARR: How about the Commission's  
11 low-level waste licensing review process, do you have  
12 any recommendations to improve that or how does it  
13 look to you from what you're going through?

14 MR. JUNKERT: I think the process as we're  
15 implementing it is going to work. I don't see any  
16 major hangups coming. I don't foresee any major  
17 problems. We've structured the application in the  
18 format that was given. The review process is being  
19 handled the same way. I think it's a workable system  
20 with the exception of perhaps a little clean up of the  
21 documents, I think the system will work.

22 CHAIRMAN CARR: Our NUREG says that, "A  
23 review of the license application, preparation of the  
24 safety evaluation report and the evaluation impact  
25 statement requires about eight person years of

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1 effort." How does that check out with you? Is that  
2 about the right amount or is that grossly under rated  
3 or over?

4 MR. JUNKERT: I believe in our case it's  
5 adequate. I haven't asked for an hour by hour, blow  
6 by blow accounting from Weston because it's a fixed  
7 price contract, but I think they looked at it quite  
8 detail to make sure that their manpower requirements  
9 are met and also they have enough money to pay for  
10 their staff, unless they would be willing to talk a  
11 little more about the correlation between the estimate  
12 and what actually they came up with.

13 David, do you have anything to add?

14 MR. SIEFKEN: Well, I think the key point  
15 has been using 1200. We go through a very systematic  
16 review, as would the NRC staff. The major challenge  
17 is, again, integrating all of those pieces. You have  
18 to have the site people looking at the design because  
19 your design is basically responding to a site, whether  
20 it's precipitation is infiltrating or whether it's any  
21 ground motion associated with seismic activity and  
22 shaking the trench cover for the BC waste.

23 So, I think this is something that we've  
24 focused on in our review. I think it's something that  
25 the staff would focus on also in their review, is how

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1 do you make all the pieces fit together to make the  
2 whole. We have done, and I think your guidance was  
3 correct, you need a very wide diverse group of staff  
4 in terms of the technical disciplines that they have  
5 in order to bring them together on all the different  
6 aspects. We have someplace between 24 and 30 people  
7 working on the application, but of course they're not  
8 working solely on this particular project.

9 In terms of the level of effort, it may be  
10 eight, it may be a little bit more than that by the  
11 time we get through the interrogatory process because  
12 the application was very substantial. We still have  
13 some additional confirmatory data coming in that we  
14 will be addressing probably in a second round of  
15 interrogatories as well, particularly as we look at  
16 what happens to the moisture pulse from where we  
17 simulated a recharge event in looking at the  
18 redistribution of the moisture and how that affects  
19 the modeling.

20 So, each of the different areas have to  
21 interface with the other areas in the license  
22 application. That's been the biggest challenge, to  
23 make sure that happens. I'm sure your staff would be  
24 familiar with that too.

25 CHAIRMAN CARR: All right. We've gotten--

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1 I, we, have gotten a few complaints from, I guess, the  
2 Cal Rad Forum that you guys are going to cost more  
3 money than required by our regulations basically  
4 because we gave out some guidance that you've decided  
5 to implement. So, we're kind of responsible for that  
6 in their view and we ought to get you to relax a  
7 little and reduce the price of going first class. Do  
8 you have any comments on that?

9 MR. WOMELDORF: Well, let me make a comment  
10 and then I'm going to ask Ron Gaynor to respond to  
11 that. I think the perception may not be entirely  
12 accurate on the part of those folks who are  
13 complaining about --

14 CHAIRMAN CARR: I assume they're complaining  
15 to you too.

16 MR. WOMELDORF: Oh, yes, right. I think  
17 they are perhaps mis-seeing what the real changes have  
18 been. I'd like to ask Ron to comment on that.

19 MR. GAYNOR: Well, there have been a number  
20 of reasons for the project to increase beyond what was  
21 included in our proposal in 1984 and I'm sure we'll be  
22 dealing with Cal Rad Forum for a long time on those  
23 reasons. We have provided them with some reasons for  
24 cost increases and you can blame up for their phone  
25 calls to you because one of those reasons that we

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1 referenced are the requirements or guidance in NUREGs  
2 1199 and 1200.

3 And the position, I guess, that we have  
4 taken and believe is that our application, our  
5 proposal in 1984 was based on the requirements of 10  
6 CFR Part 61 and related requires as we interpreted  
7 them. When NUREGs 1199 and 1200 were published, that  
8 greatly expanded what was necessary to address in the  
9 license application. For instance, in Section 1.6 of  
10 those regulatory guidance documents, titled  
11 "Conformance to Regulatory Guides," it says  
12 essentially that the applicant must follow all  
13 guidance referenced in NUREG 1199 or explain why.  
14 NUREG 1199 incorporates a lot of guidance that is not  
15 specific to near-surface disposal and certainly is  
16 inapplicable to a desert location in California.

17 That requirement alone took a great deal of  
18 time, staff time, consultant time and effort to review  
19 the guidance documents, guidance related -- just a  
20 couple of examples, 10 CFR Part 100 on seismicity  
21 design, seismic design for nuclear power facilities--  
22 to see if there was anything there that should be  
23 applied to a near-surface disposal facility and then  
24 to address it or explain it away. So, there were--  
25 we ended up with a 7,000 page license application

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1 which was never contemplated in 1984.

2 So, that's the source, I think, of --

3 CHAIRMAN CARR: So, in effect, you'd  
4 recommend we take a look at maybe modifying that to  
5 better fit a site or a disposal facility?

6 MR. GAYNOR: Well, certainly, as was  
7 mentioned earlier, having the guidance document is  
8 very positive. It gives us, who are the first ones to  
9 do this, a format to follow. It gives the --

10 CHAIRMAN CARR: California didn't lay those  
11 on you as a requirement though officially, did they?

12 MR. JUNKERT: Not officially.

13 MR. GAYNOR: They are not regulations.

14 MR. JUNKERT: Okay. We laid it on them that  
15 they are to follow 1199 and 1200 and provide an  
16 explanation if they were not following a particular  
17 guidance document because it didn't apply, we want to  
18 see a statement as to why it does not apply. So, the  
19 effort was expended, as Ron says.

20 CHAIRMAN CARR: Okay.

21 MR. JUNKERT: But it was deemed necessary.

22 MR. WOMELDORF: The point that I think maybe  
23 isn't clear is whether or not it's changes in your  
24 regulations that have caused this additional input.  
25 It isn't that, it's the use of NUREGs rather than

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1 regulatory changes as such.

2 CHAIRMAN CARR: The implication was that our  
3 NUREGs, which we don't consider as real requirements,  
4 were being laid on -- California was laying them on as  
5 a real requirement and that was the basis for their  
6 complaint, I think, if I read it right.

7 MR. WOMELDORF: Okay. Well, we'll take  
8 credit for that.

9 MR. JUNKERT: I'd like to make a clarifying  
10 statement. It was always acknowledged that it was a  
11 guidance document, but nevertheless it was that's the  
12 best that's available --

13 CHAIRMAN CARR: Guidance, but strong  
14 guidance.

15 MR. JUNKERT: It's strong guidance. It came  
16 from the right source and therefore we have to make  
17 sure that all the areas are covered. The way to do  
18 that is to go through 1199. If it doesn't apply, then  
19 say why it does not apply.

20 CHAIRMAN CARR: But you should only have to  
21 do that once, right?

22 MR. GAYNOR: That's correct. Those costs  
23 are under the bridge.

24 COMMISSIONER CURTISS: I take it what Ron is  
25 saying is since the documents sweep in a lot of

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1 guidance, that we would benefit by being especially  
2 careful in the preparation of those guidance documents  
3 to require what we mean to require and require what  
4 the regulations require so that in the event of an  
5 issue like Part 100 siting, the resources expended to  
6 go through an evaluation of whether that was really  
7 appropriate here, there are going to be some simple  
8 ones where reactor requirements don't apply to low-  
9 level waste facilities.

10 But in a case that may be less clear, it  
11 sounds to me like you expended some degree of  
12 resources to go through the evaluation and reach the  
13 conclusion that that, in fact, did not apply here.  
14 You may have to do that in any event to the extent  
15 that we can help you by being especially clear on what  
16 we intend to require and why in those guidance  
17 documents. It sounds like it benefits both sides.

18 MR. GAYNOR: I would expect that -- well,  
19 anything that's done with those in the future won't  
20 affect this project because we're past that stage.  
21 But if there are any revisions contemplated in those  
22 documents, there may be some areas that could be  
23 changed either in wording or tone or what's  
24 incorporated so that others don't have to go through  
25 it. It didn't really impact to the design or the

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1 sitting or anything. It's just a matter of the level  
2 of effort involved in putting a license application  
3 together.

4 COMMISSIONER CURTISS: Well, before you get  
5 your Nebraska application, send in your comments, what  
6 it is that you think needs to be clarified based upon  
7 your experience here that could be helpful.

8 MR. GAYNOR: That's in July, by the way.

9 COMMISSIONER CURTISS: Okay.

10 CHAIRMAN CARR: Well, I want to thank you  
11 for this excellent briefing. The Commission is  
12 pleased with the progress California has made to date  
13 in ensuring the timely development of a new low-level  
14 waste disposal facility. Your efforts to seek  
15 constructive comments from members of the public and  
16 numerous advisory committees through direct and open  
17 communication are particularly commendable.

18 Your experiences in public communication and  
19 the pre-licensing consultation process will be helpful  
20 to the Commission and other agreement states as we  
21 embark on the licensing of these new facilities.

22 I encourage the NRC staff to consider these  
23 experiences in evaluating our own regulatory program.  
24 I also encourage the NRC staff to work with the State  
25 of California and other states in resolving state

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1 concerns about regulatory uncertainties and in  
2 responding to requests for technical assistance.

3 I wish the Department of Health Services  
4 continued success as it proceeds in reviewing the  
5 license application for the new low-level waste  
6 disposal facility for the Southwestern Compact. Along  
7 with NRC and other states, you bear the important  
8 responsibility of facilitating the timely availability  
9 of disposal facilities in addition to your primary  
10 responsibility of protecting human health and the  
11 environment from the risk associated with management  
12 and disposal of low-level radioactive waste.

13 Thank you once again for your informative  
14 briefing.

15 Are there any further comments?

16 If not, we stand adjourned.

17 (Whereupon, at 3:51 p.m., the above-entitled  
18 matter was concluded.)  
19  
20  
21  
22  
23  
24  
25

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CERTIFICATE OF TRANSCRIBER

This is to certify that the attached events of a meeting  
of the United States Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON THE DEVELOPMENT OF LOW-LEVEL WASTE  
DISPOSAL CAPABILITY BY THE SOUTHWESTERN COMPACT

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: MARCH 12, 1990

were transcribed by me. I further certify that said transcription  
is accurate and complete, to the best of my ability, and that the  
transcript is a true and accurate record of the foregoing events.

Carol Lynch

Reporter's name: Peter Lynch

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3/12/90

SCHEDULING NOTES

Title: Briefing on the Development of LLW Disposal Capability  
by the Southwestern Compact

Scheduled: 2:00 p.m., Monday, March 12, 1990 (OPEN)

Duration: Approx 1-1/2 hrs

Participants: California Department of Health Services

- |   |                           |         |
|---|---------------------------|---------|
| - Don J. Womeldorf<br>Department of Health Services | Statutory Framework       | 15 mins |
| - Ron Gaynor<br>US Ecology, Inc.                    | Site Selection<br>Process | 20 mins |
| - Reuben Junkert<br>Department of Health Services   | Disposal Technology       | 10 mins |
| - David Siefken<br>Roy F. Weston, Inc.              | License Review<br>Process | 15 mins |

**CALIFORNIA PRESENTATION OUTLINE  
U.S. NUCLEAR REGULATORY COMMISSION**

**March 12, 1990, 2:00 PM**

**I. INTRODUCTION - Don Womeldorf, Chief, DHS Environmental Management Branch**

**A. Statutory Framework**

1. AB 1513
2. SB 342 - Compact formation
  - License designee selection
  - Statewide site screening
3. AB 1000
4. Southwestern Compact (P.L. 100-712)

**B. Regulatory Framework**

1. 10 CFR Part 61 adopted by reference
2. DHS Agreement State organization
  - Environmental Management Branch
  - Radiologic Health Branch
  - Toxic Substances Control Program
3. Regional Water Quality Control Board
4. Advisory Groups

**II. SITE SELECTION & CHARACTERIZATION - Ron Gaynor, Senior Vice President,  
US Ecology, Inc.**

All activities planned with satisfaction of 10 CFR 61.23 in mind.

