RAS 4569

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Private Fuel Storage, LLC

Docket Number: 72-22-ISFSI; ASLBP No. 97-732-02-ISFSI

Location: Salt Lake City, Utah

Date: Tuesday, April 23, 2002

Work Order No.: NRC-281 Pages 4544-4800

NEAL R. GROSS AND CO., INC.
Court Reporters and Transcribers
1323 Rhode Island Avenue, N.W.
Washington, D.C. 20005
(202) 234-4433

Template = SECY-032

SECY-02

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:	)	
PRIVATE FUEL STORAGE, LLC,	)	Docket No. 72-22
(Independent Spent Fuel	)	ASLBP No.
Storage Installation)	)	97-732-02-ISFSI
	)	

U. S. Nuclear Regulatory Commission
Utah State Capitol
Salt Lake City, Utah 84114

On April 23, 2002 the above-entitled matter came on for hearing, pursuant to notice, before:

MICHAEL C. FARRAR, CHAIRMAN
Administrative Judge
U. S. Nuclear Regulatory Commission

DR. JERRY R. KLINE
Administrative Judge
Atomic Safety & Licensing Board Panel

DR. PETER S. LAM
Administrative Judge
Atomic Safety & Licensing Board Panel

A P P E A R A N C E S

FOR PRIVATE FUEL STORAGE, LLC:
Jay Silberg, Esq.
D. Sean Barnett, Esq.
Paul Gaukler, Esq.
SHAW PITTMAN
Attorneys at Law
2300 N Street, N.W.
Washington, D.C. 20037

FOR THE U.S. NUCLEAR REGULATORY COMMISSION:
Catherine Marco, Esq.
Robert Weisman, NRC Staff
OFFICE OF THE GENERAL COUNSEL
Mail Stop - 0-15 B18
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

FOR SUWA:
Joro Walker, Esq.
LAND/WATER FUND
2056 East 3300 South, Suite 1
Salt Lake City, Utah 84109

I N D E X

E X A M I N A T I O N

testimony found before ~~its~~ admitted

E X H I B I T S

No.		MRKD/ADMTD
Applicant		
BB through KK	(Submitted with Prefiled Testimony of John Donnell, Susan Davis, and Douglas Hayes)	4565/4565
STAFF		
G-O	(Submitted with Prefiled Testimony of Kenneth McFarland, Gregory Zimmerman, Alice Stephenson, and Britta Laub)	4662/4663
SUWA		
1-3	(Submitted with Prefiled Testimony of Dr. James Catlin)	4796/4796
4	Off Highway Vehicle Designations Pony Express Resource Area	4679/4767
5	Information on Unit UT-020-087	4705/4767
6	Wilderness Inventory and Study Procedures	4705/4767
7	Intensive Wilderness Inventory Decision	4761/4767

April 23, 2002 9:00 a.m.

P R O C E E D I N G S

JUDGE FARRAR: Good morning, everyone. We're here for the second week of hearings. This is the week we'll be doing environmental issues. Today, a contention by the Southern Utah Wilderness Alliance on the alignment or proposed alignment of the railroad. Tomorrow, a state contention on hydrology matters, and then on Thursday, a couple of oral arguments on pending matters which we'll discuss later.

Ms. Walker, it's your contention. Would you be good enough to introduce yourself and the people with you.

MS. WALKER: Thank you. I'm Joro Walker, attorney for Southern Utah Wilderness Alliance.

JUDGE FARRAR: Excuse me. We have switches on the microphones. I think you'll have to -- there you go.

MS. WALKER: That wasn't loud enough? Joro Walker, attorney for Southern Utah Wilderness Alliance. And with me is Andrew Hartsig who works

with me and Dr. Jim Catlin, who's our expert witness.

JUDGE FARRAR: For the Applicant.

MR. SILBERG: Good morning, Judge Farrar and the Board. I'm Jay Silberg from Shaw Pittman representing Private Fuel Storage. With me at counsel table is Sean Barnett of the same law firm. Here in the audience today, John Parkyn is here. He's the chairman of the Board of Managers of Private Fuel Storage. Our witness panel who we'll introduce in a few minutes is already stationed and ready to go.

JUDGE FARRAR: For the Staff.

MR. WEISMAN: I'm Robert Weisman -- turn on. I'm Robert Weisman with the NRC Staff. With me is Chester Poslusny who is also -- who is on our staff. Also in the audience is Catherine Marco, co-counsel and Mark Delligatti.

JUDGE FARRAR: Okay. Thank you. Before we get started, yesterday, at the suggestion of the parties, the Board took a site visit out to the location of the proposed railroad siding and its routing down the Cedar Mountains. Each party was there, I think in all cases had counsel and an expert with them, and during the course of today's

proceedings, of course, nothing in yesterday's visit will make it onto the record, so even if you were there, don't hesitate -- if you want to refer to that visit, don't hesitate to describe what we saw and whatever. Because up to this point, there's nothing in the record about that visit and I think everyone found it very helpful in getting a perspective on the issues.

Are there any preliminary matters?

MR. SILBERG: Yes, Mr. Chairman. As I mentioned off the record to you and to the parties, I would like briefly to ask reconsideration of the Board's order dated April 18, denying the motion to strike that was filed by Private Fuel Storage with respect to some of the testimony of Dr. Catlin. We asked that two aspects of his testimony be stricken. One had to do with congressional consideration for the designation of the SUWA named North Cedar Mountains area as a wilderness and also an exhibit, Exhibit 3, which was an appeal paper filed by SUWA to the Board of -- the Interior Board of Land Appeals concerning again the designation of the North Cedar Mountains area.

It seems to me that neither of those have any relevance. This Board has already stated

that congressional decisions or non decisions as to the characterization and designation of the North Cedar Mountains area as wilderness are not relevant to this contention. To say that we ought to leave that testimony in and then evaluate its legitimacy after the hearing, seems to me to totally ignore the purpose of motions to strike, which as the Commission stated in its decision last year in the Fitzpatrick case, is to exclude irrelevant information. This Board has determined that that information is irrelevant to the issue. I would request reconsideration that it be excluded. Otherwise, we have to go through cross-examination on a topic which can have no possible bearing on this issue.

The second part of our motion to strike had to do with Exhibit 3 which was a pleading before the Bureau as to the characterization of this land issue -- of this land area. Again, the issue as to whether or not the BLM has or has not characterized this site is irrelevant to the issue that this Board is facing, which is the facts on the ground and not the legal characterization by an agency.

So I would ask that both of those pieces

of testimony be excluded in order to make this hearing move along considering relevant and material evidence.

JUDGE FARRAR: Ms. Walker.

MS. WALKER: Well, as I explained in our response to the motion in limine, the Board didn't say that the issue of whether or not the North Cedar Mountains would be designated as wilderness was irrelevant. I said that. And it was somewhat of a misstatement. What I really meant to say was that it didn't end the inquiry. It was an issue, but it wasn't sort of the end of the inquiry. If it hadn't been or wouldn't be designated wilderness, the second prong of the inquiry would be, is there wilderness character? So if you read what the Board, this Board stated -- or was it the Commission? Yes, it's the Board. Okay. This is a quote from the memorandum and order denying the Motion for Summary Disposition regarding contention SUWA B. "Given that there has been no statutory wilderness designation regarding the North Cedar Mountains area, in any further litigation concerning this contention, the question of the natural state of the area at issue will be a matter for party presentation."

So it doesn't say it's irrelevant. It just says that it doesn't end the inquiry.

Secondly, what the congressional support of Red Rock -- America's Red Rock Bill shows is that Congress believes that the North Cedar Mountains area as defined by the Utah Wilderness Coalition does have wilderness character. So their congressional support of the bill means two things. First of all, that they put a great deal of credence in what the Utah Wilderness Coalition says with regard to wilderness character, and secondly, that this specific area has wilderness character. Because that's the underlying criteria.

With regard to PFS's second point, PFS and the Staff both quote from -- the Staff, in particular, quote from BLM's determination of whether or not the North Cedar Mountains area -- an area of the North Cedar Mountains -- it's a little confusing because it's a different area. But they quote on and on about using that determination. So that determination is clearly subject to this hearing. I mean it's a bit odd to sort of quote on and on and then suddenly say, well, it's not something that you can cross or bring up additional evidence on, because -- well, I'm not sure even

what rationale you can give for that. So if we can't talk about what the BLM said in 1980, which is presented here with exhibits and testimony, then the Board isn't going to get to the bottom of the matter at all.

MR. SILBERG: If I could briefly --

JUDGE FARRAR: Let me ask if the Staff has anything they want to add?

MR. WEISMAN: Well, I would just add, Your Honor, that whether there's a bill pending before Congress, does not tend to make it any more likely or less likely that the North Cedar Mountains area has wilderness characteristics. That's what is the subject of this hearing and that -- the testimony on that subject is just simply not relevant. We don't see how there could be any relevance to that testimony.

With respect to the -- with respect to SUWA's ability to offer evidence on the BLM's prior determination, this motion in limine does not preclude them from doing so. But argument of counsel in a brief in the Staff's view is not evidence and should not be accepted as such.

JUDGE FARRAR: Ms. Walker, on the appeal to the Department of Interior Board, what's the

precise purpose you want to put that in front of us for?

MS. WALKER: The purpose is to show that the subject -- well, the whole issue is before the IBLA, and so it's not -- it hasn't been decided.

JUDGE FARRAR: But you're not asking us to make any factual findings based on evidence or arguments you presented in there, I take it, from what you just said; you simply want us to be aware that, in fact, there's an appeal pending, that you haven't given up that fight and that we should therefore evaluate the BLM's finding in the light of it being on appeal?

MS. WALKER: That's right. Yeah, I'm perfectly capable of making those arguments myself. I don't need to rely on a document to do that for me. So exactly.

JUDGE FARRAR: In light -- let me ask Mr. Silberg, then, in light of that statement, how that affects your position?

MR. SILBERG: If the document is offered solely to show that there is an appeal pending, I have no problem letting it in for that limited purpose. It's not the complete story, because SUWA has not called to the Board's attention that they

requested a stay and that that stay request has been denied. With respect to the congressional --

JUDGE FARRAR: Let's stay with this one for a minute. Then is simply a solution or response to your motion and to our order carrying -- our earlier order carrying these motions with the case, that we simply take judicial notice that, in fact, there is an appeal pending and if you want us to take judicial notice that as part of that appeal, a stay was requested and denied, that, I take it, would be all we would need to do with that document?

MR. SILBERG: I have no problem with that.

JUDGE FARRAR: Ms. Walker, that's all right?

MS. WALKER: Yes, thank you.

JUDGE FARRAR: The Staff?

MR. WEISMAN: The Staff would have no objection.

JUDGE FARRAR: Okay, then we will do that. We would not have the document introduced -- no, it can be introduced but for the sole purpose of showing that an appeal is pending, not for the truth of any contents therein. Mr. Silberg, that

leaves you with the congressional?

MR. SILBERG: Yeah, I would just subscribe to what Mr. Weisman said. I think the fact that the bill may have been introduced in Congress, is certainly no relevance to congressional intent. And given this Board's ruling that congressional action or inaction does not determine this inquiry, we really shouldn't get into that.

MS. WALKER: You know, I don't know what happened, but I recall during oral argument that PFS was talking about what Congress may or may not do with regard to Yucca Mountain. So it's not something that only occurs from our side of the aisle.

And secondly, I'm not talking about congressional intent in terms of all of Congress. I'm talking about what the cosponsors of the bill think. Now, they have made it plain that they think that the North Cedar Mountains has wilderness character. I mean what could be more straightforward than that?

JUDGE FARRAR: The Board's concern would be that we don't think a useful purpose would be served by getting into testimony here about what

Congress may or may not do. So again, if there's a very limited purpose for which this is offered, simply the fact that there's a bill pending, again we can take judicial notice of that. But I think Mr. Silberg's motion goes to concern about spending time here arguing about the likelihood of that bill passing.

MR. SILBERG: Well, it's a little bit broader than that, because I think if we leave it in, I'm going to have to go into what action has been taken, what the bill actually says, what the Congressmen do or don't know. It's not just a question of judicial notice that there's a bill pending on which no action has been taken. That bill says, you know, nothing about North Cedar Mountains.

MS. WALKER: The bill says everything about the North Cedar Mountains.

MR. SILBERG: That's why I think we need to exclude it, because now we're getting into a debate of what the bill says.

JUDGE FARRAR: If that's the debate, is that a matter for briefing after the --

MR. SILBERG: Absolutely not. Because I think what it says and what the words in the bill

do or don't mean, we're going to have to go into it on the record. If it's not relevant, and it's not relevant, we should keep it out. That's the purpose of this motion is to strike.

MS. WALKER: But if the issue before the Board is whether or not the North Cedar Mountains has wilderness character and Congress thinks that it does, it's relevant.

MR. SILBERG: Congress --

JUDGE FARRAR: Wait, wait.

MS. WALKER: I'm sorry, I shouldn't have said Congress. A portion of Congress and a portion of the Senate -- or a portion of the House and a portion of the Senate think that it does. And if that's not relevant, then what BLM thinks about the wilderness character of the area isn't relevant. I mean --

JUDGE FARRAR: When we get to the point in today's hearing that you could introduce this, who do you propose to have introduce this and talk about it?

MS. WALKER: Well, it's in Dr. Catlin's prefiled testimony.

JUDGE FARRAR: Right. And so --

MS. WALKER: He knows the detail of the

bill, and in correspondence with the Utah Wilderness Coalition's proposal, which is essentially the content of the bill. So the bill is intended to get Congress to act on the Utah Wilderness Coalition's wilderness proposal. And he knows with very -- with incredible specificity, the boundaries of the North Cedar Mountain area, the Utah Wilderness Coalition's proposal for that area and the way it relates to the bill. The two are identical. Because that's the whole purpose of the bill. And he knows that because he helped draft all that stuff.

JUDGE FARRAR: Mr. Weisman, you had something to add?

MR. WEISMAN: Yes, Your Honor. As Ms. Walker points out, Dr. Catlin is here to testify. He will be cross-examined on the wilderness character of the North Cedar Mountains. No member of Congress is here to testify. If we wanted to -- if SUWA wanted a member of Congress to come and present evidence, they could have asked a member of Congress to come and testify. And as for BLM, well, the Staff is providing two employees of BLM who have knowledge of the natural state of the area. They submitted prefiled testimony and

they're available for cross-examination. We're not able to cross-examine the members of Congress as to what they think about the North Cedar Mountains area and whether it possesses wilderness characteristics or not.

(Judges conferred off the record.)

JUDGE FARRAR: Counsel, we're going to grant Mr. Silberg's motion in part to this extent, Ms. Walker. Your witness will still be free to talk about his role in drafting any legislation, what his thinking was that went into that, but it is beyond the scope of this hearing to speculate about what Congress may or may not do. But as you suggest, he had a role in drafting that, we'll be happy to hear about that because he can, in fact, be cross-examined about that.

All right, with that ruling, Mr. Silberg, you may go ahead.

MR. SILBERG: Yes, we have previously distributed prefiled testimony of our three witnesses to the Board and the parties -- I'm sorry, the Staff wanted to do something before we started.

MR. WEISMAN: As a preliminary matter, we wanted to move the -- the Staff has completed

the final Environmental Impact Statement for the construction and operation of an independent spent fuel storage installation on the reservation of the Skull Valley Goshute Indians and the related transportation facility in Tooele County, Utah. This is NUREG 1714 dated December 2001. As relevant here, 10 CFR Section 2.743(g) provides that in any proceeding involving an application, there shall be offered into evidence by the Staff any Environmental Impact Statement prepared by the Director of Nuclear Material Safety and Safeguards or his designee in the proceeding. Pursuant to this regulation, the Staff hereby offers NUREG 1714, the FEIS, which is marked as Staff Exhibit E into evidence in this proceeding.

MR. SILBERG: No objection from the Applicant.

JUDGE FARRAR: Ms. Walker, any objection?

MS. WALKER: No.

JUDGE FARRAR: Then let the document be admitted.

Any other preliminary matters? Go ahead, Mr. Silberg.

MS. WALKER: Oh, it's just that I have a

bad back, and I'm not going to be able to stand -- I mean sit down the whole time. So I hope I don't bother you if I have to get up a lot.

JUDGE FARRAR: You have found a biased chairman. In fact, has had a bad back for much of his life, so whatever you need to do to remain comfortable, is fine.

MS. WALKER: Thank you.

MR. SILBERG: I would ask that the Board swear in our panel of witnesses; Ms. Sue Davis, a senior environmental scientist with Stone & Webster, Inc.; Mr. Douglas Hayes, a civil design engineer with Stone & Webster, Inc., and Mr. John Donnell, a project director for Private Fuel Storage.

JUDGE FARRAR: Would you all stand and raise your right hand, please.

JOHN DONNELL, SUSAN DAVIS, DOUGLAS HAYES,

called as witnesses, for and on behalf of the Applicant, being first duly sworn, were examined and testified as follows:

MR. SILBERG: Mr. Chairman, counsel for SUWA and counsel for the Staff have stipulated the admission into evidence at this point in time of

the testimony of these three witnesses on Contention SUWA B. I'd ask that it be incorporated in the transcript at this point as the testimony of these three individuals.

JUDGE FARRAR: We will do that. The testimony will be bound in the record as though read.

(PREFILED TESTIMONY OF JOHN DONNELL, SUSAN DAVIS, AND DOUGLAS HAYES FOLLOWS.)

A

March 18, 2002

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

TESTIMONY OF JOHN DONNELL ON CONTENTION SUWA B—RAILROAD ALIGNMENT ALTERNATIVES

I. BACKGROUND--WITNESS

Q1. Please state your full name.

A1. John Donnell

Q2. By whom are you employed and what is your position?

A2. I am Project Director for Private Fuel Storage, L.L.C. ("PFS"). In my capacity as Project Director, I am responsible for the execution and integration of the legal and technical activities of the Private Fuel Storage Facility ("PFSF") project.

Q3. Please summarize your educational and professional qualifications.

A3. My professional and educational experience is summarized in the curriculum vitae attached to this testimony. I am knowledgeable about PFS's plan for the construction and operation of a railroad from the proposed PFSF storage site to an interconnection with the Union Pacific Railroad at Low Junction, in Utah. I am also knowledgeable of the alternative alignments for a rail line servicing the storage facility that PFS has considered. I have visited the Low Corridor area a number of times over the course of my work on the PFS project.

Q4. What is the purpose of your testimony?

A4. The purpose of my testimony is to respond to the allegation in Contention SUWA B that asserts:

> The License Application Amendment fails to develop and analyze a meaningful range of alternatives to the Low Corridor Rail Spur and the associated fire buffer zone that will preserve the wilderness character and the potential wilderness designation of a tract of roadless Bureau of Land Management (BLM) land—the North Cedar Mountains—which it crosses.

Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), LBP-99-3, 49 NRC 40, 53, aff'd, CLI-99-10, 49 NRC 318 (1999). The contention was admitted so far "as it seeks to explore the question of alignment alternatives to the proposed placement of the Low Junction rail spur." LBP-99-3, 49 NRC at 53.

Q5. To what will you testify?

A5. I will testify that PFS has considered a range of alternative alignments to the Low Corridor rail line that do not cross SUWA's North Cedar Mountains (NCM) area. In response to SUWA's assertion in Contention SUWA B that PFS could avoid its purported wilderness area, PFS has considered a railroad alignment just east of the NCM area that would not run a railroad through that area. PFS also considered a potential alignment down the center of Skull Valley, and alignments parallel to Skull Valley Road on the east side of Skull Valley. I will testify that considering the additional environmental impact and the additional construction costs, the alternative railroad alignments are inferior options compared to the proposed Low Corridor alignment.

II. DESCRIPTION OF THE LOW CORRIDOR RAIL LINE ALIGNMENT AND POTENTIAL ALTERNATIVE ALIGNMENTS

A. Proposed Low Corridor Alignment

Q6. Please describe the proposed Low corridor alignment.

A6. The proposed Low Corridor rail line is described in sections 3.2.1.5 and 4.4 and Figure 3.2-2 of the PFS Environmental Report (ER) (PFS Exhibit BB). The rail line will be constructed to connect the PFSF directly to the Union Pacific mainline railroad (which runs west from Salt Lake City across the north end of Skull Valley) near Low Junction, Utah at Skunk Ridge. The single track line will be

approximately 32 miles long and begin at the mainline on the south side of Interstate 80 at Skunk Ridge. From there, the rail line will proceed southeast parallel to Interstate 80 for approximately 3 miles, then turn south along the western side of Skull Valley for approximately 26 miles, and then turn east for approximately 3 miles to the PFSF. Associated sidings will be located at the PFSF and near Low Junction. ER at 3.3-6. The construction of the railroad is described in greater detail in the testimony of Douglas Hayes on Contention SUWA B.

Q7. Where is the location of the rail line relative to the location of the North Cedar Mountains area that SUWA claims should be designated as wilderness?

A7. The NCM area, which SUWA purports is suitable for consideration as wilderness, is located at the northern end of the Cedar Mountains, just west of Skull Valley and just south of I-80. It is a rough polygon about 5.5 miles wide by 7 miles long (see PFS Exhibit JJ). The proposed rail line would run through the far eastern edge of this area near an existing dirt road for less than three miles. (see PFS Exhibit EE)

Q8. Have you seen human imprints or evidence of human presence in the part of the NCM area through which the Low Corridor route would run?

A8. Yes. I have seen cattle grazing in the area between the dirt road and higher elevations toward the mountains. I have seen numerous "jeep" trails and one-track paths that cross the Low Corridor and head in the general direction of the mountains. (See PFS Exhibit II) I have occasionally seen vehicles using the trails in the area.

B. East Skull Valley Alternative Railroad Alignments

Q9. Please describe the east Skull Valley alternative railroad alignments.

A9. PFS evaluated rail line alignment alternatives to the Low Corridor rail line that run south from the Union Pacific mainline to the PFSF. As part of a comprehensive study of transportation alternatives in 1998 and in previous versions of the PFSF ER, PFS considered multiple starting points for a railroad alignment parallel to Skull Valley Road on the east side of Skull Valley as potential alternatives to the currently proposed Low Corridor alignment. PFSF Transportation Study (SWEC 1998), §3.3 (PFS Exhibit HH); ER Rev. 0, § 4.4 (see PFS Exhibit BB).

The east side alternatives are constrained by the location of the Union Pacific mainline, in that it runs on the north-side of I-80 from Salt Lake City until reaching Skunk Ridge, near Low Junction, on the west side of Skull Valley. PFSF Transportation Study at 35. To create a rail corridor along the east side of the valley would require either using the existing I-80 underpasses servicing Skull Valley Road in Skull Valley, constructing a new rail bridge over I-80, or a making rock cut through the northern Stansbury Mountains from an acceptable access point to the Union Pacific mainline railroad in the adjacent Tooele Valley. See FEIS § 2.2.4.2.

If an alternative rail line alignment on the east side of Skull Valley could be constructed to cross I-80, the rail line would be run parallel to the existing Skull Valley Road along the east side of the road until crossing it near the Reservation to run about two miles west to the PFSF. Transportation Study at 35.

Q10. Why were the East Skull Valley alternatives rejected?

A10. PFS rejected the East Skull Valley alternative alignment in favor of the proposed Low Corridor route because of the Low Corridor's lesser environmental impact (see ER Rev. 0, § 4.4) and the alternative's impracticability.

The existing I-80 overpasses crossing Skull Valley Road in Skull Valley are relatively low and would only provide 7 inches of clearance for a loaded spent fuel cask. Transportation Study §3.3. In contrast, State of Utah and private railroad standards would require closer to eight feet of clearance without a waiver. Transportation Study §3.3. PFS concluded that obtaining such a waiver was infeasible based on discussions with the railroad that indicated the clearance requirements were non-negotiable. Id. at 39. Union Pacific would only issue an "impaired clearance" to PFS if PFS would take all liability for any user of the rail line section subject to an impaired clearance. Id.

As discussed in the testimony of Susan Davis on Contention SUWA B, both constructing a rail bridge over I-80 or a making rock cut through the northern Stansbury Mountains from an acceptable access point to the Union Pacific mainline railroad in the adjacent Tooele Valley involve substantially increased environmental impacts. See also Transportation Study at 51, 56. Such construction would also add unnecessary construction costs, difficulty, and technical and busi-

ness risks to the rail line construction project. Id. Furthermore, constructing a rail bridge over I-80 would require PFS to obtain a State permit. The relative environmental impacts of the proposed Low Corridor and East Skull Valley alternatives are further discussed in the testimony of Susan Davis.

Based on these considerations, a rail route on the eastern side of Skull Valley is inferior to the proposed Low Corridor route.

C. Central Skull Valley Alternative Railroad Alignment

Q11. Please describe the central Skull Valley alternative railroad alignment.

A11. PFS also considered a potential alignment down the center of Skull Valley. A rail corridor from the Union Pacific mainline to the PFSF faces a fundamental constraint that it must run down either the west side or the east side of the valley. Alignments down the middle of the valley would cross the large mid-valley mud flat, which, as discussed in the testimony of Susan Davis on Contention SUWA B, is a wetland as defined under the Clean Water Act § 404.

Q12. Why was that alternative rejected?

A12. PFS quickly rejected the Central Skull Valley alternative alignment in favor of the Low Corridor route because of the alternative's impracticability and, as discussed in the testimony of Susan Davis, the Low Corridor's significantly lesser environmental impact. As discussed in the testimony of Susan Davis, it is doubtful that PFS could obtain an Army Corps of Engineers permit to fill relatively large tracts of the mid-valley wetland, when east and west side alternatives are feasible and do not impact a wetland. As such, mid-valley rail line alignments are not practicable alternatives to the Low Corridor rail line alignment. The relative environmental impacts of the proposed Low Corridor and Central Skull Valley alternative are discussed further in the testimony of Susan Davis on Contention SUWA B.

D. West Skull Valley Alternative Railroad Alignment

Q13. Please describe the west Skull Valley alternative alignment.

A13. In response to Contention SUWA B, PFS also considered an alignment just east of SUWA's NCM area that would not add a railroad to that area and thus would

not have any further effect on the hypothetical potential for the area's designation as wilderness.[1] The alternate alignment would run 2,000 to 3,000 feet further east than the proposed alignment in order to avoid the NCM area. The alternative alignment would rejoin the proposed alignment to the south of the NCM area, after a total distance of about six miles.

Q14. What are the consequences for rail line construction of moving the alignment 2,000 to 3,000 feet further east than the proposed Low Corridor alignment?

A14. As discussed in the testimony of Douglas Hayes on Contention SUWA B, in terms of earthwork (i.e., cut and fill), aside from the initial cut at Low for the mainline rail connection, the remaining length (31 miles) of the proposed Low Corridor 32-mile rail line alignment has a net material balance; that is, material removed to level the railroad bed ("cut") approximately equals material added ("fill"). The mainline cut at Low will result in a stockpile of approximately 300,000 cubic yards of soil. The alternative alignment, however, is built on fill for most of its six mile length, driven by the constraints of available BLM land for rail corridor through two narrow gaps near the northern and southern ends of the alternative alignment. The gaps lie between the eastern edge of SUWA's NCM area and either the western edge of a parcel of land owned by the State of Utah at the northern end or the western edge of the large mid-valley mudflat (i.e., wetlands) at the southern end. These narrow gaps operate as constraints and limit the ability of the alternative rail line alignment to follow the natural contours of the land. The space available for the alternative alignment is shown on the map which is PFS Exhibit EE. As the proposed rail line alignment lacks these constraints, it follows natural contours to balance the amount of cut and fill needed. In contrast, the alternative alignment would require a total of about 560,000 cubic yards of fill.

