

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE COMMISSION

In the Matter of:

LOUISIANA ENERGY SERVICES, L.P.)
(National Enrichment Facility)

) Docket No. 70-3103-ML

) ASLBP No. 04-826-01-ML

Deposition of:

GEORGE A. HARPER

ROGER L. PEERY

witnesses of lawful age, taken on behalf of the Nuclear
Information & Resource Service and Public Citizen,
pursuant to notice, in the New Mexico Environment
Department, Office of the Secretary, Conference Room,
Harold Runnels Building, 1190 St. Francis Drive, Santa Fe,
New Mexico, on Friday, September 17, 2004, at 9:00 a.m.,
before Carol Oppenheimer, Notary Public, when were
present:

APPEARANCES:

On behalf of Nuclear Information &

Resource Service and Public Citizen:

LINDSAY A. LOVEJOY, JR., ESQ.

618 Paseo del Peralta, Unit B

Santa Fe, New Mexico 87501

U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of LOUISIANA ENERGY SERVICES, LP

Docket No. 70-3103-ML Official Exhibit No. 17

OFFERED by: Applicant/Licensee Intervenor NIRS/PC

NRC Staff Other

IDENTIFIED on Witness/Panel G. Rice

Action Taken: ADMITTED REJECTED WITHDRAWN

Reporter/Clerk

On behalf of the Louisiana Energy Services,

L.P.:

JAMES R. CURTISS, ESQ.

MARTIN J. O'NEILL, ESQ.

Winston & Strawn, LLP

1400 L Street, N.W.

Washington, D.C. 20005-3502

On behalf of the Nuclear Regulatory Commission:

LISA CLARK, ESQ.

Nuclear Regulatory Commission

Also Present:

GEORGE R. (RANDY) CAMPBELL

Lockwood Greene

ROD KRICH

National Enrichment Facility

JOHN W. LAWRENCE, ESQ.

National Enrichment Facility

GEORGE RICE

Expert Witness, Groundwater Hydrologist

MARK S. STRUM

Framatome ANP, Inc.

ALAN TOBLIN

Advanced Technologies and Laboratories
International, Inc.

ABE ZEITOUN, Ph.D.

Advanced Technologies and Laboratories
International, Inc.

I N D E XWITNESSEXAMINATION

George A. Harper and

Roger L. Peery

Examination by Mr. Lovejoy

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Nuclear Information & Resource Service

and Public Citizen

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P R O C E E D I N G S

Whereupon,

GEORGE A. HARPER

ROGER L. PEERY

having been first duly sworn, were called as a witnesses herein, and were examined and testified as follows:

MR. LOVEJOY: Good morning. Can we mark as Exhibits 1 and 2 these two resumes, please.

(The documents referred to were marked for identification as Exhibits NIRS-HP 1 and 2.)

EXAMINATION

BY MR. LOVEJOY:

Q Okay. For identification, Mr. Peery, is Exhibit 1 your own resume?

A (Mr. Peery) Yes, it is.

Q And, Mr. Harper, is Exhibit 2 your own resume?

A (Mr. Harper) Yes, it is.

Q Okay. Mr. Peery, I take it from looking at your resume, Exhibit 1, that you're now associated with John Shomaker & Associates, a hydrology firm in Albuquerque. Is that right?

A (Mr. Peery) That's correct.

Q And I've just gotten this right now. Can you just tell me for the record what your education is in

1 scientific fields related to --

2 A (Mr. Peery) I have a bachelor of science in
3 geology and a master's in water resources.

4 Q Okay. And since 1992, how have you been
5 employed?

6 A (Mr. Peery) Since 1992, I've been employed at
7 John Shomaker & Associates as a hydrogeologist.

8 Q And what kind of tasks have you undertaken
9 there?

10 A (Mr. Peery) I have been involved with
11 environmental investigations, development of monitoring
12 wells, networks, logging of holes, remediation of
13 environmental sites, water resources work related to well
14 siting, evaluation of water supply, groundwater flow
15 modeling, water planning, regional water planning as well
16 as municipal water planning.

17 Q Have you had occasion to testify as an expert?

18 A (Mr. Peery) Yes, I have.

19 Q Can you name the times, please?

20 A (Mr. Peery) I can give you rough times. I
21 don't remember exactly.

22 Q That's fine.

23 A (Mr. Peery) I believe last year I testified in
24 front of the Office of the State Engineer hearing
25 examiners related to a water rights issue. And I believe

1 another time in front of the New Mexico Office o State
2 Engineer related to a water issue. That was around 2000.
3 I've also testified in front of the Planning and Zoning
4 Commission and the county commissioners of Santa Fe. That
5 was probably 1995-ish in front of the Socorro County
6 commissioners, I believe, 2000. Sandoval County
7 commissioners, I testified before them on several
8 occasions in the late '90s and 2003 and probably somewhere
9 in early 2000 also.

10 Q Okay. How large an office is Shomaker &
11 Associates?

12 A (Mr. Peery) We're currently about 14 people,
13 including support staff.

14 Q Okay. And what tasks, if any, have you been
15 assigned to undertake with respect to the LES proposal for
16 an enrichment plant?

17 A (Mr. Peery) To look at the site hydrogeology
18 and to look at water supply issues.

19 Q When you say, look at hydrogeology, what do you
20 mean? What have you been asked to do?

21 A (Mr. Peery) Review available data from site
22 reports and permit applications that LES has submitted,
23 and I've also looked at other scientific reports from
24 nearby WCS facility.

25 Q Okay. Have you been asked to direct or design

1 any exploration efforts?

2 A (Mr. Peery) No, I have not.

3 Q Have you been asked to undertake any data
4 gathering efforts, apart from reviewing reports that have
5 been prepared?

6 A (Mr. Peery) No.

7 Q When did you first undertake work on matters
8 involving LES?

9 A (Mr. Peery) I think we signed a contract with
10 LES approximately three months ago.

11 Q We being Shomaker & Associates.

12 A (Mr. Peery) Shomaker & Associates.

13 Q Okay. Mr. Harper, would you identify Exhibit
14 2?

15 A (Mr. Harper) I already have.

16 Q You did. Okay. So it's still your resume.

17 A (Mr. Harper) Still my resume.

18 Q Okay. Would you please describe your
19 scientific and engineering education.

20 A (Mr. Harper) I have a bachelor of science in
21 civil engineering and a master's of science in civil
22 engineering from the University of Massachusetts at
23 Amherst. I'm a registered professional engineer in three
24 states: Maine, New Hampshire and Massachusetts. And I've
25 worked in the nuclear industry for 25 years, mostly in the

1 environmental area.

2 Q What, if any, training have you had in the
3 sphere of hydrology?

4 A (Mr. Harper) My master's in flow mechanics and
5 hydraulics. As you'll see in my resume, I've taken
6 various hydrology seminars and training courses over the
7 years. I'm also a FERC-approved hydrologist, as my resume
8 documents, and I've done a lot of hydrology and hydraulics
9 work during my career.

10 Q What is involved in becoming a FERC-approved
11 hydrologist?

12 A (Mr. Harper) I've been on two of the DM safety
13 committees where by through my experience and record, they
14 have approved me to act as a hydrologist on DM safety
15 studies.

16 Q Have you ever testified as an expert witness on
17 matters of hydrology?

18 A (Mr. Harper) Partially. I testified back in
19 the early 1990s before the Vermont Public Utilities
20 Commission on site characterization issues associated with
21 a potential low-level waste facility in Vermont, and my
22 testimony covered all types of environmental issues,
23 including hydrology and groundwater.

24 Q Okay. Is that the only instance you've
25 testified as expert in hydrology?

1 A (Mr. Harper) Correct.

2 Q And where are you employed now?

3 A (Mr. Harper) I'm with Areva Framatome out of
4 Marlborough, Massachusetts. We provide all types of
5 services to the nuclear industry in the United States and
6 throughout the world.

7 Q Now, you used the term Areva, A-R-E-V-A. Is
8 that an acronym?

9 A (Mr. Harper) No. It's our parent company name
10 in France.

11 Q And is Areva the parent of Framatome?

12 A (Mr. Harper) Correct.

13 Q Is Areva a public company?

14 A (Mr. Harper) It is in the process of becoming
15 publicly traded in Europe.

16 Q Does Areva have any corporate relationship with
17 LES or any of the partners that make up LES?

18 A (Mr. Harper) Not to my knowledge.

19 Q Is the work that Framatome is doing for LES
20 under contractual arrangement?

21 A (Mr. Harper) Yes, it is.

22 Q Do you know how long ago that contract was
23 made?

24 A (Mr. Harper) Yes. The original contract
25 with -- was actually with Urenco back in early 2002.

1 Q Okay. Can you -- let's start with you, Mr.
2 Harper. Can you please tell me what conclusions or
3 opinions you're going to be expressing in this proceeding?

4 A (Mr. Harper) I'll be -- I'm here to discuss
5 the three basins that have been designed for the facility,
6 the septic system, potential sources of contamination of
7 liquids that flow into those basins or the septic systems,
8 groundwater monitoring, the New Mexico groundwater
9 discharge permit application that LES has submitted, and
10 the UF₆ feed pump composition.

11 Q The feed composition, did you say?

12 A (Mr. Harper) Yes.

13 Q All right. You're here to testify on those
14 subjects. Well, do you have any expert conclusions that
15 you're going to provide the Atomic Safety and Licensing
16 Board in this case?

17 A (Mr. Harper) Yes, I do.

18 Q What are those? You can go down these subjects
19 if you like.

20 A (Mr. Harper) Okay. Well, in regards to the
21 basins, my conclusion is that the basins have been
22 engineered to the extent to preclude any significant
23 release of contamination to the soils underneath the
24 basins and also to the groundwater; that the groundwater
25 monitoring program has been -- as outlined in the

1 groundwater discharge permit -- in the environmental
2 report is adequate to monitor the groundwater for the
3 facility. And I guess that's it.

4 Q Those are the only conclusions you're going to
5 testify to.

6 A (Mr. Harper) That come to mind right now, yes.

7 Q Well, if in the course of today's testimony
8 something else comes to mind, can you let me know?

9 A (Mr. Harper) Sure.

10 Q Okay. And, Mr. Peery, what conclusions --
11 rather let's start a little earlier. What subject areas
12 are you here to testify about, are you going to be
13 testifying before the Board about?

14 A (Mr. Peery) I'll be testifying about the
15 characterization that was performed at the site, the
16 geologic -- type of geologic characterization. I'll be
17 discussing the absence of shallow groundwater at the
18 system; hydraulic properties of the formations at the
19 site; and the absence of fracturing or fast-flow paths,
20 you might -- as referred to yesterday in the Chinle.

21 Q When you say the absence of fast-flow paths, is
22 it your conclusion that there are no fast-flow paths in
23 the Chinle?

24 A (Mr. Peery) My conclusion is there's no
25 evidence to support that there are any fractures that are

1 fast-flow paths in the Chinle.

2 Q Okay. On the other matters that you're going
3 to be testifying about, what conclusions have you reached?

4 A (Mr. Peery) I'm sorry. What other matters are
5 you addressing?

6 Q You said you were going to testify about the
7 characterization at the site, the absence of shallow
8 groundwater, the hydraulic properties of the formations.

9 A (Mr. Peery) Can we go through those one at a
10 time, please?

11 Q Please.

12 A (Mr. Peery) The first one, adequacy of the
13 characterization of the site, the conclusions I reached on
14 that is that the investigation was what would normally be
15 done for site investigation, industry standard for
16 evaluating whether or not there's shallow groundwater
17 present, and also looking at the developed properties of
18 the aquifer at the approximately 220-foot zone.

19 Q What about that aquifer?

20 A (Mr. Peery) What do you mean?

21 Q You just said, and also about the aquifer in
22 the 220-zone. What's your conclusion about that?

23 A (Mr. Peery) That the aquifer is present under
24 confined conditions; that it has a very low hydraulic
25 conductivity, very low permeability.

1 Q Okay. You spoke of the absence of shallow
2 groundwater. What is your conclusion in that regard?

3 A (Mr. Peery) My conclusion is that based on 14
4 borings that were advanced at the site, that there is no
5 shallow groundwater present at the site. All of the
6 borings were advanced through the shallow sediments,
7 basically alluvial type and Quaternary age sediments, to
8 the top of the redbed which is the Chinle, and there is no
9 evidence to suggest that any water was there.

10 There was one report of moisture present in one
11 of the borings that was performed as part of the
12 geotechnical investigation, and the presence of just
13 someone logging a cutting as moist is not an indication
14 that there's groundwater present. Normally cuttings are
15 logged in sort of a relative fashion: very dry, dry,
16 moist, slightly moist, moderately moist, very moist,
17 saturated. And there was no indication of very moist or
18 saturated sediments in any of the boreholes.

19 In fact, that borehole that I mentioned was the
20 only one where moist sediments were actually mentioned.
21 Another boring -- I believe it was B-2 -- had report of
22 slight moisture at a zone from 6 to 14 feet, but that's
23 way above the redbeds, and we had very dry sediments
24 reported on either side of it.

25 Q So you just -- I'm sorry. Go ahead.

1 A (Mr. Peery) Also, nine of the borings were
2 left open overnight to see if any water would accumulate
3 in the borings, and none was noted.

4 Q When you talk about shallow groundwater,
5 what -- can you quantify that?

6 A (Mr. Peery) Well, I guess it's a relative
7 term, depending where you are in New Mexico, but at this
8 specific site, the shallow groundwater would normally be
9 referred to in the upper sediments, above the Chinle
10 formation.

11 Q And can you quantify the depth of that? Does
12 that vary a whole lot over the site?

13 A (Mr. Peery) It varies from around 22 feet to
14 about 55 feet, if I recall.

15 Q Uh-huh. Can you tell us exactly how the report
16 of moisture in one of the holes that you spoke of -- what
17 data was that based on?

18 A (Mr. Peery) It was based on the field
19 geologist's interpretation of the materials that came off
20 the log from a split-spoon sample.

21 Q And what drilling methods were used?

22 A (Mr. Peery) It was a hollow-stem auger.

23 Q Do you know whether the cuttings themselves
24 that came up were being logged or recorded in any way when
25 that hole was made?

1 A (Mr. Peery) I don't have firsthand knowledge
2 of that, but as a geologist who has performed logging of
3 numerous holes, you always log everything that comes up
4 the hole, whether it's a core, a split-spoon or the
5 cuttings, to verify everything you see coming out of the
6 hole.

7 Q Did you check the logs of the cuttings to see
8 if there was any mention of moisture?

9 A (Mr. Peery) The mention of moisture was for a
10 specific zone, and so I assume it's -- everything over
11 that entire zone was logged as moist, the cuttings and
12 the --

13 Q What was -- what's the name of -- the
14 designation of this hole that we're talking about?

15 A (Mr. Peery) I believe that one was B-2.

16 Q B-2. Okay.

17 A (Mr. Peery) From the geotechnical borings.

18 Q And what was the depth of the zone? What was
19 the vertical extent of the zone?

20 A (Mr. Peery) Approximately 31 to 40 feet, if I
21 recall correctly. And it's important to point out that
22 when you have a formation like the Chinle, which is
23 predominantly a shale or clay material, that you have a
24 significant amount of porosity in that material, and
25 therefore having moist samples is not an unusual thing to

1 find in the Chinle or any formation for that matter above
2 the water table in the vadose zone.

3 The fact that you have such a high porosity in
4 the fine-grain materials, it allows it to hold onto water
5 quite readily, but it doesn't allow water to move quickly
6 through that sediment or to develop necessarily a
7 saturated zone.