**A. Defined Optimum Site Based On**

- 10 CFR Part 61
- State siting guidelines and statewide screening
- US Ecology desert site experience

**B. Identified 18 Basins Satisfying Basic Requirements**

**C. Public/Agency Involvement**

- Agencies: Governor's office coordination
- Public meeting and workshops -- local service clubs
- Citizens Advisory Committee
- League of Women Voters

**D. Identified 16 Candidate Siting Areas**

- Using refined technical criteria & application of discretionary criteria rated by public & CAC

**E. Identified 3 Candidate Sites**

- Each technically excellent with community support
- Local Advisory Committees formed

## CALIFORNIA PRESENTATION OUTLINE

### F. Identified Proposed Site Based on Technical Superiority

- LAC for site continued
- Site description

### G. Characterization and Prelicensing Consultation

1. Project organization
  - Company experience
  - Expert contractors
  - QA approach
  - License Application integration approach
2. Agency consultation
  - Site selection
  - General site characterization plans (Included NRC)
  - Vadose zone testing (Included USGS)
  - Source term
  - Transport models
  - Pathway analyses
  - Release scenarios
  - Environmental monitoring
  - Facility design

### H. Environmental Impact Mitigation

- desert tortoise
- emergency response
- other

## III. DESIGN GUIDANCE - Reuben Junkert, Project Director, DHS Low-Level Radioactive Waste Program

### A. Focus on arid region characteristics

### B. Alternatives considered but eliminated

1. Above-ground vaults
2. Below-ground vaults
3. Earth-mounded concrete bunkers

### C. Alternatives Evaluated

1. Small annual trenches
2. Compacted sand backfill
3. Concrete backfill
4. Clay liners
5. Deeper burial
6. Concrete overpacks
7. Improved covers
8. All waste stabilized
9. Separate Class B and C trenches
10. Lined and unlined auger holes



## CALIFORNIA PRESENTATION OUTLINE

### D. Specific Guidance Selected

1. Deeper burial
2. Separate Class A from Classes B and C wastes and >30R/hour packages
3. Minimize open disposal areas
4. Accelerate consolidation with soil surcharge

### IV. LICENSE APPLICATION REVIEW - Reuben Junkert, DHS Project Director; David Siefken, Vice President, Roy F. Weston, Inc.

1. Licensing Approach
  - Licensing process
  - Licensing team
2. Interagency Technical Support
  - Radiologic Health Branch (DHS)
  - Toxic Substances Control Program (DHS)
  - RWQCB
  - Department of Fish and Game
3. Technical Support Contractors
  - Quality Assurance
  - Weston license application review team
  - Weston team qualifications and experience
  - Weston pre-licensing support

### V. SUMMARY - Don Womeldorf

#### A. License Review Schedule

1. Application found complete on December 8, 1989
2. February field review at site
3. Detailed interrogatories in March
4. Licensing decision anticipated in December, 1990
5. Land transfer, license issued early 1991
6. Facility in operation by end of 1991

#### B. Potential NRC Assistance Needs

#### C. Regulatory Uncertainties

1. Mixed waste
2. NESHAP

#### D. Closing

**CALIFORNIA'S PROGRAM**  
*for*  
**LOW-LEVEL RADIOACTIVE WASTE DISPOSAL FACILITY**  
**DEVELOPMENT, LICENSING AND REGULATION**

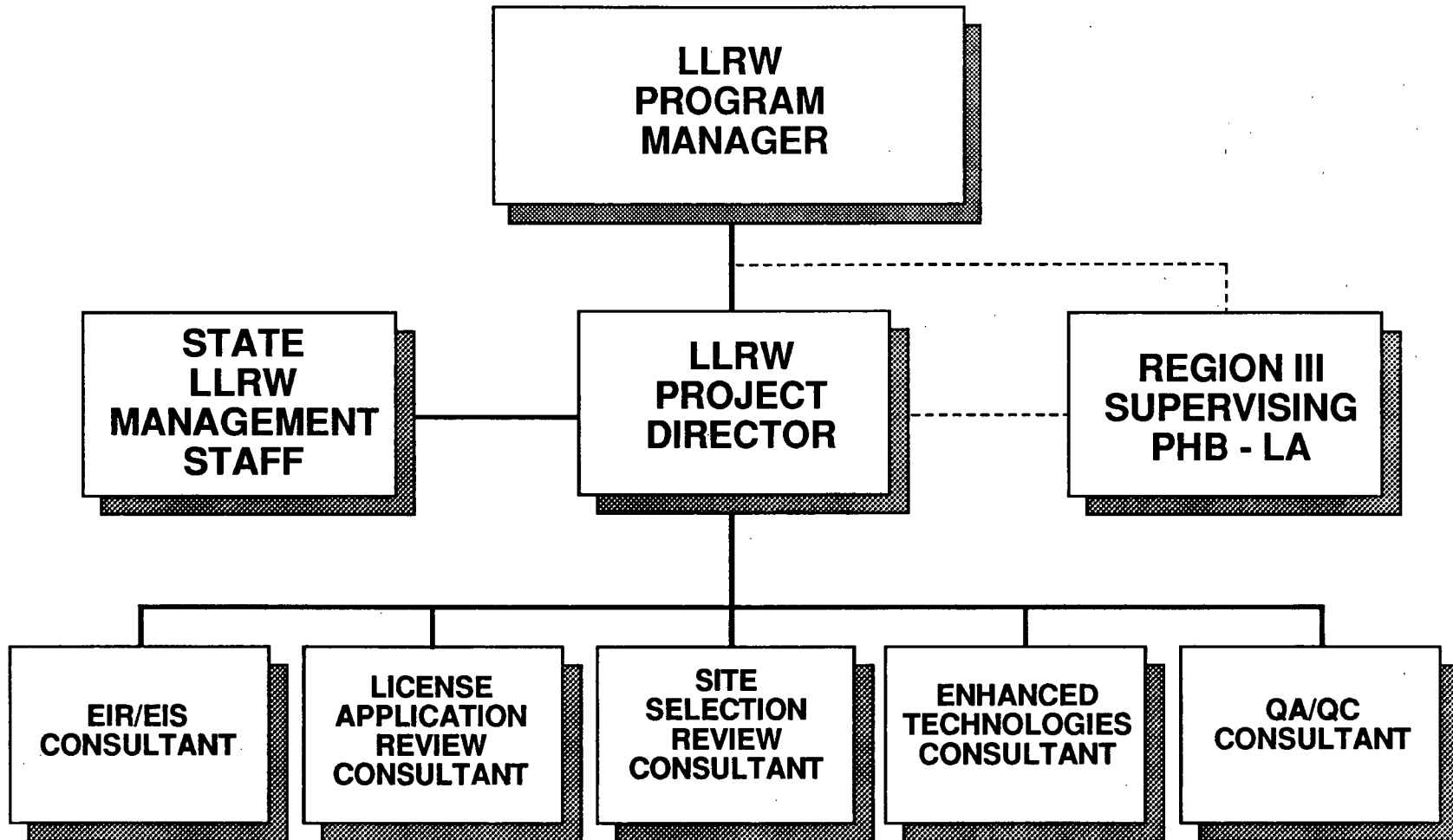
## **STATUTORY FRAMEWORK**

- **AB 1513**
- **SB 342**
- **AB 1000**
- **P.L. 100-712**

## **REGULATORY FRAMEWORK**

- **10 CFR 61**
- **Environmental Management Branch**
- **Radiologic Health Branch**
- **Regional Water Quality Control Board**

## DHS LLRW REGULATORY PROGRAM ORGANIZATION



## **ADVISORY GROUPS**

- **LLRW Advisory Committee**
- **Proposal Evaluation**
- **Environmental Impact**
- **Desert Tortoise**
- **Mixed Waste**

### **ADVISORY GROUPS (continued)**

- **License Review**
- **Fiscal Review**
- **Citizens Advisory Committee**
- **Local Advisory Committees**

## **SITE SELECTION AND CHARACTERIZATION**

- **Goal: Technically excellent site with highest degree of public support**
- **Guided by requirements of 10 CFR 61.23**



## **DEFINED OPTIMUM SITE**

- **10 CFR 61 site suitability requirements**
- **State siting guidelines**
- **Arid sites operating experience**
- **DHS screening**

## **STATEWIDE SCREENING**

- **Reviewed 71 desert basins**
- **Identified 16 basins best satisfying criteria**
- **Added 2 basins proposed by public interest groups**
- **Began public and agency involvement**

## **PUBLIC AND AGENCY INVOLVEMENT**

- **Four project review meetings with local, state and federal agencies**
- **Three rounds of public meetings (23 total)**
- **Six Citizens Advisory Committee meetings**
- **Native American tribal consultations**
- **Media briefings, service club presentations**
- **Beatty LLRW disposal site tours**

## **AGENCY MEETINGS**

- **Governor's Office of Permit Assistance sponsored**
- **State, local and federal agencies involved**
- **NRC Region V participated**

## **CITIZENS ADVISORY COMMITTEE APPOINTMENTS**

- **County Boards of Supervisors**
- **League of Women Voters**
- **Sierra Club**
- **Native American Heritage Commission**
- **Radioactive materials users (CALRAD Forum)**

## **CITIZENS ADVISORY COMMITTEE SUPPORT**

- **League of Women Voters**
- **Resource Persons**
  - **DHS**
  - **BLM**
  - **NRC**
  - **County Environmental Health Agencies**
  - **US Ecology**

## **16 CANDIDATE SITING AREAS**

- **Refined technical criteria**
- **Weighted discretionary criteria**
- **Field reconnaissance**
- **Public and CAC meeting input**

### **3 CANDIDATE SITES**

- **Fatal flaws analyses: groundwater and bedrock depth, seismic, flooding**
- **Narrowed to 1 square mile**
- **Environmental and socio-economic impact data**



## **CONTINUED PUBLIC AND AGENCY INVOLVEMENT**

- **Agency consultation**
- **Two rounds of Local Advisory Committee/public meetings**
- **Three CAC meetings**
- **Native American tribal consultations**
- **Media interviews, service clubs, Beatty tours**

## **PROPOSED SITE**

- **Public and LAC input**
- **Agency consultation on desert tortoise**
- **Technical superiority paramount**

## **SITE CHARACTERIZATION, PRE-LICENSING CONSULTATION**

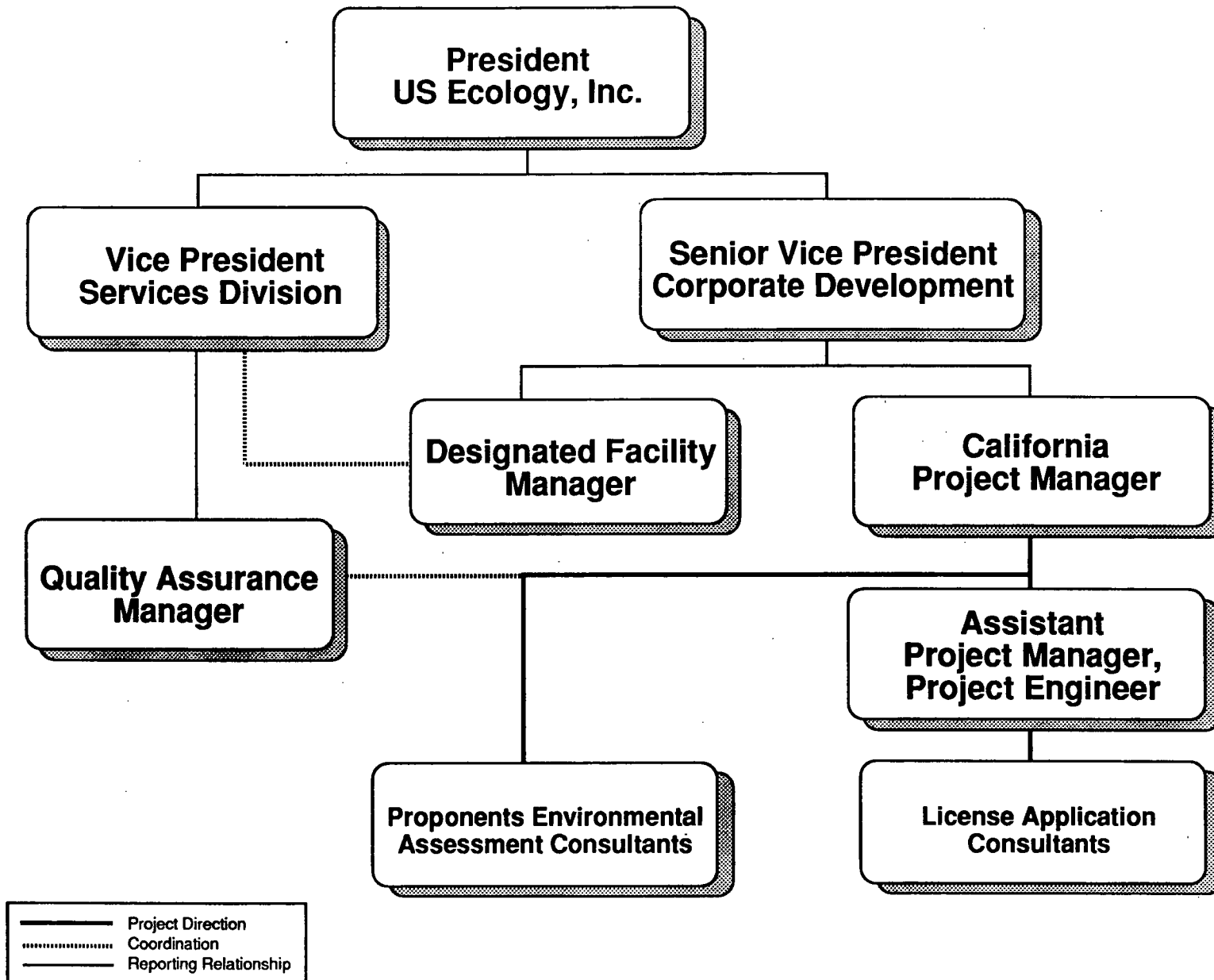
- **Project Team**
  - **Key personnel**
  - **Technical contractors**
  - **Quality assurance**
  - **Integration approach**