Q15. How much would the West Skull Valley alternative cost?

[1] Based on the Bureau of Land Management's (BLM) rejection of the North Cedar Mountains as a wilderness area for lack of wilderness characteristics in 1980 and again in 2001, see Letter from Glenn A. Carpenter, Field Office Manager, BLM, Salt Lake Field Office, to Stephen Bloch, Staff Attorney, SUWA (May 8, 2001) (PFS Exh. FF), I believe that the NCM area does not possess wilderness characteristics. PFS considered the West Skull Valley railroad alignment alternative only to address the hypothetical question of what would be the effect of moving the railroad to the east of the NCM area.

A15. The alternative alignment would be significantly more expensive than the proposed Low Corridor alignment. PFS has previously testified in this proceeding to the estimated cost of the proposed rail line. Pre-filed Testimony of Joseph F. Gase and George L. Takacs, IV on PFSF Construction Costs, June 21, 2000 (inserted into PFS Hearing Record Transcript at 1681). This alternative would increase costs by 15 to 25% by adding $5 million dollars for the fill alone, ignoring additional cost impacts for other material and related installation effects.

Q16. How was it determined that the alternative alignment would cost more than an additional $5 million to construct?

A16. As discussed in the testimony of Douglas Hayes, the anticipated construction work effort would include obtaining large quantities of fill to level the railroad bed, and some additional track and additional material needed for ballast and sub-ballast for the somewhat increased length of the rail line. The cost of this work effort is estimated based on the typical costs of labor and materials to accomplish it. Here, however, only the additional cost of obtaining, transporting, and emplacing the fill material has been evaluated, which gives a rough, but low, estimate of the total additional costs associated with the alternative alignment.

Q17. How did you determine how much additional "fill" would be required?

A17. Under the proposed rail line alignment, as noted above, excess cut material ("spoil") would be generated for the siding that is constructed near the Union Pacific mainline. As discussed in the testimony of Douglas Hayes on Contention SUWA B, this excess cut material, about 300,000 cubic yards, could be used (with BLM approval) as fill for the alternative rail alignment, but another 260,000 cubic yards would be needed. For the cost estimate, PFS assumes that the additional 260,000 cubic yards of suitable fill can be found within a 50-mile radius of the rail line construction site. If this assumption is not accurate, costs for constructing the alternative rail line alignment would be higher.

Q18. How did you calculate the cost of the West Skull Valley alternative?

A18. The cost of the alternative rail alignment, using a Salt Lake City costing basis, was estimated as follows. To load, haul and dump from the Low stockpile (at an average overall distance of 10 miles each way) 300,000 cubic yards of soil would cost $697,100, assuming $2.30 per cubic yard. To buy, load, haul and dump (at

an average radial distance of 50 miles each way) 260,000 cubic yards of soil would cost $3,120,000, assuming $12.00 per cubic yard. To place and compact (including water) 560,000 cubic yards of soil would cost $1,632,400, assuming $3.00 per cubic yard. The total cost of just this portion of the additional work would be approximately $5,000,000. As noted above, this estimate includes only the significant costs of obtaining and using additional fill material. Other costs relating to the somewhat longer track length and associated construction activities would increase this estimated cost.

Q19. Are there environmental consequences from the additional fill required?

A19. As discussed in the testimony of Susan Davis on Contention SUWA B, the additional fill required to construct the alternative rail line alignment increases the environmental impact as compared to the proposed Low Corridor alignment. The raised railroad bed required for the alternative alignment would potentially have increased impacts on wildlife, cattle grazing, visual resources and wildfire fighting capability compared to the proposed alignment, since the proposed railroad bed is not elevated.

Q20. Why would you not pursue this alternative?

A20. We would not pursue the West Skull Valley alternative because of its greater environmental impact and higher costs. The relative environmental impacts of the Low Corridor and the West Skull Valley alternative are discussed further in the testimony of Susan Davis. Considering the additional environmental impact and the additional construction costs, the alternative alignment is an inferior option compared to the proposed Low Corridor rail line.

III. CONCLUSION

Q21. In conclusion, of the railroad alignments you considered, which is preferable?

A21. The proposed Low Corridor alignment is preferable. The other alternative alignments would all have greater environmental impacts and the west Skull Valley alternative would be significantly more expensive than the proposed Low Corridor alignment.

JOHN L. DONNELL — Project Manager

EXPERIENCE SUMMARY

Mr. Donnell has 21 years of experience in nuclear project management and engineering. Currently, he is Project Manager for the Private Fuel Storage Facility project. The project is sponsored by a consortium of eleven utilities to develop a central interim storage facility for commercial spent nuclear fuel. In addition, he is the Project Manager for plant modifications work at the Prairie Island Nuclear Generating Plant for Northern States Power Company. His duties as Project Manager includes overall project direction, estimating, contract administration, controlling project costs, and scope change control.

He is also coordinating the corporate Stone and Webster Spent Independent Spent Fuel Storage Installation (ISFSI) Program and supporting all initiatives in this focus area of the power sector. In this capacity, he is responsible for project scoping, staffing, providing estimates, recommending spent fuel storage technology selection, and interfacing with client staff as well as state and federal agencies to support corporate goals for all spent fuel storage projects.

RELEVANT PROJECT EXPERIENCE

Private Fuel Storage LLC, Private Fuel Storage Facility - As Project Manager, responsible for the engineering, design, budget and schedule control for the project. Project scope includes production of all necessary federal licensing documents for submission to the NRC for this first of a kind private fuel storage facility supporting multiple nuclear utilities. The effort also includes site selection and characterization, preliminary facility engineering and design, and related facility and transportation infrastructures. The licensing documents are in compliance with the requirements of 10 CFR Part 72. Detailed engineering and design will follow the licensing effort for the storage facility, support buildings, and transportation system.

Northern States Power Goodhue County ISFSI, Prairie Island Nuclear Generating Plant - As Project Manager, responsible for overall project direction to support the site characterization study, engineering and design, and licensing for this offsite ISFSI. The licensing documents are in compliance with the requirements of 10 CFR Part 72. Duties included:

- Providing support and attending the public forum meetings.
- Participating in the site selection process and ISFSI conceptual design.
- Supervising the development of a storage technology assessment.
- Supervising the development of a storage technology bid specification.
- Supervising the development of the Minnesota State Application for Site Certificate.

He also supervised the development of the NRC License Application, inlcuding the preparation of the Safety Analysis Report (SAR), Environmental Report (ER), Emergency Plan (EP), and Security Plan (SP).

Northern States Power, Prairie Island Nuclear Generating Plant ISFSI - As Project Manager and Project Engineer, he was responsible for this project from the preparation of the license application through site operation. Project scope included:

- Generation of federal licensing documents for submission to the NRC. This effort provided the utility with a draft SAR, ER, technical specifications, and decommissioning plan.
- Engineering and design, including site selection, geotechnical studies, security system, cask monitoring system, radiation monitoring system, perimeter shielding berm, facility support

services, road access, cask transporter design review, and procurement support.

He also supervised the auxiliary building crane trolley upgrade to single-failure-proof. This project replaced the existing crane trolley with a single-failure-proof trolley operation to support the movement of the 125-ton spent fuel storage casks within the plant.

Northern States Power Company, Prairie Island Nuclear Generating Plant - As Project Manager, responsible for the overall day-to-day management of all Stone & Webster project activity at this power plant and interface with the utility management team, including departmental and project team members. Programmatic interfaces to the client project team were developed to utilize the best and most appropriate resources from both organizations. Individual task assignments include the development of more than thirty conceptual engineering studies, execution of the engineering and design for more than seventy-four modification tasks , and the preparation of Design Basis Documents.

Portland General Electric Company, Trojan Nuclear Plant - As Project Manager, responsible for all work performed by Stone & Webster at this power plant. Work included:

- Reviewing the decommissioning plan prior to submission to the NRC.
- Performing a facilities review to establish bid evaluation criteria to be used to select the storage technology vendor for an onsite ISFSI.
- Supporting the vendor selection process.
- Preparing a technical report identifying the available storage technologies, operational characteristics, and the implementation of a risk management program for the spent fuel project.
- Performing an evaluation to develop the strategy necessary to terminate the Part 50 License with the loaded ISFSI onsite.

EDUCATION

B.S., Electrical Engineering - University of Toledo

ASME Short Course Program - ASME Boiler & Pressure Vessel Code: Section III, Divisions 1 & 2, Quality Assurance for Design and Inspection of Nuclear Power Plant Components

LICENSES AND REGISTRATIONS

Professional Engineer - Colorado, Ohio, Minnesota

March 18, 2002

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

TESTIMONY OF SUSAN DAVIS ON RAILROAD ALIGNMENT ALTERNATIVES CONTENTION SUWA B

I. BACKGROUND--WITNESS

Q1. Please state your full name.

A1. Susan Davis

Q2. By whom are you employed and what is your position?

A2. I am currently employed by Stone & Webster, Inc. - a Shaw Group Company, as a Senior Environmental Scientist.

Q3. Please summarize your educational and professional qualifications.

A3. My professional and educational experience is summarized in the curriculum vitae attached to this testimony. I have extensive experience in environmental research and consulting, including providing environmental assessments for several types of construction projects, such as dams, spent fuel storage facilities, combustion turbine power plants, and pipelines and transmission lines. Environmental resource areas I have analyzed for these projects include wetlands, wildlife habitat, rare species assessments, and visual resources.

Q4. What has been your role in the PFS project?

A4. I have conducted studies analyzing environmental impacts associated with the PFSF since September of 1996, including vegetation, wildlife, threatened and endangered species. Specifically, I have assessed the impacts of the PFS facility and PFS transportation options, including those on vegetation, wildlife, threatened and endangered species (raptors). I am familiar with the portions of the PFS Environmental Report (ER) and the NRC Final Environmental Impact Statement (FEIS) relevant to PFS rail transportation options. I have visited the proposed Low rail corridor and the western side of Skull Valley, Utah at least six times in the course of my work.

Q5. What is the purpose of your testimony?

A5. The purpose of my testimony is to respond to the allegation in Contention SUWA B that asserts:

> The License Application Amendment fails to develop and analyze a meaningful range of alternatives to the Low Corridor Rail Spur and the associated fire buffer zone that will preserve the wilderness character and the potential wilderness designation of a tract of roadless Bureau of Land Management (BLM) land—the North Cedar Mountains—which it crosses.

Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), LBP-99-3, 49 NRC 40, 53, aff'd, CLI-99-10, 49 NRC 318 (1999). The contention was admitted so far "as it seeks to explore the question of alignment alternatives to the proposed placement of the Low Junction rail spur." LBP-99-3, 49 NRC at 53.

Q6. To what will you testify?

A6. As set forth in the testimony of John Donnell on Contention SUWA B, PFS has considered a range of alternative alignments to the Low Corridor rail line that do not cross SUWA's North Cedar Mountains (NCM) area. In response to the contention of SUWA that PFS could avoid their purported wilderness area, PFS has considered the "West Skull Valley Alternative" railroad alignment just east of the NCM area that would not add a railroad to that area. PFS also considered a potential alignment down the center of Skull Valley, and alignments parallel to Skull Valley Road on the east side of Skull Valley. I will testify as to my evaluation of the environmental impacts of the alternatives and my conclusion that their impacts would be greater that those of the proposed Low Corridor alignment.

II. ENVIRONMENTAL IMPACTS OF POTENTIAL ALTERNATIVE ALIGNMENTS FOR THE LOW CORRIDOR RAIL LINE ALIGNMENT

A. West Skull Valley Alternative

Q7. How would you compare the environment of the proposed Low Corridor alignment and the West Skull Valley alternative alignment?

A7. Both the proposed and the alternative alignments traverse virtually identical habitat, as both are primarily greasewood vegetation, intermixed with cheatgrass. Both alignments pass near mudflats in the lower elevations in Skull Valley to the east, however the West Skull Valley alternative alignment is closer to these mud-flats. Because the West Skull Valley alternative alignment is closer to the center of the valley, and lower gradient, it is slightly more within the greasewood habi-tat, than the proposed alignment. The area around both alignments is shown in the photographs in PFS Exhibit GG.

Q8. How would you describe the human activity or evidence of human presence along the routes of the proposed alignment and the West Skull Valley alternative alignment?

A8. As described in the testimony of Douglas Hayes on Contention SUWA B, both the proposed Low Corridor route and the West Skull Valley alternative route would begin at the Union Pacific mainline railroad at Skunk Ridge, near Low Junction. The Union Pacific mainline runs west from Salt Lake City across the north end of Skull Valley and passes just north of the NCM area. Interstate 80 runs parallel to the Union Pacific line, also passing across the north end of the valley and just north of the mountains. The West Skull Valley alternative rail line and the proposed Low Corridor line would take the same route from Skunk Ridge, parallel to I-80, for about three miles, before heading south.

In my visits to the Low Corridor area, I have observed that in addition to the Un-ion Pacific line and I-80 at the northern end of the corridor, there are multiple "jeep" trails and single-track paths crossing both alignments to provide vehicle access to the North Cedar Mountains. There is also a well-defined dirt road that runs north to south, roughly parallel to both of the alignments, in the northern portion of the Valley. Evidence of recreational use of these trails and roads, and neighboring lands is present. I have seen vehicles using them when I have visited the area. I have also occasionally seen shell casings and other trash left by people

who have been in the area. Cheatgrass, an invasive species, is prevalent throughout the area. Cheatgrass invasion is often the result of human activities such as overgrazing and fire.

Q9. Has the Bureau of Land Management (BLM) evaluated the wilderness characteristics of the area around the proposed Low Corridor route and the West Skull Valley alternative route?

A9. Yes. In 1979-80, BLM reviewed and conducted an "intensive inventory" of the North Cedar Mountains pursuant to the Federal Land Policy and Management Act of 1976 ("FLPMA") and "dropped [them] from further consideration as wilderness because of lack of wilderness characteristics. . . ." 45 Fed. Reg. 75,602, 75,603-04 (1980) (emphasis added). In doing so, BLM reasoned and concluded as follows:

> The lack of "outstanding" potential, or opportunity for solitude and/or primitive and unconfined recreational experience should drop [the North Cedar Mountains area] from further wilderness inventory consideration. Man's imprints are substantially noticeable within the unit. Natural screening contributes little to hide or enclose man and his contrasting influences. Recreation opportunities exist but all are encumbered by man's developments.[1]

Q10. How does BLM define wilderness?

A10. BLM characterizes a wilderness, as defined by Congress in the Wilderness Act, as an area "which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." 16 U.S.C. § 1131(c).

Q11. What did BLM say in 1980 about the individual characteristics of the North Cedar Mountains?

---

[1] BLM Intensive Wilderness Inventory, Final Decision on Wilderness Study Areas, Utah (November 1980) ("Wilderness Inventory"), relevant excerpts attached as PFS Exhibit JJ.

A11. Regarding the "naturalness" of the area, BLM stated that, "The imprint of man's work is substantially noticeable in the North Cedar Mountains. The cumulative effect of many minor and some large impacts are considerably evident within the relatively small unit." Wilderness Inventory.

Regarding "opportunities for solitude" in the lower portions of the area near where the Low Corridor and the West Skull Valley alternative would be located, BLM stated that, "The lower, outside portions of the unit lack outstanding opportunities for solitude due to the sparse vegetative cover, relative open terrain and the cumulative effect of many impacts in the unit." Id.

Concerning "opportunities for recreation," BLM stated that:

> Opportunities for a primitive and unconfined type of recreation which exist in the North Cedars are hunting, horseback riding, hiking, wildlife observation and sightseeing. However, these opportunities are not considered "outstanding" by the wilderness inventory teams. Wildlife populations and numbers are few. Terrain for hiking and horseback riding is not unique in nature and does not provide outstanding opportunities for these recreation types. Sightseeing is encumbered by many outside activities and interior impacts of man.

Id. BLM did not state that the portion of the North Cedar Mountains area in the vicinity of the Low Corridor route contained any ecological, geological, or other features of value. Id.

Q12. As far as the area in the vicinity of the Low Corridor and the West Skull Valley alternative rail route is concerned, do you agree with BLM's characterization?

A12. Yes. It is consistent with what I have observed in my visits to the area.

Q13. Has BLM evaluated the wilderness characteristics or the evidence of human activity in the North Cedar Mountains area since 1980?

A13. Yes. In April 2001, SUWA requested BLM to reconsider its determination that the North Cedar Mountains were not suitable for wilderness designation. In a May 8, 2001 letter to SUWA, BLM denied SUWA's request and identified further human activities and imprints that have occurred within the North Cedar Mountains within the last 20 years. Letter from Glenn A. Carpenter, Field Office Manager, Salt Lake Field Office, BLM, to Stephen Bloch, Staff Attorney, SUWA (May 8, 2001) (PFS Exhibit FF). The activities include drill seeding as part of

emergency fire rehabilitation projects, non native vegetation resulting from an emergency fire rehabilitation project, a wildlife guzzler (a device used to provide a constant source of water to wildlife) and maintenance route, and several existing mining claims. The BLM also references "numerous quarries, livestock trails, motorcycle paths, heavy sheep grazing, and other minor extensions of "ways" used primarily by 4X4 wheeled vehicles", as occurring within the North Cedar Mountain area.

Q14. Would there be any difference between the area immediately around the Low Corridor and the area immediately around the West Skull Valley alternative route with respect to wilderness characteristics?

A14. No. The two alignments are only 2,000 to 3,000 feet apart. The Low Corridor route runs just to the west of and parallel to the "jeep" road that forms the eastern boundary for the North Cedar Mountains area evaluated by BLM and proposed as wilderness by SUWA. The West Skull Valley alternative route runs further to the east and also parallel to the same road. The terrain through which both routes run is practically the same. As I discuss below, the difference between the proposed route and the West Skull Valley alternative route is that the West Skull Valley route is at a lower elevation and thus it would require the railroad to be built on a significantly raised roadbed, while the proposed Low Corridor would not. The raised roadbed would cause significant environmental impacts that the Low Corridor rail line would not. Other than that, there is no difference between the two routes.

Q15. Given what BLM determined regarding the wilderness characteristics of the area, would the Low Corridor route have a significant impact on wilderness characteristics?

A15. No. BLM stated that it found that the North Cedar Mountains lacked wilderness characteristics. 45 Fed. Reg. at 75,603-04. Further, the Union Pacific mainline and I-80 both pass close by the North Cedar Mountains to the north. Therefore, while the PFS railroad would be a visible human imprint, it would not have a significant impact on wilderness characteristics in this area.

Q16. What would be the environmental impacts of the Low Corridor rail route and the West Skull Valley alternative alignment?

A16. The environmental impacts of the Low Corridor alignment and the West Skull Valley alternative alignment, with one significant exception, will be similar and

small. The impacts of the two alignments on ecological resources generally are described in FEIS § 5.4. They are likely to be similar because of their proximity to each other. Any effects on the wildlife that uses the mudflats, and neighboring uplands, is likely to be the same for both alignments (other than the impacts of the railroad bed required to build the West Skull Valley alternative alignment discussed below), due to the alignments' proximity and continued avoidance of the mudflat habitat itself, although the alternative alignment comes closer to the mudflats than the proposed alignment. The proposed rail line is not expected to result in habitat fragmentation; FEIS §§ 5.4.1.2, 5.4.2.2; and neither the proposed nor alternative alignment would impact biodiversity. Because invasive species, such as cheatgrass, are already prevalent along both alignments, the revegetation of BLM-approved species following construction of the rail line and the firebreak created by the rail line are expected to improve, not detract from the surrounding ecosystem. FEIS §§ 5.4.1.1, 5.4.2.1.

Because of their similar concept and location, the proposed Low Corridor alignment and the West Skull Valley alternative alignment would have similar (small) impacts on water resources, FEIS § 5.2, air quality, id. § 5.3, socioeconomic and community resources (other than the impacts of the railroad bed outlined below), id. § 5.5, cultural resources, id. § 5.6, and recreation (other than the impacts of the railroad bed), id. § 5.8.3. As there will be no maintenance roads paralleling the proposed rail line, no increase in access to the NCM area is expected and no increase in recreational use of or intrusion into the area is expected. Id. § 2.1.1.3. Since either railroad alignment would use the same train configuration, the proposed alignment and the West Skull Valley alternative would have similar (small) impacts in terms of human health, id. § 5.7, and noise, id. § 5.8.1.

Q17. In what ways would the environmental impacts of the Low Corridor and West Skull Valley alignments differ?

A17. As described in the testimony of Douglas Hayes on Contention SUWA B, the West Skull Valley alternative alignment results in more significant environmental impacts due to the need to maintain the appropriate railroad grade. This will require about 560,000 cubic yards of fill along its six mile length. This additional fill also produces a railroad bed as high as twenty feet along the alternative rail line alignment. This railroad bed creates obstacles where the alternative rail line crosses existing "jeep" trails. The railroad bed will cut off the lower elevations of

the NCM area from Skull Valley for wildlife and cattle grazing and could possibly result in habitat fragmentation. See FEIS at 5-28 (the alternative would have significantly greater impact than the proposed alignment on grazing and wildlife use patterns). The railroad bed will create a greater visual impact especially when viewed from lower elevations to the east. By contrast, the proposed Low Corridor alignment follows more closely the natural contour of the land and thus does not require the use of a high and obstructing railroad bed. The alternative alignment railroad bed could also restrict access for fire fighters combating wildfires in the NCM area. See FEIS § 5.8.4. Wildfires pose a hazard to natural vegetation directly and indirectly as foreign invasive species like cheatgrass typically revegetate the area following a wild fire. Id. Much more of the proposed alignment, by contrast, will be constructed near existing grade, which will more easily provide access for firefighters across the rail line. Id. § 2.1.1.3. The plan for the proposed alignment promotes native species of vegetation to mitigate potential environmental impacts on vegetative resources from its construction. Id. §§ 5.4.1.1 and 5.4.4.1. As set forth in the testimony of Douglas Hayes on Contention SUWA B, PFS will use a seed mixture specifically approved by BLM to revegetate the area next to the railroad that will be cleared during construction. To the extent the raised railroad bed of the alternative rail line alignment would inhibit fighting wild fires it would have a greater negative impact than the proposed alignment.

Q18. What is your conclusion regarding the relative environmental impacts of the Low Corridor alignment and the West Skull Valley alternative alignment?

A18. For the reasons I discussed above, the West Skull Valley alternative rail line just to the east of SUWA's NCM area would have greater environmental impacts than the proposed Low Corridor rail line.

B. Central Skull Valley Alternative

Q19. Please describe the environment of the Central Skull Valley alternative railroad alignment.

A19. The northern end of Skull Valley is covered by mudflat wetlands, which provides a specialized habitat for a variety of shorebirds and other animals. A center of the valley railroad route would require the mudflats to be bisected by a rail line, disrupting the habitat and requiring fill. All of the mudflat habitat is classified and protected as waters of the United States under section 404 of the Clean Water Act,

because of their hydrologic connection to the Great Salt Lake. The Central Skull Valley alternative alignment would also have to cross Interstate 80 (I-80) at the Delle, Utah interchange utilizing the existing overpasses.

Q20. Is the Central Skull Valley alternative feasible from an environmental perspective?

A20. Probably not. It is improbable that PFS would be able obtain an Army Corps of Engineers permit to fill long tracts of the mid-valley mudflats when alternatives on the east and west side of Skull Valley are physically feasible (albeit, in the case of the East Skull Valley alternative, not environmentally desirable) and would not impact any wetlands or waters of the United States. 33 C.F.R. §§ 330.4(a) and (e). The alignment down the middle of the valley would only be feasible once the rail line was south of the mid-valley mud flats, which is over ten miles south of the NCM area.

Q21. What would be the environmental impacts of the Central Skull Valley alternative alignment compared to the impacts of the proposed Low Corridor alignment?

A21. Based on the significant amount of mudflats that would need to be filled to construct a rail line in the center of Skull Valley and the impacts that could result from the crossing of I-80, this alternative alignment would have much greater environmental impacts than the proposed Low Corridor alignment. In addition, while the proposed Low Corridor alignment (and the West Skull Valley alternative) would have a moderate impact on some scenic qualities both to its east and to its west, FEIS § 5.8.2, the Central Skull Valley alternative would pass through barren mudflats rather than rolling terrain covered by greasewood and grassland vegetation and would also be expected to have higher visual impacts.

Q22. In what ways are the environmental impacts of the Low Corridor and Central Skull Valley alternative alignments similar?

A22. Because of their similar concepts, the proposed Low Corridor alignment and the Central Skull Valley alternative alignment would have similar (small) impacts on geology, minerals and soils, FEIS § 5.1, water resources (other than wetlands as described above), id. § 5.2, air quality, id. § 5.3, socioeconomic and community resources, id. § 5.5, cultural resources, id. § 5.6, and recreation, id. § 5.8.3. As the train configuration is independent of the railroad alignment, the proposed alignment and the Central Skull Valley alternative would have similar (small) impacts in terms of human health, id. § 5.7, and noise, id. § 5.8.1.

Q23. What is your conclusion regarding the relative environmental impacts of the Low Corridor alignment and the Central Skull Valley alternative alignment?

A23. For the reasons I discussed above, the Central Skull Valley alternative alignment would have greater environmental impacts than the proposed Low Corridor rail line.

C. East Skull Valley Alternatives

Q24. In what ways do the environmental impacts of the proposed Low Corridor alignment and the East Skull Valley alternative alignments differ?

A24. PFS considered an alternative rail alignment along Skull Valley Road on the east side of Skull Valley with multiple starting points at the Union Pacific mainline in its 1998 transportation study and earlier versions of its ER. PFSF Transportation Study (SWEC 1998), §3.3; ER Rev. 0, § 4.4. As discussed in the transportation study, the ER, and the FEIS § 2.2.4.2, the East Skull Valley alternatives would have environmental impacts that the proposed Low Corridor alignment would not. Based on these additional environmental impacts, the East Skull Valley alignment alternatives are environmentally inferior to the proposed Low Corridor alignment.

First, either constructing a rail bridge over I-80 or a making rock cut through the northern Stansbury Mountains from an acceptable access point to the Union Pacific mainline railroad in the adjacent Tooele Valley involve substantially increased environmental impacts. Transportation Study at 39. Once south of I-80, the alternative alignment, by its proximity to the wetlands near Horseshoe Springs, would likely adversely impact those wetlands. FEIS § 2.2.4.2. Compared to the proposed alignment from Low Junction that requires only obtaining a right of way from BLM, an alignment along Skull Valley Road would also require right of way agreements with other land-owners along the road, particularly private and State of Utah interests. Id. As discussed in the FEIS, a rail line on the eastern side of Skull Valley would be likely to directly adversely impact wetlands, existing houses and ranches, and traffic on Skull Valley Road. Id.

Q25. In what ways are the environmental impacts of these two alignments similar?

A25. The proposed Low Corridor alignment and the eastern Skull Valley alternative alignments would have similar (small) impacts on geology, minerals and soils, FEIS § 5.1, water resources (other than wetlands), id. § 5.2 and air quality, id. §

5.3. As the train configuration is independent of the railroad alignment, the proposed alignment and the alternative would have similar (small) impacts on human health. Id. § 5.7.