8 Q So the moisture, if we can call it that, was in
9 a zone of the Chinle. Is that correct?

10 A (Mr. Peery) Uh-huh.

11 Q Can you describe the -- this is sedimentary
12 rock. Is that right?

13 A (Mr. Peery) Yes.

14 Q And what's the nature of it in the zone that
15 was moist?

16 A (Mr. Peery) Nature of it's a high-density,
17 highly plastic clay.

18 Q Okay. You said that you're also going to be
19 testifying about the hydraulic properties of the
20 formations. Can you say what your conclusions are in that
21 regard?

22 A (Mr. Peery) Yes. My conclusions regarding the
23 Chinle is that it has a very low permeability based on
24 data from the nearby WC site, which is a very similar
25 hydrogeologic setting in that it has the same sediments

1 overlying the redbeds, the Chinle present, and water is
2 found at the same 220-foot zone that I described.

3 The Chinle has very low permeability. Data
4 from the WCS site reflects permeabilities on the order of
5 1 times 10 to the minus 8 or minus 9 centimeters per
6 second, which is a very low permeability. And also you
7 couple that with the fact that the borings into the
8 redbeds at the LES site are reported as very dry indicates
9 that there's very limited opportunity for water to move
10 vertically downward, in addition to the fact that the
11 permeabilities recorded at WCS indicate what the Chinle
12 would be in that regional area.

13 Q And what was your source for the information
14 about permeabilities of the WCS site?

15 A (Mr. Peery) Various reports starting, I
16 believe, with Rainwater, '93 or '96, and a recent geologic
17 report for the site.

18 Q Can you identify that any more?

19 A (Mr. Peery) I believe it was a 2003 geology
20 report for the site, but I don't remember the exact title.

21 Q And how had permeability data been obtained for
22 use in those reports?

23 A (Mr. Peery) Primarily the permeability data
24 related to the Chinle is from laboratory permeabilities,
25 and normally when you get laboratory permeabilities, the

1 way the samples are collected, you often will see some
2 increased permeability, because the sample is collected by
3 pounding a split-spoon into the sediments, so therefore
4 you can get some more damage to the material that you're
5 trying to sample, so it tends to potentially give you some
6 higher permeability readings than you might otherwise have
7 gotten.

8 Q Isn't it a fact that you could also get lower
9 permeability readings than you might get in a field test,
10 using a lab test?

11 A (Mr. Peery) I would say that's dependent on
12 the nature of the material that you're sampling.

13 Q If there were any fractures or fast-flow paths
14 in the Chinle and one used a lab sample to test
15 permeability, isn't it quite possible that you'd miss the
16 fast-flow paths with the sample you took?

17 A (Mr. Peery) The boreholes that were sampled
18 and logged, no. I would say no. You would see those as
19 you drilled down and collect your samples.

20 Q Would they be present in the -- well, strike
21 that.

22 When you're conducting a lab test, you actually
23 extract a piece of the formation, and you subject it to
24 permeability tests of that piece of rock in the lab. Is
25 that right?

1 A (Mr. Peery) Uh-huh. That's correct.

2 Q And can you tell me the size of the sample that
3 was taken for testing in the WCS site?

4 A (Mr. Peery) No, I don't recall. Normally
5 those kind of samples would be on the order of an inch-
6 and-a-half diameter split-spoons, but I don't know exactly
7 what was used.

8 Q So if there were fractures at a rate of, say,
9 five inches apart in the rock body, there's no assurance
10 that you would capture that characteristic in a sample, is
11 there?

12 A (Mr. Peery) Possibly not. I should point out
13 again, though, the fact that the Chinle sediments are
14 reported as dry to very dry is strong evidence that there
15 isn't a fast-flow fracture path there. If there were, you
16 would expect to see those sediments having quite a bit of
17 moisture in boreholes.

18 Q You said that there's no evidence of fast-flow
19 paths or fractures. And were you referring to the Chinle
20 formation --

21 A (Mr. Peery) Yes.

22 Q -- when you spoke. And did you look for such
23 evidence?

24 A (Mr. Peery) Yes, I did.

25 Q And can you tell me what you did?

1 A (Mr. Peery) Well, the evidence that I did look
2 for was the logging of the moisture content, both at the
3 LES facility and at the WCS facility, and then I looked at
4 the permeability data from the WCS facility, and -- with
5 the intent that if there were very high permeabilities in
6 the lab samples, that that would indicate some sort of
7 fast-flow path fracturing or something, but I didn't see
8 any of that.

9 Q Did you --

10 A (Mr. Peery) And let me add something else.

11 Q Please.

12 A (Mr. Peery) The aquifer that I described at
13 the zone of 220 foot is -- has a very low permeability.
14 It was reported from a slug test at the LES site to have a
15 permeability or hydraulic conductivity of 3.7 times 10 to
16 the minus 6 centimeters per second, which is very low. In
17 fact, water levels recover quite slowly there, indicating
18 also that it is -- it's a poor aquifer, if you want to
19 call it that.

20 If there were fracturing in the Chinle -- and
21 the Chinle being a more clay unit than the siltstone
22 present at the 220-ish-foot depth, we would expect those
23 fractures to continue on down into the aquifer that's
24 present at 220 feet, and that would increase the
25 permeability. That aquifer would be -- it would have had

1 much higher permeabilities than what were documented from
2 field testing.

3 Q And what was the figure you gave us? Was it
4 3.7 times 10 to the minus 7?

5 A (Mr. Peery) Ten to the minus 6 centimeters --

6 Q Minus 6? Okay.

7 A (Mr. Peery) --- per second.

8 Q Okay. Why do you say you would expect the
9 fracturing to be present at depth also?

10 A (Mr. Peery) Well, it's -- geologically
11 speaking, it's very difficult to fracture an upper part of
12 a formation without some movement that fractures the lower
13 portion of the formation.

14 Q In your work for LES, did you talk to anybody
15 about how the investigation plans for the LES site had
16 been developed, and, you know, what choices had been made
17 in designing that investigation?

18 A (Mr. Peery) Before I asked them about that, I
19 reviewed the available reports, which gave a description
20 of how the investigation was designed and developed, and
21 then coupled with that, I've had some recent talk with
22 them about how it was designed.

23 Q Who did you have these discussions with?

24 A (Mr. Peery) Actually my discussions were with
25 George Harper on that.

1 Q Okay. And you say the available reports.
2 Which were those that you reviewed?

3 A (Mr. Peery) There was a preliminary subsurface
4 investigation report and then the hydrogeologic report,
5 both for the LES facility.

6 Q And who did the first one?

7 A (Mr. Peery) I don't recall.

8 Q And --

9 A (Mr. Peery) It might have been Lockwood
10 Greene, but I'm not positive.

11 Q And who did the second one?

12 A (Mr. Peery) Cook-Joyce did the second one.

13 Q And what your discussion with Mr. Harper about
14 the planning for those investigations?

15 A (Mr. Peery) Well, my discussion was that I
16 thought they took a reasonable approach to identify the
17 subsurface conditions at the site. What they did was they
18 built a grid and drilled holes on a grid, rather than just
19 sort of randomly walking around, drilling holes. They
20 actually came up with a plan and followed it to get the
21 site information.

22 And subsequent to that, when George Harper and
23 I talked, he said they came up with that plan and also
24 used Cook-Joyce because they had done so much work at the
25 nearby WCS facility and had a lot of experience with the

1 subsurface conditions in the area.

2 Q What were the dimensions of the grid?

3 A (Mr. Peery) I think the -- as I recall -- and
4 George Harper would probably be better to ask. But as I
5 recall, it was -- borings were on a three-by-three grid at
6 1,000-foot spacing. But George could probably address
7 that more accurately.

8 Q Was that accurate?

9 A (Mr. Harper) The three-by-three grid and the
10 1,000-foot spacing is approximately what I recollect.

11 Q Okay. Did you -- did it occur to you in your
12 work that there might have been some other investigations
13 carried out?

14 A (Mr. Peery) At the LES site?

15 Q Yes.

16 A (Mr. Peery) No, it did not.

17 Q Okay.

18 A (Mr. Peery) And I guess I should state my
19 reason for that.

20 Q All right.

21 A (Mr. Peery) I've done a significant amount of
22 work in Lea County related to the Lea County Regional
23 Water Plant, and during our investigation and
24 hydrogeologic study for that plant, I didn't recall any
25 activity in that area, both by my driving through the area

1 or in documents that we uncovered when we were putting
2 together our plan.

3 Q You didn't encounter any other activities?
4 That's what you're saying?

5 A (Mr. Peery) Yes. Like I didn't see anything
6 when I drove by the site, so -- there was nobody drilling
7 at the site while I was performing the Lea County plan, so
8 I didn't see anything happening there and I didn't find
9 anything in written documentation.

10 Q Well, did it occur to you that there might have
11 been certain efforts undertaken which were not?

12 MR. CURTISS: I think he's answered the
13 question no.

14 MR. LOVEJOY: Well, I think there's some
15 confusion here. He's said that he was there and nobody
16 was doing anything else.

17 THE WITNESS: (Mr. Peery) No. That's not
18 exactly what I said. I said -- you asked me if I had --
19 could you restate the question?

20 BY MR. LOVEJOY:

21 Q Well, the question is: In examining the work
22 that was done to investigate the LES site, did it occur to
23 you that there might have been certain efforts undertaken
24 which had not been undertaken?

25 A (Mr. Peery) And I said no.

1 Q Yes.

2 A (Mr. Peery) And I gave my reasons for that,
3 both visual -- having been by the site, I didn't see
4 anything happening -- and doing research for my Lea County
5 study, that didn't turn up any documentation, so, no. It
6 didn't occur to me that there would have been other work
7 done at the site.

8 Q Okay. Well, as a scientist, did it occur to
9 you that there might have been some efforts undertaken
10 which were not undertaken, that would have made the
11 investigation better?

12 A (Mr. Peery) Could you --

13 Q Is my question clear now?

14 A (Mr. Peery) No. It's not clear to me. I'm
15 sorry.

16 Q Okay. Well, did it occur to you, as you
17 examined the work done at the site, that there might have
18 been some different or additional drilling done, that
19 might have satisfied you more about knowledge of the
20 subsurface?

21 A (Mr. Peery) Well, I'm sort of at a little bit
22 of a loss for your question. I'm not sure if you're
23 asking whether or not I think that there was data
24 performed that I didn't evaluate or if --

25 Q No.

1 A (Mr. Peery) -- I would have evaluated it
2 differently.

3 Q I'm asking if you might have evaluated it
4 differently, if you were there to design the exploration.

5 MR. CURTISS: Let me just clarify the question.
6 I think the witness has said that in reviewing the
7 information that was adduced from the investigation, he
8 indicated that provided an adequate basis for the
9 characterization of the site. And if the question is,
10 Should more have been done, I would advert to his answer
11 to your earlier question, that the information that was
12 performed was adequate.

13 BY MR. LOVEJOY:

14 Q So let me just ask you. Did anything occur to
15 you that you think should have been done which was not
16 done?

17 A (Mr. Peery) No. And, in fact, when I started
18 my testimony, I said I thought the investigation was
19 formed in an adequate way and would generally be
20 considered industry standard for performing a site
21 investigation.

22 Q Okay. Did you consider at all whether there
23 might have some slant drilling done at the site?

24 A (Mr. Peery) No. That's not generally industry
25 standard for site investigations.

1 Q Why do you -- what's the basis for that
2 statement, that it's not industry standard?

3 A (Mr. Peery) The basis for that is, I guess, my
4 experience as a hydrogeologist over the last 16 years.
5 It's very unusual to perform any sort of slant drilling on
6 sites. Most everything is done by vertical drilling,
7 whether it's for leaky gas station sites, sites associated
8 with contamination in mining industries that I've been
9 involved with, and just about every environmental project
10 I've been involved with was only done vertical boreholes
11 in wells.

12 Q Has most of the work that you've had experience
13 with involved identifying the extent of contamination that
14 has taken place?

15 A (Mr. Peery) No. Some of my work has been
16 going to sites to see if there is contamination first, and
17 if there is, then to develop a program to define the
18 extent and nature of that contamination.

19 Q Did it occur to you that efforts might have
20 been undertaken to identify the age of any of the
21 groundwater found at the LES site?

22 A (Mr. Peery) No, I didn't. That's generally
23 not an activity that's undertaken, and I'm not sure
24 specifically what groundwater you're referring to.

25 Q But it didn't occur to you with respect to any

1 of it.

2 A (Mr. Peery) Well, what I did is I evaluated
3 the water quality data for the deep aquifer at 220 feet,
4 and the total dissolved solids concentration of that water
5 exceeds 6,000 milligrams per liter, which indicates it's
6 not a particularly young water. In order for water to get
7 that concentration of total dissolved solids, it has to
8 spend a fair amount of time in the aquifer in order to
9 dissolve the minerals into the water, so it indicates a
10 pretty slow movement through the aquifer and a long
11 residence time, so it didn't seem to me reasonable to try
12 to do any age-dating of a water of that nature.

13 Q How old was that water?

14 A (Mr. Peery) I don't know how old it is, but it
15 has to be -- I mean, it is not recent. It's old water.
16 Geologically speaking, it's a hard thing to quantify, but
17 it is --

18 Q Can you tell us what you mean when you say it's
19 old water?

20 A (Mr. Peery) Oh, tens of thousands of years or
21 more.

22 Q Did you examine, in your work for LES, the
23 plans for construction of the facility?

24 A (Mr. Peery) No. Some of the documentation was
25 provided to me, but that's outside my area of expertise.

1 Q So you didn't look at the sewage system or the
2 various discharge lagoons that were planned to be
3 constructed.

4 A (Mr. Peery) I know where they are physically
5 on the map and have read about the discharge of the septic
6 and the stormwater detention lagoon and the UBC and the
7 TEEB basins, but in regards to looking at actual design of
8 facility, I didn't look at it in that manner.

9 Q And you didn't involve yourself in trying to
10 estimate where water might go if it entered those basins?
11 That was outside your assignment?

12 A (Mr. Peery) Not exactly. I did look at the
13 basins, just in regard to particularly the unlined basin
14 and what might happen with that. But the lining of basins
15 and calculating anything that could potentially happen
16 through basins is outside -- lined basins is outside my
17 area of expertise.

18 Q Okay. What work did you do with respect to the
19 unlined basin?

20 A (Mr. Peery) I just looked at it in terms of
21 what kind of water it would receive.

22 Q The quantity? Quality? What were you looking
23 at?

24 A (Mr. Peery) Just where the run-off was coming
25 from.

1 Q Did you seek to quantify the amount that might
2 enter that basin?

3 A (Mr. Peery) No. It was included in the
4 reports. I didn't try to quantify --

5 Q It was in the data you had?

6 A (Mr. Peery) Uh-huh.

7 Q Well, did you try to project where that water
8 might end up if it entered that basin?

9 A (Mr. Peery) I didn't do any calculations on
10 that. The sight hydrogeology would indicate that the
11 water from an unlined basin would just have to move out
12 into the alluvial sediments, if you will, and there
13 wouldn't really be an opportunity for it to migrate the
14 Chinle and contaminate anything else because of the low
15 permeabilities at the site. But I didn't attempt to look
16 at where the water might end up in terms of its horizontal
17 extent.

18 And one of the primary reasons is evaporation
19 rates. Evapo-transpiration rates are so high in this
20 area, they're on the order of about 65 inches per year, so
21 even water that infiltrates into the shallow alluvium has
22 a relatively limited opportunity to migrate, as a lot of
23 it just gets lost.