## **SITE CHARACTERIZATION, PRE-LICENSING CONSULTATION**

**(continued)**

- **Agency Consultation**
  - **General site characterization plans  
(included NRC)**
  - **Vadose zone testing (included USGS)**
  - **Source term**
  - **Transport models**
  - **Pathways analyses/release scenarios**
  - **Facility design**
  - **Environmental monitoring**

**US ECOLOGY, INC.  
CORPORATE ORGANIZATION  
CALIFORNIA LLRW DISPOSAL PROJECT**



## **ENVIRONMENTAL IMPACT MITIGATION/COMPENSATION**

- **Desert tortoise, revegetation**
- **Emergency response**
- **Dust control, visual impacts**
- **Ethnographic resources**

## **DESIGN GUIDANCE**

- **Focus on arid region characteristics**
  - **Low precipitation, high evaporation**
  - **Deep groundwater**
  - **Relatively permeable soils**
  - **Low seismic risk**

## **ALTERNATIVES CONSIDERED BUT ELIMINATED**

- **Above-ground vaults**
- **Below-ground vaults**
- **Earth-mounded concrete bunkers**



## **ALTERNATIVES EVALUATED**

- **Small annual trenches**
- **Compacted sand backfill**
- **Concrete backfill**
- **Clay liners**
- **Deeper burial**

## **ALTERNATIVES EVALUATED (continued)**

- **Concrete overpacks**
- **Improved covers**
- **All waste stabilized**
- **Separate Class A from Class B and C**
- **Lined and unlined auger holes**

## **SPECIFIC DHS GUIDANCE**

- **Deeper burial ( 5 meter minimum)**
- **Separate Class A from Classes B, C and >30R/Hour**
- **Minimize open disposal area**
- **Accelerate consolidation with soil surcharge**

## **LICENSING PROCESS**

- **DHS and contractor quality assurance programs**
- **Completeness review**
- **Detailed technical review of license application**
- **License review team site visit with applicant**
- **Interrogatories/responses**

## **LICENSING PROCESS (continued)**

- **Public hearings and input**
- **Draft Safety Evaluation Report**
- **Review of confirmatory data**
- **Final Safety Evaluation Report**
- **Land transfer, license issued**

## **LICENSING TEAM**

- **Environmental Management Branch Staff**
  - **Program management**
  - **Quality assurance**
  - **Technical review integration**
- **Interagency Technical Support Group**
- **Technical support contractors**

## **INTERAGENCY TECHNICAL SUPPORT**

<b>DHS/EMB</b>	<b>QA/QC</b>
<b>DHS/EMB &amp; RWQCB</b>	<b>Soils engineering</b>
<b>DHS/EMB &amp; RWQCB</b>	<b>Hydrology</b>
<b>DHS/EMB</b>	<b>Structural engineering</b>
<b>DHS/EMB &amp; RWQCB</b>	<b>Construction engineering</b>
<b>DHS/EMB</b>	<b>Economics</b>
<b>DHS/EMB</b>	<b>Financial</b>
<b>DHS/EMB &amp; RHB</b>	<b>Health physics</b>

**INTERAGENCY TECHNICAL SUPPORT**  
(continued)

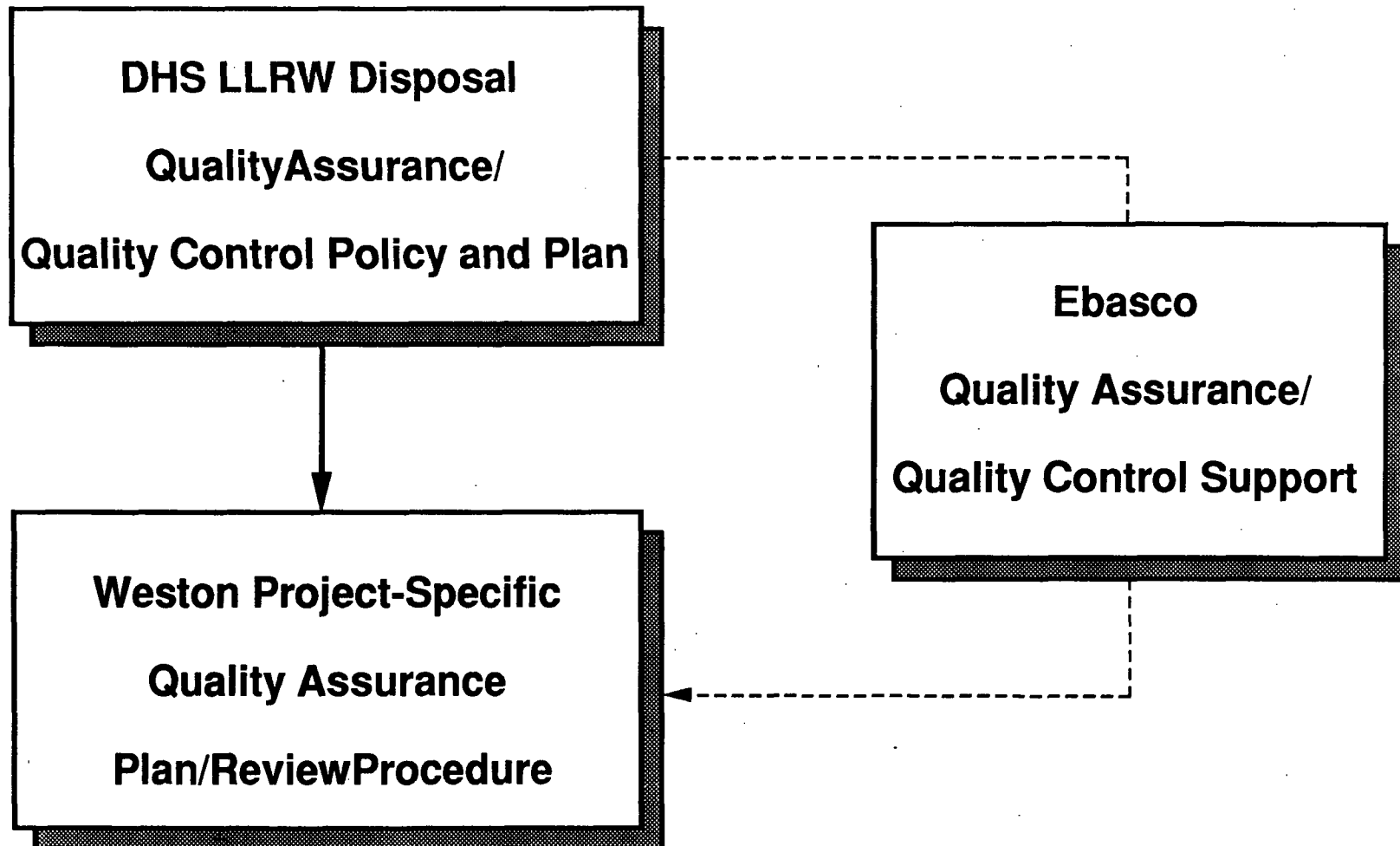
<b>DHS/EMB</b>	<b>Operations</b>
<b>DHS</b>	<b>Legal</b>
<b>DHS/EMB &amp; DFG</b>	<b>Biology</b>
<b>DHS/TSCP &amp; RWQCB</b>	<b>Environmental engineering</b>
<b>RWQCB</b>	<b>Geology</b>
<b>RWQCB</b>	<b>Chemistry</b>
<b>RWQCB</b>	<b>Seismology</b>



## **TECHNICAL SUPPORT CONTRACTORS**

- **QA/QC**
  - **Ebasco**
- **Environmental Impact Report/Statement**
  - **Dames and Moore**
  - **DOE LLRW Management Program (EG&G)**
- **License application review assistance**
  - **Roy F. Weston**
  - **Rogers & Associates**

## QUALITY ASSURANCE FOR LICENSE APPLICATION REVIEW

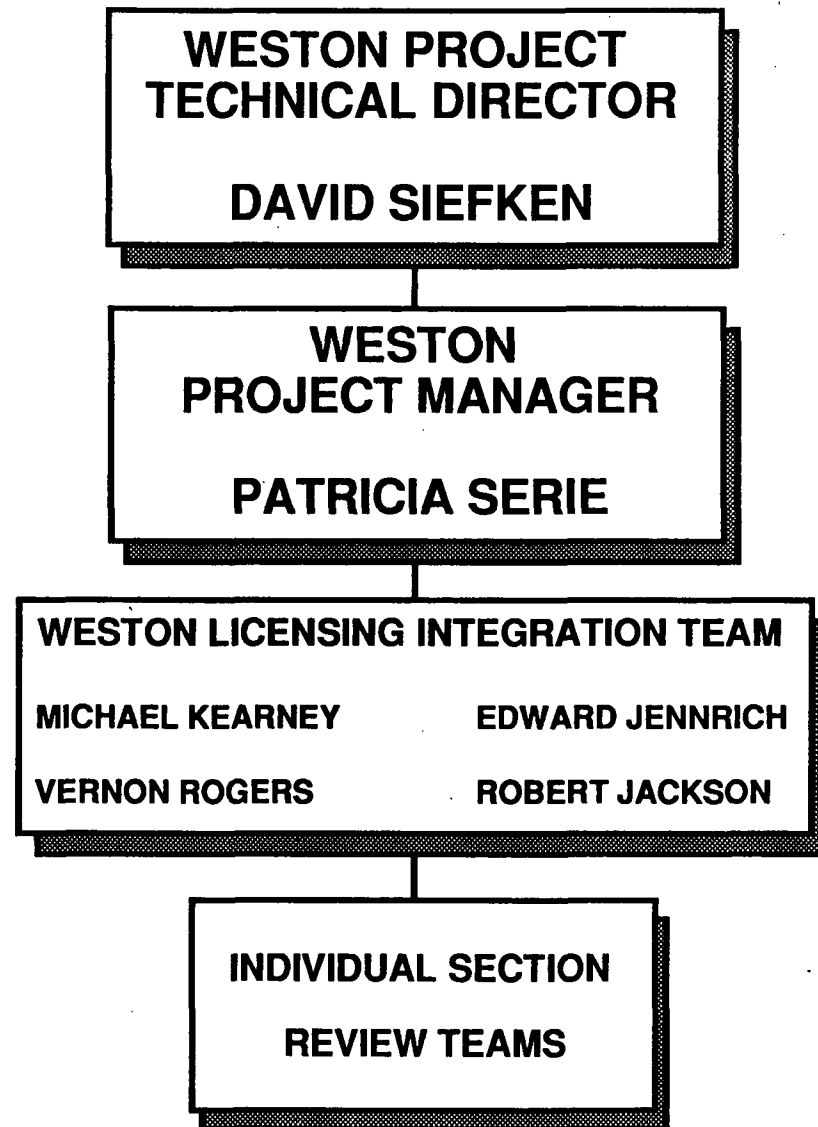


## **WESTON LICENSE APPLICATION REVIEW TEAM**

**ROY F. WESTON, INC.**

**ROGERS & ASSOCIATES  
ENGINEERING CO.**

# WESTON PROJECT ORGANIZATION



## **WESTON LICENSE APPLICATION REVIEW TEAM QUALIFICATIONS AND EXPERIENCE**

- **Integrated matrix of senior technical experts**
  - **Geology, geophysics, seismology**
  - **Surface water hydrology**
  - **Groundwater hydrology, geochemistry**
  - **Civil, environmental and nuclear engineering**
  - **Health physics**
  - **Chemistry**

## **WESTON LICENSE APPLICATION REVIEW TEAM QUALIFICATIONS AND EXPERIENCE**

- **Direct NRC staff experience**
  - **Low-level waste**
  - **High-level waste**
  - **Uranium mill tailings**
  - **Fuel cycle licenses**

## **WESTON LICENSE APPLICATION REVIEW TEAM QUALIFICATIONS AND EXPERIENCE**

- **Technical support to states in LLRW disposal facility development and regulation**
  - **Site selection and characterization**
  - **Facility design**
  - **Performance safety /assessments**
  - **Licensing and regulatory compliance**
  - **Public involvement**

## **WESTON PRE-LICENSING SUPPORT TO DHS**

- **Site selection review and site visits**
- **Site characterization review**
- **Environmental monitoring plan review**
- **Pathways analysis working paper review**
- **Model documentation/validation review**
- **DHS license review plan assistance**



## **LICENSE REVIEW SCHEDULE**

- **Complete application on December 8, 1989**
- **February field review and conference**
- **Detailed interrogatories March, 1990**
- **Environmental reviews complete November**
- **Licensing decision anticipated December**
- **Land transfer, license issue early 1991**
- **Facility operation end of 1991**

## **POTENTIAL NRC ASSISTANCE NEEDS**

- **Generator waste verification**
- **Uniform manifest**
- **Financial assurance mechanisms**
- **Long-term care plans**
- **Regulatory uncertainties**

## **REGULATORY UNCERTAINTIES**

- **Mixed Waste**
  - **Permit uncertainties**
  - **Very low volumes**
- **NESHAP**
  - **40 CFR 61 rulemaking**

## **SUMMARY**

- **Open site selection process**
- **Site characterization plans**
  - **Agencies reviewed**
  - **Pre-licensing consultation**
- **License review underway**
  - **Comprehensive technical support**
  - **Land transfer, license early 1991**
- **NRC assistance**





CALIFORNIA'S PROGRAM FOR  
LOW-LEVEL RADIOACTIVE WASTE FACILITY LICENSING  
AND REGULATION

A Briefing Paper for the  
Nuclear Regulatory Commission

in preparation for a presentation  
March 12, 1990

Don J. Womeldorf and Reuben Junkert  
California Department of Health Services  
714 P Street, Sacramento, CA 95814  
(916) 445-0498

(NOTE: This briefing paper is provided for background purposes. The oral presentation before the Commission will follow the presentation outline rather than this background paper.)