Q26. What is your conclusion regarding the relative environmental impacts of the Low Corridor alignment and the East Skull Valley alternative alignments?

A26. For the reasons I discussed above, the East Skull Valley alternative alignments would have greater environmental impacts than the proposed Low Corridor rail line.

III. CONCLUSION

Q27. What is your conclusion in your professional judgment as an environmental scientist about the relative environmental impacts of the alternative alignments considered?

A27. The greater environmental impacts of the alternative rail line alignments make them environmentally inferior to the proposed Low Corridor alignment.

Experience Summary

Ms. Davis has six years of experience in environmental research and consulting preparing environmental impact assessments for a variety of infrastructure development projects. She has had responsibility for preparation of impact assessments of the following resource areas: wetlands, forests, other vegetation, wildlife, fisheries and state and federally listed threatened and endangered species. She has prepared impact assessments for sites in mountain, desert, coastal, and marine environments.

Ms. Davis was responsible for field data collection, impact analysis, and preparation of sections of Environmental Resource Reports evaluating impacts of construction and operation of natural gas pipelines on wetlands, vegetation, wildlife, fisheries, and threatened and endangered species. These reports were submitted to the Federal Energy Regulatory Commission (FERC) as part of an Application for a Certificate of Public Convenience and Necessity and to state agencies as part of the permitting of state regulated activities. Ms. Davis has participated in alternatives analysis for new natural gas pipeline routing, including performing wetland function and value assessments.

On behalf of the FERC, Ms. Davis has prepared terrestrial resource and endangered species sections of Environmental Assessments (EA's) and Environmental Impact Assessments (EIS's) for relicensing or compliance actions on a dozen hydroelectric projects located throughout the U.S. Ms. Davis also prepared biological assessments for Section 7 consultation under the Endangered Species Act.

Ms. Davis has been responsible for evaluating ecological impacts of construction and operation of two interim spent fuel storage installations (ISFSI's) and preparing an Environmental Report for submittal to the Nuclear Regulatory Commission (NRC). She developed breadth of understanding of the scope of submittals required by the NRC for two very different (private vs. commercial) types of projects in different states (Utah vs. Minnesota) with different biological communities.

Other environmental permitting experience includes assisting in the preparation of Environmental Notification Forms (ENF's), Draft Environmental Impact Reports (DEIR's), Army Corps of Engineers Section 404 permit applications, and applications for Water Quality Certification (WQC) for public and private clients. She has also been responsible for the preparation of Notice of Intents (NOIs) for state wetlands permits for construction bridge repair construction projects.

Ms. Davis's field work experience includes wetland delineations, wildlife habitat evaluations, and wetland function and value assessments using the Corps of Engineers Highway Methodology and Vermont ANR methodology. She also participated in rare species surveys for reptiles, amphibians and insects. This field work was performed to support state and federal permit applications for proposed natural gas pipelines and compressor stations. Additional field

work includes site visits for relicensing hydropower projects on behalf of FERC and transportation corridor evaluation studies for a nuclear spent fuel facility.

Education

B. S., Wildlife Management - Univ. of New Hampshire - 1995

Training

OSHA 40 hour HAZWOPER training, Institute for Environmental Education - December 1997
Annual 8 Hour Refresher
OSHA 8 Hour Supervisor training, April 1998
FERC Environmental Report Preparation Course, Washington D.C. - 1996

Experience History

STONE & WEBSTER ENGINEERING CORPORATION, BOSTON, MASSACHUSETTS -1995 TO PRESENT

Sumpter Combustion Power Plant, Sumpter Township, Michigan
First Energy Corporation (May 2000 to Present)

Responsible for the wetland permitting for this simple cycle combustion turbine power plant. Conducted wetland delineations using the Army Corps Methodology for the 15 acre site, adjacent transmission corridor, and bisecting stream. Coordinated with the Michigan Department of Environmental Quality to prepare, submit and obtain approval for a Joint (State of Michigan and Army Corps) wetland permit. Attended and presented the project at public meetings.

Designed a 1 acre wetland replication area to provide mitigation for filled wetlands. Created finished and sub-grade designs along with planting plans for both the wetland replication area and stormwater detention basins. Oversaw the implementation of these plans and the actual construction of the wetland.

Stony Brook Pipeline Project, Hampden County, MA (October 1996 to January 1997; April 1997 to January 1998; September 2000 to Present)
Massachusetts Municipal Wholesale Electric Company (MMWEC)

As part of the Alternatives Analysis to be submitted to the Army Corps of Engineers, Ms. Davis performed a Wetland Functions and Values Assessment of three potential corridors for a 24-inch proposed natural gas pipeline. The Assessment criteria were based on the Army Corps of Engineers Highway Methodology and included the use of MassGIS data layers, NWI maps, Soil Survey maps, USGS topographic maps, and state records. Key issues of the Alternatives Analysis were minimizing forest fragmentation and wetland impact.

1. Ms. Davis also prepared portions of the ENF and the Draft Environmental Impact Report (DEIR) for submittal to the MEPA Unit. She prepared and reviewed sections relating to fisheries, wildlife, and threatened and endangered species. She also participated in threatened and endangered reptile, amphibian, and insect surveys and wildlife habitat assessments along the proposed pipeline route to satisfy MEPA requirements.

2. Conducted wetland delineations for 5.6 miles of pipeline to satisfy MEPA and ACOE requirements. Provided response to comments on the DEIR and prepared the Final FIR.

I. CONFIDENTIAL CLIENT (MARCH 2000 TO MAY 2000), SITING STUDY

Assessed numerous sites to determine preferred locations of potential gas-fired power plants. The sites were assessed for impacts to wetlands, residential areas, visual resources, recreational areas, geological conditions, and other exclusionary factors.

II. CONFIDENTIAL CLIENT (SEPTEMBER 1999 TO MARCH 2000), SITING STUDY

Assessed over 60 potential sites to determine preferred locations of potential gas-fired power plants. The sites were assessed for impacts to wetlands, residential areas, visual resources, recreational areas, geological conditions, and other exclusionary factors.

Private Fuel Storage Facility, Tooele County, UT (September 1996 to Present)
Private Fuel Storage L.L.C.

Evaluated ecological resources of a proposed site for an interim spent fuel storage facility. Developed an Environmental Report and associated documents for submittal to the NRC. Assessed impacts to vegetation, wildlife, threatened and endangered species, and sensitive areas following NUREG 1567. Researched existing conditions through consultation with federal and state agencies and local experts, summarized existing studies and literature, and participated in site visits. Conducted an on-site environmental assessment of fuel transportation options on wildlife, vegetation, endangered species, and raptors in the project area. Conducted wildlife and endangered species surveys for the transportation corridor and site. Responded to and resolved State and NRC comments and Requests for Additional Information.

Maine Yankee Nuclear Facility (May to July 1999)

Conducted wetland delineations using the Army Corps methodology along the coastline of the facility. Prepared terrestrial resource sections of the Maine Site Location of Development and Maine Natural Resource Protection Act permits.

III. EASTERN SHORES NATURAL GAS, CORRIDOR PROJECTS, DELAWARE (MARCH 1998-SEPTEMBER 1998)

Conducted wetland delineations and wildlife habitat assessments for two corridors in Delaware. Prepared Resource Report 3, Fish and Wildlife of the FERC Application for a Certificate of Public Convenience and Necessity for these corridors. Consulted with state, local, and federal agencies regarding impacts to wildlife, fisheries, threatened and endangered species, and wetlands.

Eastern Shores Natural Gas, Corridor Projects, Delaware and Pennsylvania (May 1998 to December 1998)

Prepared Resource Report 3, Fish and Wildlife of the FERC Application for a Certificate of Public Convenience and Necessity for two corridors in Delaware and Pennsylvania. Consulted with state, local, and federal agencies regarding impacts to wildlife, fisheries, threatened and endangered species, and wetlands.

Braintree/Weymouth Tunnel and Intermediate Pump Station (June 1997 to January 1998)
Massachusetts Water Resources Authority

Ms. Davis is responsible for preparing applications and securing federal and state environmental permits for construction of a proposed sewage pumping facility in Quincy, Massachusetts. The permits include Wetlands Conservation Board Notice of Intents (NOI) and an Army Corps of Engineers' Section 404 Dredge and Fill Permit.

Longfellow Bridge Remedial Repair Project, Boston/Cambridge, MA (October 1996 to November 1997)
Metropolitan District Commission

Ms. Davis is responsible for all environmental permitting issues addressed on state and local levels. Ms. Davis has prepared NOIs for submittal to the Boston and Cambridge Conservation Commissions and made a public presentation on the proposed project at public meetings. The NOIs included analysis based on the Riverfront Protection Act and the DEP Stormwater Management Guidelines. Other state and federal agencies have also been consulted throughout this project.

Interim Spent Fuel Storage Installation, Goodhue County, MN (March 1996 to June 1996)
Northern States Power

Participated in the evaluation of ecological resources for development of Environmental Report and associated documents for permitting an ISFSI with the NRC. Assessed impacts to vegetation, wildlife, threatened and endangered species, wetlands and sensitive areas. Calculated total wetland and rare community acreages within 5 miles of the site, which included areas of Minnesota and Wisconsin, along the Mississippi River. Assessed locations of rare species within a 5 mile radius of site based on the Minnesota and Wisconsin Natural Heritage Databases.

Consulted with both the Minnesota and Wisconsin Department of Natural Resources as part of the preparation of this report.

Licensing and Compliance Support
Federal Energy Regulatory Commission (FERC) - Office of Hydro Licensing (July 1995 to Present)

Prepared Environmental Assessments (EA's) and Environmental Impact Statements (EIS's) on behalf of the FERC and in conformance with FERC's NEPA requirements for relicensing of hydroelectric plants in several states. Responsible for all aspects of terrestrial sections including construction and operational impact assessment and mitigation for the following resource areas: vegetation, wetlands, wildlife, and threatened and endangered species. Responsible for identifying key resource issues at each project, determining appropriate mitigation, and responding to agency and public comments on draft EA's and EIS's. Task assignments include:

Relicensing of Existing Licensed Projects:

Flagstaff Project EA, ME

Prepared the terrestrial resources section of the EA for this storage reservoir that is a part of the Kennebec River Basin system. Addressed agency comments on potential impacts and developed recommendations to minimize adverse impacts and enhance existing resources. Recommended enhancements include the development of a Loon Monitoring Plan, a Bald Eagle Management Plan, and instituting minimum drawdowns in spring and summer months for the enhancement and protection of wetland habitat and waterfowl nesting.

Kennebec River Basin EIS, ME

Revised the terrestrial resources section of this multi-project EIS following a new analysis of the removal of Edwards Dam and assisted in preparation of draft license orders. Key issues were the effects of dam removal on wildlife habitat, wetlands, and threatened and endangered species.

Haas-Kings Hydroelectric Project Biological Assessments, CA

Prepared Additional Information Requests to the license applicant regarding threatened and endangered species information to be used in the preparation of Biological Assessments under section 7 of the Endangered Species Act. Species of interest include the bald eagle, peregrine falcon, California red-legged frog, and valley elderberry longhorn beetle.

Mokelumne Hydroelectric Project EA and Biological Assessments, CA

Addressed comments of conservation groups, the utility, and state and federal agencies in preparing the impact analysis of the hydroelectric project on terrestrial resources. Identified suitable enhancements for terrestrial resources and incorporated comments and information on terrestrial and threatened/endangered species resources into the comprehensive analysis portion

of the EA where appropriate. Ms. Davis also prepared Additional Information Requests regarding threatened and endangered species information to be used in the preparation of Biological Assessments under section 7 of the Endangered Species Act. Ms. Davis prepared draft Biological Assessments for the bald eagle, peregrine falcon, California red-legged frog, valley elderberry longhorn beetle, and delta smelt.

Santa Ana Hydroelectric Projects EA, CA

Responsible for preparing terrestrial section of the EA for multiple projects in the Lytle Creek, Mill Creek, and Santa Ana River Basins. These projects are partially in the San Bernardino National Forest. Issues include effects of minimum flows on riparian habitat, wildlife, wetlands, and rare species. Prepared Additional Information Requests for threatened and endangered species surveys. Attended site visit and participated in public scoping meeting.

Waterloo-Seneca Falls Hydroelectric Project EA, NY

Prepared terrestrial and wetland portions of the impact assessment and provided recommendations including a minimum flow for the bypassed reach and a wetland monitoring plan to maintain a wetland that could be at risk during construction for dam repairs.

Beaver River Hydroelectric Project EA, NY

Prepared terrestrial resource impact assessment including effects of large potential impoundment fluctuations that could affect nesting waterfowl, denning furbearers, hibernating reptiles and amphibians, plant species composition, and wetlands.

Oswego River Hydroelectric Project EA, NY

Prepared terrestrial resource impact assessment and provided recommendations including installation of inflatable dam crests to limit impoundment fluctuations from flashboard breakage.

Compliance Actions on Existing Licensed or Exempt Projects:

Old Mill Hydroelectric Project EA for Surrender of Exemption, VA

Assessed the impacts on terrestrial resources of the removal of a small hydroelectric project which was damaged in a flood.

Consumers Power Au Sable, Muskegon, and Manistee Hydroelectric Projects Assessment of Land Management Plans (LMPs) and Biological Assessment of the Karner Blue Butterfly MI

Assessed three river-based LMPs for technical adequacy including plans for: Bald Eagle Management, Buffer Zone Management, Wildlife and Forestry Management, Karner Blue Butterfly Management, and Indiana Bat Management. Also prepared a Biological Assessment for Karner Blue Butterfly pursuant to a formal section 7 consultation under the Endangered

Species Act. The purpose of the Biological Assessment is to determine the effects of the proposed land management actions on this federally endangered species.

Pensacola Hydroelectric Project Compliance EA, OK

Prepared the terrestrial and threatened and endangered species sections for this compliance EA that assessed the impacts of a proposed impoundment level rule curve change. Key issues involved the effect of seasonal changes in impoundment water levels on a Japanese millet seeding program ordered under the existing license as mitigation for project impacts on waterfowl food and cover.

Summersville Hydroelectric Project, WV

Prepared the terrestrial and threatened and endangered species sections for this compliance EA that assessed the impacts of a new 9.6 mile electric transmission line.

Portland Natural Gas Transmission System, VT, NH, ME, MA (August 1995 to January 1997)
Consortium of Companies

Prepared portions of the Environmental Report for an application for a FERC license for a new 240 mile natural gas pipeline stretching from the Canadian border in Vermont to Haverhill, Massachusetts. Produced a resource report on vegetation and wildlife, which included research and agency correspondence on fisheries, wildlife habitat, vegetative cover, threatened and endangered species, and wetlands resources for the states of Vermont, New Hampshire, Maine, and Massachusetts. Assisted in the coordinating of the final production of the approximately 1,000 page document, including editing, QA/QC, layout, and printing.

Participated in wetland delineations in Vermont, performing function and value assessments using Vermont ANR methodology and recording locations and boundaries collecting data points using a Geographic Positioning System (GPS). Prepared functional analyses covering over 60 separate wetlands for the VT Water Quality Certificate application. Assisted in the preparation of the Threatened and Endangered Species Report. Also prepared text descriptions of wetlands and coordinated compilation of field data collected by three biological field survey crews.

LNG Facility, Wells, ME (May 1996)
Granite State Gas Transmission Co.

Conducted wetland function and value assessments using the Army Corps of Engineers Highway Methodology along a proposed access road and for a 80 acre site. Prepared the written functional assessments for use in the preparation of a wetland replication plan.

Tennessee Gas Pipeline Company, Beverly-Salem Colonial Delivery, Lynnfield, MA
(August 1995 to October 1995)
Colonial Gas Company, Colonial Lateral Project

Prepared Environmental Notification Forms (ENF's) in accordance with Massachusetts Environmental Policy Act (MEPA) protocols for two natural gas pipeline projects.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

CERTIFICATE OF SERVICE

I hereby certify that copies of the "Testimony of John Donnell on Contention SUWA B—Railroad Alignment Alternatives," the "Testimony of Douglas Hayes on Contention SUWA B—Railroad Alignment Alternatives," the "Testimony of Susan Davis on Contention SUWA B—Railroad Alignment Alternatives," the "Testimony of George H.C. Liang and Donald Wayne Lewis on Contention Utah O—Hydrology," Applicant's prefaces to witness testimony, Applicant's outlines of key determinations on Contentions SUWA B and Utah O, and PFS Exhibits AA through KK, were served on the persons listed below (unless otherwise noted) by e-mail with conforming copies by U.S. mail, first class, postage prepaid, this 18th day of March, 2002.

Michael C. Farrar, Esq., Chairman
Administrative Judge
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
e-mail: MCF@nrc.gov

Dr. Jerry R. Kline
Administrative Judge
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
e-mail: JRK2@nrc.gov; kjerry@erols.com

Dr. Peter S. Lam
Administrative Judge
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
e-mail: PSL@nrc.gov

*Office of Commission Appellate Adjudication
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Attention: Rulemakings and Adjudications Staff
e-mail: hearingdocket@nrc.gov
(Original and two copies)

* Adjudicatory File
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Catherine L. Marco, Esq.
Sherwin E. Turk, Esq.
Office of the General Counsel
Mail Stop O-15 B18
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
e-mail: pfscase@nrc.gov

Denise Chancellor, Esq.
Assistant Attorney General
Utah Attorney General's Office
160 East 300 South, 5th Floor
P.O. Box 140873
Salt Lake City, Utah 84114-0873
e-mail: dchancel@att.state.UT.US

John Paul Kennedy, Sr., Esq.
David W. Tufts, Esq.
Confederated Tribes of the Goshute Reservation and David Pete
Durham Jones & Pinegar
111 East Broadway, Suite 900
Salt Lake City, Utah 84105
e-mail: dtufts@djplaw.com

Joro Walker, Esq.
Land and Water Fund of the Rockies
1473 South 1100 East
Suite F
Salt Lake City, UT 84105
e-mail: lawfund@inconnect.com

Diane Curran, Esq.
Harmon, Curran, Spielberg & Eisenberg, L.L.P.
1726 M Street, N.W., Suite 600
Washington, D.C. 20036
e-mail: dcurran@harmoncurran.com

Tim Vollmann, Esq.
Skull Valley Band of Goshute Indians
3301-R Coors Road, N.W.
Suite 302
Albuquerque, NM 87120
e-mail: tvollmann@hotmail.com

Paul EchoHawk, Esq.
Larry EchoHawk, Esq.
Mark EchoHawk, Esq.
EchoHawk PLLC
P.O. Box 6119
Pocatello, ID 83205-6119
e-mail: paul@echohawk.com

* By U.S. mail only

D. Sean Barnett

1088407v5

March 18, 2002

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE L.L.C.	)	Docket No. 72-22
	)	
(Private Fuel Storage Facility)	)	ASLBP No. 97-732-02-ISFSI

TESTIMONY OF DOUGLAS HAYES ON RAILROAD ALIGNMENT ALTERNATIVES CONTENTION SUWA B

I. BACKGROUND--WITNESS

Q1. Please state your full name.

A1. Douglas Hayes.

Q2. By whom are you employed and what is your position?

A2. I am currently employed by Stone & Webster, Inc. - a Shaw Group Company as a Civil Design Engineer.

Q3. Please summarize your educational and professional qualifications.

A3. My professional and educational experience is summarized in the curriculum vitae attached to this testimony. I have extensive experience with civil engineering and design requirements of site and corridor development. My experience with Stone & Webster include access and site road design of asphalt, concrete and gravel roads, including earthwork, structural and drainage considerations; railroad loading, unloading and transportation for heavy and light rail; and site development on a variety of projects. I have more than 40 years experience in surveying and engineering civil projects. Prior to joining Stone & Webster, I worked for the U.S. Geological Survey in the Rocky Mountain Region for eight years performing geodetic surveys. I also worked for consulting engineering firms in Colorado for ten years on

various surveying and civil engineering projects. I owned and operated my own surveying business in Colorado for approximately two years.

Q4. What has been your role in the PFS Project?

A4. I am Lead Railroad Design Engineer on the PFS project. I am responsible for the layout and development of construction drawings and railroad construction specifications for the new railroad alignment from the proposed PFSF storage site to a interconnect with the Union Pacific Railroad at Skunk Ridge, near Low Junction, Utah.

Q5. What is the purpose of your testimony?

A5. The purpose of my testimony is to respond to the allegation in Contention SUWA B that asserts:

> The License Application Amendment fails to develop and analyze a meaningful range of alternatives to the Low Corridor Rail Spur and the associated fire buffer zone that will preserve the wilderness character and the potential wilderness designation of a tract of roadless Bureau of Land Management (BLM) land—the North Cedar Mountains—which it crosses.

Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), LBP-99-3, 49 NRC 40, 53, aff'd, CLI-99-10, 49 NRC 318 (1999). The contention was admitted so far "as it seeks to explore the question of alignment alternatives to the proposed placement of the Low Junction rail spur." LBP-99-3, 49 NRC at 53.

Q6. To what will you testify?

A6. I will testify that PFS has considered a range of alternative alignments to the Low Corridor rail line that do not cross SUWA's North Cedar Mountains (NCM) area. In response to SUWA's claim that PFS could avoid their purported wilderness area, PFS has considered a railroad alignment just east of the NCM area, called the West Skull Valley alternative, that would not add a railroad to that area. I will testify to the consequences with respect to railroad construction of that alternative alignment.

II. DESCRIPTION OF THE PROPOSED LOW CORRIDOR ALIGNMENT

Q7. Please describe the proposed Low Corridor alignment.

A7. The proposed Low Corridor rail line is described in sections 3.2.1.5 and 4.4 and Figure 3.2-2 of the PFS Environmental Report (ER) (PFS Exhibit BB). The rail line will be constructed to connect the PFSF directly to the Union Pacific main-line railroad near Low Junction, Utah at Skunk Ridge. The single track line will be approximately 32 miles long and will begin at the mainline on the south side of Interstate 80 at Low. From the mainline at Low, the rail line will proceed south-east parallel to Interstate 80 for approximately 3 miles, then turn south along the western side of Skull Valley for approximately 26 miles, and then turn east for approximately 3 miles to the PFSF. Associated sidings will be located at the PFSF and near Low Junction. ER at 3.3-6 (see PFS Exh. BB).

III. RAIL LINE CONSTRUCTION

Q8. How will the proposed Low Corridor rail line be built?

A8. The rail line will be built using conventional construction practices. A 200-foot wide right-of-way for construction of the rail line would temporarily remove or disturb about 776 acres of greasewood and desert shrub/salt brush habitat. A 200-foot wide corridor is necessary to operate the rail line to the PFSF site. ER at 3.2-6. The approximately 36-foot wide railroad ballast and sub-ballast within the corridor will be maintained free of vegetation to allow the railroad bed to drain to protect the railroad ties from water and also to provide a buffer zone to reduce the potential for range fires that might be started by the railroad. The rail line design includes crossings identified by PFS in consultation with the Bureau of Land Management (BLM) to facilitate the crossing of the rail line by emergency fire vehicles. After construction, 621 acres of land will be actively revegetated with appropriate BLM-approved species to restore it to its prior condition; thus, approximately 155 acres of land will be permanently altered by the rail line. Id. at 4.4-1. FEIS § 9.4.2, ¶ 2.H.

Q9. Will there be any access road or maintenance road along side the PFS railroad?

A9. No. After construction only the railroad will be present.

Q10. Will there be any separate fire barrier or buffer along side the railroad tracks or road bed?

A10. No. The fire buffer will consist of the railroad ballast and sub-ballast, which will be maintained free of vegetation. The railroad sub-ballast will be approximately

36 ft. wide. The tracks, which will be in the center of the railroad bed, will be approximately 5 ft. wide. Stone ballast will cover an area approximately 17 ft. wide. Thus, there will be approximately 6 ft. of stone on each side of the railroad tracks. The ballast and sub-ballast will provide a nonflammable barrier to reduce the potential for range fires.

The area that will be disturbed during construction of the railroad will be revegetated with a seed mix approved by BLM. The seed mix will be determined based on the latest BLM guidelines on revegetation in effect at that time and would be expected to include native grass species and crested wheat grass for the purpose of preventing the incursion of foreign plant species (e.g., cheat grass), as well as reducing the potential for range fires. FEIS § 5.4.1.1.

Q11. In evaluating the west Skull Valley alternative alignment, did you consider the same construction techniques as you did for the proposed Low Corridor alignment?

A11. Yes. The alternative alignment on the west side of Skull Valley has been laid out using the same typical track section as the proposed alignment, approximately 36 feet wide for the sub-ballast, 17 feet wide for the ballast on the top of subballast, and 10.5 feet wide at the top of the ballast section. The same design basis for the proposed alignment in the horizontal and vertical direction (for example, a minimum horizontal curvature of 3 degrees, (1,908 ft. radius) and vertical grade changes using the same rate of change as the proposed alignment), have been used to create the alternative alignment. Drawing DY-SK-19-A is PFS Exhibit CC and is an overall alignment plan that shows both the proposed alignment and the alternative alignment. Drawing DY-SK-20-A, Exhibit DD, shows cross sections along the alignment and graphically indicates the amount of cut or fill at various Stations. PFS Exhibit EE is another map providing an overview of the rail alignments and the region around the NCM area.

Q12. What are the constraints on the railroad slope (maximum railroad grade) for the PFS railroad?

A12. At the siding next to the Union Pacific mainline at Low Junction, the maximum acceptable railroad grade (i.e., slope) is 0.4% and zero grade is the preferred condition. The Union Pacific Railroad Co., Industry Standards, Preferred Layout Standards for Industrial Tracks, Exhibit A-1 (rev. Oct. 30, 1991). This requirement is to minimize effort and risk during train switching operations and to ensure

that cars uncoupled from their locomotive can be held by setting their brakes. The design basis of the rail line is not to have a grade that exceeds 1.5%. Maximum rail line grade is set based on the best fit of locomotive tractive effort and horsepower. For example to start a PFSF train on the maximum 1.5% grade requires two locomotives weighing in excess of 100 tons each (the weight is required for the locomotives to obtain traction on the rails), which would convert to 1,500 hp locomotives. However, to move this same train on a 1.5% uphill grade at 25 MPH requires a minimum of 5,200 horsepower. The 1.5% maximum grade is set to enable PFS trains to move at a reasonable, but reduced, speed on the sections of track with maximum grade.

Q13. Was the railroad bed for the alternative alignment different from the proposed Low Corridor alignment in any respect?

A13. Only in one respect. The alternative alignment passes closer to the western edge of the Skull Valley mudflats than the proposed alignment. Conservatively, to minimize any potential for water to damage the railroad bed, the alternative railroad alignment maintains a minimum vertical alignment approximately 3 to 5 feet above existing grade. This height is considered as a minimum in order to engineer a suitable base for the railroad bed.

Q14. What is the effect of this conservatism?

A14. The impact of this conservatism is to slightly increase the amount of fill as more fill is required in a few spots (where the minimum vertical alignment occurs) to maintain this height. This increase is small since most of the alternative alignment is built on fill anyway. Where fill is required to maintain grade in the first place, which is over the course of most of the alternative alignment, no extra fill is required for this function.

IV. THE WEST SKULL VALLEY ALTERNATIVE ALIGNMENT

Q15. Where is the North Cedar Mountains Area that SUWA claims is suitable for wilderness designation?