24 Q When you talk about the low permeabilities at
25 the site, what bodies -- what rock bodies are you

1 referring to?

2 A (Mr. Peery) I'm referring to the Chinle.

3 Q Okay.

4 A (Mr. Peery) Well, and I guess the water zone
5 at 220 feet is low permeable.

6 Q You speak of the alluvium. What is the -- how
7 far down does the alluvium go at this site?

8 A (Mr. Peery) I addressed that earlier. As I
9 recall, I said from approximately 20 to 55 feet, which is
10 actually a combination of the younger sediments, whether
11 it's the Blackwater Draw eolian sediments, Ogallala
12 sediments, but all the younger sediments sitting on top of
13 the Chinle.

14 Q So this may be more in Mr. Harper's domain,
15 but, please, if you know the answer, go right ahead. How
16 many septic leach fields are there planned to be in the
17 plant at present?

18 A (Mr. Harper) Right now we're planning on six
19 systems.

20 Q Okay. And what is the volume of water that's
21 going to go into these septic systems?

22 A (Mr. Harper) It's approximately 5,300 gallons
23 per day.

24 Q And after it's discharged, where is this going
25 to end up? Have you made any calculations?

1 A (Mr. Harper) The only thing we've looked at is
2 that the -- that amount of water going into the basins per
3 day is -- I'm sorry -- into the leach fields per day is
4 only a very small fraction of the annual rainfall that the
5 site presently sees.

6 Therefore, it's just a minuscule additional
7 amount of water, what the site sees from rainfall today,
8 and therefore, right now all the infiltration at the site
9 is essentially taken up by evapo-transpiration. Therefore
10 I would assume the same to be the case for the discharge
11 from the leach fields.

12 Q And beyond that, you've made no calculations of
13 the fate of the water from the leach fields. Is that
14 right?

15 A (Mr. Harper) Correct.

16 Q Now, with respect to the unlined basin, the
17 stormwater basin, what's the quantity of water? That's a
18 little hard to predict, but have you assigned a quantity
19 of water flowing into that basin?

20 A (Mr. Harper) We have, and that information is
21 in the environmental report and the State of New Mexico
22 groundwater discharge permit.

23 Q And have you made any calculations of the fate
24 of that water?

25 A (Mr. Harper) Yes, we have.

1 Q And where are they reflected?

2 A (Mr. Harper) We did a water balance -- annual
3 water balance for the basins that's summarized in one of
4 the RAI responses to the -- one of the NRC questions on
5 the ER.

6 Q And do you recall now where it was projected
7 that the water to that basin would go?

8 A (Mr. Harper) Yes. Our -- for the purpose of
9 the analysis for the water balance and not having the
10 detailed design of the basin available, we assumed that
11 for the water balance calculations, 50 percent infiltrated
12 and that 50 -- approximately 50 percent infiltrated and
13 approximately 50 percent evaporated. And of the amount
14 that infiltrated, it essentially would all go back up
15 through evapo-transpiration.

16 Q What depth would it reach?

17 A (Mr. Harper) We -- I --

18 Q You didn't project it?

19 A (Mr. Harper) -- did not project that.

20 Q So your conclusion was that all of it would
21 ultimately go up through plant matter and evaporation
22 and --

23 A (Mr. Harper) Correct. Yes.

24 Q Okay. Did you undertake to make measurements
25 of a projected plume associated with the unlined basin?

1 A (Mr. Harper) No, we did not.

2 Q Okay. Now, there are two basins that are
3 planned for the plant that would have a liner. Is that
4 right?

5 A (Mr. Harper) Correct.

6 Q And one of them -- what is it? It's the TEEB.

7 A (Mr. Harper) Correct.

8 Q And that's the Treated Effluent Evaporation
9 Basin. Is that right?

10 A (Mr. Harper) Very good.

11 Q Okay. I'm learning. And the other one is the
12 UBC basin. Is that right?

13 A (Mr. Harper) The UBC stormwater --

14 Q UBC stormwater basin.

15 A (Mr. Harper) Retention basin.

16 Q Okay. Now, with respect to the TEEB, have you
17 made any projections of water going out of that and into
18 the soil and subsurface?

19 A (Mr. Harper) We have these -- the design of
20 that basin is such as to contain all the water within the
21 basin through the double-lined system with an intermediate
22 leak detection and collection system.

23 Q Uh-huh. So is the answer that you've not made
24 any calculations involving water leaking from that basin?

25 A (Mr. Harper) Correct.

1 Q All right. Okay. Where is the most recent
2 design for that basin recorded? Where is it written down?

3 A (Mr. Harper) It would be in the Lockwood
4 Greene documents for the basin, and also it is summarized
5 in the groundwater discharge permit plant application that
6 LES filed with the State of New Mexico. And the
7 information in there draws upon the Lockwood Greene
8 documents.

9 Q Okay. Can you describe the liners, liner or
10 liners that are associated with the TEEB under the current
11 plan.

12 A (Mr. Harper) Under the current plan they're
13 synthetic membranes, and we've given an example is the
14 groundwater permit of either HDPE or another brand name
15 that I'd have to look in the report. But it's mentioned
16 both in the ER and in the groundwater discharge permit.

17 Q Uh-huh. And what are the other elements of the
18 containment system for the TEEB? Is there a clay liner?
19 Can you describe the various layers?

20 A (Mr. Harper) From the bottom up, there
21 would --

22 Q Yes.

23 A (Mr. Harper) -- a minimum two-foot layer of
24 clay, and the bottom liner will then sit on top of the
25 clay. And then between -- and then above that liner,

1 there is a membrane and a series of pipes to collect any
2 leakage through the upper membrane, which would rest on
3 top of that leak collection system. And there's a minimum
4 one foot of clay layer on top of the upper liner for UV
5 protection and to protect it from inadvertent punctures.

6 Q Now, the -- you spoke of pipes. What's the
7 matrix in which it is planned to in-place these pipes?

8 A (Mr. Harper) That has not been detailed as I
9 know.

10 Q Uh-huh. Is there any system planned which
11 would alert you of the fact that there was leakage of the
12 upper liner?

13 A (Mr. Harper) Yes. That's described in the
14 groundwater permit application. The leak collection
15 system will be routed to a sump, and the sump will have
16 level monitoring, which would then alert the control room.

17 Q Uh-huh. Have you undertaken any effort to
18 project the performance of this liner system for the TEEB?

19 A (Mr. Harper) We have made certain commitments
20 that the liner material, when selected, per the vendor
21 information will have a life, a projected life, you know,
22 commensurate with the projection for the facility and that
23 it will meet the minimum thickness requirements from the
24 NMED guidelines and will be engineered and designed and
25 installed in accordance with NMED guidelines.

1 Q Which guidelines are those?

2 A (Mr. Harper) They're referenced in the
3 groundwater discharge permit. They're guidelines for
4 liners for the basins.

5 Q Okay. And what is the -- you said the vendor
6 will project the life commensurate with plant life. And
7 what is that life you're talking about?

8 A (Mr. Harper) The operational period of the
9 facility is approximately 30 years.

10 Q Okay. And what year do you expect that the
11 liner will be installed?

12 A (Mr. Harper) The liners will be installed
13 prior to operation, so I would therefore -- based on the
14 current schedule, I believe that would be sometime in
15 2008.

16 Q That it would be installed in 2008 or sometime
17 before 2008?

18 A (Mr. Harper) Sometime prior to start-up.

19 Q Okay. Do you know when?

20 A (Mr. Harper) I believe the projected start-up
21 date right now for the facility is sometime in 2008.

22 Q Okay. But what's the projected date for
23 installing liners?

24 A (Mr. Harper) Well, the liners would need to be
25 installed prior to receiving liquid effluent. I don't --

1 you know, again they haven't been designed or scheduled
2 yet, so I can't tell you when -- actually when the liners
3 will be installed.

4 Q Okay. And what is the projected date for
5 closure of the facility?

6 A (Mr. Harper) Closure of the facility would be,
7 as I stated, approximately -- the facility is projected to
8 operate for approximately 30 years from initial start-up.

9 Q So does that mean the closure date is projected
10 to be 30 years after start-up? Or is it longer?

11 A (Mr. Harper) I believe it would be
12 approximately 30 years.

13 Q Okay. And that would make it what year?

14 A (Mr. Harper) Sometime around the year 2038.

15 Q Do you know how long it would take to close the
16 facility?

17 A (Mr. Harper) My recollection from the
18 information in the ER is the decommissioning period is
19 approximately scheduled to occur over nine years.

20 Q Okay.

21 A (Mr. Harper) But the decommissioning is phased
22 in where they're decommissioning some of the units while
23 they're still operating other units. So the overall
24 decommissioning phase is approximately nine years.

25 Q Do you know when the TEEB would be closed?

1 A (Mr. Harper) It would be closed when it would
2 no longer be needed.

3 Q And would that be when no part of the plant is
4 operating?

5 A (Mr. Harper) When it is no longer required for
6 either operation or to support decommissioning.

7 Q Okay. Well, do you know if that would be at
8 the beginning of the nine-year period or at the end or at
9 some other point, or don't you know?

10 A (Mr. Harper) It would be at some point during
11 the nine-year period.

12 Q Can you describe the process of closing the
13 TEEB?

14 A (Mr. Harper) The process for closing the TEEB
15 is outlined in the groundwater discharge permit
16 application.

17 Q And just briefly, what do you when you close,
18 the TEEB?

19 A (Mr. Harper) The plan for closure, for
20 decommissioning is to -- first we will sample the soil,
21 the uppermost soil on top of the liner, segregating any of
22 it that is contaminated, and dispose of it properly.

23 MR. CURTISS: May I consult with the witness?

24 (Witness and attorney conferring.)

25 THE WITNESS: (Mr. Harper) I would like to

1 clarify a previous statement. The nine-year period for
2 decommissioning --

3 BY MR. LOVEJOY:

4 Q Yes. Go ahead.

5 A (Mr. Harper) -- falls within the 30-year
6 period of -- that I gave for the operation of the plant.

7 Q Are you saying that the closure process is
8 planned to commence 21 years after operations begin?

9 A (Mr. Harper) No. I said the closure process
10 for the TEEB would commence when it is no longer needed to
11 support decommissioning.

12 Q Okay. Well, can you put a number on it as you
13 understand the plan?

14 A (Mr. Harper) I have not reviewed the
15 decommissioning schedule in detail to provide that --

16 MR. CURTISS: I think, Lindsay, here, just to
17 clarify for the witness's benefit and for yours, the
18 question that you're raising -- and I don't have an
19 objection, but just to clarify for the record -- is
20 whether the liners will last during the period that
21 they're going to be used, and I think the witness has
22 testified that the liners, in accordance with the
23 discussions that have taken place will last the 30-year
24 period and that the decommissioning of the plant will
25 occur within that 30-year period.

1 If there's some additional question relative to
2 the liners here, which is the subject of this contention,
3 and whether they will, in fact, last the period of concern
4 that you're articulating here, I think he's in a position
5 to answer that, but he's not a witness that's qualified to
6 answer questions about the details of decommissioning the
7 plant, what's going to occur when.

8 MR. LOVEJOY: Well, I don't need the details of
9 decommissioning, but the schedule is important if you're
10 talking about projecting the life of some liners, so
11 that's what I want to go to.

12 BY MR. LOVEJOY:

13 Q You don't know whether the decommissioning
14 phase is going to be -- whether decommission -- well,
15 strike that. Let me say this.

16 Is decommissioning going to be completed by the
17 end of the 30-year period, as you understand it?

18 A (Mr. Harper) I believe LES is applying for a
19 30-year license, which is from -- covers the period from
20 when nuclear material arrives on site until they finish
21 decommissioning.

22 Q Okay. You were outlining in a general form
23 what the process is to close the TEEB.

24 A (Mr. Harper) Right.

25 Q Would you complete your testimony on that?

1 A (Mr. Harper) I think I completed the sampling,
2 disposal of the one-foot clay layer above the upper liner.

3 Q Uh-huh.

4 A (Mr. Harper) The primary or uppermost liner
5 would then be sampled for potential contamination and
6 disposed of accordingly as low-level waste or, if
7 releasable, it would be disposed of as -- in an ordinary
8 landfill.

9 We will then proceed to sample the leak
10 detection components and likewise dispose of them
11 accordingly. In similar fashion, sample and dispose of
12 the lower liner as applicable. And then we've committed
13 to test the clay layer under the bottom liner.

14 Q In closing the TEEB, what would be done with
15 any liquid contained in it?

16 A (Mr. Harper) It would all be evaporated prior
17 to.

18 Q Okay. Have you investigated the availability
19 of material with a projected life commensurate with the
20 life of the plant?

21 A (Mr. Harper) I have not.

22 Q Well, has anyone undertaking the design effort
23 for LES investigated that?

24 A (Mr. Harper) Lockwood Greene has done the
25 design of record for the TEEB.

1 Q Okay. Do you know whether they've investigated
2 the availability of material with a design life
3 commensurate with the life of the plant?

4 A (Mr. Harper) My understanding is they have
5 performed an assessment and discussed with certain
6 vendors, and the design reflects being able to locate
7 material that will last the design life of the facility.

8 Q What have you heard about availability of
9 material commensurate with the projected life --
10 commensurate with the life of the plant?

11 A (Mr. Harper) We have not picked up -- since
12 there was no material, you know, the actual liner has not
13 been specified, so I don't know anything more about it
14 than what I have just stated.

15 Q Well, has anyone from Lockwood Greene come to
16 you and said, Well, we've located four or five people that
17 can supply with the liner we --

18 A (Mr. Harper) You mean, actually to the point
19 of a vendor?

20 Q Yes.

21 A (Mr. Harper) I have not had those discussions
22 with Lockwood Greene.

23 Q Do you know if anyone has attempted to project
24 the probability of leak in either the upper or the lower
25 liner of the TEEB?

1 A (Mr. Harper) No. I'm not aware of that.

2 Q Okay. The other lined basin in the current
3 plant is the UBC storage --

4 A (Mr. Harper) Storage pad stormwater.

5 Q Stormwater storage basin.

6 A (Mr. Harper) Retention basin.

7 Q Okay. And the plan is for that to have a
8 single liner. Is that correct?

9 A (Mr. Harper) Correct.

10 Q And where is the latest plan for that basin and
11 its liner laid out?

12 A (Mr. Harper) In Lockwood Greene documents.

13 Q And do you know whether those documents were
14 produced to us in this litigation?

15 A (Mr. Harper) I cannot remember without seeing
16 them. I'd have to review the list again.

17 Q Okay. Is the plan as contained in those
18 documents also in the groundwater discharge permit
19 application?

20 A (Mr. Harper) Features of it are.

21 Q What features? What part's in that application
22 and what part's not?

23 A (Mr. Harper) Well, the Lockwood -- we have
24 provided a -- you know, a synopsis of the design in the
25 groundwater permit, but it's not to the same level

1 potentially that's in the Lockwood Greene documents.

2 Q Okay. With respect to the UBC basin, has any
3 effort been undertaken to estimate where water would go or
4 water and contaminants therein, if there were a leak in
5 that basin?

6 A (Mr. Harper) No.

7 Q Can you describe from your memory what the
8 current plan is with respect to the liner of that basin?

9 A (Mr. Harper) It's a single-lined basin, and
10 the liner would be placed on suitable material, and then
11 similar to the TEEB, would have a soil cover for UV
12 protection.