California has been an agreement state since 1962, and has responsibility and authority to issue a low-level radioactive waste (LLRW) disposal license. The U.S. Nuclear Regulatory Commission (NRC) reviews the California radioactive materials regulatory program, including low-level radioactive waste management, to ensure that the State's program remains compatible with federal standards.

California's actions to license a LLRW disposal facility are set against a background of federal and state legislation. The California Legislature in 1982 passed legislation in response to the 1980 federal LLRW Policy Act (PL 96-573), which gave interim storage authority to the State. A comprehensive statute was enacted in 1983 which mandated the State to establish a disposal facility, instructed the Governor to seek compact partners, named the Department of Health Services as lead agency and defined its duties, which included conducting a statewide site screening study, and instructed the Department to select, by a competitive process, a private firm as license designee. The role of the firm was to choose a site, characterize it, apply to the Department for a license, then construct and operate the facility under Department regulation. US Ecology, Inc., selected in December, 1985, has submitted a complete license application for disposal of all commercial LLRW except mixed waste. The proposed facility is located in the Ward Valley, about 25 miles west of Needles, San Bernardino County. When the facility goes into operation in 1991, the Department will have full regulatory and rate setting authority over disposal of LLRW generated by Arizona, California, North Dakota, and South Dakota, the party states to the Southwestern Compact. The Compact resulted from legislation in the party states passed in 1987, 1988, and 1989; Congress ratified the Compact with PL 100-712.

California and the Compact's actions are geared to meet the requirements of the 1985 Low-Level Radioactive Waste Policy Amendments Act (PL 99-240). This briefing paper describes the actions taken by the Department in carrying out its regulatory responsibilities.

#### FUNDING AND STAFFING

California's enabling legislation puts the financial burden of site selection and license preparation upon the license designee, including payment of an annual license fee of \$250,000 to the Department. In addition to the license fee, the Department has access to the surcharge rebates awarded as a result of having met milestones under PL 99-240. To date, the Southwestern Compact has received about \$1.5 million in rebates. As host state, California has the benefit of most of the money. When the facility goes into operation, surcharges will be assessed upon disposal fees to pay for all State and Compact staff and expenses.

The license fee supports a project director, who is an engineer; a health physicist; an economist; and a clerical support position. Surcharge rebates fund a second engineer, two additional health physicists, a second economist, and a radiochemist. The Department furnishes such assistance as program management and legal services by assigning appropriate staff on a part-time basis. Future staffing will include facility and field inspectors, data management personnel, and additional laboratory and clerical support.

#### PROGRAM PERFORMANCE

The Department's LLRW staff is not able by itself to do all of the necessary work, and it would not be feasible for the State to hire the requisite staff for the relatively short time involved in overseeing development of and initially licensing a facility. Technical assistance available from the NRC is limited to addressing specific regulatory questions and does not extend to performing a state's job in license review or the many other actions necessary to oversee development of a LLRW facility. The U.S. Department of Energy, through EG&G Idaho, provides technical aid under federal mandate. The Department has called upon EG&G Idaho for assistance with several specific problems, but the support program, although highly valuable, cannot meet all of any one state's needs. The Department is doing what is required to meet its regulatory requirements by means of a combination of work done by LLRW staff, ad hoc groups made of persons from elsewhere in State government and from outside State government, and contractors funded principally from surcharge rebates.

The Department has made extensive use of standing and ad hoc working groups, task forces, and steering groups. The purpose of using advisory groups is three fold. One is to involve in the decision making process individuals from entities affected by the Department's decisions. Another is to assure that all regulatory concerns are met. The third is to provide the Department with perspectives and expertise not possessed by the LLRW staff.



The basic standing entity is the statutory Low-Level Radioactive Waste Advisory Committee. It deals with general issues and provides overall continuity of counsel to the program. The ten-member Advisory Committee includes representatives of medicine, research institutions, industry, local government, and the public. Ad hoc groups, by comparison, are used to focus on specific issues and problems and are short-term.

In addition to the statutory Advisory Committee and the ad hoc groups, the Department is counseled by a Local Advisory Committee, which is made up of citizens who reside near the Ward Valley site. These knowledgeable individuals advise the Department on local perspectives related to environmental and license review issues, public involvement, and mixed waste management. Meetings of the Local Advisory Committee have been scheduled two or three times a year by the League of Women Voters' Southern California Regional Task Force, with the Department participating at each meeting to obtain guidance from the Committee. US Ecology supports the League's role through a block grant.

All basic contracts involve evaluation of fixed-price proposals submitted in response to the Department's requests for proposals. Technical proposals are evaluated without knowing the cost. Technical proposals graded 80% or better, based upon pre-developed criteria, are judged acceptable. The contract is then awarded to the lowest bidder submitting an acceptable proposal.

San Bernardino County, as host county, has been invited to participate in several aspects of the oversight and licensing processes. Modest contracts have been awarded the County to offset its costs.

Review of US Ecology's Data. During the site selection and characterization phases, Department staff monitored all of US Ecology's actions and participated in the public involvement meetings. Technical data developed by US Ecology and its several contractors during site selection, and eventually site characterization, were submitted to the Department. Staff review was enhanced by assistance provided by a contract awarded to Roy F. Weston, Inc. US Ecology's data were examined by Weston's cadre of experts who then advised the Department on their findings. The Department then either accepted the data or directed US Ecology to modify its work as needed.

Enhanced Technology. California's LLRW statutes do not impose any specific disposal technology requirements. The Department issued a contract to Ebasco Environmental (then Envirosphere) to evaluate enhancements to near-surface disposal which would provide a greater margin of safety and would increase public confidence in the facility's performance. As a result of the evaluation and consideration of public comments, the Department directed US Ecology to design the disposal trenches so as to increase the cover over the waste and to decrease worker exposure to higher-activity wastes. Specifically, the guidance will result in: increasing the cover to a minimum of 5 meters; separating Class A from Classes B and C and high-surface-activity wastes; minimizing

the area open for disposal at any one time; and accelerating consolidation of the fill and cover by placing excess spoil over filled trenches. These enhancements will add little to the cost and will afford increased safety.

Quality Assurance/Quality Control. A quality assurance/quality control (QA/QC) program is described in the NRC documents NUREG 1293 and NQA-1. The Department amended the Ebasco contract to obtain a QA/QC policy and implementation plan for its license review, and to have QA/QC audits performed of US Ecology and its contractors.

Environmental Impact Analysis. The project is subject to the National Environmental Policy Act because the land is owned by the U.S. Bureau of Land Management (BLM) and will be transferred to the State. The land transfer requires preparation of an environmental impact statement. The California Environmental Quality Act requires preparation of an environmental impact report by the Department as the licensing agency. By memorandum of understanding, BLM and the Department have agreed to prepare a single document to meet both federal and state legal requirements. US Ecology's proponent's environmental assessment will provide source information. The joint document will independently assess project impacts and will identify mitigations and compensations. Preparation of the environmental impact report/environmental impact statement will parallel license review and its certification is expected just prior to the licensing decision.

A contract to prepare the joint document was awarded to Dames and Moore, Inc., under terms of a memorandum of understanding between the Department and BLM. The proponent bears the cost of preparing the environmental documents. Dames and Moore's invoices are submitted to the Department; upon approval, the invoices are forwarded to US Ecology for direct payment to Dames and Moore.

An ad hoc steering group oversees and guides preparation of the environmental impact report/statement. Its members represent the Department, BLM, US Ecology, Dames and Moore, the Governor's Office of Planning and Research (which coordinates preparation and review of environmental documents written by State agencies), and a user's group, the California Radioactive Materials Management (Cal Rad) Forum. The group coordinates with US Ecology to ensure that necessary data are collected in a timely fashion. It will continue to function until the documents have been completed.

Public scoping meetings were held in May and June, 1989. The draft environmental impact report/environmental impact statement will be issued in April, 1990, followed by public hearings which will be held during May, 1990.

The major environmental issue, the desert tortoise, requires special consideration. The proposed site is in a tortoise habitat. An ad hoc working group was convened to address the issue of the desert tortoise, a species protected under both federal and State law. The working group included members from the Department, aided by a nationally-known tortoise

biologist whose participation was funded by the DOE technical assistance program; BLM; US Ecology; the Cal Rad Forum; the U.S. Fish and Wildlife Service; the California Department of Fish and Game; San Bernardino County; the Sierra Club; and the Desert Tortoise Council, an organization of individuals interested in preservation of the species. The working group's charge was to guide studies to identify significant adverse impacts of the project upon the tortoise, then to suggest mitigations and compensations to offset the impacts. Their recommendations will be incorporated into the environmental impact report/statement. The working group met five times from April, 1988, through January, 1989, at which time the work was completed.

License Review. NUREGs 1199, 1200, 1274, and other NRC guidance documents set forth guidelines for comprehensively reviewing a LLRW license application. The Department contracted with Roy F. Weston, Inc., for assistance in reviewing the application. Weston teamed with Rogers and Associates Engineering for the review. The Weston team includes individuals with extensive licensing experience, some of whom are former NRC employees. Under terms of the contract, Weston is to prepare a management plan, review the license for completeness and detail, and prepare a draft safety evaluation report for consideration in the Department's licensing decision.

An ad hoc license review team of 13 people is made up of persons from the Department, the Colorado River Regional Water Quality Control Board (which has specific regulatory requirements under law), the Department of Fish and Game, and the Department's QA/QC contractor, Ebasco Environmental. The team's role is to review work done by Weston in reviewing the license in order to ascertain that all regulatory requirements are met. Individual members, depending upon their particular interest and expertise, will review portions of the work as it is completed. The team will continue its work until the license is issued. The license application was deemed complete in December, 1989, and the review process is expected to take a minimum of 12 months.

Mixed Waste. Unresolved regulatory uncertainties led to the Department's decision to delay progress toward developing a facility for disposal of that small quantity of LLRW which is also subject to laws governing disposal of hazardous waste. However, the State and its license designee remain responsible to provide for all commercial LLRW. Mixed waste disposal will be handled by means of a separate environmental review and license application if California determines that a facility within the State is needed.

The Department awarded a contract to Ebasco Environmental to evaluate management options and develop a mixed waste management plan. The options include disposal within California, disposal elsewhere within the Southwestern Compact, and disposal outside of the Compact.

An ad hoc mixed waste management task force includes representatives of the Department's LLRW and Toxic Substances Control Programs, the State of Arizona, the California Resources Agency, the California State Water

Resources Control Board, the Governor's Office of Planning and Research, US Ecology, and the Cal Rad Forum. Its role is to oversee and direct Ebasco Environmental and counsel the Department as the mixed waste management plan is prepared and implemented. The task force was formed in December, 1988, and has met several times. It will continue to function until a final plan for mixed waste disposal is completed.

Fiscal Review. Under State law, the Department is to review and approve disposal rates charged by US Ecology. This function, similar to that of a public utility commission, is separate from the Department's role as regulator. A contract is being prepared to give the Department assistance in reviewing US Ecology's expenditures for reasonableness and prudence and to establish the rate-setting mechanism.

An ad hoc fiscal review group will be composed of representatives from the Department, the Low-Level Radioactive Waste Advisory Committee, the Cal Rad Forum, US Ecology, and the Public Utility Commission. It will guide the Department and its contractor in all aspects of rate-setting and fiscal control. Its anticipated life is about two years.