A15. The North Cedar Mountain area, which SUWA purports is suitable for consideration as wilderness, is located at the northern end of the Cedar Mountains. Second Declaration of Jim Catlin for Petitioner Southern Utah Wilderness Alliance (SUWA) (Dec. 8, 1998) (PFS Exhibit KK). It is a rough polygon about 5.5 miles

wide by 7 miles long (see PFS Exh. JJ). The proposed rail line would run through the eastern edge of the NCM area traversing a small segment at most a half mile wide and three miles long. See PFS Exhibits CC and EE.

Q16. Please describe the West Skull Valley alternative railroad alignment.

A16. In response to SUWA's claim that PFS could avoid their purported wilderness area, PFS considered an alternative alignment that does not cross the NCM area but rather passes just to the east of it. See PFS Exhibits CC and EE. The alternative follows the proposed Low Corridor rail line parallel to I-80 for about three miles, but at the curve south would turn less sharply so the alternative rail line would proceed more to the east than the proposed rail line route. After proceeding southeast for about two miles, the alternative rail line would curve south just east of the eastern edge of the NCM area (which is bounded by a dirt road) and just west of a parcel of land owned by the State of Utah. The alternative rail line would parallel the eastern edge of the NCM area (the dirt road) for about three miles. At that point, the edge of the NCM area (the road) turns southwest and so would the alternative rail line alignment. After a mile heading southwest, the alternative alignment would rejoin the proposed alignment somewhat south and east of the NCM area. The net result is the alternative rail line would be about 2,000 to 3,000 feet east of the alignment of the proposed rail line for about 6.5 miles.

Q17. How did you choose the route for the alternative alignment?

A17. Pushing the horizontal alignment of the Low Corridor rail line about 2,000 to 3,000 feet east presents challenges in that its location is constrained by two narrow gaps on BLM land through which it must pass, that are not encountered by the proposed Low Corridor alignment. As shown on the map (PFS Exhibit EE), the first gap is at the northern end of the alternative alignment; it passes east of the NCM area but stays west of the parcel of land owned by the State of Utah. The second gap is at the southern end of the alternative alignment; it must not go too far east to avoid impacting the large mud flat (i.e., wetland) in the middle of Skull Valley before rejoining the proposed rail line alignment. Even if PFS were to route the rail line across State-owned land, as shown on the map, the rail line would still have to remain west of the environmentally-sensitive mud flat.

Q18. What changes would be needed to construct the alternative rail line 2,000 to 3,000 feet east of the proposed Low Corridor rail line?

A18. In terms of earthwork (i.e., cut and fill), aside from the first mile of corridor which will generate a large pile of stockpiled earth at Low Junction, the remaining 31 mile length of the proposed Low Corridor rail line alignment has a balance, that is material removed to level the rail road bed ("cut") approximately equals material added ("fill"). On the other hand, because of its constrained location, the alternative alignment heads over terrain that falls at a steeper grade than the maximum acceptable grade for the PFS rail line. Thus, the alternative alignment requires additional fill material to maintain a practical grade for PFS trains as they thread their way through the two narrow gaps. See Table 1 for a summary of the grades along the alternative alignment.

TABLE 1

SUMMARY OF PROFILE OF ALTERNATIVE RAIL LINE SEGMENTS

Distance from Low Junction where each grade change starts (feet to the nearest hundred)	Grade of Climb [negative number is falling grade]	Length of segment that is the distance the grade is maintained (feet to the nearest hundred)	Railroad bed height over this segment (to the closest 5 foot increment) [negative height indicates a cut]
14,400	-1.11%	3100	0 to 15 feet
17,500	-1.5%	3700	15 to 20 to 0 feet
21,200	-1.34%	7200	0 to –5 to 0 to 20 to 5 feet
28,400	+0.34%	1900	5 to 0 to 5 feet
30,300	-0.66%	2700	5 to 10 to 5 feet
33,000	+0.56%	1800	5 to 10 feet
34,800	flat	2200	10 to 0 feet
37,000	+0.99%	6000	0 to 10 to 0 feet
43,000	-1.5%	1500	0 to 10 feet
44,500	+1.5%	3200	10 to 20 feet
47,700	+0.26%	800	20 to 0 feet

Q19. Starting at the northern end of the rail line, please describe in greater detail why the alternative alignment must be built on more fill than the proposed alignment.

A19. The requirement for more fill starts when the proposed rail line curves south away from paralleling I-80. The hill in this area slopes down toward the east at a sharper grade than the maximum permissible grade of the rail line. The proposed route avoids this problem by making a sharper curve so the rail line runs more toward the southwest and can follow the contours of the existing land. The alternative, on the other hand, must go more to the southeast to avoid the NCM area. Along the first two miles of the alternative alignment, the elevation of the ground decreases about 175 feet, which is approximately the theoretical maximum grade the rail line could descend. In fact, the rail line is constrained from decreasing in

elevation that rapidly due to the hill's naturally undulating contour; only an average grade of about 1.33% can be achieved compared to a maximum permissible of 1.5%. To account for this contour, the alternative alignment requires fill throughout almost all of its initial two mile length from the curve to the gap. In fact, the construction requires the rail line to be built on an embankment varying in height up to 20 feet. Only over a few hundred feet is any cut (i.e., removal of earth) required over the two mile descent.

This need for more fill is exacerbated as the alternative rail line must thread the narrow gap between the dirt "jeep" road that bounds the NCM area and the land owned by the State of Utah near the northeastern corner of the NCM area (or alternatively, it must remain west of the mud flat) as shown in PFS Exhibits CC and EE. The proposed rail line avoids this problem by staying further west of the State land and following the hill's natural contours. The alternative alignment is constrained to pass through a gap that is quite narrow and restricting for a railroad corridor. The gap between the dirt road and the western boundary of the State land at the point where the alternative alignment would enter the gap is approximately 500 feet wide.[1] Since the elevation of the alternative alignment is still about 15 feet above the ground at this point (because of the need to maintain steady descents, which average about 1.33% in grade), there must be fill added to construct an embankment about 20 feet high. This amount of fill requires a right of way (ROW) of approximately 300 feet wide, to allow the earthen embankment to be self-supporting, plus 50 feet on each side of the ROW for temporary construction easement. This does not include the ROW width required for unimproved road crossing approach ramps. The rail line must be laid out with a total ROW width of 400 feet to fit through a gap that may be no more than 450 feet wide.

Running a rail line through the gap between the dirt road and the State land imposes vertical constraints as well as tight horizontal constraints. In addition to constraints on horizontal alignment requiring the rail line to fit through a gap with as little as 50 feet of margin, the vertical alignment of the alternative route decreases about 175 feet along its first two miles. As the average grade that can be

[1] The 500 foot distance is scaled from 1"=2,000' USGS 7 ½ Min. Topographic Map with a margin of error approaching 10%.

achieved is about 1.33%, the rail line only descends about 160 feet. Consequently, the rail line would be built at the top of an earthen embankment that would be constructed on what is naturally a hill sloping downward to the east. The tracks of the alternative rail line would be about 17 feet above the uphill (western) side and closer to 25 feet above the downhill (eastern) of the base of the road bed.

Furthermore, the roughly two story embankment where the alternative rail line crosses the dirt road here, as the road turns away from the NCM area, is an imposing obstacle to the use of the road. Approximately 1,400 feet of the road will have to be realigned horizontally and vertically to make a crossing at this location (approximately 450 feet in a northeasterly direction and approximately 950 feet in a southerly and westerly direction) which dramatically increase the width of the ROW. The maximum vertical grade used for the road relocation would be 6%. The proposed alignment avoids this problem as it follows the hill contours; where the proposed alignment crosses the road further south, the crossings can be at or near the existing grade.

Q20. What happens as the alternative alignment continues to the south?

A20. The alignment of the alternative is constrained by another narrow gap at its southern end, where the alternative alignment stops paralleling the dirt road. At that point, the road, which is also the boundary of SUWA's NCM area, turns west, and crosses back over to the west of the proposed PFS rail line alignment. At that point, the proposed alignment no longer crosses the NCM area and thus the alternative alignment is free to rejoin the proposed alignment and continue south to the PFSF. The narrow gap is created because the alternative alignment runs within two tenths of a mile of the western edge of the large mud flats that cover the center of Skull Valley. In other words, the alternative alignment must run between the road (before it turns west) and the mudflats.

At this point, the elevation of the proposed rail line alignment is approximately 100 feet higher than the alternative alignment. Under ideal topography, this requires a minimum of 6,700 feet of travel to get the alternative alignment back to the proposed rail line alignment elevation at the maximum permissible grade of 1.5%. However, the actual topography is undulating and the alternative rail line alignment follows the hill contour with a steady 1% rise for 6,000 feet. Following

the hill contour minimizes the amount of fill needed and minimizes the impacts of this alternative alignment. Over the last mile the alternative rail line first falls and then rises with the bumpy hill contour at the maximum grade of 1.5 %, finally rising at 0.26% for the last 800 feet to match up with the proposed rail line alignment. Even incorporating the maximum rate of rising and falling in rail line elevation over the last mile, considerable fill is still required to build the railroad embankment as high as 20 feet over the last mile to avoid exceeding the maximum allowable grade.

Q21. Overall, how much of the alternative alignment is built on fill?

A21. In order to produce a workable horizontal alignment, as described above, the total length of the realignment is approximately 6 miles. This reflects following the topography as much as possible while threading the narrow corridors near the northern and southern ends of the alternative alignment section. Because of the constraints caused by these narrow corridors and their associated elevations, the great majority of the six miles is built on fill. See Table 1.

Q22. How much fill material would be needed for the West Skull Valley alternative?

A22. Ignoring the stockpile (300,000 cubic yards.) at Low Junction in the first mile, the proposed remaining Low Corridor 31-mile railroad alignment has a balance of earth work, that is material cut approximately equals fill. The alternative railroad alignment, over its 6-mile length, requires a net of approximately 560,000 cubic yards of fill. This means that 560,000 cubic yards of fill material would need to be imported from another location to build the alternative. The Low Junction stockpile (300,000 cubic yards) could be used for 56% of the required fill.

Q23. If you moved the alternative alignment farther to the east, across the State-owned land but still west of the mud flat, what effect would it have on fill requirements?

A23. It would make things worse. As shown in the map that is PFS Exhibit EE, as one moves to the east of the route of the West Skull Valley alternative that I have described, the elevation of the ground descends toward the floor of Skull Valley. Therefore, because of the railroad grade limitations I discussed, more fill would be required to run the rail line down to those lower elevations. Furthermore, more fill would be required to get back up to the elevation where the alternative would have to pass between the dirt road and the mud flat (as I discussed above). There-

fore, even if PFS were to route the west Skull Valley alternative over the State-owned land, that would not reduce the fill requirements for the alternative and hence it would still require more cut and fill than the proposed Low Corridor alignment.

Q24. How did you calculate how much fill would be needed for the West Skull Valley alternative?

A24. After laying out the route of the rail line, all earthwork calculations were developed from 3D digital models using the INROADS computer program. This program is commonly used by civil engineers for the purpose of designing linear features, such as roads and railroads, along with site grading and drainage.

Q25. Where would the fill come from?

A25. The railroad siding for the PFS rail line constructed at Low Junction would have a surplus of cut material at the Low Pass siding area of approximately 300,000 cubic yards. As proposed, this material would be added to the natural contours around the siding and stabilized with BLM-approved vegetation. If the alternative rail line alignment were built instead, the surplus cut material could be used (with BLM approval) for fill on the alternative rail line. This would require stockpiling the 300,000 cubic yards of material, protecting the pile to control fugitive dust emissions, and require moving the material from the Low Pass siding area to the locations needing the fill, which would make the alternative more expensive. In addition, the balance of any material not coming from the Low Pass siding area would need to be imported from an offsite location; i.e., about 260,000 cubic yards. This would increase the cost of the alternative further. The cost estimate below only considers the cost of the additional fill used for the alternative and so is probably an underestimate.

Q26. How much more would you estimate the West Skull Valley alternative alignment would cost compared to the proposed Low Corridor alignment?

A26. As described in the testimony of John Donnell on Contention SUWA B, the alternative rail line alignment would increase the costs of constructing the rail line by $5 million, driven primarily by the costs associated with the need for more fill. This cost would include loading, hauling, and installing the fill from the Low stockpile and procuring, loading , hauling, and installing additional fill (260,000 cubic yards) from a location within a 50-mile radius of the alternative route.

Experience Summary

Mr. Hayes is a Civil Design Engineer in the Denver office of Stone & Webster Inc. He joined Stone & Webster in 1980 and is responsible for civil engineering and design requirements of site and corridor development. His assignments include access and site road design of asphalt, concrete and gravel roads, including earthwork, structural and drainage considerations, railroad loading, unloading and transportation for heavy and light rail and site development on a variety of projects. He has more than 40 years experience in surveying and engineering civil projects. Prior to joining Stone & Webster, Mr. Hayes worked for the U.S. Geological Survey in the Rocky Mountain Region for eight years performing geodetic surveys. Mr. Hayes also worked for consulting engineering firms in Colorado for ten years on various surveying and civil engineering projects. He owned and operated his own surveying business in Colorado for approximately two years.

Education

Industrial Engineering – (Course Work – No Degree) Fresno City College, Fresno, California

Licenses, Registrations, and Certifications

Certified Engineering Technician - 1968
Registered Land Surveyor - Colorado - 1971

Experience History

STONE & WEBSTER ENGINEERING CORPORATION, DENVER, COLORADO
(JUN 1980 - PRESENT)

Private Fuels Storage Facility, Skull Valley, Utah
(May 2000 - Present)

As Lead Railroad Design Engineer responsible for the layout and development of construction drawings and railroad construction specifications for the new railroad alignment from the proposed PFSF storage site to a interconnect with the Union Pacific Railroad at Low Pass, in Utah. Comprising a total length of approximately 32 miles and maximum vertical grades of 1.5%.

Great River Energy, Pleasant Valley Station, Minn.
(Jan 2000 - May 2000)

As Lead Civil Design Engineer responsible for the layout and development of construction drawings for a new peaking power station located in Minnesota. Developed site access road, on site roads, grading and drainage including calculations and construction specifications.

Monticello, Martin Lake and Big Brown Stations, Texas Utilities
(Jun 1996 - Jan 2000)

As Lead Civil Design Engineer developed bypass and unloading loop for switching fuel delivery from existing 14 car lignite trains to proposed 140 car Powder River Basin coal trains for the three generating stations. Provided cost studies, traction studies and unloading time line studies for unloading 140 car unit coal trains at the three stations. The projects included railroad plans, site plans, calculations, drainage and realignment of existing roads, including the crossing of Interstate 45 with a new rail line.

Monticello - North Interchange, Texas, Utilities
(Apr 1996 - Jan 1997)

As Lead Civil Design Engineer responsible for the layout and development of construction drawings for approximate 2 mile spur track connecting Southern Pacific Railroad with existing TU track to allow receiving Western coal unit trains at Monticello Station. Project includes construction drawings, construction specifications, grading and drainage.

Northern States Power Company, Mescalero, New Mexico
(Feb 1996 - Apr 1996)

As Lead Civil Design Engineer provided conceptual railroad routing from existing SP mainline to several sites under consideration for independent spent fuel storage site on or near the Mescalero Indian Reservation in New Mexico. The railroad spur was to accommodate heavy rail loads having grades of 2% $\pm$ over lengths of 2 to 10 miles and considered grading and drainage.

Northern States Power Company, Goodhue County, Minnesota
(Nov 1995 - Feb 1996)

As Lead Civil Design Engineer developed rail spur of approximately 2 miles from existing CTX mainline to independent spent fuel storage site for Prairie Island Nuclear Generation Plant. Mr. Hayes performed the necessary alignment, grading and drainage calculations and produced design drawings for submission to the NRC.

Stanton Station, Ash Haul Rosa, United Power Association
(May 1995 - Oct 1995)

As Lead Civil Design Engineer, Mr. Hayes was responsible for the final design and grading of an Ash loading loop road and Ash Haul Road capable of handling CAT 773B off highway trucks. The loaded gross weight of this vehicle is approximately 186,000 lbs with approximately 125,000 lbs on the rear axle. The design period was 20 years, and the design included crossing of 2 existing railroad spurs, 13 buried utilities, the design of a concrete road crossing at an existing main access road to an adjacent power plant. The design also included the surface drainage features along the haul road alignment.

Hampton Corners Mine Site, Akzo Nobel Salt, Inc.
(Dec 1994 - May 1995)

As Lead Civil Design Engineer, Mr. Hayes was responsible for the conceptual layout and design of the surface facilities of a new salt mine and processing facility. His area of responsibility included roads and access, site grading, railroad access, loading and car storage for 100 car unit trains, surface runoff detention highway access improvements and building, parking, working and storage pad development. All design and drawings for the site work was created using AutoCad and ADCADD.

Tesla Hydroelectric Project, City of Colorado Springs
(Jun 1994 - Dec 1994

As Lead Civil Design Engineer, Mr. Hayes was responsible for development of an AutoCad, AdCADD final design of a 15 acre regulating reservoir and approximately 0.85 mi of access and maintenance roads in a mountainous area. The grading design includes a balanced earthwork scheme for the 250,000 cubic yards of earthwork excavation.

Banfield LRT System Improvements, Tri-County Metropolitan Transportation District of Oregon
(Nov 1993 - Jun 1994)

As Lead Civil Design Engineer, Mr. Hayes' responsibilities include design of two and one-half miles of double tracking for an existing light rail transit system mainline. The work includes preparing horizontal and vertical alignments using AutoCad and preparing special trackwork details. He is also responsible for design of an expansion to an existing maintenance and storage yard.

Three - 750 MW Coal-Fired, Navajo Generating Station, Salt River Project
(Aug 1993 - Oct 1993)

As Lead Civil Design Engineer, Mr. Hayes supervised final design of site preparation for the addition of scrubbers to the three - 750 MW coal-fired Navajo Generating Station. The work included modifying one mile of Arizona State Highway 98, upgrading three existing intersections, and adding one new

intersection. The work also included site grading and layout and design of on-site plant roads. He was responsible for coordinating and interfacing with the Arizona Department of Transportation

Thompson Falls Hydroelectric Project, Montana Power Company
(May 1993 - Aug 1993)

As Lead Civil Design Engineer, Mr. Hayes supervised final design of an Intergraph CAD grading, dredging, drainage design for a new 50 MW powerhouse at Thompson Falls Hydroelectric Plant. Grading included removal of 100,000 cubic yards of rock excavation, including one-quarter mile of river channel tailrace excavation, using a current diversion dike. Tailrace excavation was accomplished using a moving rockfill work pad.

Keahole Combined Cycle Project Company, Hawaiian Electric Light Company
(Jan 1993 - Apr 1993)

As Civil Design Engineer, Mr. Hayes provided final design of an Intergraph CAD grading and drainage design for a two-unit expansion of the existing Keahole power plant site. Design included site grading, site roads, and site drainage, including storm water detention and stormwater reinjection.

NO_x Abatement Project, Idaho National Engineering Laboratory
(Sep 1992 - Dec 1992)

As Civil Design Supervisor, Mr. Hayes supervised final design of an AutoCad grading, excavation, and draining design for a NO_x abatement process at an existing site, including grading, excavation, utility relocation, emergency fire access, and ammonia storage on a very congested area of Idaho National Engineering Laboratory.

Rosario Dominicana, Dominican Republic
(Jun 1992 - Aug 1992)

As Civil Design Supervisor, Mr. Hayes supervised preliminary design of an 85 million metric tonne per year tailings reservoir, decant reservoir, drainage diversion system, drainage capture and treatment system, and drainage capture around a planned, expanded open pit mining operation. The total area was 1241 hectors with drainage to handle 14.5 million cubic meters of annual runoff. All design and drawings were produced using Microstation, Version 4.0, and Inroads/Insite, Version 4.

Pathfinder Combined Cycle Expansion, Northern States Power Company
(Apr 1992 - Jun 1992)

As Civil Design Supervisor, Mr. Hayes supervised final design of an Intergraph CAD grading and drainage design for a combined cycle facility on the existing Pathfinder generation site. All civil design and construction drawings were produced using Microstation, Version 4.0. and Inroads/Insite, Version 4.0. They included site grading, drainage, road improvements, contractors parking and laydown, and wetlands improvement areas.

Prairie Island Nuclear Generation Plant, Northern States Power Company
(Feb 1992 - Apr 1993)

As Civil Design Supervisor, Mr. Hayes supervised Intergraph CAD civil design of an independent spent fuel storage installation site at Prairie Island Nuclear Plant. The design included grading and drainage, 18-foot high, earth protection berms, spent fuel cask transport vehicle access road, security fencing, and drainage from the site to existing off-site drainage facilities.

Healy Clean Coal Project, Alaska Industrial Development and Export Authority
(Aug 1991 - Feb 1992)

As Civil Design Supervisor, Mr. Hayes supervised final design of an Intergraph CAD grading and drainage site design for a second unit at the Healy Power Plant site. The design included excavation, grading and drainage, bottom ash settling pond, fly ash haul road, new access road, and plant parking lot.

Thompson Falls Hydroelectric Project, Montana Power Company
(Oct 1991 - Apr 1992)

As Civil Engineer, Mr. Hayes performed Intergraph CAD grading and quantity development for a detailed cost analysis of a proposed 50 MW second powerhouse at Thompson Falls Power Plant. All civil design and drawings were produced on an Intergraph 32C workstation, using Intergraph's Insite/Inroads civil design program. Work consisted of intake excavation, tailrace excavation, cofferdam quantities, powerhouse excavation, access road, and development of powerhouse concrete quantities.

Miscellaneous Architect/Engineer Services, Lowry Air Force Base
(Jun 1991 - Oct 1991)

As Civil Design Supervisor, Mr. Hayes coordinated mapping, surveying, CAD design, and manual design drafting of a relief storm sewer line approximately two miles in length for a portion of Lowry Air Force Base.

Engineering Design Services, Department of Defense
(Jun 1991 - Oct 1991)

As Civil Design Supervisor, Mr. Hayes supervised final design of Intergraph CAD grading and drainage design of a site for a 17,000 square foot warehouse addition. Design included grading and drainage, excavation of old landfill trash under structure, concrete access road design, asphalt POV parking, and vehicle staging area.

Public Utility District No. 2 of Grant County, Washington
(Mar 1991 - Apr 1991)

As Civil Design Supervisor, Mr. Hayes used Intergraph's site design program and Interview 32C workstation to three-dimensionally model a hydro turbine blade from manufacturer's supplied information. He was responsible for extracting cross sections at specific locations to analyze potential surface wear problems of in-service blades.

Steamboat Hills Geothermal, Yankee-Caithness Joint Venture
(Dec 1990 - May 1991)

As Civil Design Supervisor, Mr. Hayes supervised Intergraph CAD civil design of the site work for a geothermal site near Reno, Nevada. All design and drawings were produced on Intergraph Interview 32C workstation, using Microstation and Inroads/Insite software packages.

Bradley Lake Hydroelectric Project, Alaska Energy Authority
(Dec 1990 - Apr 1991)

As Civil Design Supervisor, Mr. Hayes supervised Intergraph CAD civil design of a rehabilitation contract, including waterfowl nesting area, fish rearing area, and construction camp rehabilitation.

Engineering Design Services, Department of Defense
(Sep 1990 - Dec 1990)

As Civil Design Supervisor, Mr. Hayes supervised Intergraph CAD grading and drainage design of two warehouse sites. One was a general purpose warehouse of approximately 101,000 square feet, and the other was a warehouse addition of approximately 17,000 square feet. Design included grading and drainage, new road design, tank road relocation, and parking.

Thousand Springs Project Unit No. 1, Great Basin Energy
(Jan 1990 - Aug 1990)

As Civil Design Supervisor, Mr. Hayes supervised Intergraph CAD civil design of the site work for a coal-fired power plant site near Wells, Nevada. All design and drawings were produced on Intergraph Interview 32C workstation using Microstation and Inroads software packages. Design included grading and drainage for a 160 acre plant site, 14-mile main access road, five miles of plant site roads, 14 mile railroad spur for unit train delivery of coal, evaporation ponds, and ash disposal area.

Colorado River Water Supply, Unocal
(Sep 1989 - Nov 1989)

As Civil Design Supervisor, Mr. Hayes supervised Intergraph CAD grading and drainage design of a 14-acre site to accommodate two settling ponds, site access road, and electrical substation. In addition two 5-acre sites located at an existing oil shale processing plant site were designed to accommodate mobile water filter units, access road, backwash pond, and surge basin.

Denver International Airport, City and County of Denver
(Dec 1988 - Aug 1989)

As Lead Civil Engineer, Mr. Hayes was responsible for civil design of Runway 8L-26R site preparation for the new Denver International Airport. The area designed included the main terminal and parking area, a three concourse configuration apron area, Ramp Taxiways K, M and Q, Parallel Taxiway J, Crossfield Taxiways XT-5, XT-4, and XT-H, along with Runway 8L-26R and Parallel Taxiway 3. All design and drawings were done on a VAX 8550 Intergraph CAD system using ESP software. Earthwork volume calculations generated by the Intergraph system were checked using a 80386 PC with DCA V10 software. All construction drawings were translated using a VAX based OCTAL translator to an Autotrol Series 5000 Apollo system per client requirements.

Additionally, Mr. Hayes provided a mass earthwork balance for the entire Phase I Airport Project

(approximately 20 square miles), which included six runways, all associated taxiways, maintenance and support area, terminal area, and concourse-apron area. The total earthwork volume for Phase 1 is approximately 113,000,000 cubic yards.

Teberebie Goldfield Ltd.
(Jul 1988 - Nov 1988)

As Civil Design Supervisor, Mr. Hayes supervised Intergraph CAD civil design of a new open pit gold mining operation in Ghana, Africa. The design included location and grading for a 19-unit family housing area and mess hall. Also included was location and grading of separate sites for an administration and office building with a helicopter landing pad, a maintenance facility, and grading for a 5000 metric ton per day ore crushing plant. In addition, 6200 meters of 9-meter wide access roads and 1600 meters of 24-meter wide heavy vehicle maintenance and ore hauling road was designed using Intergraph's ESP package.

Southern Pacific Railroad Spur, Lower Colorado River Authority
(Nov 1987 - May 1988)

As Lead Civil Engineer, Mr. Hayes was responsible for civil effort of a five route alignment study and CAD-produced preliminary civil design of two twenty-mile rail alignments connecting the Southern Pacific main line near La Grange, Texas with an existing rail unloading loop at Fayette Power Plant.

Salton Sea Unit 3 Geothermal Power Project, Unocal
(Mar 1987 - Nov 1987)

As Civil Design Supervisor, Mr. Hayes was responsible for civil design of the plant site for a geothermal power plant. Site drawings for this project were produced on the Intergraph CAD System.

Bear Canyon Geothermal Power Project, Freeport
(Jun 1986 - Jan 1987)

As Civil Design Supervisor, Mr. Hayes was responsible for civil design of the plant site for a geothermal power plant, including site grading, site drainage, and site access. Design of this plant site was created on the CAD system utilizing IGDS, digital terrain modeling, and earthwork software.