13 Q When you say, suitable material, can you
14 elaborate?

15 A (Mr. Harper) The information in the
16 groundwater discharge permit reflects a clay-like material
17 obtainable on site or nearby.

18 Q And with respect to the liner of that basin,
19 what is the expected life of that liner?

20 A (Mr. Harper) It would be similar to my
21 previous testimony for the TEEB. It will be selected to
22 last the operational life of the UBC.

23 Q What's the operational life of the UBC basin?

24 A (Mr. Harper) Well, similar to the TEEB, it
25 will need to be initial operation sometime prior to start-

1 up, and I have --- and it would need to function throughout
2 the operational life of the plant.

3 Q Do you know anything about any warranties that
4 manufacturers of liner material might offer for these
5 basins?

6 A (Mr. Harper) There's information. I believe
7 it's either in the groundwater discharge permit or the
8 environmental report, but it attests to the fact that the
9 liner would be installed in accordance with all the
10 manufacturer's recommendations so as not to void any
11 manufacturer warranties.

12 Q Okay. But do you know what kind of warranties
13 such manufacturers offer?

14 A (Mr. Harper) No, I do not.

15 Q Has any effort been made to estimate the
16 qualities of the water present in either of these basins,
17 the TEEB or the UBC basin?

18 A (Mr. Harper) Yes, there has.

19 Q Okay. Can you describe what that work has
20 involved?

21 A (Mr. Harper) That information is provided in
22 both the ER and in the groundwater discharge permit plan
23 application.

24 Q And were you involved in that effort?

25 A (Mr. Harper) To some extent.

1 Q Beyond what's reported in those two
2 applications, has there been any effort to estimate the
3 quality of that water?

4 A (Mr. Harper) Not to my knowledge.

5 Q Okay. You said that you were also here to
6 testify about the constituents in UF_6 feed material. What
7 facts or opinions are you here to give us about that?

8 A (Mr. Harper) The UF_6 feed material for the
9 plant will contain only natural UF_6 and any daughter
10 products of uranium.

11 Q Now, how do you know that?

12 A (Mr. Harper) Based on the -- I've been working
13 on the project for several years now, and that's just
14 information that I have picked up throughout my
15 involvement with the project.

16 Q Okay. Where is the feed material going to
17 arrive from?

18 A (Mr. Harper) The feed material arrive --
19 that's described in the environmental report.

20 Q Do you remember where, what plants it's coming
21 from?

22 A (Mr. Harper) Off the top of my head, no.

23 Q Okay. Well, how do you know that it's only
24 going to contain natural UF_6 ? Do you remember some
25 reports about the constituents in the feed, or are there

1 some documents? What's the basis for your statement?

2 A (Mr. Harper) It's based on information that I
3 believe is documented in the environmental report.

4 Q Okay. And beyond that you don't recall?

5 A (Mr. Harper) Not off the top of my head.

6 Q All right.

7 MR. LOVEJOY: Okay. We can take a short break
8 now if you'd like.

9 MR. CURTISS: That would be fine.

10 (Whereupon, a short recess was taken.)

11 THE WITNESS: (Mr. Harper) I would like to
12 supplement my last -- one of my earlier responses.

13 BY MR. LOVEJOY:

14 Q Yes.

15 A (Mr. Harper) In regards to the UF₆ feed, the
16 UF₆ as described in the license application, the site will
17 not accept any feed material that is not ASTM certified as
18 natural uranium, natural uranium hexafluoride.

19 Q Okay. Thanks. How does feed material achieve
20 an ASTM certification?

21 A (Mr. Harper) That is outside my area of
22 expertise.

23 Q Has any estimation been made of the
24 contaminants that would be present or could be present in
25 the unlined stormwater basin or in the sewage leach

1 fields?

2 A (Mr. Harper) In the ER and, I believe, in the
3 groundwater discharge permit, we make note that the in-
4 flow to the unlined stormwater basin would be typical of
5 an industrial site, would receive run-off from roofs,
6 paved areas, and areas in the immediate vicinity around
7 the buildings, and that it would contain -- potentially
8 contain some oil and grease that one would typically see
9 from parking lot areas. There are no process activities
10 that occur in the drainage area to that basin. There's no
11 chemical process activity in that area.

12 Q And --

13 A (Mr. Harper) Other than inside the buildings,
14 so --

15 Q Are you saying that the areas inside the
16 buildings would not be drained to the basis?

17 A (Mr. Harper) Correct.

18 Q Okay.

19 A (Mr. Harper) Only the roofs.

20 Q Now, with respect to the septic systems, what
21 contaminants are projected?

22 A (Mr. Harper) The design calls for only
23 domestic sewage, domestic waste going to the septic
24 system, essentially toilets.

25 Q Okay.

1 A (Mr. Harper) And we have made a statement in
2 the ER that it would be just typical of that type of
3 normal sanitary waste.

4 Q Would there be any showers drained to the
5 septic systems?

6 A (Mr. Harper) Showers and hand-wash all goes to
7 the Treated Effluent Evaporative Basin.

8 Q In the plant, are there planned to be specific
9 decontamination rooms in case of inadvertent contamination
10 of somebody?

11 A (Mr. Harper) I have not reviewed that portion
12 of the application recently. I can't recall. I would
13 assume so, but I can't recall, other than to make note
14 again that only sanitary wastes are going to the septic
15 system.

16 Q Okay. Let me ask -- and this may be for you,
17 Mr. Peery. Have any tests been done on the hydraulic
18 properties of rock bodies above the Chinle?

19 A (Mr. Peery) No, they have not.

20 Q And there have been some tests of hydraulic
21 properties of the Chinle. Is that correct?

22 A (Mr. Peery) Yes.

23 Q And how many holes have been tested?

24 A (Mr. Peery) Oh, the hydraulic properties of
25 the Chinle? That data comes from the nearby WCS site, and

1 I don't know exactly how many holes have been drilled over
2 there, but I think it's over 200.

3 Q So on the LES site, there've been no tests of
4 hydraulic properties of the Chinle?

5 A (Mr. Peery) Not of the Chinle above the 220-
6 foot aquifer zone. Now, that siltstone at 220, 230 foot,
7 has had a test on Monitor Well 2 for hydraulic properties.

8 Q Okay. What tests were done? Do you remember?

9 A (Mr. Peery) On the LES site?

10 Q Yes.

11 A (Mr. Peery) It was a rising-head slug test, an
12 MW-2.

13 Q Just that one test?

14 A (Mr. Peery) Yes.

15 Q Can you describe that test?

16 A (Mr. Peery) A rising-head slug test
17 essentially is where a volume of water or an object placed
18 in the water is displaced from the water column, which
19 causes the water column in the well to drop down, and then
20 you monitor the subsequent rise of the water level until
21 it gets back to a higher point, essentially where you
22 started the test at.

23 Q You measure the time of it. Is that correct?

24 A (Mr. Peery) Yes. The change in elevation of
25 the water or depths of water versus time.

1 Q Do you have any understanding yourself of where
2 the water in MW-2 came from?

3 A (Mr. Peery) Yes. It comes from the siltstone
4 at the 200 to 230-ish nomaly zone.

5 Q And where did it come from to get into the
6 siltstone?

7 A (Mr. Peery) Oh, it -- you're -- I'm sorry.
8 Where did it come from? Where did that aquifer water
9 develop?

10 Q Yes.

11 A (Mr. Peery) Recharge water over time, and the
12 nearest recharge area is many tens of miles east -- west
13 of this location.

14 Q Where is that recharge area?

15 A (Mr. Peery) It's towards the -- I can't tell
16 you specifically, but it's towards the boundary of Eddy
17 and Lea County.

18 Q How do you know that that's a recharge area?

19 A (Mr. Peery) The -- with very low
20 permeabilities overlying that zone, recharge is not from
21 water falling directly, either -- you know, water directly
22 overlying that aquifer, so the recharge areas have to be
23 where that aquifer is closer to the ground surface.

24 Q All right. And you've identified an area. Are
25 you saying that you're aware that the -- this aquifer is

1 closer to the ground surface at a point near the Eddy
2 County boundary?

3 A (Mr. Peery) I would have to verify the depth
4 to the aquifer in that area. And, in fact, some of the
5 water in that aquifer is probably quite ancient water that
6 has not recharged in, as I said, a very, very long time.

7 Q Uh-huh. Okay. Did you see a report of a
8 pesticide being detected in MW-2?

9 A (Mr. Peery) Yes, I did.

10 Q And did you reach any conclusion about that?

11 A (Mr. Peery) Yes, I did.

12 Q What's your conclusion?

13 A (Mr. Peery) My conclusion is that the
14 contamination identified in that sample was probably a
15 result of something introduced either during drilling or
16 possibly a laboratory error, and that is based on
17 subsequent samples not having any contamination in them.

18 Q Well, do you know anything about the history of
19 the sample that contained a pesticide that leads you to
20 think it became inadvertently contaminated, either in the
21 lab or at this site?

22 A (Mr. Peery) Could you restate that question,
23 please?

24 Q Well, do you know anything about how that
25 sample was taken, the first one -- was it the first one in

1 MW-2 that showed --

2 A (Mr. Peery) Yes, it was.

3 Q -- pesticide? Do you know anything about how
4 that sample was taken that would lead you to think it was
5 contaminated inadvertently by a pesticide?

6 A (Mr. Peery) No. I don't know how -- exactly
7 how the sample was collected.

8 Q But you've rejected that as an accurate sample.

9 A (Mr. Peery) Yes.

10 Q And you've rejected it because two later
11 samples showed no pesticide.

12 A (Mr. Peery) Correct.

13 Q And there's no other basis for your rejection.

14 A (Mr. Peery) The other basis for the rejection
15 would be the potential source for a pesticide to be in
16 that lower aquifer that isn't being recharged from
17 anywhere in the immediate vicinity. There's no mechanism
18 to get a pesticide into the aquifer there.

19 Q So you rejected the possibility that there was
20 a mechanism to get the pesticide into the aquifer.

21 A (Mr. Peery) After the subsequent samples came
22 back clean.

23 Q I believe there's a statement in the
24 environmental report -- we can find it if we need to --
25 that the water in the Santa Rosa Aquifer is not potable.

1 Is that -- are you aware of that?

2 A (Mr. Peery) Yes, I am.

3 Q Do you agree with that?

4 A (Mr. Peery) Yes, I do. Yes.

5 Q Can you explain why that's so in your mind?

6 A (Mr. Peery) The total dissolved-solids
7 concentration of water produced from the Santa Rosa
8 Aquifer is above the drinking water standard.

9 Q And what standard is that?

10 A (Mr. Peery) The EPA drinking water standard.

11 Q And what's -- can you quantify it?

12 A (Mr. Peery) It's 500 milligrams per liter with
13 a cap of 1,000. It's an aesthetic standard.

14 Q A cap of 1,000?

15 A (Mr. Peery) Yes. It's 500 to 1,000.

16 Q Okay. And what is the depth of the water in
17 the Santa Rosa Aquifer underneath the LES site?

18 A (Mr. Peery) It would be approximately 1,100
19 feet.

20 Q Do you know the speed at which water is
21 traveling in that aquifer?

22 A (Mr. Peery) No.

23 Q Do you know where that water is going to emerge
24 on the surface, if anywhere?

25 A (Mr. Peery) No, I don't.

1 Q Do you know if that aquifer is pumped anywhere
2 downstream from the LES site?

3 A (Mr. Peery) I believe that -- downstream?

4 Q Down gradient.

5 A (Mr. Peery) Yes. I don't know of wells
6 specifically completed in there. There may be some
7 domestic or windmill wells, but I don't know of any that
8 are specifically completed in there, that I can recall.

9 Q Do you know if that aquifer is used for stock
10 watering, the down gradient?

11 A (Mr. Peery) It likely is. If wells are,
12 indeed, completed in it, it would likely be for stock
13 watering, because of the low yield of the well, of the
14 aquifer.

15 MR. LOVEJOY: Let's pass out one for each
16 lawyer and one for the witnesses. I guess the panel only
17 gets one, because there has to be one exhibit.

18 We should mark this Exhibit 3. We should mark
19 the official exhibit. I'm sorry. There's a process we
20 need to follow.

21 (The document referred to was
22 marked for identification as
23 Exhibit NIRS-HP 3.)

24 BY MR. LOVEJOY:

25 Q Would you please take a look at Exhibit 3.

1 MR. LOVEJOY: We can give each witness a copy,
2 but we really need to have one official exhibit.

3 BY MR. LOVEJOY:

4 Q Has either one of you seen this document
5 before?

6 A (Mr. Harper) I have.

7 Q You have? Mr. Peery, have you?

8 A (Mr. Peery) I have not reviewed this document.

9 Q Okay. Mr. Harper, did you see this at or about
10 the date it has, which is August 5 of '03?

11 A (Mr. Harper) Yes, I did.

12 Q And what was the purpose of this document?

13 A (Mr. Harper) I haven't looked at it in a
14 while, so --

15 Q Okay.

16 A (Mr. Harper) -- if you'll give me a minute
17 here. (Perusing document.) I think it's clearly stated
18 in the purpose of the document on page 1.

19 Q Okay. What language are you referring to?

20 A (Mr. Harper) "The objective of the study is to
21 evaluate and present potential options for treatment of
22 the low-level waste generated through the normal
23 operations of the NEF to remove uranium."

24 Q Okay. There's a reference right after that,
25 under Purpose, to new MCL requirements for uranium in

1 drinking water under EPA standards. Do you see that?

2 A (Mr. Harper) Yes.

3 Q Do you know whether the NEF as planned would
4 comply with those standards now, as now planned?

5 A (Mr. Harper) I'd have to go back and review
6 the report. I haven't read the report in over a year.

7 Q Uh-huh. The page that has the stamped number
8 LES-905 has a signature on it. Can you read that?

9 A (Mr. Harper) Yes, I can.

10 Q Whose signature is that?

11 A (Mr. Harper) Based on the initials and the
12 signature, I believe it is John Shaw.

13 Q And does he work for Lockwood Greene?

14 A (Mr. Harper) Yes, he does.

15 Q Where are they based, Lockwood Greene?

16 A (Mr. Harper) They're based out of Spartanburg,
17 South Carolina.

18 Q Was the work done, that Lockwood Greene did for
19 LES in connection with the NEF, to your knowledge, done at
20 the Spartanburg location?

21 A (Mr. Harper) That was their principal office
22 for this job. Yes.

23 Q What was Mr. Shaw's -- what is his expertise?
24 Do you know? What is his training?

25 A (Mr. Harper) I do not know, other than the

1 fact I know he's a trained engineer.

2 Q Okay. Over on page LES-909, under the caption,
3 Unlined Basin, the second paragraph has certain language
4 in it. I'll read it to you.

5 It says, "There are two major factors
6 considered for this decision" -- referring to the unlined
7 basin. "First, for an unlined basin, the uranium will
8 permeate into the soil. At the end of the life of the
9 plant, the contaminated soil will have to be disposed of.
10 The depth to which the uranium will permeate into the soil
11 is difficult, if not impossible, to calculate at this
12 time."

13 Do you agree with that statement?

14 A (Mr. Harper) At the time this report was
15 written, I don't believe there was sufficient design
16 detail available.