#### SUMMARY

The California Department of Health Services, assigned a strong regulatory role by State legislation, is meeting its mandates relating to licensing a LLRW facility through teamwork among Department staff, contractors, and ad hoc groups chosen for their expertise in the particular subject area. All activities are proceeding under the close oversight of the Department's LLRW staff. The Department expects to license, early in 1991, the nation's first new LLRW disposal facility in accord with current federal, State, and Southwestern Compact requirements.

**SITE SELECTION, CHARACTERIZATION AND  
LICENSE APPLICATION DEVELOPMENT FOR  
THE WARD VALLEY LOW-LEVEL RADIOACTIVE  
WASTE DISPOSAL FACILITY**

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**This briefing paper is provided for background purposes. The oral presentation before the Commission will follow the California Department of Health Services Presentation Outline rather than this background paper.**

**March 1990**

## **Introduction**

US Ecology, Inc. is the State of California's license designee to site develop and operate a low-level radioactive waste (LLRW) disposal facility. The facility will serve member states of the Southwestern Compact. US Ecology's license application for a desert site in the Ward Valley of southeastern California was deemed complete for detailed regulatory review by the California Department of Health Services (DHS) in December 1989. By mutual agreement, disposal of mixed waste is not proposed pending the State of California's decision on appropriate management of this small LLRW subset. This paper summarizes the program undertaken by US Ecology in consultation with the DHS to select and characterize the Ward Valley site, and to prepare a license application and environmental assessment report.

## **Statewide Screening**

California Senate Bill 342 directed the DHS to conduct a statewide screening study for potentially suitable siting areas. DHS completed this study in March 1984, applying the 10 CFR Part 61 site selection criteria and additional factors relevant to California. Chief among these additional criteria was a preference for areas with less than 10 inches of average annual rainfall.

US Ecology expanded on the State's work in preparing its application to serve as license designee. The company proposed siting in topographically closed desert basins on the premise that such sites can generally be characterized and modeled with a high degree of confidence. Fourteen desert basins in the southeastern desert were identified as preliminary study areas. After securing license designee status in late 1985, US Ecology reviewed the 14 study areas and added four additional areas. These 18 basins in Inyo, Riverside and San Bernardino Counties provided the focus for detailed regional screening studies.

## **Regional Screening**

Regional screening studies of the 18 study basins during 1986 were integrated with an extensive public involvement program. Citizen input was obtained through public meetings, speaking engagements with service organizations in the desert communities, consultations with Native American groups, and recommendations from an independent Citizens Advisory Committee (CAC) supported by the League of Women Voters Southern California Regional Task Force.

The CAC was established through a US Ecology grant to the League of Women Voters. Twelve members were appointed through independent nominations. These included two members appointed by the County Board of Supervisors for each of the three counties under study, one member from each county appointed by the League of Women Voters, a representative from the Native American Heritage Commission, a Sierra Club appointee, and a representative of the Cal Rad Forum, an organization of radioactive materials users. Committee meetings were moderated by a non-voting convenor selected by the League. Meeting arrangements and support services were supplied by the League. In addition to US Ecology, technical expertise was provided to the CAC by the DHS, representatives from the County Environmental Health Departments, the California State University Desert Studies Consortium and U.S. Nuclear Regulatory Commission staff. Regional screening was structured around six CAC meetings and three rounds of public meetings and workshops. Prior to each round of public meetings, CAC members commented on US Ecology's plans. After each round of meetings, members discussed the public's input and worked with US Ecology to translate that input into specific siting guidance.

The first round of five public meetings provided basic information about the siting process and LLRW management. US Ecology then worked with the CAC to identify ten siting objectives based on public concerns, and specific implementing criteria for each objective. The CAC assigned a preliminary importance rating to discretionary criteria, (high, moderate or low importance), and endorsed exclusionary criteria which eliminated areas from consideration for either regulatory or restrictive land use reasons. Finally, the CAC recommended two high avoidance criteria; agricultural land and designated wilderness study areas.

The next step was to identify 16 candidate site areas for detailed comparison. Each area chosen satisfied both the technical exclusion and high avoidance criteria, and represented the remaining portion of each basin that best satisfied the rated discretionary criteria. This was done with a computerized mapping system which allowed digitized information for each criterion to be superimposed on a grid system. Results were presented to the CAC in November 1986. The CAC recommended that the 16 candidate site areas be presented to the public in workshops to promote a high degree of one-to-one interaction with US Ecology staff.

The third round of ten public workshops was conducted by US Ecology in December and January 1987. Resource persons were available to discuss displays on groundwater protection, transportation, radiation properties and safety practices, and sources of LLRW. A drum containing noncontaminated waste samples was displayed along with a videotape of US Ecology's Beatty, Nevada disposal site operation. DHS personnel were on hand to discuss their independent

regulatory role. Finally, raised relief maps depicting the 16 candidate site areas were displayed. Citizens were asked to identify which siting areas they considered the most and least favorable on questionnaires, and to explain their reasoning.

After reviewing the public workshops results, CAC members were asked to individually rate the 16 siting areas. Resource materials included maps and detailed descriptions of each site area, public workshops results, and all resolutions and citizen correspondence sent to the CAC, the League, US Ecology or DHS regarding site selection. Each CAC member was asked to indicate if a site should be considered in the top five, bottom five, or middle six category and to state the reasons for their classification. The group then convened to discuss results and, in some cases, to revise individual ratings.

### **Selection of Three Candidate Sites**

US Ecology designated three candidate sites for detailed field work in February 1987. The decision was based on field reconnaissance by US Ecology and its support contractors, CAC recommendations, agency input, public meeting comments, citizen letters, resolutions received from local officials, and consultations with Native American tribal groups. Two of the siting areas -- the Ward and Silurian Valleys -- were considered most favorable by CAC members. The third site, in Panamint Valley, was rated most favorably by citizens completing siting questionnaires at the round three workshops. Additional field studies and analysis of land ownership status assisted US Ecology in defining a four square mile candidate site in each valley.

### **Candidate Sites Evaluation**

Evaluation of the three candidate sites required compilation of technical, environmental, and socio-economic information. Technical data collection was guided by a Site Characterization Plan which was reviewed and later revised to reflect comments received from affected agencies, and interested citizens and organizations.

Initially, each candidate site received equal attention. Mineral resource assessments, well canvasses, electrical resistivity soundings, gravity and magnetics surveys, seismic refraction/reflection work and surface water flow studies were initially conducted. These studies were intended to identify fatal flaws from a licensing standpoint. Exploratory borings and groundwater table observation wells were also planned for each site. However, seismic profiles for the Panamint Valley site indicated the potential presence of earthquake faults underlying the



site. Consequently, drilling was deferred at Panamint. Exploratory borings, wells and meteorological stations were developed at the Ward and Silurian sites, however.

At the same time field studies were underway, US Ecology worked with the League of Women Voters to establish a Local Advisory Committee (LAC) for each site. Recommendations on formation, composition and tasks of the local committees were provided by the CAC. The purpose of the LACs was to serve as objective fact-finding bodies, to share local views with the company, and to help make information available in the community. The LACs were formed through independent local nominations, and varied in size depending on the size and diversity of communities near each site. The League of Women Voters scheduled meetings, reimbursed members' expenses, and provided convenor services. Local citizens were invited to attend these well-publicized meetings and time was set aside for public question and comments.

Each LAC met twice during this phase. The initial meetings held in June 1987, focused on identifying local concerns about the project, describing technical studies underway at the sites, and discussing the Committees' role. Four public information meetings were held as an outgrowth of local committee recommendations. Descriptions of the nearest candidate site were mailed to each LAC member prior to their second meetings. Members were asked to review information on the site in their vicinity, rather than all three sites. This was done to reduce potential bias in favor of, or opposing the closest site.

Site descriptions included available data from the field studies as well as information on demographics and land use; hospital, fire and emergency response service availability; road conditions and transportation networks, and community economic profiles. The descriptions were then discussed and refined at LAC meetings. Cultural resource evaluations of the candidate sites were obtained through archaeological surveys, and field visits by Native American representatives. These visits were coordinated with biological studies. Site comparison information was also obtained from state, federal and local agencies attending an interagency meeting on the project sponsored by the Department of Health Services and the Governor's Office of Planning and Research.

During this siting phase, US Ecology continued direct public outreach efforts and opened locally-staffed public information offices in the local communities. Arrangement of numerous citizen bus tours to the Beatty, Nevada LLRW disposal facility was a major focus of activity.

## **Proposed Site Selection**

Comprehensive descriptions of each candidate site were mailed to CAC members in September 1987. They were asked to compare and contrast the three sites and indicate which site should be proposed for development and which sites, if any, should be dropped from further consideration. At a meeting convened to discuss the results, the CAC unanimously recommended that the Panamint Valley site be removed from consideration. The group split its vote on the question of which of the two remaining sites was preferred. Questions regarding the nature and extent of potential desert tortoise impacts at the Ward Valley site were at the heart of the CAC's lack of consensus.

Both the Ward and Silurian Valley sites satisfied US Ecology's criteria of a technically excellent site that was generally supported by the local community. Both sites were considered licensable, both offer good transportation access, and both are remote from nearby residents. Neither site overlies potable groundwater and neither contains significant cultural resources. Both sites are managed by the U.S. Bureau of Land Management (BLM), and are eligible to be transferred to state ownership. No known mineral resources are present at either site and neither site is subject to mining claims. From the standpoint of technical factors related to licensing, however, Ward Valley is clearly the better location. Contributing factors include superior surface water and erosion control conditions, greater depth to groundwater and bedrock, greater distance to active and potentially active earthquake faults, and superior infiltration resistance characteristics. From a biological standpoint, development of the Ward Valley site involves a greater environmental impact due to its location in desert tortoise habitat and in an area of greater overall biological diversity.

US Ecology requested guidance from the California DHS before designating a proposed site. DHS advised US Ecology that technical factors relating to licensing should receive the greatest consideration. Impacts to the desert tortoise were considered to be mitigable. The Ward Valley site was subsequently designated as the proposed site in March 1988.

## **Site Characterization and License Application Development**

Extensive pre-licensing consultation between US Ecology and the DHS and its support contractors helped focus site characterization and license application development activities, and promoted early identification and resolution of technical and regulatory questions. Prior to detailed site characterization, US Ecology issued a general Site Characterization Plan for review and comment by the DHS and interested state, local and federal agencies. This dynamic document

was modified based on comments received on the Plan, and was later refined in consultation with the DHS and its contractors based on detailed site characterization studies underway at the Ward Valley site. DHS also reviewed US Ecology's Quality Assurance Program Plan, related contractor Quality Assurance Plans and various procedures used to implement these plans. Field audits by US Ecology and DHS were conducted to verify compliance with the procedures. As work proceeded, DHS and its support contractors reviewed a series of US Ecology working documents to help ensure that data and analyses required for licensing would be developed in timely fashion. These included the Environmental Monitoring Plan, Vadose Zone Study Plan, Pathways Analysis Working Paper, and documentation and validation problems for models used in transport mechanism and dose assessment analyses.

US Ecology's license application was submitted to DHS in two phases. This flexible approach allowed DHS to begin preliminary completeness reviews of certain sections while US Ecology was finalizing others. The DHS completeness check identified several areas requiring additional information. Following US Ecology's response and subsequent DHS review, the license application was deemed complete in December 1990.

### **Environmental Assessment**

US Ecology completed its Proponent's Environmental Assessment (PEA) in August 1989. The PEA was distributed for review to interested federal, state and local agencies. The PEA and the agency comments on it provide a basis for development of a joint Environmental Impact, Report/Statement (EIR/EIS) by DHS and the BLM. (An EIS is being prepared to support BLM's land transfer decision.)

Potential project impacts on the desert tortoise, a recently listed state threatened and federal endangered species, were considered sufficiently important to establish a special planning group during preparation of the PEA. The DHS established an Ad Hoc Desert Tortoise Work Group to review US Ecology's field studies and to recommend specific mitigation measures. The group included representatives from the BLM, the U.S. Fish and Wildlife Service, the Desert Tortoise Council, the Cal Rad Forum, the California Department of Fish and Game, San Bernardino County, US Ecology and DHS. An independent tortoise expert assisted DHS through a U.S. Department of Energy grant.

Location of the Ward Valley site within the Fenner-Chemehuevi Valleys desert tortoise habitat required a series of interrelated studies that were commented on by the group. These included an

intensive survey of tortoises utilizing the project site, tortoise density surveys in the vicinity of the site with emphasis on areas adjacent to Interstate-40, and a cumulative impacts assessment of existing and planned impacts on the tortoise within the Fenner-Chemehuevi Valleys habitat. The freeway-related studies provided the key to development of compensation for disposal facility impacts. The freeway is significantly depleting tortoise populations in adjacent areas; a problem that can be significantly reduced by fencing the freeway across Ward Valley. A tortoise protection fence will be tied in to existing culverts allowing tortoises to pass beneath the freeway, thereby promoting genetic exchange between populations north and south of the highway. Other project features include fencing of the disposal site, relocation of resident tortoises, education of site workers on tortoise protection measures, truck escorts during tortoise activity periods, and studies to assess the effectiveness of mitigation and compensation measures.