Land Base Mapping, City of Aurora, Colorado
(Jan 1987 - Feb 1987)

As Civil Design Supervisor, Mr. Hayes was responsible for a test project creating CAD-produced base maps for the Public Works Department. Input data was client-supplied recorded subdivision plats and engineering drawings. The graphics files were created using customized Land Base Mapping software to produce a series of base maps for various public works departments.

Land Base Mapping, Salt River Project
(Nov 1986 - Dec 1986)

As Civil Design Supervisor, Mr. Hayes was responsible for creating Intergraph CAD files from client-supplied planimetric mapping, including recorded subdivision plats, quarter-section assessor's maps,

address and street name plats, city street maps, and aerial photography. Graphics files were created using customized Land Base Mapping software to produce a series of base maps for various utility uses.

Assessor's Mapping, Town of Winchester, Connecticut
(Apr 1986 - Aug 1986)

As Civil Design Supervisor, Mr. Hayes was responsible for creating Intergraph CAD files from a combination of stero-digitized data and planimetric base maps to produce assessor maps in and around Winchester, Connecticut.

Cloverdale-Geysers Road Improvement, Central California Power Agency
(Sep 1985 - Apr 1986)

As Civil Design Engineer, Mr. Hayes was responsible for civil design of highway improvements to two and one-half miles of existing Sonoma County Highway to eliminate substandard alignment conditions.

Ramsey/Washington Waste to Energy Project, Northern States Power Company
(Jan 1985 - Aug 1985)

As Civil Design Engineer, Mr. Hayes was responsible for civil engineering design of a plant site for a refuse derived fuel processing plant. The design included site access and on site roadways capable of handling 500 trucks per day, site grading, and site drainage. The design for this job was developed on Intergraph CAD using IGDS graphics.

Coldwater Creek Geothermal Power Plant, Central California Power Agency
(Mar 1984 - Jan 1985)

As Civil Design Engineer, Mr. Hayes was responsible for civil engineering design of a 13-acre plant site for a geothermal power plant, including site grading, site drainage, and site access. Approximately one-half of the civil drawings on this job were developed on the CALMA CAD System.

Aidlin Geothermal Project, Geothermal Resources International
(Jul 1984 - Sep 1984)

As Civil Design Engineer, Mr. Hayes was responsible for civil engineering design of a 3-acre plant site for a 12.5 MW geothermal power plant in a mountainous region of California, including site grading, site drainage, and site access.

Fluid Gas Desulfurization Retrofit Project, Wyodak
(Feb 1984 - May 1984)

As Civil Design Engineer, Mr. Hayes was responsible for civil engineering design of site modifications to an existing plant site to accommodate installation of a flue gas scrubber, including new roads, site grading, and site drainage.

Salem Station, Montana Power Company
(Nov 1983 - Jan 1984)

As Design Engineer, Mr. Hayes was responsible for supervision of preliminary civil engineering design of nine miles of railroad and the relocation of approximately one-half mile of county road.

Biomass Combined Cycle Power Plant, OPC Bio-Energy Corporation
(Jun 1983 - Jul 1983)

As Design Engineer, Mr. Hayes was responsible for supervision of civil engineering design of the plant site and main access road.

Sage Point, Dugout Canyon Project, SUNEDCO
(Oct 1982 - Jan 1983)

As Lead Civil Engineer, Mr. Hayes was responsible for supervision of the preliminary civil engineering design of twelve miles of railroad, railroad loading loop, and site grading of central facilities area. He also supervised preparation of the plant area, raw coal and clean coal storage areas, two mine portal areas, and one portal area being capable of supporting facilities for miners and equipment to mine 6.7 million tons of coal per year. In addition, he was responsible for preliminary design of 16 miles of main access and maintenance roads to service portal areas and refuge disposal areas.

Western Fuels Project
(Jun 1980 - Jan 1983)

As Design Engineer, Mr. Hayes was responsible for supervision of civil engineering design of three and one-half miles of overland conveyor pad and maintenance road, site grading around transfer buildings, site grading of slot coal storage area, and civil design of 35 miles of electric railroad, railroad loading loop, and maintenance facility area.

Sacramento Municipal Utility District Geothermal Project
(Jun 1980 - Jun 1981)

As Design Engineer, Mr. Hayes was responsible for design of the main access road approximately two miles long through a mountainous region.

Southeast Project, Public Service Company of Colorado
(Jun 1980 - Apr 1982)

As Design Engineer, Mr. Hayes was responsible for supervision of civil engineering functions of the plant site and a 2-mile railroad unloading loop, access roads, etc.

MR. SILBERG: I'd also ask, subject to the consent of the counsel for SUWA and the NRC Staff, that we introduce at this point into the record the exhibits that have been previously prefiled with the Applicant's testimony. This would be Exhibits BB through KK. Three copies of the exhibits have been previously provided to the reporter. There is one change in the exhibits as prefiled, and that is a typographical change on the first page of PFS Exhibit GG, which is the designation of photographs, and we will make that change in the exhibit that's been provided to the court reporter and ask that that be replaced with the existing first page of GG. And with that, I would ask that the designated exhibits to Applicant's testimony on SUWA B be introduced into the record at this time and admitted into evidence.

JUDGE FARRAR: Ms. Walker, any objection?

MS. WALKER: No, Your Honor.

JUDGE FARRAR: Staff?

MR. WEISMAN: The Staff has no objection.

JUDGE FARRAR: Then the exhibits will be admitted.

MR. SILBERG: The witnesses are available for cross-examination.

JUDGE FARRAR: Ms. Walker, before you start, if at any point, you need a break because of your back, let us know and we'll do that.

MS. WALKER: Thank you. So can I go in any order I want?

MR. SILBERG: Yes, you can.

MS. WALKER: Wow, I like that.

CROSS EXAMINATION

BY MS. WALKER:

Q. Mr. Donnell, I'd like to start with you.

MR. DONNELL: Okay.

Q. We were on the site visit together yesterday, and when we were standing near Skunk Ridge, you were talking about the process of how the casks would be taken off the main rail and onto the new rail line, if it's constructed. Would you go over that for me, please.

MR. DONNELL: Yes. As I recall, the question was involving the logistics of a siding area at Skunk Ridge and how a train would leave the main line, either from the easterly direction or from the westerly direction. And my comment in the

area was that the trains would stop on the main line, a switch would be thrown, there would a single switch on the main line and the train, depending on the direction, would either back off of the main line onto the new PFS rail line, which has sidings adjacent to Skunk Ridge, or if the train was coming from the other direction, it would merely drive off of the main line onto the sidings. And there were two sidings adjacent to the single track that goes the extent of the valley down to the reservation.

Q. So what happens then? The train gets off the main rail, then what?

MR. DONNELL: At that time, there -- depending on how the train has been contractually agreed to with Union Pacific, since they're the main line operator at that point, the train on the sidings would either have a crew change, because the crew that would be on it would be a main line crew and it would be a different crew that would go down the rail line. Or as an alternative, the main line locomotives could be detached from the train and different locomotives that would be provided by PFS, short haul or short line locomotives would be attached and a PFS crew on those short line

locomotives would make the transit, the 32 miles to the PFS site.

Q. So you're saying that you haven't decided but either you could use the same locomotive or new locomotives?

MR. DONNELL: That is correct?

Q. Okay. Do you have a copy of the FEIS handy?

MR. DONNELL: Not here, no. I'm sure there's one in the room?

Q. Okay. I'm looking at Page 2-19. And let's see, the third paragraph down, on average.

MR. DONNELL: Okay?

Q. Do you see that?

MR. DONNELL: Yes, I do?

Q. So I take it that what you just told me is basically what it says here; right?

MR. DONNELL: Yes. Essentially, yes. In the license application, PFS has identified that approximately 200 casks per year would be shipped to the site. That's what I see in the first sentence?

Q. Yeah. Well, what I mean is, the thing about the trains.

MR. DONNELL: All right.

MR. SILBERG: Is there a question pending?

Q. (By Ms. Walker) I'm just making sure that it's all the same.

MR. DONNELL: Yes?

Q. Okay. And that paragraph refers to via, one of the rail routes shown in figure 2-7, and then in the FEIS also you have Exhibit -- I mean Appendix C which are rail routes to the proposed PFS site. And I take it, that means that the casks could be shipped on a variety of rail lines, these being some of them or all of them?

MR. DONNELL: You're referencing Figure C1?

Q. Yeah, and for example, on C7, you have some routes listed, route to Skull Valley from Granger, Wyoming, route to Skull Valley from Green River, Utah.

MR. DONNELL: These are routes that the Staff has identified. What is your question to me?

Q. That the casks could be coming to Skunk Ridge, or the plan is for the casks to be coming from Skunk Ridge by these varies routes?

MR. DONNELL: No route that I'm aware of has been identified specifically by PFS. What we

were talking about a minute ago was the intersection at the proposed rail line and the main line on the Union Pacific location at Skunk Ridge?

Q. Right. But what I'm asking you now is to get from wherever the casks are now to Skunk Ridge, you're going to use the main rail line system already in existence?

MR. DONNELL: Yes?

Q. And in the FEIS, have you identified some of the routes that the casks might take?

MR. SILBERG: Mr. Chairman, I would object to this line of questions. Where the railroad goes, the rail trains go, until they get up to the rail spurs, is totally outside the scope of this contention. I should have objected at the very beginning, but I thought I knew where it was going. We're clearly outside the scope of the contention. I object to this line of questions.

JUDGE FARRAR: Ms. Walker, your contention does deal with the several alternatives for the siding, and I take it from your question, you talked about things being at the main line, and your first question was how do they get onto the siding, but now you have gone far -- it sounds like you've gone far beyond that. But do you have a

response to Mr. Silberg?

MS. WALKER: The line of questioning is intended to investigate exactly what kind of terrain the locomotives have encountered previous to arriving at Skunk Ridge, which is relevant to the design of the rail line.

MR. SILBERG: I don't understand how that's possibly true.

MS. WALKER: Because you're going to use the same locomotives, so if the locomotives --

MR. SILBERG: That is not a true statement.

JUDGE FARRAR: Wait, wait, Mr. Silberg. First, I would do better if you were back over here.

MR. SILBERG: I was just -- so I could look at the FEIS is why I was there.

MS. WALKER: There's plenty of copies around.

JUDGE FARRAR: I'm sorry, if you don't have one, let's get you one.

Mr. Silberg, we did discuss yesterday questions of the grade that the siding would encounter and why it had to be constructed one way or another, and those are things that will be

discussed today. Ms. Walker now says in the anticipation of testing that, she wants to know what terrain is being encountered in getting to the siding. What's your response to that?

MR. SILBERG: I don't see any relevance of one to the other. She can ask the witness, is there some relevance to the terrain that a train may have encountered on its way to Skunk Ridge with the terrain that a train can handle in Skunk Ridge, and see where that goes, but without some foundation, we're just asking questions that are totally off point.

JUDGE FARRAR: Well, it is cross-examination. I don't know how much foundation we need. Does the Staff have anything to add to this?

MR. WEISMAN: Not really. We don't really see how this is relevant to the contention.

JUDGE FARRAR: Ms. Walker, let's go at it this way: Your question was framed very broadly. Why don't we -- why don't you question the witnesses about the Skull Valley routing, the siding, and then at any point in that, feel free to challenge any statements they make based on properties or characteristics of the locomotives

and what they might have encountered somewhere else. But Mr. Silberg's concern, that it sounded like we were going to be talking about rail routes throughout the country, and we're here today to focus on the siding.

MS. WALKER: So you're saying that I can't ask about what kind of terrain a train goes across to get to Skunk Ridge?

JUDGE FARRAR: Why don't you ask that question as opposed to --

MS. WALKER: I was trying to pinpoint whether these were some of the routes that the train might take, listed in the FEIS. So for example, might the train be coming from Green River, Utah?

MR. SILBERG: And if that were true, what difference does it make?

MS. WALKER: Because there happens to be the Rocky Mountains between the east coast and Utah. And if the train can get over the Rocky Mountains, you'd think it could drive down Skull Valley.

JUDGE FARRAR: Let's do this: The objection is overruled. Ask your questions, but pinpoint them in the manner you just did as opposed

to the -- you know, the generalities.

Q. (By Ms. Walker) Mr. Donnell, do you anticipate trains coming over the Rocky Mountains with casks in them -- on them?

MR. DONNELL: I think that's a true statement, yes?

Q. Are you familiar with how trains get over the Rocky Mountains?

MR. DONNELL: I don't understand that question?

Q. What type of grades do trains encounter in getting over the Rocky Mountains?

MR. DONNELL: I do not know?

Q. Are they all 1.5 percent?

MR. DONNELL: I do not know?

Q. And based on what you said earlier, PFS hasn't decided if it's going to use the same locomotives that in theory make it over the Rocky Mountains to drive -- you don't drive trains, do you? You -- well, maybe you do. To drive down Skull Valley?

MR. DONNELL: I believe what I said was that it's a business decision that will be made. I did include in my answer the short haul locomotives, which is what PFS believes it will do

to move the casks from Skunk Ridge to the reservation. But there certainly is the other option available, since no business contract has been written yet?

Q. Okay, thank you.

Another thing you were talking about on our field trip was sort of the design criteria behind the Low -- let me just clarify. When I say Low route, I talk -- what I mean by that is the proposed rail line, the first one, the one that's carried forward in terms of analysis in the FEIS. So is that clear which one we're talking about.

MR. DONNELL: I understand.

JUDGE FARRAR: And Ms. Walker, for the benefit of the record, Low is a proper noun referring to a little town, as opposed to low versus high?

MS. WALKER: Right. It's very confusing, because it's actually higher.

Q. (By Ms. Walker) And when I say the West Valley alternative, I mean the alternative developed and spoken about in the FEIS at -- let's see. I thought I had this one tabbed.

MR. WEISMAN: Exhibit 249.

MS. WALKER: Okay.

Q. (By Ms. Walker) So when I talk about West Valley alternative, that's what I mean, okay.

MR. DONNELL: I understand?

Q. All right, great. So you were talking about sort of the criteria behind the development of the Low rail spur. Can you explain that for me, please?

MR. DONNELL: I don't remember the conversation you're referencing. Could you add a little bit more to that, please?

Q. How -- I want to know how you or PFS came up with the route that the Low rail line takes? You know, I know it's not there yet, but you've designed a route. What was the reasoning behind the route?

MR. DONNELL: Well, there's a couple of factors that we discussed in the field. One was the physical arrangement of the valley and specifically the northern end of the valley, the northern end of the Cedar Mountains where the mountains are relatively close to I-80. That presents a high spot, a ridge that we have to cross. And we drove through that on the jeep trail adjacent to the I-80 corridor. I remarked that that was one starting point that our design

engineer, Mr. Hayes up here with me, would have looked at in terms of having to crest that high spot, which would be a starting point for the alignment in the valley side, and that would ignore the sidings that are on the western side of the Cedar Mountains at Skunk Ridge, which we just talked about a minute ago.

The other aspect of the valley is the destination down at the reservation. We have an end point to the corridor of which Mr. Hayes would have looked at in terms of the two ends, and that gave him a gradient across the roughly 30 miles or thereabouts of track that exists within Skull Valley.

There are other constraints that we have identified and we looked at some of those yesterday; the mud flats and the jeep road that exists out there. So we have crossing issues of wherever the alignment goes. And there's also -- I don't recall if we talked about this yesterday, but one of the constraints that was identified was the location of State trust land. There's a section of that land that's in that same general vicinity. Those pieces all fit together with what Mr. Hayes would have used to eventually lay out the track,

and he would have, from an economic standpoint, attempted to balance the cut and fill. In other words, when we had to go through high spots, we would make a cut; where we were in low spots, we would add fill. And from an engineering standpoint, the objective is to try to create a route that balances that so we don't end up with excess dirt to import or excess dirt to dispose. Those all have a cause factor, they all have an environmental impact. I think that's what sums up what we talked about in the field.

Q. In the beginning of our field trip, we saw an area where the rail line was quite deep, the main rail, the main rail line was quite deep. It was sort of in a trench. And explain exactly what would happen along that area. So we're going from the rail line being in the trench to -- do you remember where the mountains kind of came really close to the freeway?

MR. DONNELL: Uh-huh.

Q. Explain what happens in there.

MR. DONNELL: The location you're talking about, the trench is actually the main line, which is making a cut, which I just described a minute ago. It's a pretty significant cut, the

main line does, east to west. We are attaching our rail line, so to speak, at that point. So we, in turn, have to start with a very large cut in depth that would be located at that main line tie-in point. As you move easterly from that main line tie-in point, the natural topography of the land does drop, and I believe actually, as you're going towards the Cedar Mountains, it actually climbs, and the net effect is that the railroad, so to speak, is coming out of the ground. So the cut becomes a lesser dimension in depth. The further you go east until when you get to the actual Cedar Mountains corner, so to speak, where the railroad has to pass through, we're actually, I think making the cut, but Mr. Hayes would be better to describe the actual details of the topography. I was generalizing when we were on the jeep trail in that location. But essentially we hit near grade over near the Cedar Mountains and then go around the northern end of the Cedar Mountains and enter Skull Valley?

Q. So there's going to be a lot of earth moving going on with regard to that part of the project?

MR. DONNELL: Yes. The location from

the main line tie-in point and the Northern Cedar Mountains where these sidings we talked about previously is located, there will be a significant amount of dirt, I believe it's 300,000 yards will be spoiled. The phrase means to pile the dirt and save it for later use. I think we talked about that in the field, too. That there will be a spoil pile there that will contain the dirt largely from that excavation in making the cut, and at some point in time in the future when the rail line is decommissioned, that dirt would then be reused to refill the hole?

Q. Okay. And then where the mountain comes pretty close to the freeway, there's also a jeep trail or an unimproved road or a road or whatever you want to call it?

MR. DONNELL: Yes?

Q. Do you know the width of the -- the width from basically the butt of the mountain to the highway or right there?

MR. DONNELL: No, I do not?

Q. Do you anticipate having to cut into the butt of the mountain as it comes down to provide more room?

MR. DONNELL: I probably should defer to

Mr. Hayes on that. I do know there is room in the design to maintain the jeep road or the two track road that's there plus the rail corridor and meet engineering design requirements. Other than that, I couldn't answer more specific information.

MS. WALKER: May I just switch and ask Mr. Hayes?

JUDGE FARRAR: Sure, yes.

MS. WALKER: This is kind of cool.

Q. (By Ms. Walker) So Mr. Hayes, can you answer that? Do you understand where we are on the route?

MR. HAYES: Yeah, you're on the nose of the Cedar Mountains where it comes down towards I-80?

Q. Right. So what's going on to the north there in terms of highway, rail line, and how much room do you have?

MR. HAYES: To the north of --

Q. Yeah. So we have the butt of the mountains coming down here, and over here we have a highway and a rail line. Am I right?

MR. HAYES: Yeah?

Q. And then we got a jeep road and the proposed rail line is going to go in there?

MR. HAYES: That's correct?

Q. So how much room do we have?

MR. HAYES: There's enough room to place the jeep road on existing grade and also push the railroad -- the railroad is pushed a little bit to the south, and so we'll be making a cut on that -- the nose of that ridge?

Q. Okay. So it's kind of a tight fit?

MR. HAYES: Yes, it is a tight fit?

Q. Okay. Okay, Mr. Donnell --

MR. SILBERG: Excuse me, it's Donnell.

MS. WALKER: Donnell.

JUDGE FARRAR: Ms. Walker, before you ask the next question, if you don't mind, let me ask a question. Somewhere in the testimony is the notion of a 200-foot right-of-way being employed. Why the 200?

MR. DONNELL: The 200-foot right-of-way originates from a meeting that I had with BLM many years ago as we had our first dialogue on the design of the railroad and obtaining a right-of-way. In that dialogue, we suggested that we thought from our preliminary work, that a 200-foot right-of-way would be sufficient to construct, as you need more room for the

construction activity, and then later, the final corridor that would actually be the rail bed and track and ballast, et cetera, would be less than that, but the lease would likely be a nominal width of 200 feet. And I say nominal here, because where you have large cuts or large fills, you may exceed that at a point, and the plan of development document that we have submitted to the BLM identifies those points from the design standpoint of where those would occur.

But the gist of the meeting was that the BLM at that time felt it was appropriate for us to start with that design basis, that 200 foot would be a reasonable amount of area to use for our purpose. That's the source of the number.

JUDGE FARRAR: Thank you, Mr. Donnell. Mr. Hayes, in light of that answer, can you -- does that affect your previous -- your answer to the previous question, from Ms. Walker? In other words, do you need -- how does that 200-foot right-of-way fit into the cramped space that we saw yesterday?

MR. HAYES: On that point, on the north side, the right-of-way is shortened to match the existing interstate right-of-way fence, and on the

south side, it increases because of the cut. And it's increased to the top of the cut just strictly for maintenance purposes.

JUDGE FARRAR: All right. Thank you. Go ahead, Ms. Walker.

MS. WALKER: I'm sorry, Mr. Hayes, what did you mean by the right-of-way fence?

MR. HAYES: The right-of-way fence that designates the limits of the interstate highway, you drove right by that fence when you went through that gap.

MS. WALKER: So that's the right-of-way for I-80?

MR. HAYES: That's correct.

MS. WALKER: So the right-of-way that you need is not going to overlap the right-of-way --

MR. HAYES: No, it will not. It will go to that fence or to that point. The fence may or may not be on that right-of-way, but we will go to the right-of-way line and then it would be south of that.

MS. WALKER: Okay.

Q. (By Ms. Walker) All right. Now, I'm going to mess up again. Donnell?

MR. DONNELL: I'll answer either way. It's Donnell, but that's okay.

Q. Well, I got all used to calling you John yesterday. Is it all right if I call you John?

MR. DONNELL: You can call me John.

Q. Thank you, because I'll just mess it up consistently from now on otherwise. John is easy.

So you explained why -- sort of the design criteria for the Low rail. Now, how about the design criteria for the West Valley alternative?

MR. DONNELL: What I discussed in the field was the fact that the West Valley alternative was a demonstration from PFS of what would be required to miss the Northern Cedar Mountain area and still not impact the mud flat or the State trust land. And in doing that, the design that Mr. Hayes can speak more fully to, was to -- from my perspective, using simple words, was attach the West Valley line to the railroad at two points; one on the northern end and one on the southern end of the area of the North Cedar Mountains. Mr. Hayes did some calculations of what that would entail, and as you would guess from being in the field and seeing the slopes, that when you move further to

the east, it raises the railroad out of the ground essentially. We have to have more fill to do that and still maintain our one and a half percent slope design basis.

So the net effect was what has been published in the text. That's as much as I can speak to it here?

Q. And if I understand your prefiled testimony correctly, there's significant fill required for the West Valley alternative?

MR. DONNELL: That is correct?

Q. And the reason is, is because the Low corridor or the Low line is kind of up high, to avoid the North Cedar Mountains, you have to get lower, so the fill is to get it down low and back up again?

MR. DONNELL: That's essentially true, but it would be better that you talk in more detail with Mr. Hayes about the process he used to actually lay out that section. I gave you an overview perspective of the -- using the words attachment, I'm sure Doug won't use that. But he did design the alternative to make a rational demonstration of a route that would meet the objectives, as I outlined, of missing the mud

flats, missing the State trust land and stay outside of the Northern Cedar Mountain area. And the net result was the calculations that it requires a lot of fill.

Q. But why -- what about the design makes the fill necessary?

MR. DONNELL: I don't understand your question?

Q. Well, in your prefiled testimony, you explain that a lot of fill is required to make the West Valley route a viable route.

MR. DONNELL: Yes, I referenced Doug Hayes' testimony in doing that, but yes?

Q. Okay. So what about the design requires the fill? Why does the fill -- why do you need fill to make the design viable, workable?

MR. DONNELL: I think you're getting beyond what I can answer. To talk about the design constraints and how that track was laid out, whether it's the Low track or the West Valley track, you should talk to Mr. Hayes about that?

Q. Okay. But am I right in saying that your prefiled testimony says that the -- the West Valley alternative essentially leaves the Low corridor to avoid the North Cedar Mountain

wilderness proposal, the mud flats and the State section, and then when all those obstacles are gotten around, it joins back with the Low corridor?

MR. DONNELL: As I previously stated, that West Valley alternative was a demonstration of what the effect would be to create an alternate route that missed the mud flat, missed the State trust land and missed the Northern Cedar Mountain area. And the results of that alternate alignment are in my prefiled testimony largely relating back to the work that Mr. Hayes did?

Q. But the West Valley route leaves the Low corridor and joins up with it again?

MR. DONNELL: That is correct?

Q. Okay. Are you familiar with the, what I call the truck alternative -- maybe that's not a good way to explain it, but the alternative of putting the casks on trucks that's described in the FEIS?

MR. DONNELL: Do you want to give me a reference for that? You're talking about heavy haul, I presume?

Q. Well, maybe I should ask it this way: In terms of alternatives that you analyzed thoroughly through the FEIS with regard to

transportation, other than the rail line, what was the other alternative?

MR. SILBERG: I'm sorry, the rail line means the Low railcar?

MS. WALKER: Yes.

MR. SILBERG: Mr. Chairman -- excuse me, go ahead.

Q. (By Ms. Walker) So in other words, the FEIS examines transportation alternatives?

MR. DONNELL: Yes?

Q. And some of these alternatives are carried -- the analysis is done throughout the FEIS as opposed to being considered but rejected for the review, however you want to say it; right? So what alternatives did you carry through the whole analysis?

MR. SILBERG: Mr. Chairman, to the extent we're going to talking about the heavy haul option, this is clearly outside the scope of the contention. As admitted by LPP 99-3, the contention was admitted so far, quote, as it seeks to explore the question of alignment alternatives to the proposed placement of the low junction rail spur. So anything about heavy haul options is well beyond the scope of the contention.

JUDGE FARRAR: Ms. Walker.

MS. WALKER: Well, what I'm interested in is the criteria used generally, when to carry an alternative forward or not. I could talk about Wyoming site alternative if you want. But it's just the notion behind when the FEIS will carry forward an alternative as opposed to rejecting it.

MR. SILBERG: That's really a question to the NRC Staff, it seems to me.

JUDGE FARRAR: You remember the Applicant did an environmental report that they're responsible for, and the Staff does the FEIS. So No. 1, in talking to these witnesses, they didn't write the FEIS, they did an environmental report. And questions about the FEIS are more appropriate for the Staff. Mr. Silberg's basic objection, this contention, as it now stands, deals with rail line alternatives. Okay, but you were asking for the limited -- the question you asked about making the truck route relevant just for the purpose of how does the Staff go about saying here's an alternative worth considering versus one not worth considering, that's the question better put for the Staff.

MS. WALKER: Right. Okay, but I can

talk about that with them?

JUDGE LAM: Well, the way I understand Mr. Silberg's objection, is that in our earlier ruling in LPP 99-3, this particular contention has been restricted to, quote, "as it seeks to explore the questions of alignment alternatives to the proposed placement of the Low junction rail spur", end of quote. LPP 99-3, 49 NRC 53. So I think our focus here is on that. If you had questions on the FEIS to the Staff, of course, you know you're free to ask them, but perhaps in another venue.

MR. SILBERG: Mr. Chairman, I would certainly note that Ms. Walker is certainly free to ask how the Applicant chose its rail alternatives to review. Not in the context of the FEIS, of course, but in context of our responsibilities and our choices.

JUDGE FARRAR: And, Ms. Walker, you will be free to ask the Staff as part of your cross-examination how they go about their business as long as you do that generally, because we don't want to get into the specifics of why not a truck route which is not part of the contention in this proceeding. But go ahead, I think we have an understanding of how to go ahead.