17 Q I see. So at the time it was true.

18 A (Mr. Harper) Yes. I believe it was a true
19 statement at the time.

20 Q Okay. And what work was done since this report
21 was prepared on the question addressed there?

22 A (Mr. Harper) Explicitly on estimating the
23 depth of --

24 Q The depth to which the uranium will penetrate
25 into the soil.

1 A (Mr. Harper) I'm not aware of any additional
2 work that was done in this area.

3 Q Okay.

4 MR. LOVEJOY: This will be Exhibit 4. Here's
5 another copy.

6 (The document referred to was
7 marked for identification as
8 Exhibit NIRS-HP 4.)

9 BY MR. LOVEJOY:

10 Q Would you, both witnesses, please take a look
11 at Exhibit 4 and state whether you've seen this one
12 before, either of you.

13 A (Mr. Peery) I don't recall reviewing that
14 report.

15 Q Okay. Mr. Harper, have you seen this?

16 A (Mr. Harper) I have most likely seen this
17 report.

18 Q Okay. Can you tell from any of the marks on
19 this whether it came your way at or about the date it was
20 produced?

21 A (Mr. Harper) Well, I'm not listed on the
22 distribution list there, but it did come to -- it was
23 copied to Framatome, and it's quite likely that I did
24 review this. Thus, they sent it as a --

25 Q Okay. Over on page 5, under, Lined Basin,

1 there's some text I want to ask you about, the first
2 paragraph there. You can --

3 A (Mr. Harper) Page 5?

4 Q Page 5. It's LES-928. Under Lined Basin, it
5 says, "The basin should be double-lined. The liner could
6 consist of a layer of clay and a HDPE" --

7 A (Mr. Harper) Could you stop? Where are yo
8 now?

9 Q Under 2.3.2.3 --

10 A (Mr. Harper) Okay.

11 Q -- Lined Basin.

12 A (Mr. Harper) Yes.

13 Q "The basin should be double-lined. The liner
14 could consist of a layer of clay and a HDPE liner on top
15 or two layers of HDPE. Basin design will be done after
16 all geological information is obtained. The liner type
17 and design may be contingent on whether or not the State
18 or the NRC may require leak monitoring or just groundwater
19 monitoring."

20 As the terms are used here, do you understand
21 what's meant by "leak monitoring" and "groundwater
22 monitoring"?

23 A (Mr. Harper) Yes, I do.

24 Q What is leak monitoring, and what's groundwater
25 monitoring, as used in this document?

1 A (Mr. Harper) I would interpret leak monitor to
2 apply to a system similar to what we have now in the
3 design of the TEEB, which is a -- you know, the leak-
4 detection system, which would be designed to monitor a
5 leak through the liner. Groundwater monitoring I would
6 interpret to mean putting in some groundwater monitoring
7 wells in the vicinity of the basin and monitoring the
8 groundwater.

9 Q At some point, did you learn that you were
10 going to have leak monitoring rather than just groundwater
11 monitoring in the system, in the plant?

12 A (Mr. Harper) The -- well, the final design or
13 the design of record for the TEEB does have a leak
14 detection system, and as outlined in the ER in the
15 groundwater permit application, we have designed a
16 groundwater monitoring program.

17 Q So you're going to have both.

18 A (Mr. Harper) We're going to have both.

19 Q Okay. Did you hear at some point whether the
20 State or the NRC required leak monitoring?

21 A (Mr. Harper) We based on our decisions on
22 providing leak detection in groundwater monitoring as a
23 result of our overall design and a look at all the
24 regulations and requirements. At no point am I aware of
25 either the State or the NRC directing that we had to have

1 either of those.

2 Q Okay.

3 A (Mr. Harper) Other than it is -- you know, it
4 is called out for and discussed, especially groundwater
5 monitoring, in the groundwater discharge permit plan.

6 Q Okay.

7 MR. LOVEJOY: Let's mark this, please.

8 (The document referred to was
9 marked for identification as
10 Exhibit NIRS-HP 5.)

11 BY MR. LOVEJOY:

12 Q Let me ask each of you to look at -- I'm
13 captioning my exhibits HP, with your initials, Number 5.

14 A (Mr. Harper) Okay.

15 Q Look at Exhibit 5, please, and identify it if
16 you can.

17 A (Mr. Harper) It is the draft report that was
18 prepared by contractor to -- the MACTEC contractor to
19 Lockwood Greene on the preliminary subsurface geotechnical
20 exploration.

21 Q Was there a final version of this report
22 prepared?

23 A (Mr. Harper) Yes, I believe there was.

24 Q Mr. Peery, have you seen this report?

25 A (Mr. Peery) Yes, I have.

1 Q Okay. Did you see a final version also?

2 A (Mr. Peery) I don't recall.

3 Q Okay. Over on page 5 of the report -- Mr.

4 Peery, maybe I should ask you this -- there's a paragraph
5 starting, "Based on the information." Why don't you read
6 that.

7 A (Mr. Peery) "Based on the information from
8 geotechnical" --

9 Q Well, you can just read it to yourself. It's
10 in the record.

11 A (Mr. Peery) (Perusing document.) Okay.

12 Q Did you review this document as part of your
13 review of the geological investigations made for the LES
14 site?

15 A (Mr. Peery) Yes, I did.

16 Q Okay. There's a reference here to an
17 investigation done by Weaver Boos & Gordon. Did you
18 examine that, that report?

19 A (Mr. Peery) I'd have to see the title of that
20 report. I don't remember exactly that reference offhand
21 without seeing the title of the report.

22 Q Do you know anything about that investigation
23 referred to, other than seeing this reference?

24 A (Mr. Peery) Well, again, I'd really need to
25 see what the title of that report was.

1 Q Okay. Then the paragraph also refers to
2 piezometers installed for a project in Andrews County,
3 Texas, and there's a reference to Jack H. Holt, Ph.D. &
4 Associates. Did you review any materials about that
5 investigation?

6 A (Mr. Peery) Okay. Let me clarify the Weaver
7 Boos report first. It's in the references here, and I
8 have not reviewed that report. (Perusing document.) I
9 would have to see the Holt report. It's possible that I
10 saw that, but I don't recall.

11 Q In hydrology, what is the function of
12 piezometers?

13 A (Mr. Peery) Piezometers specifically are to
14 monitor water levels.

15 Q Did you -- apart from this reference, were you
16 aware that piezometers had indicated a depth to
17 groundwater of about 150 to 188 feet for a project in
18 Andrews County?

19 A (Mr. Peery) Yes. I am aware of that, but I
20 think I should clarify that their -- the depth to water is
21 actually the potentiometric surface elevation, so it's
22 the -- if a well is completed in a confined aquifer, such
23 as see at the 220-foot zone at the LES site and at the WCS
24 site for that matter, the water in the aquifer actually
25 rises about the top of the aquifer, because the overlying

1 Chinle has such a low permeability that it holds the water
2 into this little zone of aquifer, and so when a hole goes
3 into it, the water level can then rise up to what is
4 called the potentiometric surface elevation.

5 These depth to waters of 150 to 188 feet
6 correspond well with the potentiometric surface elevation
7 or the depth to the water, if you will, in these confined
8 aquifer wells.

9 Q How do you know that the water under the LES
10 site was in a confined aquifer?

11 A (Mr. Peery) The sediments above the aquifer
12 were dry, and the water level in MW-2 started off quite
13 low in the aquifer and continued to rise up to a depth of
14 about 120 feet below ground surface.

15 Q Okay. Now, the MACTEC contractor did some
16 drilling on the LES site, did they not?

17 A (Mr. Peery) Yes, they did.

18 Q However, on page 8, under Groundwater
19 Conditions, the first paragraph says, "Groundwater was not
20 observed in the test borings at the time of drilling.
21 Also, it was reported that groundwater was not encountered
22 in borings drilled at the site by others for water well
23 development to depths of 220 feet."

24 Do you know anything about those borings
25 drilled for water well development? Did you hear anything

1 about that in your investigations?

2 A (Mr. Peery) No. Other than this reference, I
3 haven't heard anything about that.

4 Q Did you make any inquiry about those wells?

5 A (Mr. Peery) I'm assuming that this isn't the
6 monitoring wells. No, I did not.

7 Q Then it says, "For safety reasons, the borings
8 drilled as part of MACTEC's scope of work were backfilled
9 promptly after drilling. Consequently, long-term
10 measurements for the presence or absence of groundwater
11 were not obtained." Did you express any opinion about the
12 fact that those MACTEC wells were backfilled promptly
13 after drilling?

14 A (Mr. Peery) Any opinion related to what?
15 Safety reasons?

16 Q No, not safety, but the opinion addressed to
17 the data which might have been obtained if they had not
18 been backfilled.

19 A (Mr. Peery) I did, specifically related to the
20 moist sediments in, I believe it is, B-2 of MACTEC's
21 drilling, and as my earlier testimony reflects, the
22 occurrence of moist samples doesn't indicate anything in
23 terms of additional data to be gained.

24 Q Well, you didn't tell anybody, It's too bad
25 they filled them right up again, because we might have had

1 some groundwater data?

2 A (Mr. Peery) No, I did not say that.

3 Q Okay. What are the safety reasons that support
4 backfilling these holes?

5 A (Mr. Peery) I can speculate why they did it.
6 I know why I would do it on a site. I can only speculate
7 why --

8 Q Why would you do it?

9 A (Mr. Peery) I would do it to keep people from
10 falling in the hole. You don't want people to trip or
11 animals to fall inside these kind of things.

12 Q Over on the page stamped LES-750, there is a
13 plan view of the site. Can you identify that?

14 A (Mr. Peery) I'm sorry. What page?

15 Q LES-750. It says, Figure 2: Boring location
16 plan.

17 A (Mr. Peery) Okay. I see that figure.

18 Q Okay. Are these -- are the -- do the circles
19 with, let's say, black and white pie sections marked on
20 them, do they indicate the wells drilled by MACTEC or
21 under their supervision?

22 A (Mr. Peery) My understanding, based on this
23 boring and what I've read, is, yes, that's correct.
24 They're actually borings, not wells.

25 Q Okay. And are you making a distinction? What

1 would be a well but not a boring?

2 A (Mr. Peery) Casing, actual physical casing of
3 the well.

4 Q Oh, okay. The completed well.

5 A (Mr. Peery) Yes.

6 Q And where was moisture detected as among these
7 holes?

8 A (Mr. Peery) I believe it's B-2.

9 Q Okay.

10 MR. LOVEJOY: Let's move on. That's November
11 19. This would be 6.

12 (The document referred to was
13 marked for identification as
14 Exhibit NIRS-HP 6.)

15 BY MR. LOVEJOY:

16 Q Would both witnesses please look at this,
17 what's been marked Exhibit 6, and state whether you've
18 seen it before.

19 A (Mr. Peery) I've seen this before.

20 A (Mr. Harper) I have also seen it before.

21 Q Okay. Is this a report prepared in connection
22 with the hydrogeologic investigation of the LES site?

23 A (Mr. Peery) Yes, it is.

24 Q I'll state for the record that this has in the
25 upper right corner an ML number which indicates how it was

1 retrieved from NRC's computer system. I put that there.

2 Was this report prepared as part of the basis
3 for -- no. Strike that. I've asked that.

4 In preparation of this report, did the Cook-
5 Joyce firm conduct some drilling on the LES site?

6 A (Mr. Peery) Yes, they did.

7 Q And what -- do you recall what boreholes were
8 made?

9 A (Mr. Peery) They drilled nine boreholes and
10 installed three monitoring wells.

11 Q These were in addition -- the three wells were
12 in addition to the boreholes?

13 A (Mr. Peery) Yes.

14 Q And did they locate groundwater in the wells
15 they drilled?

16 A (Mr. Peery) They were -- reported groundwater
17 in Monitor Well 2.

18 Q And at what depths did they find groundwater?

19 A (Mr. Peery) I'd have to look specifically at
20 what they said, but it's in the aquifer, currently
21 referred to as the one at about 220, 230 foot down the
22 siltstone.

23 Q At the bottom of page 3 of this report, the
24 statement appears, "Groundwater has not been identified in
25 the 125-foot silty sandstone zone. Groundwater in the

1 180-foot zone is present at some locations but not
2 continuously across the WCS property." And it says,
3 "Groundwater is present in a 230-foot across the entire
4 portion of the WCS property that's been investigated."

5 Does that refresh your recollection as to where
6 they found groundwater, the Cook-Joyce firm?

7 A (Mr. Peery) Yes, it does.

8 Q Okay. Where did they -- where to your
9 recollection now did they find groundwater?

10 A (Mr. Peery) According to this, the 180-foot
11 zone, it says it's present in some locations. Where I
12 recalled they actually found water is in Monitor Well 2 at
13 that 230-foot zone.

14 Q Okay. Do you know what drilling techniques
15 were used by Cook-Joyce, what methods?

16 A (Mr. Peery) As I recall, the B-1 through -9
17 borings were hollow-stem auger, and the monitoring wells
18 were direct air rotary.

19 Q Did they use no fluids at all in their air
20 rotary drilling?

21 A (Mr. Peery) I do not recall the mention of
22 using fluids when they drilled.

23 Q Over on page 5, they talk about monitor well
24 drilling and installation program. It says, "The three
25 monitor wells were designed based on the results of the

1 geophysical logs. The design consisted of the placement
2 of the screen interval across the 230-foot zone that is
3 approximately 15 feet in thickness."

4 Do you know why monitoring screens were not set
5 at any shallower zones?

6 A (Mr. Peery) Based on my understanding of this
7 report, there wasn't water present above this zone as
8 determined by drilling these three monitoring wells in the
9 geophysical logs.

10 Q Over on page 8 under, Data Analysis -- well, in
11 connection with this, do you know what well development
12 efforts were conducted with respect to the monitoring
13 wells?

14 A (Mr. Peery) I believe it's spelled out here
15 fairly clearly, but to the best of my memory, they tried
16 to develop the wells and were having a difficult time
17 getting some water in, and they put some water in the
18 wells to try to induce flow, so they could sort of surge
19 the formation with some water, try to develop the
20 formation, and then recovered that water.

21 Q Now, are you talking about MW-1, MW-2 -- and
22 was it in MW-3?

23 A (Mr. Peery) Yes. I think it's spelled out in
24 here, but that's generally what I recall.

25 Q Where is that spelled out? Can you find it? I

1 can tell you that on Table 2, there's reference to
2 development in the footnote.

3 A (Mr. Peery) (Perusing document.) No. I'm not
4 finding that. I don't see a reference in this reference
5 to the development of the wells.

6 Q Okay. What efforts in the way of well
7 development would industry practice have called for at
8 this site?

9 A (Mr. Peery) There would -- industry practice
10 would normally allow several things to occur. I think the
11 first thing that would generally occur would be to attempt
12 to bail and swab the screen section or the bailing could
13 actually do some swabbing of the screen section to try to
14 induce flow from the formation into the well, try to
15 repair the formation damage that occurs during drilling.

16 If that's unsuccessful, it's not uncommon for
17 people to attempt to introduce water into the well, using
18 various methods, sometimes pouring it in the well and then
19 swabbing it, as I previously described, or using a jetting
20 technique to try to repair the formation damage, and
21 subsequently bailing that water from the well.

22 Q What formation damage are you referring to?

23 A (Mr. Peery) Formation damage occurs when a
24 hole is drilled into the ground by any method.

25 Q What kind of damage?

1 A (Mr. Peery) It tends to smear the side walls
2 of the formation, and development is undertaken to remove
3 that material, the fine-grain sediments that are generated
4 during drilling, so that water can enter the well.

5 Q On page 8, there's a reference in the fourth
6 paragraph to recovery rates of groundwater in Monitor Well
7 MW-2. Is that the reference to the testing that you spoke
8 of several minutes ago?