A second working group was established by US Ecology to work with Native American groups expressing concern about the project. While no significant archaeological resources exist on the site, plants and animals used by Native Americans are present and the Ward Valley is within the traditional boundaries of the Mojave and Chemehuevi peoples. Based on the groups' discussions, US Ecology proposed a study to identify trails used by Native Americans to traverse Ward Valley and surrounding areas. Native American participation is a central element of the proposed study.

Several additional impact categories will require specific measures to minimize impact on the environment. Examples include facility design and operational measures to control dust, building design features to reduce glare and minimize visual obtrusiveness, and training and equipment provision for local government emergency response personnel.

## **Summary**

US Ecology, Inc., the State of California's license designee, recently became the first entity to submit a complete license application for a new LLRW disposal facility under the 10 CFR Part 61 regulatory framework. Site selection was guided by the requirements of Part 61, consultation with the DHS, and an open process that provided for extensive public and agency input prior to key decisions. Site characterization and license application development proceeded with the benefit of additional input from interested agencies, and timely pre-licensing consultations with the licensing agency (DHS) to identify and resolve key technical and regulatory questions. It is anticipated that a license will be issued followed by initiation of facility construction in early 1991. Waste acceptance is projected prior to the end of that year.

## PUBLIC INVOLVEMENT SUMMARY

### CANDIDATE SITES SELECTION PHASE (1/86 - 2/87)

#### I. PUBLIC MEETINGS & WORKSHOPS

##### Round #1 Meetings

Estimated  
Attendance

Provide information on project, answer questions, and receive citizen input on siting and general project concerns.

June	24	-	-	Blythe	30
	25	-	-	Twentynine Palms	150
	26	-	-	Barstow	60
	30	-	-	Lone Pine	45
July	1	-	-	Riverside	50

##### Round #2 Meetings

Provide information on siting progress, answer questions, and receive citizen input on weighting of siting criteria.

Sept.	30	-	-	Needles	35
Oct.	1	-	-	Blythe	28
	2	-	-	Indio	30
	7	-	-	Yucca Valley	257
	8	-	-	Barstow	60
	9	-	-	Bishop	25
	13	-	-	Trona	23
	28	-	-	Desert Center	75

##### Round #3 Workshops

Provide information, answer questions through one-to-one discussion of siting progress displays and maps, and receive citizen input on rating of 16 candidate siting areas.

Dec.	3	-	-	Trona	35
	4	-	-	Lone Pine	14
	8	-	-	Barstow	25
	9	-	-	Baker	10
	10	-	-	Needles	20
	11	-	-	Blythe	17
	12	-	-	Desert Center	30
	15	-	-	Twentynine Palms	165
Jan.	7	-	-	Shoshone	102
	14	-	-	Rancho Mirage (Coachella Valley Assoc. of Govts.)	12

B. MEETING NOTICES

1. Press releases to media mailing list, and to business wire.
2. Personal invitations mailed to project mailing list. (List numbered about 1,250.)
3. Paid radio announcements.

Round #1

June	22, 23	- -	Blythe - KSFE-AM	
	23, 24	- -	Twentynine Palms -	KDHI-AM KQYN-FM
	4, 25	- -	Barstow - KIOT-AM KRXV-FM	
	29, 30	- -	Bishop - KBOV-AM KIBS-FM	

Round #2

Sept.	30	- -	Needles - KSFE-AM	
Oct.	1	- -	Blythe - KJMB-AM/FM	
	2	- -	Indio - KCHV-FM	
	7	- -	Yucca Valley - KSES-AM	
			Twentynine Palms -	KDHI-AM
	8	- -	Barstow - KIOT-AM KRXV-AM	
	9	- -	Bishop - KBOV-3x/day KIBS-FM	
	13	- -	Ridgecrest - KLOA-AM KZIQ-AM/FM (Trona meeting)	

Round #3

Dec.	2, 3	- -	Ridgecrest - KLOA-AM (Trona Workshop)	
	2, 3	- -	Ridgecrest - KZIZ-AM/FM (Trona Workshop)	
	3, 4	- -	Lone Pine - KBOV-AM/KIBS-FM (Bishop Workshop)	
	7, 8	- -	Barstow - KIOT-AM KRXV-/KXVR-FM	
	9, 10	- -	Needles - KSFE-AM	
	10, 11	- -	Blythe - KJMB-AM/Fm	
	14, 15	- -	Twentynine Palms - DKHI-AM	
	14, 15	- -	Yucca Valley - KSES-AM (Twentynine Palms Workshop)	

4. Newspaper notices and tabloid inserts were placed as follows:

Round #1

June	24	- -	Blythe PALO VERDE VALLEY NEWS:	Ad run and tab insert 6/18
	25	- -	Twentynine Palms DESERT TRAIL:	Ad run and tab insert 6/19
	26	- -	Barstow DESERT DISPATCH:	Ad run 6/24, 25 Tab insert 6/24
	30	- -	Bishop CHALFANT PRESS:	Ad run and tab insert 6/26
July	1	- -	Riverside PRESS ENTERPRISE:	Ad run and tab insert 6/30

## Round #2

Sept.	30	- -	Needles DESERT STAR:	Ad run and tab insert 9/24
Oct.	1	- -	Blythe PALO VERDE VALLEY NEWS:	Ad run 9/26, 10/1
				Tab insert 9/26
	2	- -	Indio DESERT ADVERTISER:	Ad run 9/30
	7	- -	Yucca Valley HI-DESERT STAR:	Ad run 10/3, 7
				Tab insert 10/3
	8	- -	Barstow DESERT DISPATCH:	Ad run 10/6, 8
				Tab insert 10/6
	9	- -	Bishop CHALFANT PRESS:	Ad run 10/5, 8
				Tab insert 10/8
	13	- -	Trona ARGONAUT:	Ad run and tab insert 10/8
	13	- -	Ridgecrest DAILY INDEPENDENT:	Ad run 10/10, 13

## Round #3

Dec.	3	- -	Inyokern NEWS REVIEW:	Ad run 11/27
	3	- -	Ridgecrest DAILY INDEPENDENT:	Ad run 12/1,2
	3	- -	Trona ARGONAUT:	Ad run 12/3
	4	- -	Bishop CHALFANT PRESS:	Ad run 12/3
	8	- -	Barstow DESERT DISPATCH:	Ad run 12/5, 6
	9	- -	Baker VALLEY NEWS:	Ad run 12/4
	10	- -	Needles DESERT STAR:	Ad run 12/10
	11	- -	Blythe PALO VERDE VALLEY NEWS:	Ad run 12/10
	12	- -	Desert Center TMC PRODUCT:	Ad run 12/9, 10
	15	- -	Twentynine Palms DESERT TRAIL:	Ad run 12/11

## Candidate Sites Selection Announcement: (Newspaper Tabloid Inserts - February, 1987)

Barstow DESERT DISPATCH  
Needles DESERT STAR  
Trona ARGONAUT  
Bishop INYO REGISTER  
Barstow DESERT DISPATCH SHOPPER (rural distribution)  
Beatty DEATH VALLEY GATEWAY GAZETTE (California distribution)  
Inyokern NEWS REVIEW  
Ridgecrest DAILY INDEPENDENT  
Bishop CHALFANT PRESS

## II. CITIZEN ADVISORY COMMITTEE MEETINGS

A 12 member Citizens Advisory Committee (CAC) was formed to advise US Ecology on site selection and public involvement activities. The Committee was formed through nominations from the County Boards of Supervisors for the 3 counties studied, the Native American Heritage Commission, the Sierra Club, the CALRAD Forum, and League of Women Voters chapters in the 3 counties. The League provided a convenor and administrative support to the Committee through a US Ecology grant.

Meetings leading to selection of 3 candidate sites were held as follows:

June	6-7, 1986	Riverside
July	18-19, 1986	Victorville
August	22-23, 1986	Barstow
October	17-18, 1986	Ridgecrest
November	14-15, 1986	Highland Springs
January	16-18, 1987	Death Valley

### III. NATIVE AMERICAN CONSULTATIONS

After completion of a literature search and known archaeological site mapping, consultations were held with knowledgeable elders of individual Native American groups having a traditional or historic interest in the study area. Consultations were conducted by Cultural Systems Research (CSR) in November, 1986. In January, 1987, CSR arranged a series of trips for Native American representatives to visit those candidate sites for which concerns were expressed during the earlier consultations.

### IV. SPEAKING ENGAGEMENTS

Speaking appearances were scheduled with community service organizations, local governments, and others to provide information on low-level waste management practices and the project.

May	5	-- Twentynine Palms - Wonder Valley Improvement Association
July	15	-- Colorado River Indian Tribes Reservation - Resource Development Committee (RDC)
	23	-- Twentynine Palms - Rotary
	24	-- Yucca Valley - Sunrise Rotary
	31	-- Barstow - Optimists and Kiwanis
Aug.	5	-- Blythe - City Council Study Session
	6	-- Blythe - Chamber of Commerce Mixer
	6	-- Blythe - Rotary
	11	-- Twentynine Palms - Chamber of Commerce
	13	-- Ridgecrest - Optimists
	26	-- Trona-Searles Valley Community Service Council
Sept.	2	-- Twentynine Palms - Kiwanis
	2	-- Victorville - Rotary
	12	-- Riverside - County Health Dept. Educational Forum
Oct.	9	-- Bishop - Lions Club
	13	-- Ridgecrest - Environmental Studies Class at Cerro Coso College
	14	-- Trona - Searles Valley Senior Citizens
	21	-- Colorado River Indian Tribes Reservation - RDC
	24	-- Yucca Valley - Rotary
	29	-- Barstow - Soroptimists
Nov.	4	-- Needles - Grace Henderson High School and Kiwanis
	4	-- Desert Center - Desert Center Unified School District
	5	-- Needles - Lions Club
	6	-- Palm Springs - BLM California Desert District Advisory Council
	13	-- Century City-CALRAD Forum
	18	-- Needles - Rotary
	19	-- Ridgecrest - Rotary
Dec.	2	-- Ridgecrest - Lions Club



Jan. 13 -- Yucca Valley - Soroptimists  
 14 -- Colton - San Bernardino County Medical Society  
 22 -- State Assembly Staff Briefing  
 Feb. 10 -- Colton - San Bernardino County Medical Society  
 10 -- Newberry Springs - Community Services District  
 Feb. 13 -- Los Angeles - California State Colleges Desert Studies Consortium

V. MEDIA INTERVIEWS AND BRIEFINGS

In-person editorial board briefings were held during the first quarter of 1986 at the Sacramento Bee and Union, Los Angeles Times and Herald Examiner, Barstow Desert Dispatch, Bishop Chalfant Press, Baker Valley News, San Bernardino Sun, Riverside Press-Enterprise, Twentynine Palms Desert Trail, Victor Valley Daily Press, Ridgecrest Daily Independent, Blythe Palo Verde Valley News, Needles Desert Star, and Indio Daily News.

The following in-person interviews were held after the above round of briefings:

June	25	- -	Twentynine Palms - KDHI-AM/KQYN-FM (Listener call-in show)
	30	- -	Bishop - KBOV-AM/KIBS-FM
July	31	- -	Barstow - KRXV/KXVR-FM
	31	- -	Barstow - KIOT-AM
Aug.	6	- -	Blythe - KJMB-AM/FM
	12	- -	Victorville - KCIN-AM (Listener call-in show)
	13	- -	Ridgecrest - KLOA-AM/KF10-FM (Listener call-in show) - Daily Independent
Sept.	30	- -	Needles - KSFE-AM
Oct.	1	- -	Blythe - KJMB-AM/FM
	2	- -	Indio - KCVH-FM
	7	- -	Yucca Valley - KSES-AM
	8	- -	Victorville - KCIN-AM
	8	- -	Twentynine Palms - KDHI-AM/KQYN-FM (Listener call-in show)
	9	- -	Barstow - KRXV/KXVR-FM
	8	- -	Bishop - Channel 12
	13	- -	Ridgecrest - KLOA-AM/KF10-FM (Listener call-in show) - KZIQ-AM/FM
	29	- -	Barstow - KRXV/KXVR-FM
	29	- -	Yucca Valley - KSES-AM (Listener call-in show)
Nov.	19	- -	Ridgecrest - KLOA-AM/KF10-FM (Listener call-in show) - KZIQ-AM/FM - Daily Independent
Dec.	3	- -	Ridgecrest - KZIQ-AM/FM - KLA-AM/KF10-FM
	4	- -	Bishop - KBOV-AM/KIBS-FM
	8	- -	Barstow - KIOT-AM - KRXV/KXVR-FM
	11	- -	Blythe - KJMB-AM/FM
	15	- -	Yucca Valley - KSES-AM
	15	- -	San Francisco - KPIX-TV
	16	- -	Yucca Valley - KESQ-TV

VI. BEATTY DISPOSAL SITE TOURS

Beatty disposal site tours have been co-sponsored by the Western Forum for Education in cooperation with US Ecology since 1984. Prior to US Ecology's selection as license designee in late 1985, WFE sponsored tours for approximately 170 citizens. During the candidate sites selection phase, approximately 130 additional citizens toured the Beatty site.