MS. WALKER: Okay, great. That's good. I'll save that for the Staff, sorry.

Q. (By Ms. Walker) John, do you know how much the rail line costs, the Low rail line costs?

MR. DONNELL: As I recall, it's on the order of $25,000,000?

Q. And how about the whole project?

MR. DONNELL: On the order of a hundred million dollars?

Q. Okay, thanks.

Okay, Mr. Hayes, I have a few questions. Do you have your exhibits handy, your exhibits, the exhibits that were attached to your prefiled?

MR. HAYES: Yes.

Q. Now, the question is, do I have them? Would you take a look at Exhibit BB. And can you just tell me what it is?

MR. HAYES: Exhibit BB is a overall plan of the Low corridor that goes from our tie-in with the Union Pacific at Skunk Ridge to the PFS site?

Q. Okay. And then if you would turn to the figure 3.2-2. Oh, I'm sorry. 204. Yeah, 204. All right. And there's sort of in the middle of the page, there's a graph kind of thing under the word that says plan with -- do you see that? And

it says existing grade profile grade line? Do you see that?

MR. HAYES: Yes?

Q. So would you please explain to me what that is?

MR. HAYES: Which, the profile?

Q. The little graph thing. Is that what it's called, a profile?

MR. HAYES: Well, the graph I think is a profile which represents the center line of the rail. It indicates where the existing ground is and where our proposed top -- yeah, top, profile grade line would be, which is the top of the dirt portion of the railroad embankment?

Q. Okay. So where it says existing grade with a little arrow.

MR. HAYES: Right?

Q. That means --

MR. HAYES: Existing ground?

Q. So it's kind of a side view of the -- of the topography, is that a good way to say it?

MR. SILBERG: I'm sorry.

MR. HAYES: If you cut it and looked at it from the side --

MR. SILBERG: I'm sorry, a side view of

the --

MS. WALKER: Topography.

MR. SILBERG: Topography, I'm sorry.

MR. HAYES: Correct.

Q. (By Ms. Walker) And then the profile grade line is what?

MR. HAYES: The profile grade line is the top of the dirt of the railroad embankment?

Q. The top of the dirt. Okay. And what's the scale on this --

MR. HAYES: Small?

Q. Okay. So going up and down the side there, it says elevation, and, what, you have ticks every 50 feet? Are those feet?

MR. HAYES: Yeah, that's what it appears to be?

Q. Okay. And then along the bottom, we have zero, five, 10, are those feet, too?

MR. HAYES: Those are feet?

Q. From where? From the beginning?

MR. HAYES: The zero -- where it says zero plus zero zero?

Q. Uh-huh.

MR. HAYES: That's at the end of the siding where we're beginning the single track?

Q. Okay. Now, if we could see it, would the existing grade line look different from the profile? I mean, is it hatched mark or it a solid? I mean how do you tell the two apart?

MR. HAYES: Well, yeah, a full size plan of this would show the existing ground with a dash line and then the proposed grade line would be with a solid line?

Q. Okay. Now, if you would turn to, please, three of four.

JUDGE FARRAR: Ms. Walker, before you leave that, so as we look at this plan, there are supposed to be two lines there, one solid, one hatched, but we can't see them in most places?

MR. HAYES: That's correct.

JUDGE FARRAR: And that's because they're --

MR. HAYES: The scale is so small, and the vertical distortion there is not enough to really demonstrate it the way you normally would on a one to a hundred or something.

JUDGE FARRAR: Go ahead, Ms. Walker.

Q. (By Ms. Walker) Okay. So three of four. I'm looking at the same type of thing, which is across the bottom here. Do you see in the very

beginning where it says, I think 520 on the bottom?

MR. HAYES: Yes?

Q. So that's a place where the lines are kind of far apart. Well, at least relatively far apart. Am I right?

MR. HAYES: I'm sorry, I didn't --

Q. Do you see the place where the lines are relatively far apart right there?

MR. HAYES: Yeah, they're about 20 feet apart?

Q. 20 feet. So what happens there?

MR. HAYES: What happens there? That indicates that there's a fill there?

Q. And why?

MR. HAYES: About a 20-feet fill?

Q. Okay. And is this the part of the Low route beyond where -- this is going to be tough. Beyond where the West Valley alternative comes back so they're together?

MR. HAYES: No. Where the West Valley alternative comes back is somewhere around station 800. Eight zero zero plus zero zero?

MR. SILBERG: Excuse me, just for our convenience, are those feet or are those thousands of feet, tens of thousands of feet?

MR. HAYES: Those are in stations and it's by hundreds. So eight zero zero plus zero zero is 80,000 feet from the point of beginning.

MR. SILBERG: Thank you.

Q. (By Ms. Walker) Okay. So where the West Valley comes back in is on sheet three of four at eight zero zero plus --

MR. HAYES: Yes?

Q. Okay. So that's kind of in the middle of the page. So the part I'm asking you about, five seven -- no, 520, is before it comes back in?

MR. HAYES: That's correct?

Q. Okay. All right. And --

JUDGE FARRAR: Ms. Walker, while you're preparing your next question. Mr. Hayes, you said that's 800 plus zero zero is 80,000 feet?

MR. HAYES: That's correct.

JUDGE FARRAR: From --

MR. HAYES: From the zero in. From where we're beginning the single line track at the end of the sidings.

JUDGE FARRAR: So this is 16 miles down the valley, more or less?

MR. HAYES: Yeah.

JUDGE FARRAR: Right before you get to

the 80,000, the profile grade line seems to have a distinct rise in it.

MR. HAYES: You're talking around station 700 plus a pair?

JUDGE FARRAR: Yeah. 700 would be the height of it, and it goes a little bit in each direction. Can you explain that to us?

MR. HAYES: Yeah, the existing ground there rises and so the profile grade line is going to mimic the existing ground.

JUDGE FARRAR: I thought you'd said before the profile grade line is the line of the road bed, the railroad bed?

MR. HAYES: That's correct. If you notice, both lines are parallel. They're together there. You can't -- there's no distinction between the two of them, which is indicating that it is at or near existing ground and is mimicking the ground.

JUDGE FARRAR: Why wouldn't you make a cut there to keep the rail line more level?

MR. HAYES: Well, if you made a cut and made it straight across there, I could conceivably see it cuts in the range of 50 feet deep. When you do that, you create all kinds of problems with

drainage. How do you get drainage from one side of it to the other side?

JUDGE FARRAR: I could be wrong, but that looks like a significant -- to avoid making the cut for the reasons you've just described, it looks like a fairly significant grade change on the rail line over that short period?

MR. HAYES: I don't think so. I mean all of our grade lines are one and a half percent or less, so what you're looking at is a grade that's one and a half percent or less.

JUDGE FARRAR: That elevation change we're talking about takes place over a 5,000-foot area?

MR. HAYES: It looks like it goes from about, oh, six, 640 plus a pair to 700 plus a pair, and that's 6,000 feet.

JUDGE FARRAR: Thank you. Sorry for the interruption, Ms. Walker. Go ahead.

Q. (By Ms. Walker) I just want to clarify. Where we're looking at 520, the line that's on the bottom is the profile of the ground, am I right?

MR. HAYES: That's correct?

Q. And the line that's on the top is the

rail?

MR. HAYES: That's correct?

Q. Proposed rail. So you're actually putting fill in there?

MR. HAYES: That's correct?

Q. Okay. And about 20 feet?

MR. HAYES: About 20 feet?

Q. Okay. And then just a little out of order, but sheet one of four. Just the drawing at the top, where it says see sheet two of four. Oh, okay. Sheet two of four. Sorry. So the drawing at the top there shows the place we were talking about before where things are kind of squished against the highway. Can you point out where that is?

MR. HAYES: Are you talking about where we're getting close to the Interstate 80 right-of-way?

Q. Yeah.

MR. HAYES: On the north end of the North Cedar Mountains?

Q. Correct.

MR. SILBERG: Actually, I think you can identify it by -- I think the section numbers all have -- the section -- I guess those are sections,

all have numbers in them, just for the clarification of the record. If you want to identify it a particular location.

Q. (By Ms. Walker) How about this; is it in Section 17? Is that what it looks like to you?

MR. SILBERG: The one below 16?

MR. HAYES: If you can read that, your eyes are better than mine. Right there where the I for Interstate Highway 80?

MS. WALKER: Okay. That's a great way to do it. Thanks.

MR. HAYES: Which is in Section 17.

MR. SILBERG: Next time, Mr. Chairman, we'll use larger type.

Q. (By Ms. Walker) Mr. Hayes, I want to refer to table one, which is on Page 7 of your prefiled, so I don't know if you have that handy. I'm sorry, did you find the table?

MR. HAYES: Yes?

Q. Okay, thanks. So this is what?

MR. HAYES: This is the grade that goes from Station 144 plus a pair to Station 477 plus a pair?

Q. What does plus a pair mean?

MR. HAYES: Zero zero?

Q. But what does that mean?

MR. HAYES: Plus zero zero. The stations are always measured in hundred foot increments, which is a survey way of telling a surveyor how far is that point up there?

Q. So is this for the whole West Valley alternative, all 6.5 miles of it?

MR. HAYES: This is -- yes?

Q. Did you do a table like this for the Low corridor or the Low rail?

MR. HAYES: No?

Q. What about for the part where the two go together, so where the West Valley joins and the two go off into the sunset?

MR. HAYES: Well, this indicates where you depart from the Low corridor at Station 144 plus a pair and where you tie back in at 477 plus a pair?

Q. Okay. But there's no table for the rest of the route?

MR. HAYES: No?

Q. Okay. All right, I'm asking for it, but can you tell me how a change in grade relates to a change in slope? And what I mean by that is, I think, you know, you use often 1.5 percent slope --

grade, grade. 1.5 percent grade. So if you were to change that to, say, two percent, that would be steeper; right?

MR. HAYES: That's correct?

Q. How much steeper in terms of vertical feet? Is that a question I can ask? I mean I know I can ask, but I mean does that make sense? Is that a --

MR. HAYES: Well, 1.5 percent literally means one and a half feet per hundred feet?

Q. So you're going up and down?

MR. HAYES: So you go horizontally a hundred feet, you drop one and a half feet?

Q. Okay, so if I change it to two --

MR. HAYES: You go a hundred feet, you drop two feet?

Q. Okay.

MR. HAYES: So the delta is a half a foot?

Q. The delta?

MR. HAYES: The difference?

Q. Oh, sorry. That was bad. I did take math in school.

All right. So a half a foot. A half a foot? Oh, 1.5, okay. All right.

So on that same page, Page 7 of your prefiled, towards the bottom, you're saying -- and we're talking about the West Valley alternative here. You say along the first two miles of the alignment, the elevation of the ground decreases about 175 feet, which is approximately the theoretical maximum grade the rail line could descent. Am I right? That means it's 1.5 percent?

MR. HAYES: Yes?

Q. Okay. But then you say, in fact, the rail line is constrained from decreasing elevation that rapidly -- decreasing, sorry, in elevation that rapidly, due to the hill's naturally undulating contour. Only an average grade of 1.33 percent can be achieved. Can you explain that? I don't get it.

MR. HAYES: It's to keep the profile grade line at a constant height or fairly constant height above existing ground or near existing ground. The ground is doing this, going up and down.

MR. SILBERG: Can you on the record describe your hand motion. Undulating perhaps?

MR. HAYES: Right, undulating. And so at some point, you have to select, where am I going

to intersect that? Where am I going to make little cuts, where am I going to have fills? How deep are they going to be? Because you cannot design a railroad that has a whole bunch of these little intersecting grade changes. Trains just don't like that kind of an operation scenario.

Q. (By Ms. Walker) Okay. The thing I don't understand is, if the train undulates and you know you want to go at 1.5 or you know you want to go at 1.3, why don't you just cut and fill to make that happen?

MR. HAYES: Because the cut would become excessive and we probably had some drainages that we had to get from one side of the railroad to the other side, and if you start cutting too deeply, then in order to get the drainage to go from one side of the railroad to the other, you're cutting as much as a quarter of a mile away from the railroad. You're having to make a ditch to get the water to go across the railroad?

Q. And that happens when -- I lost you, a cut or fill?

MR. HAYES: That would happen in a cut situation?

Q. Oh, because the water would collect in

the --

MR. HAYES: That's correct.

Q. Oh, okay. Okay, I got it.

MR. HAYES: I might explain a little bit about this 1.5 percent. That's a maximum grade, and it's called -- you also have to take and reduce this grade to account for curvature. Curvature adds to your grade. It adds tension on the train. So when you're going in an ascending direction, you would in a sense be imposing more than a one and a half percent grade unless you reduce that grade to account for those curves?

Q. And by curves, you mean curves in the rail line?

MR. HAYES: The horizontal curve?

Q. But you could also, I imagine, decrease the curve and go back --

MR. HAYES: Well, the curves right now are very large, you know. They're 19 -- the smallest curve we have is 1908 feet radius. Now, that's a very large curve, and --

Q. And large, you mean gentle?

MR. HAYES: A large radius?

Q. Yeah, okay.

MR. HAYES: However you want it

described at.

Q. All right. So is 1.5 percent pretty mellow?

MR. SILBERG: Could we have a definition of mellow, please, in railroad terminology.

Q. (By Ms. Walker) Not steep. Is it fairly gentle?

MR. HAYES: In railroad terms, no. 1.5 is a fairly substantial grade. When you're designing railroads for modern trains, you're usually limited to one percent or less?

Q. Do you know the grade of the main line coming up to Skunk Ridge?

MR. HAYES: Coming up --

Q. To Skunk Ridge?

MR. HAYES: Yeah, I have a profile of that. I believe the maximum grade there is 1.39. Keep in mind, that was built in about 1913. Their criteria was quite a bit different than we have now?

JUDGE FARRAR: You mean, Mr. Hayes, criteria were stricter, less stringent?

MR. HAYES: It was generally less stringent. The trains were smaller, the locomotives were quite a bit heavier. They

could -- they had more tracking effort.

JUDGE FARRAR: So they could have more of a grade?

MR. HAYES: They could pull more of a grade.

Q. (By Ms. Walker) So, Mr. Hayes, if you would turn to Exhibit EE. The pictures that are sort of -- they look almost like blowups of certain points.

MR. HAYES: Yes?

Q. Can you explain what those are?

MR. HAYES: I'm sorry, repeat?

Q. Can you explain what they are?

MR. HAYES: Those are cross-sections taken at about that point on the alignment?

Q. And what's the scale going up and down the side?

MR. HAYES: Those are feet that are indicated?

Q. And each hatch mark -- well, I don't want to say each hatch mark, but each numbered -- well, each hatch mark.

MR. HAYES: Each labeled hash mark is a five-foot increment.

MR. SILBERG: You're talking about on

the vertical access?

MR. HAYES: Yes.

Q. (By Ms. Walker) Then across the bottom, horizontal, each hatch mark is --

MR. HAYES: Each labeled hash mark is 50 foot?

Q. Okay. But if you were to take the hatch marks on the side, how big they are and put it on the horizontal axis, what would be the ratio?

MR. HAYES: I think you're asking me what the distortion is here. It's usually five to one, and I believe that's what this one was?

Q. Okay. So five which way and one which way?

MR. HAYES: The vertical is five times greater than the horizontal would be, just to show that there is, in fact, a difference between the existing grade and where the proposed alignment would be?

Q. So you called it distortion?

MR. HAYES: Right?

Q. And it's distorted to make it look higher?

MR. HAYES: No, not to make it look higher. Just so you can see relative where the top

of the rail is to the existing ground. If you made it one to one, and at these scales, that first one at station -- at that first section at 17,800, you would have hardly any separation between the top of the rail and the dash line indicating existing ground. It's a common way in civil engineering of indicating grade, how much fill you'd have, how much cut you'd have, what the section is going to look like?

Q. But when you say one to one, that's reality?

MR. HAYES: If you made it one to one, no matter what the scale of the drawing was, the dimension horizontally would equal the dimension vertically?

Q. And that's what the real world is?

MR. HAYES: That's what the real world is?

Q. Okay. Do you have any of these drawings for the Low rail spur -- cross-sections, sorry?

MR. HAYES: Included in this, no?

Q. And how about where the two come together?

MR. HAYES: No. Well, do we have -- I don't think we included -- no. What you see right

here is what you get?

Q. Okay. All right. Mr. Hayes, please, Page 8 in your prefiled -- I'm jumping around, I'm sorry. Your prefiled testimony, Page 8, please. I'm looking at the first full paragraph that starts, "this need for more fill is exacerbated". And kind of low down in the paragraph, you say, "This amount of fill requires a right-of-way of approximately 300 feet."

Can you explain that part?

MR. HAYES: Yeah. This right-of-way is including the 50 feet on each side that we need as temporary construction access. The right-of-way would be approximately -- would be the standard 200 foot wide, but the 50 foot on each side for construction access makes that temporary right-of-way or construction right-of-way 300 feet wide?

Q. Okay. And then a little bit lower, you say, this right-of-way does not include -- oh, I'm sorry. "This does not include the right-of-way required for unimproved road crossing approach ramps. The rail line must be laid out with a total right-of-way width of 400 feet to fit through a gap that may be no more than 450 feet wide."

How wide is -- I mean not wide. How long is a football field?

MR. HAYES: 300 feet?

Q. No. 300 feet, okay. And that includes -- doesn't include the end zones; right?

MR. HAYES: That's correct?

Q. So what you're saying here is, you need a right-of-way that's probably bigger than a football field to build a rail line?

MR. HAYES: That's correct?

Q. Okay.

MS. WALKER: May I take a short break?

JUDGE FARRAR: Certainly. It's a good time to do that. How long do you mean -- given your back, how long do you mean by short?

MS. WALKER: I have to go downstairs. It has nothing to do with my back.

JUDGE FARRAR: It's twenty of. Let's come back at five of.

MS. WALKER: Thank you.

(A recess was taken.)

JUDGE FARRAR: All right. Let's resume. Ms. Walker, before you pick up again, Mr. Hayes, could you look at that Exhibit EE that you were talking about. Do the widths of the green and red

lines represent pictorially the amount of fill, like the broader the red and green lines, the more the fill or cut?

MR. HAYES: That's correct.

MR. SILBERG: Excuse me, if I'm reading that, I think the red or the pink looks like fill and the yellow looks like cut.

MR. HAYES: That's correct.

MR. SILBERG: The green is the ground elevation, I believe.

JUDGE FARRAR: No, I don't mean in the little blowup pictorials, but on the main vertical lines --

MR. SILBERG: Oh, I'm sorry. I'm sorry.

JUDGE FARRAR: -- coming down the page. Is that what you understood me to mean, Mr. Hayes?

MR. HAYES: That's correct. Along the alignment there.

JUDGE FARRAR: Right. So I've got a skinny green line which means --

MR. HAYES: That's the extent of the cut or fill.

JUDGE FARRAR: Right, and the -- oh, I took it as meaning the volume of the cut or fill. It's the width?

MR. HAYES: That's correct.

JUDGE FARRAR: The lateral width of the cut or fill, which would probably depend --

MR. HAYES: The higher the cut, the wider the width.

JUDGE FARRAR: Okay, I've got that. Go ahead, Ms. Walker.

Q. (By Ms. Walker) Did you just say the higher the cut, the wider the width?

MR. HAYES: It would be true for both cut or fill. The higher the fill, the wider the width. The deeper the cut, the wider the width?

Q. Okay.

JUDGE FARRAR: And that relates just to a matter of the embankment?

MR. HAYES: That's correct.

JUDGE FARRAR: So the higher you are above grade, the wider the embankment, the supporting embankment has to go?

MR. HAYES: That's correct.

Q. (By Ms. Walker) Ms. Davis, hi?

MS. DAVIS: Hi?

Q. I'd like to ask you some questions. If it's okay, do you mind if I stand up?

MS. DAVIS: That's okay?

Q. I've been told I'm intimidating when I stand up. Isn't that funny?

Can you just explain basically what your role in all of this is?

MS. DAVIS: I've been working on this project since 1996, doing the -- preparing the ER specifically, the ecology section which would include wildlife vegetation, any aquatic resources, the endangered species. I've also been involved with the site and the transportation studies in the same roles?

Q. Okay. In your prefiled testimony, you talked about the wilderness character of the area around the Low rail corridor?

MS. DAVIS: Yes?

Q. What was your conclusion there?

MS. DAVIS: Could you be more specific?

Q. Let me see. Page 5 in your prefiled testimony. I just want to talk about question and answer 12.

MS. DAVIS: Okay?

Q. So you were asked, as far as the area in the vicinity of the Low corridor and the west Skull Valley alternative -- oh, before I go on, do you understand the distinction that I've been making

between the two --

MS. DAVIS: Yes, I do?

Q. "Do you agree with BLM's characterizations", and then you say, "Yes, it's consistent with what I've observed in my visits to the area."

So you're essentially talking about the area of the two rail lines?

MS. DAVIS: Correct?

Q. Are you talking about anything else?

MS. DAVIS: My personal experience, it extends probably within three quarters of a mile to a mile of the Low alternative and west Skull Valley, the Skull Valley alternative.

MR. SILBERG: For clarification, when you say three quarters of a mile, in which direction is that?

MS. DAVIS: West, up into the North Cedar Mountain area.

MR. SILBERG: Thank you.

Q. (By Ms. Walker) Okay. Is that from the -- so three quarters of a mile higher in elevation than the Low --

MS. DAVIS: Linear distance?

Q. Linear. That didn't make any sense,

sorry. Three quarters of a mile linear but up slope from the corridor or from the road?

MS. DAVIS: From the corridor?

Q. Okay. And what did you do to gain this experience?

MS. DAVIS: I've visited the area numerous times?

Q. So you were hiking around?

MS. DAVIS: Hiking and also driving along the existing trails?

Q. Okay. On the next page, you say the BLM -- whoops, let me give you more context. It's the top of the page, but it's still question 13. You say, "The BLM also references numerous quarries."

Did you see those quarries?

MS. DAVIS: No, I did not?

Q. Did you see sheep?

MS. DAVIS: No, I did not?

Q. My take on your testimony is that once -- well, let's take the Low corridor, so the Low rail. Once that's built, the impact to wildlife shouldn't be that great?

MS. DAVIS: Correct?

Q. So can you sort of explain the kind of wildlife in the area and how they'll deal with the

rail line?

MS. DAVIS: Sure. The main big game species that you could expect to be in the area would be mule deer, occasionally prong horn antelope. They don't really have any set migration patterns that would be blocked off. The Low corridor itself is -- will be built primarily to go along with the existing grade so it won't have as many, you know, large obstacles that would prohibit them or sort of steer them off from crossing the rail corridor. Additionally, from an operation impact point of view, the -- which I believe is what you're asking me about is operations impact. The frequency of use of the rail corridor would be approximately one, two times a week, a train would go down, which is actually, you know, far less frequent than the current use by off-road vehicles -- not necessarily off-road, but, you know, using the existing jeep trails, the recreational vehicles. So it's not likely to have any major impact on their activities.

In terms of birds, there's a number of species that use the area, including raptors and other birds. And I wouldn't expect it to really have any impact on them, the rail corridor, again

because it wouldn't have much of an operation impact from a noise perspective, it's infrequent. And there's certainly existing conditions in that area which would be similar to that type of impact. So -- and they've acclimated to them, so I would expect acclimation, as well.

Q. So if I were to -- what about rodents and whatnot?

MS. DAVIS: Again, the Low corridor, the proposed Low corridor has -- the grade changes are minimal, and I don't see how that would necessarily prohibit any rodents from crossing back and forth?

Q. So if I go to the area, I could expect to see deer, antelope?

MS. DAVIS: To be honest with you, it's -- there aren't -- the population numbers are not large, so if you go there, you may or you may not. I haven't seen that many -- I've been to the area probably seven to 10 times. I've seen a couple of mule deer in all those times. In that particular area, I've not seen prong horn antelope. They tend to stay a little more south of the valley?

Q. Did you hike up to the higher elevations to see if they were up there?

MS. DAVIS: No, I did not.

MR. SILBERG: Excuse me, by the higher elevations, you mean beyond this three quarters of a mile from the alignment?

MS. WALKER: Yeah.

Q. (By Ms. Walker) Did you see any wild horses?

MS. DAVIS: Not in this area?

Q. Do you know that the North Cedar Mountains is considered critical deer habitat?

MS. DAVIS: Yes, I do?

Q. What does that mean?

MS. DAVIS: It provides critical mule deer wintering habitat up in the mountains and extending somewhat down to the foothills, but that does not extend to the area where the Low corridor is?

Q. Okay. And where's this wildlife going to get -- well, I should talk larger, so I hate to say this, but game species. Where do they get their water?

MS. DAVIS: There are some springs up in the mountain areas. I know there's a wildlife guzzler that the BLM maintains within the North Cedar Mountain area?

Q. Did you visit that?

MS. DAVIS: No, I did not?

Q. Okay. Is there water available in the valley?

MS. DAVIS: Yes, there is. They most likely get some of their water from there, as well?

Q. All right. So when -- your understanding of the rail lines come from looking at drawings?

MS. DAVIS: Could you be more specific by understanding?

Q. Well, when you make conclusions regarding the impacts of the rail lines -- and I'm talking about both of them now, on wildlife, how do you do that? How do you know what the rail line is going to be like? Do you look at the drawings?

MS. DAVIS: Do you mean in terms of the design?

Q. Yeah.

MS. DAVIS: Yes?

Q. Okay. So you're using essentially the same information that we have?

MS. DAVIS: Yes?

Q. Did you, you know, relate the drawings to what's going on on the ground, so you stood

somewhere and said, oh, here's where something happens?

MS. DAVIS: In a general sense, yes?

Q. So, for example -- and I should be more clear. Where there are 20-foot embankments, did you know where on the ground -- you did GPS or something, so you knew where on the ground that was going to occur?

MS. DAVIS: In regards to which corridor?

Q. Oh --

MS. DAVIS: Or which route?

Q. Well, they both have 20-foot embankments, but let's say the West Valley alternative?

MS. DAVIS: Yes?

Q. So you know -- you knew where in the ground -- where on the ground that 20-foot embankment would occur?

MS. DAVIS: Yes. I mean within a little bit of margin, but yes?

Q. Okay. And when you say there's no sort of specific seasonal migration -- I better get the term right. Hang on. I would hate to put words into your mouth. Okay. This is in the FEIS at

5-16.

MS. DAVIS: Yes?

Q. Okay. The section on wildlife, second paragraph, you say, "also because there's no clearly defined migration or seasonal use pattern for wildlife in the Skull Valley."

How do you know that?

MS. DAVIS: I did not write the FEIS. You would have to direct that to Staff?

Q. Okay. They don't have a biologist here.

JUDGE FARRAR: Ms. Walker, you can ask her if she shares that view.

Q. (By Ms. Walker) Do you share that view?

MS. DAVIS: The time I've spent out there and the research I've done on the area, does not show that there's any set migration pattern, that there is mule deer wintering habitat in the mountains. They do come down into the valley. However, there's no -- there's no bottleneck, so to speak, or whatever that would cause them to go in one particular area, one particular route. And so yes, I would agree with that?

Q. Yeah. Did you see any game trails?

MS. DAVIS: Mostly out there, you see

livestock trails. I would imagine the game probably might use some of the same ones?