9 A (Mr. Peery) Yes, it is.

10 Q What kind of a test do you call that, just for
11 shorthand?

12 A (Mr. Peery) Slug test.

13 Q Slug test? Okay.

14 A (Mr. Peery) And they give a reference here for
15 the type of --

16 Q Oh, yes. Sorry. And in Table 2, would you
17 look at that, please.

18 A (Mr. Peery) Yes. I'm at Table 2.

19 Q Do you see the references to water levels,
20 groundwater level data with respect to Monitor Well MW-2?

21 A (Mr. Peery) Yes.

22 Q And those dates indicate the measurements were
23 made. Is that right?

24 A (Mr. Peery) Yes. The dates are the
25 corresponding -- for the corresponding water level.

1 Q Does this show the gradually-increasing water
2 level in MW-2 that you spoke about before?

3 A (Mr. Peery) Yes.

4 Q And what do you infer from this?

5 A (Mr. Peery) What I infer from this is that the
6 well was completed in a confined aquifer.

7 Q Now --

8 A (Mr. Peery) As evidenced by the fact that the
9 water level is roughly 100 feet above the top of the
10 screen.

11 Q Now, what do the indications in Monitor Well
12 MW-1 report, the DTW TOC? Is that depth to water?

13 A (Mr. Peery) Yes.

14 Q And what is TOC?

15 A (Mr. Peery) Top of casing.

16 Q Okay. So that's the difference from the top of
17 the casing to the depth of the water?

18 A (Mr. Peery) Yes.

19 Q And what do those numbers mean here under MW-1?

20 A (Mr. Peery) It reports that the well is dry
21 for quite a number of measurements, September 22 through
22 the October 15 measurements. There's some water measured
23 for several of the following measurements to November 10,
24 and then it appears they have N/As at the last couple of
25 measurements.

1 Q What does N/A mean? Does it mean no test was
2 taken?

3 A (Mr. Peery) It doesn't reference it at the
4 bottom of the table.

5 Q Okay. And what's the significance of a report
6 of water present in MW-1 at 212, 215 feet in October of
7 '03?

8 A (Mr. Peery) That's just the fact that they
9 measured some water in there, and I don't recall if this
10 was after their development technique or attempts, or if
11 they put some water in the borehole and there was some
12 residual water left or not.

13 Q Okay. And do you know the significance of the
14 water levels reported for MW-3 in October 16 through
15 November 19?

16 A (Mr. Peery) Yes. And upon a little further
17 evaluation of this table, it's -- the last footnote on
18 this table says, "Monitor Wells MW-1 and -3 were surged
19 five times using 12 to 13 gallons of DI" -- which I assume
20 would be deionized -- "water from 10/16 to 10/20."

21 So the corresponding depth-to-water
22 measurements prior to -- I should say, the water level
23 measurements prior to 10/16 were dry, and then there's
24 some reports of water in these holes after they added
25 water to them and attempt to develop them, so the

1 conclusion I would draw is that this water is most likely
2 deionized water that they couldn't retrieve after their
3 development attempts.

4 Q What does the word "surged" mean here?

5 A (Mr. Peery) Surged normally means a bailer or
6 other device placed in the well, and it moved up and down
7 through the screen section to try to force water through
8 the gravel pack and formation to repair formation damage,
9 just mechanical action.

10 MR. LOVEJOY: Let's mark this.

11 (The document referred to was
12 marked for identification as
13 Exhibit NIRS-HP 7.)

14 BY MR. LOVEJOY:

15 Q Would you both, please, look at Exhibit 7 and
16 tell me whether you've seen that before.

17 A (Mr. Harper) I have.

18 Q Okay. This is addressed to you, isn't it, Mr.
19 Harper?

20 A (Mr. Harper) Correct.

21 Q Okay. And this is dated in March of this year.
22 Is that about when you received it?

23 A (Mr. Harper) Yes. That's correct.

24 Q Okay. Would you look at the second page where
25 there's a diagram of, to my understanding, a basin liner.

1 A (Mr. Harper) Yes.

2 Q Does that diagram show the present plan that
3 LES intends to use for a basin liner of the TEEB?

4 A (Mr. Harper) No, it does not.

5 Q Okay. How does the present plan vary from what
6 we see here?

7 A (Mr. Harper) The present plan is described in
8 the ER and in the groundwater discharge permit.

9 Q And how does that vary from this?

10 A (Mr. Harper) The text description on the top
11 half of the page is pretty much in accordance with the
12 design as specified in the license application, the
13 groundwater discharge permit. The figure is a
14 representation that Lockwood Greene put together, and this
15 was developed as part of the preparation of the -- of
16 information that was developed during the preparation of
17 the groundwater discharge permit. But this figure is not
18 an actual representation of the design.

19 Q Well, how does it vary from the design?

20 A (Mr. Harper) Well, the basin has not been
21 designed completely to the level of detail that this
22 little schematic is attempting to represent, so this is
23 not -- I would not consider this design to be -- it was
24 not prepared as part of the true design package for the
25 TEEB. It more or less was prepared as an informational

1 package.

2 Q Okay. So are you saying that LES is not
3 committed to follow this design?

4 A (Mr. Harper) We're committed to follow the
5 design that's in the groundwater discharge permit
6 application.

7 Q Okay.

8 A (Mr. Harper) And in the license application.

9 MR. LOVEJOY: This is 8.

10 (The document referred to was
11 marked for identification as
12 Exhibit NIRS-HP 8.)

13 BY MR. LOVEJOY:

14 Q Mr. Harper, would you look at Number 8 and tell
15 us if you've seen this before.

16 A (Mr. Harper) Yes, I have.

17 Q Is this something you received around March 1
18 of this year?

19 A (Mr. Harper) Yes, it is.

20 Q And looking at the second page, can you say
21 whether the diagram represents the liner plan that LES is
22 going to follow with respect to the UBC basin?

23 A (Mr. Harper) It does with respect to the
24 description of the -- from the bottom up, the compacted
25 clay layer, two-foot thick.

1 Q Uh-huh.

2 A (Mr. Harper) It also does with regards to the
3 one-foot thick protective layer on top of the geosynthetic
4 liner. But the details provided for the geosynthetic
5 liner are beyond those that are presently specified in the
6 design of the basin.

7 Q Okay.

8 A (Mr. Harper) Again, this was prepared as --
9 during the -- this was prepared during the preparation of
10 the groundwater discharge permit, but is not an official
11 design document.

12 Q Did you consider including this in the
13 groundwater discharge permit application?

14 A (Mr. Harper) These were developed while we
15 were working with Lockwood Greene to develop the
16 information required for the groundwater discharge permit
17 application. This was -- it evolved during the
18 development of the permit application.

19 Q Okay. Well, did you discuss with others
20 working on that application whether this should be
21 included in that application?

22 A (Mr. Harper) Not whether this should
23 specifically be included.

24 Q Well, did you -- sorry. Go ahead.

25 A (Mr. Harper) We have included -- what we

1 included in the groundwater discharge permit adequately
2 reflects the current design for the system.

3 Q Well, do you remember discussing with others
4 involved in preparing that application whether you should
5 include more detail, such as is shown in this diagram in
6 the application?

7 A (Mr. Harper) In the groundwater permit
8 application?

9 Q Yes.

10 A (Mr. Harper) We were -- I did review other
11 permit applications, and we feel that what we've provided
12 in the application is adequate.

13 Q But the question was: Do you remember
14 discussing with others working on that whether you should
15 put in more detail, such as is shown in this diagram?

16 A (Mr. Harper) No. We believed that the text
17 description adequately defines the proposed system. I'm
18 referring to the text description from the permit
19 application.

20 MR. LOVEJOY: Can we mark this one? 172. I
21 guess this is Number 9.

22 (The document referred to was
23 marked for identification as
24 Exhibit NIRS-HP 9.)

25 BY MR. LOVEJOY:

1 Q Mr. Harper, I'll ask you to look at Number 9
2 and state whether you saw this around March 1 of this
3 year.

4 A (Mr. Harper) (Perusing document.) Yes, I
5 believe I did.

6 Q This is from someone named Carroll Walker to
7 you, and the text says, "How close is this to what you
8 need?" Do you remember requesting something from Carroll
9 Walker to which this is a response?

10 A (Mr. Harper) We went down and met with the
11 Lockwood Greene staff during the early preparation phase
12 for the groundwater discharge permit, and these emails
13 were in response to some preliminary information that
14 Lockwood Greene was putting together to support the permit
15 development.

16 Q Okay.

17 A (Mr. Harper) And I would also like to point
18 out this email was a earlier version of the two exhibits
19 ago.

20 Q This was an earlier version of what?

21 A (Mr. Harper) Of the exhibit that starts on
22 page LES-168.

23 Q That's Exhibit 7?

24 A (Mr. Harper) Yes. You'll notice there the
25 first line of that email says, "Treated Effluent Basin

1 (REVISED) ."

2 Q Okay. Well, do you remember how you responded
3 to Exhibit 9 and the question, "How close is this to what
4 you need?"?

5 A (Mr. Harper) It was likely there was -- we had
6 a former discussion. I can't remember the exact details.
7 I'd have to go back and do a line-by-line comparison and
8 see what if any changes there are between the two emails.
9 But since they look quite similar and there's the
10 "Revised" note on Exhibit 7, I'm assuming it was a follow-
11 up email, and given the timing of the emails also.

12 Q Does Exhibit 9 show a -- what I would call a
13 two-layer liner system for a basin? Is there's a
14 reference to 60 mil HDPE liner, and then a 60 mil HDPE
15 liner, secondary liner.

16 A (Mr. Harper) Correct. It is a representation
17 of a -- of what a double-lined system could look like.

18 Q Okay. And do you remember discussing with the
19 Lockwood Greene people the possibility of having a double
20 liner for the UBC storage pads, stormwater retention
21 basin?

22 A (Mr. Harper) No. At no time did we -- in
23 fact, I do note the difference on Exhibit -- Exhibit 9
24 says, "Treated Effluent Evaporative Basin and UBC Storage
25 Pad Stormwater Retention Basin." You'll then notice on

1 Exhibit 7 that the "UBC Storage Pad Stormwater Retention
2 Basin" has been deleted in the revised version.

3 Q Uh-huh. I see that. And the question is: Did
4 you discuss with them having a double-lined system for the
5 UBC storage pad stormwater retention basin as shown in
6 Number 9?

7 A (Mr. Harper) I believe that upon review of the
8 Exhibit 9, it's likely I had a discussion with Lockwood
9 Greene, pointing out the mistake in Exhibit 9, that said
10 that this applied to the UBC storage pad stormwater
11 retention basin.

12 Q Had they misunderstood your instructions?

13 A (Mr. Harper) I'm not sure.

14 Q Was there a contractor working for LES or maybe
15 for Framatome named GL Environmental, Inc., that worked on
16 the LES project?

17 A (Mr. Harper) Yes, there is.

18 Q And where are they based?

19 A (Mr. Harper) They're based out of, I believe
20 it is, Rio Rancho, New Mexico.

21 Q And what were their functions in connection
22 with the LES project for New Mexico?

23 A (Mr. Harper) It provided some various
24 environmental-related services. Some examples would be
25 endangered species surveys, archaeological evaluations of

1 the site.

2 Q Who were the individuals at GL Environmental
3 that did work on this project?

4 A (Mr. Harper) Any aspect of the project?

5 Q Yes.

6 A (Mr. Harper) Denise Gallegos, Tim Leftwich.

7 Q Anybody else?

8 A (Mr. Harper) That is all.

9 Q And what is the professional training of Denise
10 Gallegos?

11 A (Mr. Harper) I have not reviewed her resume.

12 Q Okay. And what is the professional training of
13 Tim Leftwich?

14 A (Mr. Harper) I have not reviewed his resume.

15 Q Okay. GL Environmental did work in connection
16 with the groundwater discharge permit, did they not?

17 A (Mr. Harper) They did -- they performed a
18 review o the draft permit application that we put
19 together.

20 Q And did you receive the results of that review?

21 A (Mr. Harper) Yes, we did.

22 Q Did you yourself in your job review the review
23 and decide what action to take?

24 A (Mr. Harper) Yes, I did.

25 Q Okay.

1 MR. LOVEJOY: Let's mark this. This would be
2 10.

3 (The document referred to was
4 marked for identification as
5 Exhibit NIRS-HP 10.)

6 BY MR. LOVEJOY:

7 Q Do you have Number 10, Mr. Harper?

8 A (Mr. Harper) Yes, I do.

9 Q Can you tell us whether you've seen this one
10 before.

11 A (Mr. Harper) Yes, I have.

12 Q Did you see this around April 6 of this year?

13 A (Mr. Harper) Yes, I did.

14 Q Yes. Do you remember receiving this and
15 reviewing the contents?

16 A (Mr. Harper) Yes, I did.

17 Q Did you respond to this?

18 A (Mr. Harper) I do not believe I responded to
19 it, other than to review the comments.

20 Q Do you remember what action you took based on
21 these comments?

22 A (Mr. Harper) Without going back and reading
23 right here, I would -- I believe in some cases, we
24 incorporated those comments and suggestions into the
25 permit.

1 Q Do you remember what instances those were?

2 A (Mr. Harper) Not specifically without -- I'd
3 have to do a comparison between --

4 Q Okay. Would you read the text on the page that
5 has LES-122 on it. Just read to yourself the entry under,
6 Groundwater Conditions.

7 A (Mr. Harper) (Perusing document.) Yes.

8 Q It says, "Copies of drill logs should be
9 provided and referenced. Under 'Groundwater Conditions,'
10 will information on the fault under NEF be provided?" Do
11 you know what fault is referred to?

12 A (Mr. Harper) Yes, I do. But it is not
13 properly characterized in the comment here.

14 Q Okay. What fault is referred to?

15 A (Mr. Harper) Given the timing here, I believe
16 it was back just before this email was sent to me, there
17 was a fault identified on the WCS property

18 Q And how did you learn about that fault?

19 A (Mr. Harper) It was either conveyed to me by
20 WCS and/or Cook-Joyce. I'm not sure who without going
21 back and --

22 Q So you got information orally?

23 A (Mr. Harper) It was probably orally. Yes.

24 Q Was there anything in writing about it?

25 A (Mr. Harper) No. Other than I did receive

1 some photographs also.

2 Q What were the photographs of?

3 A (Mr. Harper) I forget the exact year, but a
4 number of years ago, during excavation at the WCS
5 property, there was a fault in some very -- I believe in a
6 Triassic formation was noted during excavation for one of
7 their burial pits.

8 Q And what were you told about the fault when you
9 first learned about it?

10 A (Mr. Harper) I was told that WCS was
11 undertaking an evaluation of the fault.

12 Q And that was in 2004 you were told that?

13 A (Mr. Harper) That's correct.

14 Q Did you ever hear of any of the outcome of that
15 evaluation?

16 A (Mr. Harper) Yes. Back in the end of May,
17 LES, which I was a part of the team, accompanied the NRC
18 to the site to visit the fault or to inspect the fault, I
19 should say. And then we have subsequently received and
20 provided a report to the NRC on the characterization of
21 the fault.