VII. INTERAGENCY MEETINGS

At the recommendation of the Governor's Office of Planning and Research (OPR), US Ecology, DHS and OPR participated in a series of interagency meetings for federal, state and local agencies interested in the project. The meetings provided an opportunity for US Ecology to inform and update agencies, and to receive information relative to site selection and environmental assessment work and permitting/licensing matters. Prior to candidate site selection, meetings were held June 16, 1986 in Barstow and October 3, 1986 in Ontario. October meeting participants were invited to complete siting criteria importance rating sheets. Their ratings were later shared with the Citizens Advisory Committee.

CANDIDATE SITES EVALUATION PHASE (2/87 - 3/88)

I. CITIZENS ADVISORY COMMITTEE

The CAC met to provide recommendations on establishing Local Advisory Committees, public information efforts, and proposed site selection during this phase. They met as follows:

March	20-21, 1987	Barstow
June	26-27, 1987	Independence
October	16-17, 1987	Barstow

II. LOCAL ADVISORY COMMITTEES

In response to CAC recommendations, Local Advisory Committees were formed for each of the three candidate sites. Local nominating groups selected members. Meetings were open to the public and a question and comment period was provided at each meeting. Two rounds of meetings were held prior to the proposed site decision:

Round #1

June 8	- -	Baker (Silurian Valley site)
June 9	- -	Needles (Ward Valley site)
June 11	- -	Trona (Panamint Valley site)

Round #2

Aug. 31	- -	Trona
Sept. 2	- -	Baker
Sept. 3	- -	Essex (Ward Valley site)

Based on Local Committee recommendations and community requests, additional public information gatherings were held as follows:

		<u>Estimated</u>
April 26	Essex (Fenner and Lanfair Valleys)	200
July 16	Homewood Canyon	20
September 3	Goff	10
September 29	Fort Mojave Reservation	15

### III. NATIVE AMERICAN CONSULTATIONS

Native American field visits were held in April and May, 1987 at the three candidate sites. The visits were conducted to identify any unique cultural features at the specific sites selected, and to conduct ethnobotanical studies.

### IV. SPEAKING ENGAGEMENTS

Speaking engagements were undertaken for the following organizations during the candidate sites evaluation phase.

Feb.	21	-- Baker - Chamber of Commerce
March	18	-- Rancho Mirage - Colorado River Regional Water Quality Control Board
	19	-- Redlands - Inland Geological Society
	19	-- Berkeley - Northern California Health Physics Society
April	2	-- Needles - Chamber of Commerce
	7	-- Baker - Community Services District
	8	-- Baker - Baker Valley Unified School District
	9	-- Trona - American Association of University Women
	11	-- Victorville - BLM Desert Advisory Council
	22	-- Needles - Lions Club
	23	-- Needles-Soroptimists and Chamber of Commerce
May	1	-- Palm Springs - CALRAD Forum
	15	-- Ridgecrest - Lahonton Regional Water Quality Control Board
	18	-- Essex - Essex School
	19	-- Needles - Kiwanis
June	2	-- Ridgecrest - Society of American Military Engineers, and Lions Club
	3	-- Lone Pine - Lions Club
July	29	-- Sacramento-State Low-Level Radioactive Waste Advisory Committee
Nov.	3	-- Needles - Kiwanis
	13	-- Manhattan Beach - CALRAD Forum Fall Meeting

### V. PUBLIC INFORMATION REPOSITORIES

Information repositories were established in public libraries in the siting area in cooperation with the League of Women Voters Southern California Regional Task Force. US Ecology technical reports and information materials, and other publications developed or selected by the League were made available for public reference at the following San Bernardino County libraries:

- - Main Branch ( San Bernardino)
- - Barstow
- - Trona
- - Bookmobiles (covering Baker and Essex/Goffs areas)

Repositories were also established in the Inyo County library at the Shoshone, Bishop and Lone Pine branches, and the Kern County library Ridgecrest branch.

In addition to the libraries, US Ecology established Public Information Centers in Needles (Masonic Building, 825 Broadway), and Baker (Chamber of Commerce office, Route 127). The centers offered technical report access, information materials, display panels depicting the Beatty, Nevada disposal operation, and a drum containing simulated waste. A receptionist maintained regular hours.

VI. MEDIA INTERVIEWS (In Person)

April 9 -- Ridgecrest - KLOA/FM and KZIQ/FM  
Sept. 4 -- Needles - KSFE/AM  
30 -- Needles - KSFE/AM  
Nov. 20 -- San Bernardino - KVCR-TV, "Dialogues"  
Dec. 22 -- Needles - KSFE/AM

VII. Beatty Tours

During 1987, US Ecology sponsored Beatty disposal site tours for citizens living near the three candidate sites. These are listed below.

	<u>Participants</u>
Feb. 10 -- Needles area citizens	16
March 17 -- Needles area citizens	19
27 -- Trona area citizens	18
April 14 -- Needles area citizens	22
Sept. 22 -- Needles area citizens	19
<u>24 -- Baker area citizens</u>	<u>5</u>
Total	99

In addition, the Western Forum for Education sponsored three trips involving 72 citizens in 1987.

VIII. INTERAGENCY MEETINGS

During the proposed site selection phase, two rounds of interagency meetings were held to reduce overall participant travel. Meetings were held in March, 1987, to provide information on the three candidate sites, and the process that would be used to select a proposed site and develop a license application and Proponent's Environmental Assessment (PEA) for that site. Prior to the September meetings, invited agencies were mailed descriptions of the three candidate sites and were asked to provide additional information and offer comments on proposed site selection. Responses were incorporated into materials shared with the Citizens Advisory Committee for their candidate sites rating exercise. Interagency meetings were held as follows:

Round #1:

March 16 -- Sacramento  
17 -- Ontario

Round #2

Sept. 25 -- Ontario  
28 -- Sacramento

US Ecology and DHS also arranged a field trip to the Beatty, Nevada disposal facility and the three candidate sites May 6-9, 1987. Participants included DHS, Colorado River Regional Water Quality Control Board staff, San Bernardino County Environmental Health Department staff, the U.S. Department of Energy and support contractor staff (EG&G Idaho, Inc.), US Nuclear Regulatory Commission staff, and US Ecology.

## **ENVIRONMENTAL IMPACT ASSESSMENT PHASE (3/88 - Present)**

### **I. PUBLIC INFORMATION**

1. Newspaper tabloid inserts describing site characterization and environmental assessment studies and identifying the proposed site were placed in March, 1988, as follows:

Death Valley Gateway Gazette  
Needles Desert Star  
Baker Valley News  
Barstow Desert Dispatch

2. The US Ecology Public Information Center remains open to citizens seeking information on the project. Project reports and other information materials are also maintained at the San Bernardino County Library Needles Branch.

### **II. LOCAL ADVISORY COMMITTEE MEETINGS**

Following selection of the Ward Valley site for licensing, the Local Committee for that site continued to meet. (The Local Committees for the other two candidate sites were disbanded.) Meetings were publicly noticed in newspaper ads and local radio announcements. All meetings included opportunities for public comment. The Local Committee for the Ward Valley site will continue to meet throughout the site development process and beyond. The following meetings have been held to date:

March 22, 1988      -- Needles  
September 14, 1988 -- Needles  
March 16, 1989     -- Needles

### **III. NATIVE AMERICAN CONSULTATIONS**

A Native American impact mitigation planning group was established to assist US Ecology in completing its environmental assessment. The group met on August 22, 1988 at Joshua Tree National Monument to discuss impacts and potential mitigations. Comments on specific proposals were requested in subsequent mailings. On April 6, 1989, US Ecology met on mitigation topics in Parker, Arizona at the invitation of the Colorado River Indian Tribes.

### **IV. MEDIA INTERVIEWS**

March 23, 1988 -- Needles - KSFE/AM  
April 28        -- San Bernardino Sun briefing  
June 18        -- Needles - KSFE/AM  
August 26      -- Needles - KSFE/AM  
September 15   -- Needles - KSFE/AM  
December 2     -- Needles - KSFE/AM  
April 19, 1989 -- Bullhead City, AZ - KBAS/AM

## V. SPEAKING ENGAGEMENTS

March	22, 1988	- - Needles - Rotary Club, Chamber of Commerce, Kiwanis
	23	- - Needles - Senior Citizens
	27	- - East Mojave National Scenic Area - Sierra Club
April	7	- - El Centro - B.L.M. Desert Advisory Committee
	13	- - Palm Springs - CALRAD Forum Board
	14	- - Palm Springs - CALRAD Forum Spring Meeting
May	3	- - Needles - City Council Meeting
	12	- - El Centro - Colorado River Regional Water Quality Control Board
	25	- - Pasadena - National Resource Managers Forum
June	3	- - Needles High School Graduation Ceremony
	14, 15	- - San Diego - American Nuclear Society
	27	- - Needles - Nuclear Medicine Seminar
July	14	- - Needles - Business and Professional Women
	15	- - Needles - Fort Mojave Indian Reservation
	19	- - Las Vegas - Nevada Chapter, American Nuclear Society
	27	- - Los Angeles - California Medical Association Environmental Health Committee
Aug.	2	- - Sacramento - DHS Waste Management Advisory Committee
	20	- - Havasu Landing, CA - Municipal Advisory Committee Meeting
	23	- - Needles - Lions Club
Oct.	18	- - Needles - Women's Club
	10	- - Needles - Beta Epsilon Sorority
Nov.	21	- - Los Angeles - CALRAD Fall Meeting
Dec.	1	- - Needles - Nuclear Medicine Citizens Seminar
Jan.	12, 1989	- - Needles - Beta Epsilon Sorority
Feb.	13	- - Goffs - Open House: Goffs General Store
	23	- - Tustin - American Nuclear Society
March	1	- - Needles - Business and Professional Women
	16	- - Needles - Chamber of Commerce
	18	- - Mesquite, NV - Desert Tortoise Council Annual Symposium
April	5	- - Needles - Lions Club
	11	- - Needles - Rotary Club
	12	- - Los Angeles - UCLA Graduate Student Symposium
	14	- - Costa Mesa - California Environmental Health Association
	18	- - Needles - Rotary Club
	24	- - San Diego - CALRAD Spring Meeting
May	16	- - Los Angeles - UCLA Extension Class

## VI. BEATTY TOURS

### PARTICIPANTS

April	19, 1988	- - Needles area citizens	30
Nov.	30, 1989	- - Needles Area Citizens	18

## VII. WARD VALLEY SITE TOURS

Following selection of Ward Valley as the proposed project location, numerous citizens have requested and received tours of site by the Public Information Center staff in Needles. In addition, several special tours have been arranged as listed below.

March	28,	1988	- -	Desert Tortoise Council Symposium Group
May	1		- -	League of Women Voters/Sierra Club representatives
	27		- -	BLM, DHS, CA Fish & Game, State of Arizona representatives
Feb.	23,	1989	- -	DHS, San Bernardino County, California Health & Welfare Agency, Office of Planning & Research
March	16		- -	San Bernardino County Sanitarians

# FACTSHEET

## ENHANCEMENTS TO LOW-LEVEL RADIOACTIVE WASTE SHALLOW LAND BURIAL

*This is the second factsheet prepared by Envirosphere Company under contract to the California State Department of Health Services. California state law requires that a low-level radioactive waste disposal facility be built to meet the needs of the state's hospitals, universities, industries, and utilities. The Department, through its contractor Envirosphere, is studying alternative disposal enhancements to shallow land burial to be used at the proposed Ward Valley site.*

### BACKGROUND

In response to public comment, the California Department of Health Services has evaluated the effectiveness and cost of various disposal alternatives for low-level radioactive wastes. This factsheet compares 11 enhancements to shallow land burial to the anticipated performance of a traditional shallow land burial facility, referred to as the reference case. The comparisons are made under differing conditions, or scenarios, which reflect public concerns about low-level radioactive waste disposal.

### THE DISPOSAL ALTERNATIVES

The reference case and the 11 disposal enhancements are as follows:

**Reference case.** The reference case is based on US Ecology's existing low-level waste disposal facility near Beatty, Nevada. In the reference case, 5.5 million cubic feet of waste is contained in four large disposal trenches, each 50 ft deep. Stabilized wastes are separated from other wastes and disposed of in two of the trenches. Native soil is used to backfill spaces between packages and to construct 6.5-ft-thick trench covers. Completed trenches are covered with 6 in. of cobble for erosion control.