Q. Okay. So in -- on Pages 7 to 8 in your prefiled, when you're quoting from the FEIS here, does that mean you agree with it?

MS. DAVIS: Where on Page 7, I'm sorry?

Q. Yeah. It's the bottom of 7 -- so it's Answer 17.

MS. DAVIS: Answer 17?

Q. Right. But most of it's on 8, Page 8. You know, you say, see FEIS here and there. Does that mean you agree with that?

MS. DAVIS: Yes?

Q. Okay. So what do you know about fire fighting? Like how does it work? There's a fire, what happens?

MS. DAVIS: My understanding of fire fighting in terms of the wildfire situation out there extends to the fact that I know that they need to have access to the different areas of the valley in order to --

Q. Oh, I'm sorry. I didn't mean to interrupt you.

MS. DAVIS: I was done?

Q. Well, you know, do the fire fighters, do

they drive or do they walk, do they use helicopters?

MS. DAVIS: I'm really not specifically knowledgeable about the different methods?

Q. And then just a bit above that, the railroad bed -- now, let's -- we better figure out which one we're talking about here. I think you're talking about West Valley. Why don't you check.

MS. DAVIS: I agree, West Valley?

Q. Okay, good. So the West Valley alignment railroad bed will create a greater visual impact. So this is a couple of lines down -- did you find it? Sorry. Especially with -- especially when viewed from lower elevations to the east. How did you come up with that analysis there?

MS. DAVIS: I've been in the valley and I've viewed the area from different perspectives around and it's from the -- sort of envisioning what, you know, a 14 to 20-foot high fill with railroad would look like in that area?

Q. So when you say from the east, you'd be looking at it maybe from the mud flats section?

MS. DAVIS: It could be. I've viewed that area from, you know, east in terms of Skull Valley Road, I've viewed that in terms of from a

higher elevation in the mountains. I've viewed it from, you know, viewing southwest from the I-80 Dello area, and also to some extent from the mud flat area, though not from the center of the valley?

Q. So if you were at Skull Valley Road, you could look west and visualize, oh, what is that, about -- it's pretty far away. You could visualize the Low rail corridor, and you could visualize the West Valley corridor and you would know kind of where in the hill they were and how high they would be and you could compare that?

MS. DAVIS: Well, the Low valley corridor follows the existing grade more. So it sort of will undulate. It will -- I use the word undulate because we're talking too closely, it's a problem. But it will sort of go along the grade more closely, which would make it, especially from a distance like that, you know, not as noticeable. So when you have the area that where it starts to get lower in elevation, and then in the middle of that, you put a 20 to 14-foot embankment, it's visible. I would consider it to be visible?

Q. Well, you're basing this on sort of -- on standing there visualizing and thinking about

it?

MS. DAVIS: Yes?

Q. Did you climb up, you know, on the North Cedars themselves and visualize from there?

MS. DAVIS: How far?

Q. Farther -- I mean I know your answer, I don't want to sound like I'm trying to make you say stuff. But farther than three quarters of a mile, for example?

MS. DAVIS: No, I haven't?

Q. I'm not trying to be mean.

Have you visited the central -- or I'm sorry, the Cedar Mountains WSA?

MS. DAVIS: No, I have not?

Q. Have you visited any --

JUDGE FARRAR: Ms. Walker, could you say what WSA means?

MS. WALKER: Wilderness study area. It's a legal designation.

Q. (By Ms. Walker) Have you visited any WSAs in Utah?

MS. DAVIS: No, I have not?

Q. Any wilderness areas in Utah?

MS. DAVIS: I have been on the outskirts of the -- I believe it's called the Deseree Peak

Wilderness area, which is in the Stansbury Mountains?

Q. Which outskirt?

MS. DAVIS: I believe the southern end?

Q. Southern end, okay.

So what do you know about wild horses?

MS. DAVIS: In terms of the herd that's in the Cedar Mountains?

Q. Well, I mean what they eat, what they do, their behavior, that kind of thing?

MS. DAVIS: I know that the herd that's in the Cedar Mountains mainly stays in that area, and that's the objective is to generally keep them down there. They're likely to occasionally go into the valley to -- for feeding, such things like that.

MR. SILBERG: Excuse me, just for clarification, when you say in the Cedar Mountains --

MS. DAVIS: I'm sorry. I can't recall the name of the herd, the West Valley herd. I'm not sure. I don't recall the name of it.

MR. SILBERG: But you're referring to the Southern Cedar Mountains WSA?

MS. DAVIS: Yeah, down in that area.

MS. WALKER: There is -- I'm sorry, Jay, but I don't think it's called the Southern Mountains WSA. It's the Cedar Mountains.

MR. SILBERG: Okay. But it's the WSA rather than just the Cedar Mountains generally?

MS. WALKER: Right.

MR. SILBERG: Okay.

Q. (By Ms. Walker) So are you saying that the herd only stays in the WSA?

MS. DAVIS: I said it's primarily in the more southern area of the Cedar Mountains. The WSA is obviously a boundary place now. Not major. But that's what they tend to?

Q. And how do you know that?

MS. DAVIS: BLM documents that I've read?

Q. Did you examine the entire rail corridor?

MS. DAVIS: Yes, I did?

Q. All the way to the facility?

MS. DAVIS: Yes, I did?

Q. So -- and at the time, you were looking at drawings and visualizing how high the embankments were and whatnot?

MS. DAVIS: I don't believe that I spent

a lot of time enough for the entire corridor, no. I've been along the entire corridor numerous times with different objectives each time?

MR. SILBERG: We didn't know whether we were waiting for the Board or for counsel.

JUDGE FARRAR: No, if we don't say hold it, we're listening and conferring while we wait for the next question.

MS. WALKER: Okay.

Q. (By Ms. Walker) Ms. Davis, back to Page 7 in your prefiled, where you cite 5.4.1.2 in the FEIS, I think we were there already, which is on Page 5-16. So by citing -- whoops, sorry.

MR. SILBERG: Is there a question pending?

Q. (By Ms. Walker) Yeah, are you there, I'm sorry?

MS. DAVIS: Yes, I am?

Q. So we have the second full paragraph. And just tell me if you agree with this. The last sentence in that, "The physical presence of the railroad may help to keep the pharaoh horses up on the mountain within the herd area. So there might be a slight beneficial impact to horses from the proposed project."

Do you agree with that?

MS. DAVIS: I agree with it. However, I don't think that it's a necessary -- which is not what the FEIS is saying. I agree with the understanding that it wouldn't be prohibitive of the horses crossing the railroad?

Q. Oh, I didn't follow you. Can you try again.

MS. DAVIS: I do agree with the statement. I would add that I don't feel that it would be prohibitive of the pharaoh horses coming down into the valley or crossing the railroad?

Q. So you're saying at the same time that they may -- that the railroad may keep the horses up there, it won't keep them up there?

MR. SILBERG: Excuse me, I don't think the FEIS says it will keep them up there. I think it says it may help keep them there.

MS. DAVIS: Exactly. That's my point. It may help to keep them up there. However, I don't feel that it would be prohibitive in terms of it wouldn't exclude them from the possibility of crossing the railroad.

Q. (By Ms. Walker) Okay. So what about the rail line would help keep them up there?

MS. DAVIS: The physical presence and acting as a minor -- I can't think of the word. I'm drawing a blank on the word I want to use. But acting as a minor deterrence, the actual existence of the railroad and the limited amount of use that it gets?

Q. So is there something about horses, wild horses that is different than deer in this regard?

MS. DAVIS: I can speak to the deer a little better than the horses in this case to say that they generally are able to adapt. They're not particularly skittish, and I feel like something like the rail corridor as it is close to grade, would not prohibit them from crossing it. Whether or not the horses are more skittish, many species of different levels of what they are willing to accept in terms of, you know, an activity before it would change their behavior. Deer are fairly accepting?

Q. How about antelope?

MS. DAVIS: I'm not sure the exact level of skittishness of antelope?

Q. I love that word. It's a perfect word, skittish. Okay.

JUDGE FARRAR: Ms. Walker, if you could

hold on, we need to change the tape?

MS. WALKER: I was just going to say I'm done with these witnesses.

JUDGE FARRAR: All right. Thank you. Does the Staff have examination of them?

MR. WEISMAN: I just have a line of questions I'd like to pursue with Mr. Hayes.

CROSS EXAMINATION

BY MR. WEISMAN:

Q. I understood you to say, Mr. Hayes, that with reference to -- let me pull up the exhibit. Hold on one second.

JUDGE FARRAR: Mr. Weisman, while you're looking for that, let me ask a quick question.

Ms. Davis, you mentioned critical habitat for the mule deer. I take it for the record, that means critical for those mule deer that happen to be there, not -- you don't mean critical in terms of preservation of the species?

MS. DAVIS: The BLM and Utah Division of Wildlife Resources doesn't need certain areas to be critical wildlife habitat. There's different kinds. In this case, this is the species -- I'm sorry, the area has been designated critical mule

deer wintering habitat, certainly to the local populations. But I mean if you want to expand it, it would have an impact on the overall. I mean it gets smaller as you branch out. Because there's certainly a lot of other critical mule deer wintering habitat in the State of Utah and even this area.

JUDGE FARRAR: Okay, thank you. Go ahead, Mr. Weisman.

Q. (By Mr. Weisman) We're referring to Applicant's Exhibit BB, sheet three of four. And I understood your response to one of Ms. Walker's questions that the West Valley alternative would tie back into the proposed low corridor rail line at approximately -- I think it was around 80 or -- I'm not sure exactly the right number to say. 800 -- I want to just make sure that that is the correct location.

MR. HAYES: If you use the table one that's in my testimony, it says it's a 447. Excuse me, 477 plus zero zero.

JUDGE FARRAR: You have to repeat what you said.

MR. HAYES: It appears that what I had stated that 800 plus zero zero is not the correct

number, but referencing table one that's in my testimony, the tieback would be somewhere around Station 477 plus zero zero.

Q. (By Mr. Weisman) That doesn't appear to -- I just want to make sure I know where this is on Figure 3.2-2, that sheet three of four. Where would that be? Is it not on that figure?

MR. HAYES: No?

Q. So would that show back up on sheet two of four?

MR. HAYES: It would show on two of four.

MR. WEISMAN: Okay. Thank you very much. That is what I wanted to explore.

JUDGE FARRAR: That's all you have Mr. Weisman?

MR. WEISMAN: Yes, that's all I have.

JUDGE FARRAR: Any redirect, Mr. Silberg?

MR. SILBERG: Yeah, I just have a very few.

REDIRECT EXAMINATION

BY MR. SILBERG:

Q. Mr. Hayes, could you explain to the

Board, the basis for choosing the one and a half percent grade as the design limit for the Low rail corridor and for the West Valley alternative?

MR. HAYES: The one and a half percent grade is based on an optimizing of tractive effort and horsepower. You don't want to attempt to oversize your locomotives just strictly to be able to pull the grades. And the one and a half percent limit is kind of a mean between what you would expect in designing railroads for Burlington Northern and Union Pacific. If they were -- if you were a subcontractor to either one of those firms, your grade limitation would probably be less than the one and a half percent. And we were a little more liberal because of the total weight of the -- that the train could conceivably be carried.

Q. Ms. Davis, I think I heard you say that the critical mule deer habitat that's been identified in the Cedar Mountains does not include the area that would be crossed by the Low rail corridor; is that correct?

MS. DAVIS: That's correct.

Q. Is there a figure in the FEIS that shows that?

MS. DAVIS: Yes, it does.

Q. Do you have that handy?

MS. DAVIS: I will find it for you.

Q. While you're looking for that, let me ask one question for Mr. Hayes. Based on the answer that you gave Mr. Weisman, the 20-foot fill that we identified, I think it was at location 52000, would be in the corridor regardless of whether or not it included the West Valley alternative; is that correct?

MR. HAYES: That's correct.

Q. Did you find that reference?

MS. DAVIS: Yes, I did. It's on Page 3-27 of the FEIS.

Q. And as I read that, the designation of critical mule deer habitat excludes or -- does not include any of the area affected by the rail corridor?

MS. DAVIS: That's correct.

Q. And that habitat determination was made by whom? Is that a BLM determination?

MS. DAVIS: This -- this particular situation, I believe was identified Utah Division of Wildlife Resources.

Q. All right, thank you.

And the last question, Mr. Donnell, in

terms of fire fighter access across the rail corridor, could you tell me how that might be accomplished if that were necessary?

MR. DONNELL: Yes, Private Fuel Storage has already had a number of meetings with BLM to consult specifically for their needs with regard to crossing the rail alignment. The obvious choices are to use existing two track jeep trail crossings that are already out there. But the BLM, in my last consultation with them, also identified some other areas where they would like PFS to add crossings at the southern end of the valley near the reservation for the purpose of fire fighting. So there's an active dialogue that has occurred and will continue to occur for the purpose of providing that access to fire fighters.

MR. SILBERG: Thank you. I have no further questions.

JUDGE FARRAR: Any recross, Ms. Walker?

MS. WALKER: Yeah.

RECROSS EXAMINATION

BY MS. WALKER:

Q. Just -- just to be totally clear, Mr. Hayes, so the place where the West Valley

alternative comes back and joins the Low corridor is on figure -- on sheet two of four; is that right?

MR. HAYES: That's correct.

Q. And then, Ms. Davis, you said that the critical deer habitat, so I'm looking at that figure that you pointed out, doesn't -- so the rail corridor pictured in that picture is the Low corridor?

MS. DAVIS: I believe so.

Q. I'm sorry.

MS. DAVIS: I believe so.

Q. Yeah, and it doesn't cross critical deer habitat?

MS. DAVIS: Correct.

Q. But it comes quite close?

MS. DAVIS: I think you have to look at the scale of the map and realize that it's -- while it might appear to be quite close in terms of the two lines as it relates to the reality, is probably a third distance. It's a very -- this one figure shows the entire route.

Q. So how does the critical deer habitat correspond to the Utah Wilderness Coalition proposed unit?

MS. DAVIS: I don't know.

Q. You don't know the boundaries of the --

MS. DAVIS: The Utah Wilderness -- oh, I'm sorry, the North Cedar Mountain area?

Q. Yeah.

MS. DAVIS: I'm sorry, I don't figure on those terms. Could you repeat your question, then.

Q. How does the critical deer habitat overlap on the North Cedar Mountains area that the Utah Wilderness Coalition has defined as possessing wilderness character?

MS. DAVIS: Within the North Cedar Mountain area, there is a fair amount of critical mule deer wintering habitat, but not in the portion of the low corridor.

Q. And when you replied to Mr. Silberg, you said -- -- did you say that the rail line wouldn't impact the critical habitat, or that it wouldn't cross the critical habitat?

MS. DAVIS: I don't recall what the specific --

MR. SILBERG: I think the record will say what it says.

Q. (By Ms. Walker) Okay. I'm asking you again. Cross or impact or both, or neither?

MS. DAVIS: It wouldn't cross or impact.

Q. Okay. Since we were talking about fire fighters, my understanding of mitigation measures is that there's going to be crossings over and underneath the rail line for wildlife. Can fire fighters use those, too?

MR. SILBERG: I'm sorry, did you say crossings underneath the rail line?

MS. WALKER: Yeah.

MR. DONNELL: Specific to what you just said, there are no crossings that go underneath the rail alignment. In answering your direct question about the crossing over, yes, the crossings that we have provided in the engineering package would allow vehicles, off-road vehicles or pickup trucks that traverse the jeep trails out there to easily cross the rail alignment. Those same crossings would be available for fire fighters. And as I just said a little while ago, I have been in consultation with BLM to identify from their perspective whether or not the existing crossings that would be put into service existing jeep trails would be sufficient or were there areas that they wanted more crossings or are there areas where the BLM would prefer there be no crossing provided. In

other words, to cut off an area. And those consultations are ongoing.

Q. (By Ms. Walker) So there are no crossings underneath the rail line?

MR. DONNELL: That is correct. There are culverts, but there are no crossings.

Q. Could you turn to Page 5-23 in the FEIS, please.

MR. DONNELL: All right. I'm on 5-23.

Q. The second paragraph. Does that mean you disagree with that paragraph?

MR. DONNELL: In principle, no, it says over or under the rail line, and it's a recommendation.

Q. Recommendation to whom?

MR. DONNELL: A recommendation to PFS on the perspective of providing wildlife crossings. But it says over or under. We have provided over.

Q. Oh. So the decision has been made, then?

MR. DONNELL: The design has been completed to the point that I have consulted with BLM about crossings on fire, and those crossings or the extent of the rail alignment as we talked yesterday, the rail alignment in a number of areas,

even adjacent to the Northern Cedar wilderness area is near grade. So there's no impediment out there directly from a railroad alignment or the road bed that would necessarily inhibit or prohibit, for that matter, wildlife from crossing the alignment.

Q. Okay. So let me get this straight. So there's a recommendation in here, the answer to which has already occurred?

MR. DONNELL: I'm not understanding your question.

Q. All right. So this paragraph is a recommendation to PFS as to how to accommodate wildlife?

MR. DONNELL: Uh-huh. Yes.

Q. And you've already figured that out?

MR. DONNELL: Yes, I guess you could look at it that way. There was a draft Environmental Impact Statement previously. I don't know if these exact words were in that, but PFS did read the draft Environmental Impact Statement and considered many things that were in there and how it related to the detailed design.

Q. So this makes it seem like under is an option, but it's not an option anymore?

MR. DONNELL: I know of no reason to

open or reopen the design up unless new information comes forth that says that we were somehow impacting wildlife. This statement here is identifying an option to help minimize impacts of going either over or under. We have gone over.

Q. Did you consider going underneath the West Valley alternative for fire fighters and wildlife?

MR. DONNELL: The West Valley alternative is not an engineered solution. That was a demonstration. The Low alignment is an engineered solution.

Q. Okay. Got it. Thank you.

MR. DONNELL: Uh-huh.

JUDGE LAM: Mr. Donnell, Ms. Davis and Mr. Hayes, I'd like to hear from you collectively how much effort have you spent in analyzing the alternatives in terms of man-hours?

MR. SILBERG: I'm sorry, Dr. Lam, did you say the alternative or the alternatives.

JUDGE LAM: The alternatives. There are three of them, right?

MR. DONNELL: Let me field the question. There were a number of studies performed. I can't give you off the top of my head a number of

man-hours, but there was a significant transportation study that was performed in late '97 into '98 that reviewed the valley in terms of a more global look at transportation from the main line Union Pacific Railroad to the PFS site on the reservation. That included a number of intermobile options and a number of direct rail options. And to do that study, there were field teams that came out, some of them that were more specific to the issues of how to build an alignment to get the engineering considerations put together. Then there were follow-ups, as we began to narrow down in terms of what alternatives offered reasonable and practical approaches of getting the corridor or using the existing Skull Valley corridor. And to complement that, there were then the plant and animal studies, threatening an endangered species, a number of those studies have been performed. So there's been a large amount of effort certainly in many hundreds of man-hours in terms of evaluating and obtaining information to understand the implications of a particular corridor.

In our particular application, that effort identified, and which is residing in the application now, the choice of the Low corridor as

the preferred route and direct rail as the preferred mode of transportation, but the application still carries within it, an alternate route, which is Skull Valley Road and an alternate mode of transportation which is heavy haul. And that heavy haul option is a continuation of the initial application as it was submitted to the NRC back in '97. That was refined a little bit on the basis of some of the study information that we performed in late '97, early '98, in terms of moving to a slightly different location for the MOA transfer point, about 1.8 miles west. So I think that sums up pretty well what was done by the project over the years.

JUDGE LAM: So there has been a substantial amount of effort?

MR. DONNELL: Yes.

MR. SILBERG: Dr. Lam, excuse me, that transportation study that Mr. Donnell referenced is Exhibit HH in the testimony.

JUDGE LAM: Okay. Now, in your prefiled testimony, I had the impression that at the conclusion you would like to have made, is that the three alternatives that you have studied within the context of this contention are inferior to the

proposed alignment; is that correct?

MR. DONNELL: The proposed alignment that we have, the Low corridor, we believe is the best choice. The screening that I mentioned in that Tab HH study, looked at, I think it was six heavy haul and five direct rail. That has been somewhat summarized now to be the east valley alternatives to reduce down the number of options. But we actually looked at 11 different options; one of which was the Low corridor. There was also a heavy haul option that was on the west side of the valley following the same general corridor.

JUDGE LAM: So the question then is, have you seen a superior alternative to the proposal?

MR. DONNELL: To the Low corridor?

JUDGE LAM: Yes.

MR. DONNELL: No. The impacts of the Low corridor from our investigations offer the least impact to the Skull Valley. The other alternatives, in generalizing here, had other circumstances that caused more impacts. As an example, in Skull Valley Road, there were adjacent wetlands, there's traffic that's existing on Skull Valley Road, so whether or not you were actually

heavy hauling down the road or putting in a rail corridor adjacent to the highway, there would still be impacts on traffic, and there were ranch houses and other houses along the corridor that would be impacted again. Whereas on the Low corridor, there are none of those type impacts.

JUDGE LAM: So what you're saying is you have looked and you have not found anything better?

MR. DONNELL: That's right.

JUDGE LAM: Okay. Thank you.

JUDGE FARRAR: Does the Staff have any questions prompted by Ms. Walker's cross, recross or Judge Lam's questions?

MR. WEISMAN: The Staff has no further questions.

JUDGE FARRAR: Mr. Silberg?

MR. SILBERG: We have none, Your Honor.

JUDGE FARRAR: Ms. Walker?

MS. WALKER: No, thanks.

JUDGE FARRAR: Okay. That concludes, then, this panel's testimony. We thank you for coming here. And we'll move onto the next Staff's panel of witnesses. Why don't we get them sworn in and then we'll see where we stand in terms of time and breaks.

Go ahead, Mr. Weisman.

MR. WEISMAN: Okay. Do we need to swear in the witnesses?

JUDGE FARRAR: These are the people you want sworn? Would you stand and raise your right hands, please.

KENNETH McFARLAND, GREGORY ZIMMERMAN, ALICE STEPHENSON, AND BRITTA LAUB,

called as witnesses, for and on behalf of the Staff, being first duly sworn, were examined and testified as follows:

DIRECT EXAMINATION

BY MR. WEISMAN:

Q. Did you prepare written testimony for filing in this proceeding.

MR. McFARLAND: Yes.

MR. ZIMMERMAN: Yes.

MS. STEPHENSON: Yes.

MS. LAUB: Yes.

Q. Please -- I'm not sure that we -- please state your names so the court reporter can identify who you are on the record.

MR. McFARLAND: My name is Kenneth McFarland.

MR. ZIMMERMAN: I'm Gregory Zimmerman.

MS. STEPHENSON: My name is Alice Stephenson.

MS. LAUB: My name is Britta Laub.

Q. Do you recognize the document that I've placed before you?

MR. McFARLAND: Yes, I do.

MR. ZIMMERMAN: Yes.

MS. STEPHENSON: Yes.

MS. LAUB: Yes.

Q. Please identify it.

MR. McFARLAND: It's my prefiled testimony.

MR. ZIMMERMAN: This represents my prefiled testimony.

MS. STEPHENSON: This represents my prefiled testimony.

MS. LAUB: This represents my prefiled testimony.

Q. Have you prepared a statement of professional qualifications?

MR. McFARLAND: Yes, I have.

MR. ZIMMERMAN: Yes, I have, and I

believe it has been attached hereto.

MS. STEPHENSON: Yes, I did.

MS. LAUB: Yes, I have.

Q. And as Mr. Zimmerman has indicated, his is attached. Are your professional qualifications attached to your testimony?

MR. McFARLAND: I don't see it.

MR. ZIMMERMAN: Mr. Zimmerman's does not appear to be here.

MR. WEISMAN: Okay. We will make copies of the professional qualifications and attach them to the testimony. I'm sorry, I thought we had done that. But we left them off. We'll bring those in after lunch.

JUDGE FARRAR: That will be fine. We can include them later.

Q. (By Mr. Weisman) Do you have any corrections, revisions, additions or deletions that you wish to make at this time to your prefiled testimony?

MR. McFARLAND: No, I don't.

MR. ZIMMERMAN: No, I do not.

MS. STEPHENSON: I have no additional corrections.

MR. WEISMAN: I'll note that the Staff

filed an errata on April 18th and we have marked those in by hand, by pen and ink on the copies of testimony.

JUDGE FARRAR: Fine.

Q. (By Mr. Weisman) With the corrections, revisions, additions and deletions noted in pen and ink, is your written testimony true and correct to the best of your information, knowledge and belief?

MR. McFARLAND: Yes, it is.

MR. ZIMMERMAN: Yes.

MS. STEPHENSON: Yes, it is.

MS. LAUB: Yes, it is.

Q. Do you adopt your written testimony as now revised as your sworn testimony in this proceeding?

MR. McFARLAND: Yes.

MR. ZIMMERMAN: Yes, I do.

MS. STEPHENSON: Yes.

MS. LAUB: Yes.

JUDGE FARRAR: The Staff requests that the testimony be admitted into evidence and bound into the record.

MR. SILBERG: No objection.

MS. WALKER: No objection.

JUDGE FARRAR: All right, then the

testimony will be bound into the record at this point as if read.

(PREFILED TESTIMONY OF KENNETH MCFARLAND, GREGORY ZIMIMERMAN, ALICE STEPHENSON, AND BRITTA LAUB FOLLOWS.)

March 18, 2002

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE, L.L.C.	)	Docket No. 72-22-ISFSI
	)	
(Independent Spent Fuel Storage Installation)	)	

NRC STAFF TESTIMONY OF
BRITTA N. LAUB, KENNETH E. McFARLAND, ALICE B. STEPHENSON, AND
GREGORY P. ZIMMERMAN CONCERNING CONTENTION SUWA B
(RAIL LINE ALIGNMENT ALTERNATIVES)

Q1. Please state your names, occupations, and by whom you are employed.

A1(a). My name is Britta N. Laub ("BNL"). I am employed as a Outdoor Recreation Planner for the Department of the Interior ("DOI"), Bureau of Land Management ("BLM"), Salt Lake Field Office ("SLFO"). I am providing this testimony under an agreement between the NRC Staff ("Staff") and the BLM, SLFO. A statement of my professional qualifications is attached hereto.

A1(b). My name is Kenneth E. McFarland. ("KEM"). I am employed as a principal engineer with Washington Infrastructure Services, Inc. ("WIS") in San Ramon, California. I am providing this testimony under an agreement between the NRC Staff and the U.S. Surface Transportation Board ("STB"), and a third party contractor agreement between the STB and WIS. A statement of my professional qualifications is attached hereto.

A1(c). My name is Alice B. Stephenson ("ABS"). I am employed as an Environmental Specialist for the Department of the Interior ("DOI"), Bureau of Land Management ("BLM"), Salt Lake Field Office ("SLFO"). I am providing this testimony under an agreement between the NRC Staff and the BLM, SLFO. A statement of my professional qualifications is attached hereto.

A1(d). My name is Gregory P. Zimmerman ("GPZ"). I am employed as Leader of the Environmental Impact Analysis Group, in the Environmental Sciences Division, at the Oak Ridge National Laboratory ("ORNL"), in Oak Ridge, Tennessee. I am employed by the University of Tennessee - Battelle Memorial Institute ("UT-Battelle"), which manages and operates the ORNL facilities for the U.S. Department of Energy. I am providing this testimony under a technical assistance contract between the NRC Staff and ORNL. A statement of my professional qualifications is attached hereto.