22 Q Did you learn anything about the results of the
23 WCS evaluation of the fault?

24 A (Mr. Harper) I have reviewed their report that
25 was submitted to the State of Texas.

1 Q Who did that report?

2 A (Mr. Harper) Cook-Joyce and a company by the
3 name of Enterra.

4 Q Do you have a copy of that report?

5 A (Mr. Harper) Yes, I do.

6 MR. LOVEJOY: We're going to be requesting a
7 copy of that report.

8 MR. CURTISS: Okay. We'll see if we've
9 provided it already, but --

10 THE WITNESS: (Mr. Harper) It was submitted to
11 the NRC.

12 MR. LOVEJOY: Is this in the ADAMS system?

13 MR. KRICH: Should be. I haven't checked the
14 last couple days, but I believe it is.

15 MR. LOVEJOY: Was it submitted recently?

16 MR. KRICH: Yes. In the last two weeks. In
17 August actually.

18 THE WITNESS: (Mr. Harper) Correct. Yes.
19 With the last round of our --

20 MR. KRICH: It was submitted at the end of
21 August.

22 BY MR. LOVEJOY:

23 Q So you and some others visited the site of the
24 fault in May of this year.

25 A (Mr. Harper) That's correct.

1 Q And who was there at that time?

2 A (Mr. Harper) There was one person from the NRC
3 Washington office.

4 Q Who was that?

5 A (Mr. Harper) Herman Graves.

6 Q Herman --

7 A (Mr. Harper) Graves.

8 Q Herman Graves. Who else was on this visit?

9 A (Mr. Harper) There was three contractors to
10 the NRC.

11 Q And who were they?

12 A (Mr. Harper) I couldn't accurately give you
13 their names right now, but I --

14 Q Okay. Do you have it written down somewhere?

15 A (Mr. Harper) Yes, I do.

16 Q And where did you go? You went to the site of
17 the fault?

18 A (Mr. Harper) We went to the site of the fault.
19 That's correct.

20 Q Were there people there from WCS to show you
21 the site?

22 A (Mr. Harper) We were showed the excavation by
23 staff from Cook-Joyce and from Enterra.

24 Q Do you remember any of those folks' names?

25 A (Mr. Harper) Yes. From Cook-Joyce it would

1 have been Doug Granger.

2 Q Doug Ranger?

3 A (Mr. Harper) Granger, G. I believe Steve Cook
4 was there.

5 Q He's the Cook in Cook-Joyce?

6 A (Mr. Harper) He's the Cook in Cook-Joyce. And
7 a gentleman by the name of Gerry Grizak, Gerry with a G,
8 Grizak with a G.

9 Q Who's he with? Cook-Joyce?

10 A (Mr. Harper) He's with Enterra.

11 Q Enterra?

12 A (Mr. Harper) Yes. And Dan Green, who is a
13 contractor to LES.

14 Q Okay. So what did you see when you looked at
15 the site of the fault?

16 A (Mr. Harper) We first observed the excavation
17 from the top side, which pointed out the fault in the
18 mapping activities that were going on in the excavation,
19 and then we drove down into the excavation. It's quite
20 deep. It's quite a large excavation. They had opened up
21 a large face of the redbeds, the Chinle redbeds, and they
22 were doing detailed mapping of the fault.

23 Q How deep was this excavation?

24 A (Mr. Harper) I'll estimate it 70 feet, if not
25 deeper. It was fairly deep. The actual -- there's more

1 information in the report that was submitted to the NRC.

2 Q Okay. Was the report that was submitted to the
3 NRC, was this the report by Cook-Joyce and Enterra?

4 A (Mr. Harper) Yes, it was. We submitted the
5 section of the report -- this was a report that was
6 generated for WCS as part of one of their license
7 applications. We submitted just the portion on the fault
8 investigation to the NRC, because that was the issue that
9 we were responding to.

10 Q What prompted this submission?

11 A (Mr. Harper) A request from the NRC.

12 Q What had they requested?

13 A (Mr. Harper) They requested that we would
14 provide them with a copy of the report when it was
15 completed.

16 Q How did they know there was a report?

17 A (Mr. Harper) They accompanied us on the May
18 site inspection.

19 Q Okay. Well, how did they find out that there
20 was a fault to inspect?

21 A (Mr. Harper) That I do not know.

22 Q Okay. Do you remember what conclusions were
23 reached in the report?

24 A (Mr. Harper) The main focus of the report was
25 to determine the age of the fault and whether or not it

1 was considered active or capable, and the report concludes
2 that the fault was -- I believe it was Triassic-aged or
3 earlier. It's on the order of hundreds of millions of
4 years old.

5 Q Was there a determination whether it was --
6 strike that.

7 The age of the fault was Triassic. Are you
8 distinguishing between the age of the fault and the age of
9 the strata?

10 A (Mr. Harper) The purpose of the investigation
11 was to determine the age of the fault displacement.

12 Q And what was the age of the strata?

13 A (Mr. Harper) I'd have to go back and read the
14 report. It was at least that old, since the fault was in
15 it. But I don't -- again, I used -- it's Triassic or
16 Jurassic. It was pre-Quaternary, I believe.

17 Q Was there any discussion in the report about
18 the -- whether the fault was active or capable, as you use
19 it?

20 A (Mr. Harper) I believe a summary that -- I
21 believe it is -- it concluded that the fault was very old.
22 That was gist.

23 MR. CURTISS: Lindsay, let me raise a question
24 here in terms of a form of an objection.

25 MR. LOVEJOY: Yes.

1 MR. CURTISS: If you're endeavoring to tie this
2 back in some way to the groundwater question that you're
3 raising, these are the witnesses that can address that.
4 If you're, as you appear to be, pursuing of line of
5 inquiry that goes to a seismic issue -- and my
6 understanding is that the individuals who accompanied --
7 who visited this fault were seismic experts and looked at
8 it for that reason -- I think we would interpose an
9 objection.

10 At this point, you're entitled to pursue this
11 line of questioning, but if and to the extent that the
12 questions here can be linked to the groundwater issue
13 that's properly within the scope of this contention, this
14 is the panel that can address it.

15 MR. LOVEJOY: Good.

16 MR. CURTISS: But if you're seeking to address
17 issues related to seismic -- and it appears that that's
18 the direction that the question is going -- I would submit
19 (a) this is not the panel, and (b) your contention doesn't
20 encompass that. So we would hope that if you could link
21 it back to the groundwater question, feel free to do that.
22 In the alternative, we would object to a seismic inquiry,
23 because that's not an issue that's before the board.

24 MR. LOVEJOY: Well, it may touch on both
25 issues. That's the thing, so I'm going to be asking these

1 folks about the hydrologic aspects of this, and I think
2 that's --

3 MR. CURTISS: That's a fair question, and to
4 the extent that it's related to that, I think that's an
5 appropriate question. But to the extent that it's not, I
6 think we would object and just for the record note that.

7 MR. LOVEJOY: Okay.

8 BY MR. LOVEJOY:

9 Q You say the reported concluded that the fault
10 was very old. Did the report conclude whether the fault
11 was possibly still active or not, or did --

12 A (Mr. Harper) I can't remember. I'd have to
13 look at the report again.

14 Q Okay.

15 A (Mr. Harper) It was more focused on the age.

16 Q Okay. Mr. Peery, have you received any
17 information about this fault in connection with your work?

18 A (Mr. Peery) No, I have not.

19 Q Has any effort been undertaken to examine the
20 question of this fault from the standpoint of flow paths
21 for water?

22 A (Mr. Harper) Not to my knowledge.

23 Q Is there any reason why that was not examined?

24 A (Mr. Harper) The focus of the investigation
25 was seismic-related.

1 Q Was there any reason it was considered
2 inappropriate to investigate this from a hydrologic
3 standpoint?

4 A (Mr. Harper) I'm only aware of the evaluation
5 that was done in regards to the -- whether it was a
6 capable fault or not. I'm not aware of any other studies
7 they did while the excavation was open.

8 Q Is this fault mentioned in any version of the
9 environmental report?

10 A (Mr. Harper) The report was issued in, I
11 believe it was, sometime -- August, late August of '04, so
12 it has not been -- it is not mentioned in the ER, but it
13 has been -- it is part of the license application in that
14 we have submitted formal RAIs to the NRC.

15 MR. CURTISS: Let's take a break here, Lindsay,
16 and you're still going to pursue this, or if you're at the
17 conclusions of your questions and are prepared to move on,
18 that's fine. If not, we'll take a break, and we'll
19 discuss whether we have the right people here, and whether
20 this is relevant to the issues that we think you've raised
21 here.

22 So we'll take a brief break --

23 MR. LOVEJOY: Do you want to take a break?

24 MR. CURTISS: Yes. Five minutes.

25 MR. LOVEJOY: Okay.

1 (Whereupon, a short recess was taken.)

2 MR. CURTISS: I think we can discuss an
3 approach to go forward here, and propose an approach.
4 This panel that we have here is able to answer any
5 questions that you have -- and we'll stay as long as you
6 wish -- on the groundwater contamination issues that are
7 the subject of the deposition this morning.

8 If you are able to articulate for us the nexus
9 that you see between the seismic issue that you've been
10 discussing in the past 45 minutes or so and that was the
11 subject of an early objection from me, on the ground that,
12 at least at that point, I didn't see the nexus -- but also
13 allowing the possibility that you might, in your
14 questioning, get to that point of establishing nexus.

15 I think we're to the point now where we get to
16 see what you view the nexus to be between the seismic
17 issue and the groundwater contamination contention that
18 these folks are the experts on.

19 If at some point you think you -- and we're I
20 think perfectly willing to listen to how you might
21 articulate that nexus and get into the questions of these
22 experts, who are experts on the groundwater issue as to
23 the relationship between the seismic inquiry that you've
24 undertaken and the groundwater issue that they're experts
25 on.

1 In the absence of that, I think we're going to
2 have to say if you think you're entitled to pursue the
3 seismic issue at some point, feel free to seek to bring it
4 before the Board in the manners that are permitted, and if
5 it's -- you're successful on that, we'll get the right
6 panel here on that, but this is not the panel to go into
7 the detailed questioning of the seismic issue.

8 If you have a view about that and questions
9 that relate to the groundwater that will be the nexus that
10 we get to see in the line of questioning that you pursued,
11 please outline that for us, and you can start questioning
12 about this.

13 But in the absence of that, I propose to move
14 on to your next line of inquiry, as these are not the
15 folks to talk about seismic absent a connection to the
16 groundwater issue.

17 BY MR. LOVEJOY:

18 Q Mr. Peery, as a hydrologist, would you consider
19 a fault line to be at least potentially a fast-flow path?

20 A (Mr. Peery) Potentially. Faults can be --
21 faults can create fracturing, but faults can also create
22 gouge within the fault itself, making it a low-permeable
23 barrier as well.

24 Q So if you were investigating the hydrology of a
25 particular site, would you wish to know whether there was

1 a fault present beneath or near the site?

2 A (Mr. Peery) Yes.

3 Q You would. Okay. When did you complete you
4 investigations of the LES site?

5 A (Mr. Peery) I didn't actually perform
6 investigations as such. I performed a review of the
7 investigations at the site.

8 Q And when was that, did you finish that?

9 A (Mr. Peery) Oh, earlier this week.

10 Q And you've not seen the report that was
11 submitted to NRC concerning this fault.

12 A (Mr. Peery) I have not.

13 Q Would you like to see that?

14 A (Mr. Peery) Yes, I would.

15 Q Why is that?

16 A (Mr. Peery) I want to see what extra
17 information was discovered relating to the fault. It's
18 interesting in that there was a fault discovered at the
19 site, and the data collected at the WCS facility clearly
20 shows low permeability throughout the Chinle formation, so
21 I'm interested to see what happens with the fault.

22 Q Are you going to pursue that investigation?

23 A (Mr. Peery) Yes.

24 Q Okay.

25 MR. LOVEJOY: Let's mark this one. Is this 11

1 now?

2 THE REPORTER: Yes.

3 (The document referred to was
4 marked for identification as
5 Exhibit NIRS-HP 11.)

6 BY MR. LOVEJOY:

7 Q Would you both please look at Number 11 and
8 state whether you can identify this as something you've
9 seen before.

10 A (Mr. Peery) Yes. I've seen this.

11 A (Mr. Harper) And I have seen this before.

12 Q Okay. What -- are wells indicated on the
13 diagram that's page 2? I see it's got some groundwater
14 monitoring well locations.

15 A (Mr. Harper) This is a figure that was
16 prepared in response to the RAIs that we received from the
17 NRC where we were providing the latest information on the
18 locations for the groundwater monitoring wells for the
19 site.

20 Q Does this describe wells that exist now?

21 A (Mr. Harper) No.

22 Q Are these wells planned to be --

23 A (Mr. Harper) These are planned.

24 Q Okay. So the references here to MW-1, MW-2,
25 and MW-3, do they bear any relation to the MW-1, MW-2, and

1 MW-3 that were drilled and reported on by Cook-Joyce?

2 A (Mr. Harper) No. No, they do not.

3 Q Okay.

4 MR. LOVEJOY: This is 12.

5 (The document referred to was
6 marked for identification as
7 Exhibit NIRS-HP 12.)

8 BY MR. LOVEJOY:

9 Q Would you look at Number 12 and each of you
10 please state whether you've seen this before.

11 A (Mr. Peery) I've seen this before.

12 A (Mr. Harper) And I have seen this before also.

13 Q And, Mr. Harper, can you tell why this was
14 created? Do you know?

15 A (Mr. Harper) It appears that this figure was
16 created to -- for inclusion in the groundwater discharge
17 permit application, although I can't tell by looking at
18 the document here if it is the final version of the
19 figure.

20 Q Okay. There's a legend which refers to number
21 1, soil sample; number 2, vegetation sample; and number 3,
22 water sample/sediment sample.

23 A (Mr. Harper) Yes.

24 Q Are these identified to identify proposed
25 sampling locations for use under the discharge permit?

1 A (Mr. Harper) Yes, they are.

2 Q Do you know the frequency of the samples that
3 was proposed?

4 A (Mr. Harper) I'd have to check the permit.

5 Q Okay.

6 A (Mr. Harper) They may vary for different
7 media.

8 MR. LOVEJOY: This will be 13.

9 (The document referred to was
10 marked for identification as
11 Exhibit NIRS-HP 13.)

12 BY MR. LOVEJOY:

13 Q Mr. Harper, Mr. Peery, could you identify
14 Exhibit 13?

15 A (Mr. Peery) Exhibit 13 is LES Boring and
16 Monitor Well Survey Data.table.

17 Q Okay. Mr. Harper, do you recognize this as
18 something you've seen?

19 A (Mr. Harper) I'm not sure if I have seen this
20 information in this particular form right here, but I'm
21 familiar with the information.

22 Q What wells does this refer to?

23 A (Mr. Harper) The BH-1 through the BH-9 would
24 be the nine shallow groundwater borings.

25 Q And the MW-1, -2 and -3, are those the wells

1 that were drilled --

2 A (Mr. Harper) The three --

3 Q -- under Cook-Joyce's supervision?

4 A (Mr. Harper) Right. The three deep wells.

5 Q Okay. Good.

6 MR. LOVEJOY: This is 14.

7 (The document referred to was
8 marked for identification as
9 Exhibit NIRS-HP 14.)

10 BY MR. LOVEJOY:

11 Q Would you each please say if you've seen this
12 document before.

13 A (Mr. Peery) I have not reviewed this document.

14 Q Mr. Harper, do you --

15 A (Mr. Harper) I have seen this document.

16 Q Okay. Do you know what the date of this
17 document is approximately?

18 A (Mr. Harper) This document was prepared --
19 originally prepared in support of the Rev. 0 license
20 application.

21 Q And that was submitted in December of '03. Is
22 that right?

23 A (Mr. Harper) Correct.

24 Q Was it shortly before that date?

25 A (Mr. Harper) The calculation was originally

1 performed sometime before that date.