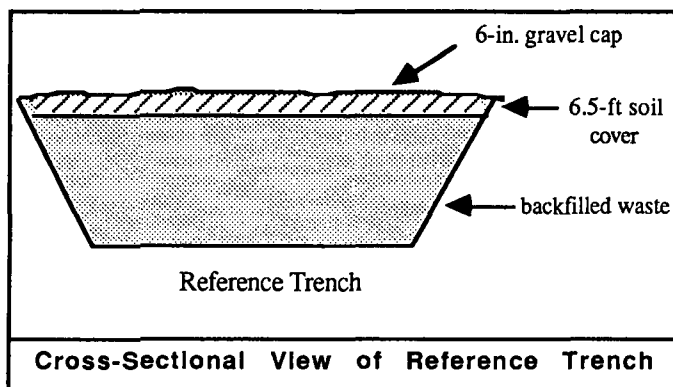
**Small annual trenches.** This alternative involves the same depth of disposal, backfill, waste segregation, and cover design as the reference case, except the trenches are smaller. This design may reduce the risk of potential operational accidents or unexpected events such as fire; hence, the effects of an unanticipated event may be smaller.

**Reference with compacted sand backfill.** This disposal method is the same as the reference case, except compacted sand is used to backfill the spaces between packages. Compacted backfill may reduce subsidence and long-term trench cap maintenance needs.

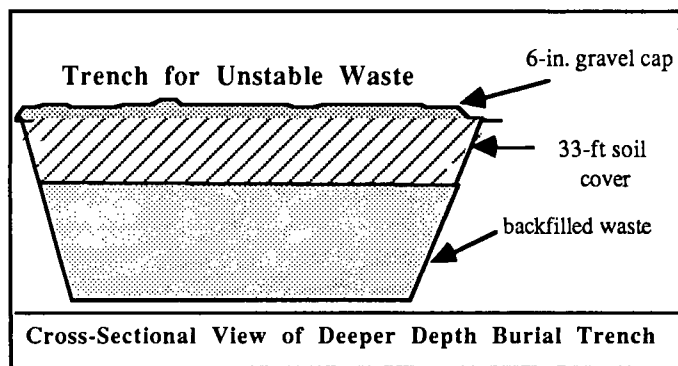
**Reference with low-strength concrete backfill.** This disposal method is the same as the reference case, with the exception of the backfill material. Low-strength concrete (grout) is poured between packages. Grout fills spaces better than compacted sand and may provide additional long-term protection from intruders, plants, and animals, and reduces subsidence and long-term trench cap maintenance needs.

**Reference with clay liner.** Clay liners are used in low-level waste disposal designs in the eastern United States to limit water infiltration into the trench. Clay can also adsorb radionuclides. This alternative considers the use of clay at the arid California site. A clay liner under arid conditions is likely to dry out and crack, providing no additional protection.

**Deeper depth burial.** Trenches are deeper and 33 ft of native soil is placed between the waste and the ground surface. Trench capacity, backfill material, and cover material are the same as the reference case. Deeper burial provides greater long-term protection of the waste from wind and water erosion and from possible plant and animal intrusion.







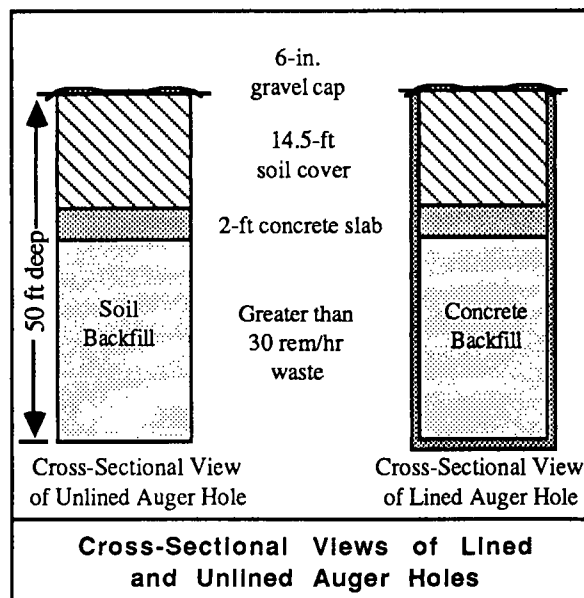
**Commercially available concrete overpacks.** The waste is repackaged into precast concrete containers at a shielded on-site facility. The uniformly sized concrete containers are placed in the disposal trenches and stabilized with backfill and cover materials as used in the reference trench. The concrete overpacks provide structural support to the trench cover which prevents subsidence of the cover.

**Trench closed with improved cover.** A 10-ft-thick, multilayered cover of various earthen materials is used instead of the 6.5-ft cover of native soil over the reference trench. The improved cover reduces wind and water erosion, discourages plant growth and animal intrusion, and further limits water infiltration.

**All waste stabilized.** Under this alternative, all wastes would be stabilized. Stabilizing all wastes increases the total volume of waste disposed but reduces subsidence.

**Separate trenches for Class B and C wastes.** Class B and C wastes must be stabilized because they pose a greater long-term health risk. Stabilized wastes are those that have been treated or contained to retain their shape and form for at least 300 years. Unstabilized wastes are not certified to meet these requirements. In this alternative, all Class A wastes are separated from stabilized Class B and C wastes. A separate trench for Class B and C waste enhances the waste isolation and reduces worker exposure. Since over 90 percent of the volume is Class A waste, the Class B and C trench would be small. Backfill and cover are the same as the reference case.

**Unlined auger hole with soil backfill.** Approximately 10 packages per year could have external dose rates of 30 rads/hr or more. The transfer of these waste packages from their shipping containers into the disposal facility can cause radiation exposure to workers. Auger holes reduce the potential for worker exposure by allowing the rapid transfer of the waste package into vertical, 50-ft holes drilled into the soil. Soil backfill is placed between each layer of packages in the unlined auger hole. After waste emplacement, a 2-ft-thick concrete plug is placed over the auger hole, and a 14.5-ft soil cover is placed over the plug.



**Lined auger hole with concrete backfill.** This alternative is the same as the unlined auger hole, except the hole is lined with concrete and the backfill between the waste is concrete.

**Other alternatives.** Other alternatives, such as an above-ground vault, below-ground vault, and earth-mounded concrete bunker (partially above-ground/below-ground vault), were reviewed, and found inappropriate to address conditions existing in the Mojave Desert region. Above-ground structures are more affected by the forces of nature such as wind, water erosion, and intrusion by plants and animals, including man. These alternatives are discussed in more detail in the final report.

## SCENARIOS

The following scenarios were used to evaluate the alternative enhancements to shallow land burial. The worker radiation exposure scenario results from routine operations. The other scenarios considered in this factsheet represent hypothetical events which may, or may not, ever occur.

**Worker radiation exposure.** A detailed time/motion evaluation of operations for each alternative waste was made. Alternatives reducing the annual dose to the whole body, in the order of decreasing effectiveness, are: concrete overpacks, lined and unlined auger holes, stability for all wastes, and separate trench for Class B and C wastes. One alternative, compacted sand backfill, resulted in a slight increase in dose from the extra work required to compact backfill.

**Accidental atmospheric release.** Two types of accidents are considered for both a worker and a person at the facility boundary. The first involves a waste package that drops from a significant height and its contents are dispersed into the air. Reductions in worker dose are evident only when all wastes are stabilized. In all cases the person at the facility boundary receives essentially no dose. The second accident involves a fire in the disposed waste. The following alternatives reduce the dose, presented in the order of decreasing effectiveness: concrete overpacks, concrete backfill, sand backfill, and stability for all wastes.

**Earthquakes.** Because the facility is located a great distance from active and potentially active faults, scenarios involving ground cracking or fissures caused by earthquakes are highly unlikely. The most likely scenario is vibratory ground motion, which is not expected to cause any significant damage to the facility. In this scenario, no protection is provided by the Class A waste packaging, and the buried waste responds equally to all potential impacts. Therefore, all alternatives are expected to perform equally.

**Human intruder scenario.** Three kinds of human intruder scenarios are considered. The scenarios in which the intruder recognizes the waste or drills through the waste in search of water result in negligible doses (less than 1 millirem). The only intruder scenario resulting in a nontrivial dose occurs if a house with a basement is built on top of the waste. In this case, the following alternatives are assumed to prevent direct contact with the waste: concrete backfill, deeper disposal, concrete overpack, and lined and unlined auger holes. The small annual trench provides only a small dose reduction.

**Plant and animal intrusion into the waste.** Intrusion into the waste by plants and animals was considered qualitatively in this study. Alternatives providing almost total protection are the deeper depth burial and concrete overpack. Alternatives providing greater protection than the reference case are concrete backfill, improved cover, stability for all wastes, and separate trench for Class B and C wastes. The small annual trench and sand backfill were expected to provide less protection due to increased surface area and ease of penetration of the sand by plants and animals.

**Wind and water erosion and flooding.** The site is located in an area of minimal scour, thus significant erosion is not likely. Nevertheless, effects were modeled assuming removal of 6.5 ft of trench cap and calculating the effects of airborne transport. Because no permanent surface water exists at the site, the human ingestion pathway was not considered. All alternatives indicated only negligible doses due to this scenario.

**Groundwater contamination.** Although groundwater contamination is the most significant pathway at humid eastern sites, it is not a pathway that can be used to differentiate alternative enhancements at the arid California site. The downward migration of moisture to groundwater would likely require at least thousands of years, if it occurs at all. In this timeframe, the waste would decay to levels that would not pose a health risk. At the Ward Valley site, the groundwater is 700 feet beneath the surface and annual rainfall averages less than 6 inches.

## COSTS

Anticipated annual operational and disposal costs in excess of those calculated for the reference alternative are presented in Table 1. The extra cost per cubic foot for disposal is divided by the reduction in dose for each alternative and displayed in Table 2.

## DOSE LIMITS

The regulatory dose limits are as follows:

- Occupational worker dose limit is 5,000 millirem per year.
- Dose limit to public at the site boundary is 25 millirem per year.
- Intruder dose limit is 500 millirem per year.

## CONCLUSIONS

- All calculated potential doses are well within regulatory limits for all alternatives and scenarios considered, including the reference case, Beatty. With the exception of the accidental fire scenario, the potential doses to the general public are a fraction of the doses routinely received from natural background radiation.
- Any radiation exposure to the general public from the hypothesized accident scenarios is highly improbable.
- No single alternative eliminated potential exposures for all the situations considered.
- Alternatives can be combined to increase effectiveness or reduce the probability the scenario will occur (e.g., improved backfill with deeper disposal).
- Some enhancements considered in this study, such as disposal depth and trench size, may be modified to provide comparable protection at lower cost.

**TABLE 1: COMPARISON OF DISPOSAL COSTS TO POTENTIAL DOSES REDUCED, ARRANGED IN ORDER OF INCREASING COST. THE VALUES LISTED ARE ONLY FOR COMPARISON. THEY DO NOT REPRESENT REAL DOSES TO REAL INDIVIDUALS.**

	Reference Cost (\$/ft <sup>3</sup> )	Intruder Scenario Dose (mrem)	Occupational Dose * (mrem/yr)	Accident Scenario Dose (mrem)
Reference Trench	86.00	24	180	1,612
<b>Disposal Enhancement</b>	<b>Additional Cost</b>	<b>Dose Reduction**</b>		
Separate Trench for Class B and C	+0.00	NB***	-10	NB
Reference Trench Lined with Clay	+0.13	NB	NB	NB
Reference Trench with Improved Engineered Cover	+0.58	-22	NB	NB
Reference Trench with Compacted Sand Backfill	+0.70	NB	+10	-3
Small Annual Trench	+1.34	-2	NB	NB
Unlined Auger, Soil Backfill	+2.09	-24	-40	NB
Lined Auger, Concrete Backfill	+2.17	-24	-40	NB
Deeper Depth Burial	+4.14	-24	NB	NB
Reference Trench with Concrete (Grout) Backfill	+8.35	-24	NB	-6
Reference Trench with Concrete Overpack	+54.25	-24	-80	-11
Stability Requirement for Class A	+71.30****	-24	-20	-441

**TABLE 2. ESTIMATED COST PER MILLIREM SAVED.**

Disposal Enhancement	Intruder Scenario (\$/ft <sup>3</sup> /mrem)	Occupational Dose * (\$/ft <sup>3</sup> /mrem/yr)	Accident Scenario (\$/ft <sup>3</sup> /mrem)
Separate Trench for Class B and C Waste	0.0	0.0	0.0
Reference Trench Lined with Clay	NB***	NB	NB
Reference Trench with Improved Engineered Cover	0.03	NB	NB
Reference Trench with Compacted Sand Backfill	NB	Dose increased	0.23
Small Annual Trench	0.67	NB	NB
Unlined Auger, Soil Backfill	0.09	0.05	NB
Lined Auger, Concrete Backfill	0.09	0.05	NB
Deeper Depth Burial	0.17	NB	NB
Reference Trench with Concrete Backfill	0.35	NB	1.44
Reference Trench with Concrete Overpack	2.26	0.68	4.93
Stability Requirement for Class A	2.97	3.57	0.16

\* The routine occupational worker dose is an annual dose during the operational disposal period whereas the intruder and accident scenarios are worst case single event phenomena.

\*\* A negative value denotes a reduction in dose, a positive value denotes an increase in dose.

\*\*\* NB = No Benefit (i.e., no reduction in potential dose).

\*\*\*\* Includes additional cost of \$70.00 to waste producers for stabilizing their waste.

**For more information or comments about the  
technology assessment study contact:**

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