2 Q Okay. Over on page 4 of 40 in the lower right
3 corner --

4 A (Mr. Harper) I'd like to make one --

5 Q Please. Go ahead.

6 A (Mr. Harper) Supplement my previous response.
7 Even though the calculation was prepared prior to the
8 application submittal, it was not formalized until
9 recently.

10 Q What was the formalizing process you're talking
11 about?

12 A (Mr. Harper) It was essentially just to get
13 the cover sheets on and it all signed and dated.

14 Q Has that been submitted to NRC now?

15 A (Mr. Harper) This calculation?

16 Q Yes.

17 A (Mr. Harper) No, it has not.

18 Q Over on page 4 of 40, under the caption,
19 Radioactivity Estimate, why don't you read the first
20 paragraph there.

21 A (Mr. Harper) (Perusing document.)

22 Q It says -- well, under the major caption,
23 Inputs and Assumptions, it says, "The radioactivity
24 present on the surface of cylinders is the maximum
25 allowable for standard offsite transport per 49 CFR 173."

1 And it goes on.

2 Did you give instructions to someone preparing
3 an estimate of contamination that --

4 A (Mr. Harper) Where did you just read that
5 statement?

6 Q It's under, Radioactivity Estimate.

7 A (Mr. Harper) Okay.

8 Q Did you give instructions to use the maximum
9 allowable, as it's stated here, in estimating
10 radioactivity that would be present on the cylinders in
11 storage?

12 A (Mr. Harper) No, I did not.

13 Q Well, do you know who did? Do you know why
14 that rule is chosen?

15 A (Mr. Harper) It was an assumption that was --
16 a conservative assumption that was proposed by the author
17 in conjunction with discussions with other staff of
18 Framatome.

19 Q The author is Mr. Bellini?

20 A (Mr. Harper) Mr. Bellini. Correct.

21 Q Okay. Do you know whether calculations were
22 done assuming a greater amount of radioactivity than that
23 allowable for transportation?

24 A (Mr. Harper) I am not aware of it.

25 Q Okay.

1 MR. LOVEJOY: Let's mark this.

2 (The document referred to was
3 marked for identification as
4 Exhibit NIRS-HP 15.)

5 BY MR. LOVEJOY:

6 Q Have you seen Number 15, Mr. Harper, and you
7 too, Mr. Peery, if you might have seen this?

8 A (Mr. Peery) I have not reviewed this document.

9 A (Mr. Harper) I have seen it before.

10 Q Do you know what the date of this document is?

11 A (Mr. Harper) This calculation was originally
12 prepared in support of our submitting the responses to the
13 round NRC RAIs. I believe it was originally prepared back
14 in the July time frame.

15 Q July of '04?

16 A (Mr. Harper) July of '04.

17 Q And this is marked, Draft. Do you know if this
18 was ever completed?

19 A (Mr. Harper) The calculation, I believe, has
20 been signed or is awaiting final sign-off right now.

21 Q Well, has this or a version of this document
22 been submitted to NRC in response to an RAI?

23 A (Mr. Harper) A summary of it was supplied as
24 part of the RAI.

25 Q When was that?

1 A (Mr. Harper) I'd like to also add. These
2 types of calculations are not routinely submitted to the
3 NRC.

4 Q When was the summary submitted?

5 A (Mr. Harper) July of '04 time frame.

6 Q Okay. That's all I have on that one. Now, I
7 copied part of the latest environmental report. Draft 2.
8 Some of the pages are marked December '03, rather than
9 bring the whole thing.

10 A (Mr. Harper).

11 MR. LOVEJOY: This would be 16?

12 (The document referred to was
13 marked for identification as
14 Exhibit NIRS-HP-16.)

15 BY MR. LOVEJOY:

16 Q I just have a couple of questions about this.
17 Certainly, Mr. Harper, you've reviewed the environmental
18 report in various versions as it's been submitted. Is
19 that right?

20 A (Mr. Harper) Correct.

21 Q Now, Mr. Peery, have you?

22 A (Mr. Peery) I've reviewed sections related to
23 the site hydrogeology.

24 Q Did you review Section 3.4?

25 A (Mr. Peery) Yes.

1 Q Did you comment on it, or did you --

2 A (Mr. Peery) I haven't provided any comments to
3 anyone.

4 Q Okay. Over on page 3.4-5, there's a paragraph
5 a little over halfway down. It says, "The first presence
6 of saturated porous media," and it goes on. Why don't you
7 take a look at that one, Mr. Peery. I'm going to ask you
8 just a couple of questions.

9 A (Mr. Peery) (Perusing document.)

10 Q Okay. There's a reference to intersecting of
11 saturated porous media 200 to 300 below land surface. Do
12 you know what intersections that refers to?

13 A (Mr. Peery) As I recall, that's the zone I
14 previously described as the 220- to 230-foot zone.

15 Q That was encountered in MW-2 also?

16 A (Mr. Peery) Yes.

17 Q Okay. Then there's a reference to a zone -- it
18 says, "Similarly. there is a 30.5-meter, 100-foot, thick
19 water-bearing layer at about 183 meters, 600 feet, below
20 ground surface," and a reference, I take it, to Cook-
21 Joyce.

22 Do you know what data supports that statement?

23 A (Mr. Peery) I don't recall that offhand. I
24 don't recall offhand.

25 Q Okay. And then in the next paragraph, it says,

1 "The first occurrence of a well-defined aquifer is
2 approximately 244 meters, 800 feet below land surface."

3 Do you know what supports that statement?

4 A (Mr. Harper) Could I speak to that statement?

5 Q Of course.

6 A (Mr. Harper) In the Revision 2 to the ER, we
7 revised the discussion on the Santa Rosa formation, and
8 this particular passage that describes it here was either
9 missed during the revision or somehow got -- did not get
10 typed and incorporated.

11 Q Well, is the statement now incorrect in your
12 view?

13 A (Mr. Harper) Based on the February 2004
14 information from the Cook-Joyce report, we have revised
15 that statement, and it is revised in other sections here.
16 I'm just trying to put my -- (Perusing document.)

17 Q Do you want to find places where it's stated as
18 revised?

19 A (Mr. Harper) (Perusing document.) On page
20 3.4-13 --

21 Q Would you point to what you're talking about?

22 A (Mr. Harper) The third paragraph from the
23 top --

24 Q Yes.

25 A (Mr. Harper) -- starts off, "The first

1 occurrence."

2 Q Yes.

3 A (Mr. Harper) So that prior passage on the
4 prior page should read similar to that passage, and that
5 change is in progress for the next revision of the ER.

6 Q So are you saying that the Santa Rosa should be
7 identified as occurring 340 meters or 1,115 feet below
8 land surface, rather than 244 meters or 800 feet?

9 A (Mr. Harper) Correct.

10 Q Do you know how to figure 800 feet or 244
11 meters got into the text originally?

12 A (Mr. Harper) I believe it's based on some
13 early information that we obtained during the original
14 development of the ER.

15 Q What information was that?

16 A (Mr. Harper) I believe it was information that
17 was informally provided or, let's say, verbally provided,
18 based on discussions with WCS personnel.

19 Q So you were told by WCS personnel that the
20 Santa Rosa was found at 800 feet?

21 A (Mr. Harper) I believe that is probably the
22 case.

23 Q Okay.

24 A (Mr. Harper) And I'm also not sure -- well,
25 let's say I would like to -- I'm not sure if they were

1 referring, now when I read this passage, the physical
2 location of the Santa Rosa or the piezometric surface of
3 the Santa Rosa, which may describe the difference,
4 assuming it's a confined aquifer and the piezometric
5 surface is higher than the physical location of the Santa
6 Rosa formation itself.

7 Q Okay. I have a couple of questions about the
8 text of the draft EIS.

9 MR. LOVEJOY: I didn't run a full copy of this,
10 and you can either show the witness the text, or I will
11 show him the text.

12 BY MR. LOVEJOY:

13 Q Let's first identify the map on page 3-36.
14 Now, I realize this is not an LES document, but based on
15 your knowledge of the site and the work that's been done
16 there, can you state what's depicted in Figure 3-21?

17 MR. CURTISS: Can the record reflect that the
18 witnesses are looking at page 3-36 of the draft
19 environmental impact statement published by the NRC.

20 THE WITNESS: (Mr. Harper) This is your note
21 there on the very small text, near the bottom of the
22 legend there, the source of the ER report December 2003.
23 And what we're looking at here is the borings that have
24 been -- that were performed prior to December 2003 on the
25 site. So you see the nine shallow groundwater borings,

1 the five geotechnical borings, and the location of the
2 three monitoring wells.

3 BY MR. LOVEJOY:

4 Q You called them geotechnical borings. Under
5 whose supervision were they made?

6 A (Mr. Harper) Those are MACTEC borings.

7 Q Those are the earlier ones --

8 A (Mr. Harper) Correct.

9 Q -- and then the Cook-Joyce.

10 A (Mr. Harper) Yes. The sole purpose of those
11 borings was to collect geotechnical information.

12 Q Okay. Would you look at page 4-13 of the DEIS,
13 please. There is a discussion of a site stormwater
14 detention basin, and the second paragraph has some text
15 that I'll just read and I'd like your comments on.

16 "A conservative estimate of the impact from
17 this basin assumes that the local groundwater velocity at
18 the plume coming from the site stormwater detention basin
19 could be 252 meters at .16 mile per year. The cross-
20 section perpendicular to the flow direction of this plume
21 would be 2,850 square meters, 30,700 square feet. The
22 depth of the plume would be about 2.85 meters, 9.3 feet,
23 for a nominal plume width of 1,000 meters, 3,280 feet."

24 Do you know of the calculations which gave rise
25 to these figures?

1 A (Mr. Harper) I do not.

2 A (Mr. Peery) I do not.

3 Q Okay. Over on the next page, 4-14, in the
4 first paragraph on that page, there's a discussion of
5 septic tanks and leach field. At the end of that first
6 paragraph, it says, "The local groundwater velocity of the
7 plumes coming from the septic system would then be about
8 252 meters, .16 mile, per year. The total cross-section
9 perpendicular to the flow direction of the septic system
10 plumes would be 116 square meters, 1,250 square feet. The
11 depth of the plumes was calculated to be about 1.16
12 meters, 3.8 feet, for a nominal total plume width of 100
13 meters, 328 feet."

14 Do you know the origin of those figures, either
15 one of you?

16 A (Mr. Peery) I do not.

17 A (Mr. Harper) I do not, either.

18 Q That's all I have on that.

19 MR. LOVEJOY: If we can have a minute or two
20 with my technical advisor, we may be able to end this.

21 (Whereupon, a short recess was taken.)

22 THE REPORTER: We're back on the record.

23 MR. LOVEJOY: Thank you.

24 BY MR. LOVEJOY:

25 Q Mr. Harper, we just looked at the discussion in

1 the draft EIS of plumes associated with the site
2 stormwater detention basin and the septic tanks and leach
3 fields. From reading those, can you tell whether you
4 would agree or disagree with those analyses?

5 MR. CURTISS: Could we have a page reference
6 there?

7 BY MR. LOVEJOY:

8 Q On page 4-13 and 4-14.

9 A (Mr. Harper) The first one's on 4-13?

10 Q Yes.

11 A (Mr. Harper) I guess I make two points.

12 First, I would have to see the calculation to understand
13 the basis for the assumptions made and the inputs. And,
14 number two, for the site stormwater detention basin, it's
15 not clear in this calculation if they're taking any credit
16 for evapo-transpiration, and that may be a -- if they're
17 not, that would be a very overly conservative assumption
18 in my belief.

19 Q And what's your view of the discussion of the
20 septic tanks and leach fields on 4-14?

21 A (Mr. Harper) Based on the sentence there in
22 the middle of the paragraph -- "A conservative estimate of
23 the impact from septic systems assumes all of the
24 infiltrating water was transported down gradient." So,
25 again, without seeing the calculation and also -- and

1 specifically here it says they did not take any credit for
2 evapo-transpiration. This would appear to be an
3 evaluation that assumes that all -- that the evapo-
4 transpiration is not accounted for in the analysis, so I
5 would not agree with it.

6 Q Can I ask each of you witnesses: Have you ever
7 known a liner of a basin to leak?

8 A (Mr. Peery) I don't have a lot of experience
9 with lined sites.

10 Q Okay. Mr. Harper?

11 A (Mr. Harper) During my career as an engineer,
12 I believe at some points I have read articles over heard
13 cases where liners have leaked.

14 Q Can you remember the causes that were
15 attributed to those leakages?

16 A (Mr. Harper) Since I don't have any particular
17 examples, I -- they would just be this -- I would assume
18 the usual suite of potential reasons why a liner could
19 leak.

20 Q What's the usual suite?

21 A (Mr. Harper) Improper installation, for
22 example.

23 Q Anything else?

24 A (Mr. Harper) Some type of a puncture due to
25 poor maintenance practice or burrowing animals, something

1 else, would be a potential.

2 MR. LOVEJOY: Okay. I'm done.

3 MR. CURTISS: Okay.

4 MR. LOVEJOY: We'll go off the record here.

5 (Whereupon, the taking of the instant
6 deposition was concluded.)

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CERTIFICATE

This is to certify that the foregoing proceedings
in the matter of: The Deposition of
George A. Harper
Roger L. Peery
held on: September 17, 2004
at the location of: Santa Fe, NM

were duly recorded and accurately transcribed under my
direction; further, that said proceedings are a true
and accurate record of the testimony given by said
witness; and that I am neither counsel for, related
to, nor employed by any of the parties to this action
in which this deposition was taken; and further that
I am not a relative nor an employee of any of the
parties nor counsel employed by the parties, and I am
not financially or otherwise interested in the outcome
of the action.

Carol Oppenheimer

Carol Oppenheimer

AUTHENTICATION BY SIGNATURE

I, the undersigned, do hereby certify by my signature hereunder that I have read the foregoing deposition of testimony given by me on September 17, 2004, and find said transcription to be a true and accurate record, as corrected.


George A. Harper

Sworn to and subscribed before me this 28th day
of October, 2004.


Notary Public

My commission expires August 29, 2010.



Barbara Ann Lema, Notary Public
Commonwealth of Massachusetts
My Commission Expires 8/29/2010

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ERRATA

ERRATA

RE THE DEPOSITION OF

George A. Harper
(deponent's name)

TAKEN ON

Sept. 17, 2004
(date)

IN THE MATTER OF

LES
(party)NIRS/PC
(party)

DOCKET NO. _____

IN _____
(name of court)

PAGE NO.	LINE NO.	CORRECTION
10	12	"DM" should be "dam"
10	14	"DM" should be "dam"
12	10	"pump" was probably an "ah"
13	1	"--" should be "and"
37	13	"is" should be "in"
38	1	"membrane" refers to the "upper liner"
38	2	"membrane" refers to "liner"
63	7	"yo" should be "you"
64	21	first use of "on" should be deleted GAH/28/04 deleted
64	22	"in" should be "and"
85	6	"former" should be "phone"
87	18	"o" should be "of"

TELEPHONE (202) 234-4433

[illegible]

AUTHENTICATION BY SIGNATURE

I, the undersigned, do hereby certify by my signature hereunder that I have read the foregoing deposition of testimony given by me on September 17, 2004, and find said transcription to be a true and accurate record, as corrected.

Roger L. Peery

Sworn to and subscribed before me this _____ day
of _____, 20__ __.

Notary Public

My commission expires _____.