Q2. Please describe your current responsibilities.

A2(a). (BNL) I serve as the lead Outdoor Recreation Planner for the SLFO. I am the team lead for the management and development of two special recreation management areas. I am also responsible for processing applications for special recreation permits. This includes application review, completion of National Environmental Policy Act ("NEPA") requirements, preparation of records of decision, permit issuance, monitoring, bonding and post use reporting. I provide analyses of impacts resulting from recreation and off-highway vehicle use; information regarding visual resource management and wilderness characteristics; information concerning requirements and mitigation measures for incorporation into field office NEPA documents; and determinations of NEPA adequacy, as needed, in support of recreation and wilderness program projects. As part of my responsibilities, I am currently serving as the BLM representative for recreation, visual, and wilderness resource programs for the proposed rail line facilities in Skull Valley, Utah, associated with the Independent Spent Fuel Storage Installation ("ISFSI") proposed by Private Fuel Storage, L.L.C. ("PFS" or "Applicant") to be constructed and operated on the Reservation of the Skull Valley Band of Goshute Indians, located in Skull Valley, Utah ("the proposed PFS Facility").

A2(b). (KEM) I serve as the Principal Engineer for all heavy and light rail projects out of the San Ramon, California office for Washington Infrastructure Services, Inc. As part of my responsibilities, I am currently serving as the principal engineer on behalf of the STB for evaluating

engineering issues for the proposed rail line facilities in Skull Valley, Utah, associated with the proposed PFS Facility.

A2(c). (ABS) I am responsible for coordination and implementation of National Environmental Policy Act ("NEPA") reviews, involving preparation and/or review of environmental assessments and environmental impact statements, and providing policy and program direction for implementation of existing office land use plans. I provide guidance on the NEPA process, including document preparation, and content requirements. I provide analytical and technical review of all environmental assessments and environmental impact statements. I also maintain current land use plans and assure that all proposed projects, both BLM and third party, are within the scope of the current plan. I monitor all steps for completing land use plan amendments. I provide guidance and expertise on all planning matters, including the relationship between NEPA and the Federal Land Policy Management Act ("FLPMA"). As part of my responsibilities, I am currently serving as the BLM Project Leader, Environmental Planning and Review, for the proposed rail line facilities in Skull Valley, Utah, associated with the proposed PFS Facility.

A2(d). (GPZ) As Group Leader, I supervise a group of twelve research staff members and additional administrative support personnel. My group conducts reviews of proposed Federal projects and evaluates the potential environmental impacts thereof. I am responsible for providing technical direction and supervision to the members of my group. As part of my responsibilities, I am currently serving as ORNL's project leader in providing assistance to the NRC staff in the environmental review of the proposed PFS Facility in Skull Valley, Utah, and its associated rail line facilities.

Q3. Please explain what your duties have been in connection with the NRC Staff's review of the PFS license application for the proposed PFS Facility?

A3(a). (BNL) As part of my official responsibilities, I assisted the NRC Staff in its evaluation of the potential environmental impacts related to the Applicant's proposed construction and operation of the transportation facilities, and alternatives to those facilities, associated with the proposed PFS Facility. Further, I assisted in the preparation of the Staff's "Final Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah," NUREG-1714, issued in December 2001 ("FEIS"). In addition, I assisted the NRC Staff in preparing the "NRC Staff's Response to Applicant's Motion for Summary Disposition of SUWA Contention B (Railroad Alignment Alternatives)," dated July 19, 2001, and the NRC Staff's responses to the January 29, 2002, discovery request from the Southern Utah Wilderness Alliance ("SUWA"), directed to the Staff. In particular, I assisted in evaluating the effects that PFS's proposed Low Corridor rail line might have on potential recreation, visual, and wilderness issues in the area through which it passes, as well as such issues with respect to rail line alternatives.

A3(b). (KEM) At the request of STB, I independently reviewed and verified the amount of cut and fill necessary to construct both the Applicant's proposed Low Corridor rail line and the "West Skull Valley Alternative" that has been developed by the Applicant in response to SUWA's contention (referred to herein and in the FEIS as the "west valley rail alternative"). In addition, I have reviewed the engineering issues associated with rail line alternatives originating north of Interstate 80 ("I-80"), and the quantities of excavation and embankment ("cut and fill") materials associated with a rail line alternative suggested by SUWA, that would lie approximately two miles to the east of the Applicant's proposed Low Corridor rail line.

A3(c). (ABS) As part of my official responsibilities, I assisted the NRC Staff in its evaluation of the potential environmental impacts related to the Applicant's proposed construction and operation of the transportation facilities, and alternatives to those facilities, associated with the

proposed PFS Facility in Skull Valley, Utah. Further, I assisted in the preparation of the Staff's "Draft Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Facility on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah," NUREG-1714, issued in June 2000 ("DEIS"), and the FEIS issued in December 2001. In addition, I assisted the NRC Staff in preparing the "NRC Staff's Response to Applicant's Motion for Summary Disposition of SUWA Contention B (Railroad Alignment Alternatives)," dated July 19, 2001, and the NRC Staff's responses to the January 29, 2002, discovery request from SUWA directed to the Staff. In particular, I assisted in evaluating the environmental effects that PFS's proposed Low Corridor rail line might have in the area through which it passes, as well as the environmental impacts of rail line alternatives.

A3(d). (GPZ) As part of my official responsibilities, I assisted the NRC Staff in its evaluation of the potential environmental impacts related to the Applicant's construction and operation of the proposed PFS Facility and its associated transportation facilities. Further, I assisted in the preparation of the Staff's DEIS, issued in June 2000, and the Staff's FEIS, issued in December 2001. In addition, I assisted the NRC Staff in preparing the "NRC Staff's Response to Applicant's Motion for Summary Disposition of SUWA Contention B (Railroad Alignment Alternatives)," dated July 19, 2001, and the NRC Staff's responses to the January 29, 2002, discovery request from SUWA directed to the Staff.

Q4. What is the purpose of this testimony?

A4. The purpose of this testimony is to provide the Staff's views concerning Contention SUWA B, regarding railroad alignment alternatives. In particular, the following issues are addressed herein: (a) unresolved problems regarding crossing I-80 for alternatives originating north of I-80 in Skull Valley; (b) impacts to wetlands, houses, ranches and traffic, and excavation impacts, of alternatives originating south of I-80 and east of the Stansbury Mountains; (c) impacts to a portion of the North Cedar Mountains resulting from the proposed Low Corridor rail line and

the west valley rail alternative; and (d) the amount of cut and fill necessary to construct the Low Corridor rail line and the west valley rail alternative.

Q5. Are you familiar with Contention SUWA B?

A5. Yes. Contention SUWA B, as admitted by the Licensing Board in LBP-99-3, states as follows:

> The License Application Amendment fails to develop and analyze a meaningful range of alternatives to the Low Corridor Rail Spur and the associated fire buffer zone that will preserve the wilderness character and the potential wilderness designation of a tract of roadless Bureau of Land Management (BLM) land — the North Cedar Mountains — which it crosses.

More specifically, the Licensing Board indicated that this contention was admitted insofar as "it seeks to explore the question of alignment alternatives to the proposed placement of the Applicant's proposed Low rail spur," and whether consideration should be given by PFS and the Staff to "alternative rail routes that might prove more environmentally benign than PFS's chosen route." *See Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-99-3, 49 NRC 40, 53, *aff'd*, CLI-99-10, 49 NRC 318, 327 (1999).

Q6. Did SUWA make any assertions regarding railroad alignment alternatives in its basis for SUWA Contention B?

A6. Yes. SUWA, in the contention's basis section (at 5), specifically asserted as follows:

> SUWA incorporates as a basis for this Contention, the basis stated for Contention A. As was demonstrated in Contention A, despite the wilderness character of the North Cedar Mountains and its potential designation as wilderness pursuant to the Wilderness Act of 1964, PFS has failed to adequately develop and analyze a meaningful range of alternatives to the Low Rail Spur and the associated fire buffer zone on this roadless [area] and the alignment of these proposed projects that will protect the wilderness character of the North Cedar Mountains and will preserve, for Congress, the opportunity to designate the area as wilderness pursuant to the Wilderness Act of 1964.

In an affidavit submitted in support of the proposed contention, SUWA also stated that:

> [a]n alternative alignment to the proposed rail spur that avoided the North Cedar Mountains roadless area, exhibit "2", and/or ran two miles to the east of the current alignment (avoiding sensitive wetlands, etc.) would have less impact on the wilderness character of the North Cedar Mountain roadless area is identified by exhibit "2" attached to SUWA's petition to intervene.

Q7. Subsequent to the filing of this contention, has the Staff issued its environmental evaluation of the proposed PFS Facility and its associated transportation facilities?

A7. (GPZ) Yes. Contention SUWA B was filed in November 1998. In June 2000, the Staff and three cooperating federal agencies (BLM, STB, and the Bureau of Indian Affairs ("BIA")) published their DEIS for the proposed PFS Facility and associated transportation facilities; and, in December 2001, the Staff and cooperating agencies published their FEIS for the proposed PFS Facility and associated transportation facilities.

Q8. Please describe the process in which the Staff considers alternatives to a proposed action under the National Environmental Policy Act ("NEPA")?

A8. (GPZ) The Commission's duties under NEPA are discussed in 10 C.F.R. Part 51. In accordance with those provisions, an applicant for an ISFSI under 10 C.F.R. Part 72 must file an environmental report. The Staff then conducts an environmental scoping process, after which it issues a draft EIS. The draft EIS includes a preliminary analysis that considers and weighs the environmental effects of the proposed action; the environmental impacts of alternatives to the proposed action; and alternatives available for reduction or avoiding adverse environmental effects. Following the receipt of comments on the draft EIS, the Staff issues a final EIS based on a review of information provided by the applicant, information provided by commentors on the draft EIS, and other information and analysis obtained by the Staff. The final EIS includes a response to comments received on the draft EIS, and may include a modification of alternatives and/or the development and evaluation of alternatives which were not previously given serious consideration.

Q9. Did the Staff follow this process, described in 10 C.F.R. Part 51, in connection with its evaluation of the proposed PFS Facility and its associated transportation facilities?

A9. (GPZ) Yes. This process was followed by the Staff in connection with the application for a license to construct and operate the proposed PFS Facility and its associated transportation facilities, resulting in publication of the DEIS and the FEIS, in June 2000 and December 2001, respectively.

Q10. In the DEIS and FEIS, did the Staff and cooperating agencies consider the issues raised by SUWA in Contention SUWA B?

A10. (GPZ) Yes. The issues raised by SUWA in this contention are addressed in Chapter 2 of the DEIS and FEIS. The DEIS discussed a range of alternatives to the proposed Low Corridor rail line, not including the west valley rail alternative (which was later discussed in the "Applicant's Motion for Summary Disposition of Contention SUWA B – Railroad Alignment Alternatives," dated June 29, 2001, and the Licensing Board's decision in *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-01-34, 54 NRC 293 (2001)). The FEIS addressed the west valley rail alternative, in addition to the alternatives considered in the DEIS.

Q11. Please describe Skull Valley and the existing transportation facilities in or near Skull Valley.

A11. (GPZ) Skull Valley is a topographical valley located approximately 50 miles west of Salt Lake City, Utah, and about 22 miles east of the Great Salt Lake Desert. As shown in Figure 1.1 of the FEIS, Skull Valley is bounded on the east by the Stansbury Mountains and on the west by the Cedar Mountains. The northern end of Skull Valley lies just south of the Great Salt Lake. The valley is generally about 10 miles wide (east-to-west), although the width varies at different latitudes, and is about 30 miles long (north-to-south).

The peaks in the Stansbury Mountains rise to an elevation of up to 11,000 feet (above mean sea level), while the peaks of the Cedar Mountains rise to elevations of approximately 7,700 feet.

The proposed project area within Skull Valley is shown in Figure 1.2 of the FEIS. The floor of Skull Valley at the location of the proposed PFS Facility is at an elevation of approximately 4,450 to 4,490 feet above mean sea level.

Existing transportation facilities in or near Skull Valley are limited to a single rail line and a few paved roadways. As shown in Figure 1.2 of the FEIS, Interstate 80, running in a generally east-west direction, lies at the northern end of Skull Valley, approximately 25 miles north of the proposed location of the proposed PFS Facility. The Union Pacific main rail line, also running in a generally east-west direction, similarly lies at the northern end of Skull Valley to the north of I-80, except where the rail line passes under (and south of) the interstate near the proposed Low (or Skunk Ridge) rail siding to the west of Skull Valley. In addition, a spur from the Union Pacific main line also passes under (and south) of I-80 in the valley to the east of the Stansbury Mountains.

A two-lane, paved road (identified as "Skull Valley Road" in Figure 1.2 of the FEIS) runs in a generally north-south direction in the eastern portion of the valley, passing approximately 2 miles east of the proposed PFS Facility. Approximately 10 miles southeast of the proposed PFS Facility, a two-lane, paved road enters Skull Valley from the east, crossing Johnson Pass in the Stansbury Mountains, near Terra, Utah, as shown in Figure 1.2 of the FEIS. The only other paved roadway access into Skull Valley enters the valley from the south, through Dugway, and connects with Skull Valley Road (as shown in Figure 1.2 of the FEIS). Other roads or trails in Skull Valley consist of unimproved roads and trails used by off-highway vehicles ("OHVs").

I. Description of Proposed Low Corridor Rail Line And Alternatives

Q12. Please describe the location of the proposed rail line.

A12. (GPZ) The proposed Low Corridor rail line would run approximately 32 miles from the Union Pacific main rail line in a generally southerly direction toward the proposed PFS Facility. The specific location of the proposed rail line is described in detail in Section 2.1.1.3 (pages 2-14

and 2-15) of the FEIS. The specific route and alignment is shown in Figure 1.2 (page 1-3) of the FEIS. The proposed rail line would originate just south of I-80 near Low, Utah, at the northern end of the Cedar Mountains. The proposed right-of-way for the new rail line generally follows the 4380-foot elevation (above mean sea level) topographical contour along the eastern foot of the Cedar Mountains, which lies on the western side of Skull Valley; thus, the proposed Low Corridor rail line would run along the western side of Skull Valley.

Q13. Please describe the proposed Low Corridor rail line. .

A13. (GPZ, ABS) The specific details of the proposed rail line are described in Section 2.1.1.3 (pages 2-14 and 2-15) of the FEIS, and are depicted in cross-section in Figure 2.5 (page 2-17) of the FEIS. As described in Section 2.1.1.3 (pages 2-14 and 2-15) of the FEIS, the right-of-way would be 200 feet wide, within which the rail bed (during operation of the rail line) would be 40 feet wide. This 40-foot width would contain a 17-foot wide area filled with ballast (*i.e.*, 2-inch maximum sized rock for use as base material for the cross-ties and rails).

As stated in Section 2.1.1.3 of the FEIS, the disturbed portion of the 200-foot right-of-way would be revegetated. Section 5.4.1.1 of the FEIS describes the revegetation plan, the type of plants being considered, and the high fire tolerance of such plants. Section 5.4.2.1 of the FEIS describes how the revegetated rail corridor would be required to follow BLM's fire management plan for Skull Valley. That same section of the FEIS also describes how the Applicant would be required to use herbicides to control noxious weeds and other non-native species within the rail corridor. In accordance with standard operating practices, the 17-foot wide ballast area would be expected to be kept completely clear of vegetation (thereby providing the core of a fire break region). Finally, Section 5.8.4 of the FEIS discusses the occurrence and potential for wildfires in Skull Valley, and describes the measures that would be taken (1) to allow the revegetated rail corridor to function as a green strip to prevent the spread of wildfires, and (2) to include rail crossings, as appropriate,

to minimize the potential for the elevated railbed to adversely impact any fire-fighting efforts in Skull Valley.

In this regard, it should be noted that Contention SUWA B uses the term "associated fire buffer" in conjunction with the Low Corridor rail line, although that term has not been used by the Applicant in its description of the proposed rail line. Rather, the proposed rail line incorporates certain fire-resistant elements, including a raised elevation, rock ballast, control of invasive, noxious weeds, and partial right-of-way revegetation with fire-resistant vegetation. In sum, construction of the rail line would include elements that may serve as a "fire buffer," consisting of the 17-foot wide area of rock ballast that would be cleared of vegetation, the surrounding area filled with sub-ballast (occupying a 34-foot width, including the 17-foot wide ballast area), and such additional portions of the 200-foot wide right-of-way that are cleared during construction of the rail line and then revegetated with fire-resistant vegetation. *See* FEIS, §§ 5.4.2.1 (page 5-19) and 5.8.4 (page 5-74).

Q14. How would the proposed Low Corridor rail line be constructed?

A14. (ABS, GPZ) As described above, the proposed right-of-way for the rail line would be approximately 32 miles long and 200 feet wide. An additional "temporary use area" of 50 feet on each side of the 200-foot permanent right-of-way would also be needed for topsoil stockpiles and other construction uses. The bed for the new rail line would be approximately 40 feet wide. The rail bed would be composed of a standard 4 foot 8.5 inch gauge single track, a 17-foot wide layer of ballast material, which rests on a 34 foot wide layer of sub-ballast material, and a 3 foot wide cleared area on each side of the sub-ballast. Any of the remaining right-of-way which is disturbed during construction would be revegetated using the native seed mix recommended by the BLM. The top of the completed rail line would be approximately 4.5 feet above the surrounding terrain.

The rail line would cross 32 arroyos (*i.e.*, gullies or gulches cut by ephemeral streams) at which drainage culverts designed to address flooding would be installed. The rail line would cross

two improved gravel roads, as well as seven dirt roads and/or OHV trails. At-grade crossings would be constructed so as not to impair travel on these roads and trails.

The rail line would not be fenced, and no access roads along the rail line would be provided. Access for maintenance purposes would be accomplished by existing roads in the area and by railroad (*i.e.*, hi-rail) vehicles moving along the track.

Q15. Did the Staff consider alternative alignments to the Applicant's proposed Low Corridor Rail Line alignment?

A15. (GPZ) Yes.

Q16. Please identify each alignment alternative that the Staff considered in the FEIS.

A16. (GPZ) As described in Section 2.2.4.2 (pages 2-47 to 2-51) of the FEIS, the Staff considered three rail alignment alternatives: (1) a new rail line originating from somewhere along the existing Union Pacific main rail line at the northern end of Skull Valley and north of I-80, (2) a new rail line originating from an existing rail line east of the Stansbury Mountains, to the east of Skull Valley, and (3) a "west valley rail alternative" that would follow the alignment of the Applicant's Low Corridor rail line, except for a segment about 6.5 miles in length, where it would deviate about 2000 to 3000 feet to the east of the proposed Low Corridor rail line so as to avoid an area that has been described by SUWA as the "North Cedar Mountains Area" ("NCMA"). The first two of these alternatives included consideration of a rail alignment in the eastern portion of Skull Valley, parallel to the route of the existing Skull Valley Road. The west valley rail alternative and the proposed Low Corridor rail line are shown on a map submitted with this testimony (Staff Exhibit "G").

II. Evaluation of the Proposed Low Corridor Rail Line

A. Overall Evaluation

Q17. Does the Staff's FEIS address the environmental impacts of the proposed Low Corridor rail line route?

A17. (GPZ) Yes. Chapter 5 of the FEIS addresses the environmental impacts of the proposed Low Corridor rail line (as well as other alternatives, including the proposed Intermodal Transfer Facility near Timpie, Utah).

Q18. What environmental impacts does the Staff's EIS identify with respect to the proposed Low Corridor rail line?

A18. (GPZ) Chapter 5 of the FEIS describes the potential environmental impacts from the construction and operation of the proposed Low Corridor rail line. Chapter 5 of the FEIS sets forth the NRC Staff's evaluation of the impacts in the areas of geology, minerals and soils; water resources; air quality; ecological resources; socioeconomic and community resources; cultural resources; human health impacts of transporting spent nuclear fuel; noise; visual qualities; recreation; and wildfires. In addition, Section 5.9 (page 5-74) of the FEIS discusses the environmental impacts of decommissioning the proposed rail line.

As set forth in the FEIS, the NRC Staff concluded that the potential environmental impacts in the aforementioned areas would be small, except for the areas of (1) water resources (small to moderate impacts from flooding), (2) air quality (small to moderate impacts from dust generated during construction near I-80), (3) socioeconomics (small to moderate land use impacts to holders of grazing allotments and to wildlife use of watering resources within the project area), (4) cultural resources (small to moderate impacts to portions of eight important historic properties), and (5) scenic qualities (moderate impacts to recreational viewers and possibly to residents of Skull Valley).

Q19. Do you agree with the assessment of impacts from the Low Corridor rail line, presented in the FEIS?

A19. (GPZ) Yes. The FEIS presents a fair and accurate assessment of the potential impacts of the Low Corridor rail line. This conclusion is based upon my own review of the Low Corridor rail line; my expertise as Leader of the Environmental Impact Analysis Group at ORNL;

my personal involvement and interaction with the experts and specialists who conducted the respective assessments and evaluations in each resource category and who documented their findings and conclusions for presentation in the FEIS; my experience with the preparation and findings of other environmental impact statements; and my participation and interaction with NRC Staff and the staffs of the three Cooperating Federal Agencies (BLM, BIA and STB) during preparation of the DEIS and the FEIS.

B. Earthwork ("Cut and Fill") Evaluation

Q20. Has the NRC Staff considered the earthwork (excavation and embankment, or "cut and fill") necessary for the proposed Low Corridor rail line?

A20. (KEM) Yes. I performed that review at the request of the STB, acting in its role as a Cooperating Federal Agency with respect to the proposed PFS Facility.

Q21. What information did you review with respect to the Applicant's proposed Low Corridor rail line?

A21. (KEM) I have reviewed various documents and drawings pertaining to the Low Corridor rail line. In particular, I reviewed the following documents:

- [PFS] Application For Construction and Operation Authority, Vol. 1 &2, January 5, 2000.
- Clarification - Low Rail Corridor Alignment, John L. Donnell, Project Director, Private Fuel Storage, December 4, 2001.
- Applicant's Motion for Summary Disposition of Contention SUWA B, June 29,2001.
- Final EIS, Section 2.2.4, "Transportation Options."

Q22. Please describe the rail alignment for the Low Corridor rail line that you analyzed for cut and fill considerations.

A22. (KEM) I analyzed the proposed Low Corridor rail line, from its point of origin where it connects to the Union Pacific Railroad mainline at Low Junction, Utah, to its terminus at the PFS Facility. This single track rail line will be approximately 32 miles in length. Beginning at Low, the

rail line will run along the south side of I-80 for approximately 3 miles. It will then turn south along the western side of Skull Valley near the base of the Cedar Mountains for approximately 26 miles, where it will then turn west for approximately 3 miles to the proposed PFS Facility. Associated sidings will be located at Low and at the proposed PFS Facility. This rail alignment is described in more detail in the discussion above.

Q23. Did the results of your analysis of the necessary cut and fill agree with the analysis presented by PFS to the STB, in its Application For Construction and Operation Authority of January 2000, which is described in the FEIS?

A23. (KEM) Yes.

Q24. Based on your analysis, what are the earthwork quantities needed to construct the Low Corridor rail line?

A24. (KEM) Specifically, the earthwork quantities are approximately 885,000 cubic yards of excavation (cut) and approximately 630,000 cubic yards of embankment (fill). This results in approximately 255,000 cubic yards of extra cut material. The Applicant has proposed to place this excess material in the areas adjacent to the new rail line, as additional embankment.

Q25. What was the Applicant's stated goal in aligning the Low Corridor rail line as it did?

A25. (KEM) The Low Corridor rail line was laid out in a manner that attempted to balance cut and fill throughout its length, while maintaining grades not to exceed 1.5 percent.

C. Wilderness Evaluation

Q26. What defines "wilderness characteristics"?

A26. (BNL, ABS) The Wilderness Act of 1964 defines "wilderness characteristics." Specifically, four wilderness characteristics are defined in the Wilderness Act: (1) size (contains at least 5,000 acres); (2) naturalness (affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable); (3) outstanding opportunities for solitude or a primitive

and unconfined type of recreation; and (4) may contain supplemental values (ecological, geological, or other features of scientific, educational, scenic, or historical value). For an area to possess "wilderness characteristics" under the Wilderness Act, it must satisfy all of the first three of these criteria; satisfaction of the fourth criterion, standing alone, is not sufficient.

Q27. Please identify the location of the area described by SUWA as the "North Cedar Mountains Area."

A27. (BNL, ABS, GPZ) The North Cedar Mountains Area ("NCMA") is an area identified and designated as such by SUWA on certain maps provided by SUWA in its "Exhibit 2," attached to SUWA's contentions. Based on my review of those maps, I understand that the area referred to by SUWA as the "NCMA" lies at the northern end of the Cedar Mountains, and encompasses an irregular area approximately 7 miles long (north to south) by 5 miles wide (east to west). The "NCMA" lies to the north of the existing Cedar Mountain Wilderness Study Area, which is an area designated as such and defined by the BLM. The "NCMA" is also shown on Staff Exhibit "G".

Q28. Has the BLM made a determination as to whether the area referred to by SUWA as the "North Cedar Mountains Area," possesses wilderness characteristics?

A28. (BNL, ABS) The BLM has made a determination that the "NMCA" does not possess wilderness characteristics. The North Cedar Mountains (UT-020-087), were inventoried by BLM in 1979 for wilderness characteristics. The area met the Wilderness Act's size requirement of containing at least 5,000 acres. However, the area was found to lack each of the other three wilderness characteristics. Specifically, the area was found to lack (1) naturalness (affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable); (2) outstanding opportunities for solitude or a primitive and unconfined type recreation; and (3) supplemental values (ecological, geological, or other features of scientific, educational, scenic, or historical value). Based on the wilderness characteristics analysis, the BLM recommended that the North Cedar Mountains not be designated a wilderness study area. This determination was

documented in "The North Cedar Mountains Intensive Inventory File," UT-020-087, dated March 20, 1980.

Q29. Please describe any further BLM determinations with respect to whether the North Cedar Mountains have wilderness characteristics.

A29. (BNL, ABS) Pursuant to BLM Manual H-6310-1 ("Wilderness Inventory Handbook" or "WIH"), on April 11, 2001, SUWA submitted a proposal to the BLM, suggesting that the proposal contained "supplemental and new information" which would cause the BLM to revisit the 1980 North Cedar Mountains wilderness determination.

The BLM considered SUWA's April 2001 proposal, in accordance with the BLM Wilderness Inventory Handbook. Pursuant to the WIH, proposals must contain the following: (1) A map identifying specific boundaries, (2) a detailed narrative that describes the suggested wilderness characteristics of the area, and (3) photographic documentation. The SUWA proposal contained the required components as outlined in the WIH; however, the proposal did not describe or present information which significantly differed from information in prior inventories conducted by the BLM regarding the wilderness values of the area. Rather, the SUWA submission primarily disagreed with the prior (1979-1980) BLM wilderness inventory, but did not provide significant new information that would change the BLM's 1980 intensive inventory determination and did not provide information to support a re-evaluation of the area.

Accordingly, a determination was made on May 7, 2001 by the BLM Salt Lake Field Office Manager that the material provided by SUWA did not constitute significantly different information to warrant further review of the North Cedar Mountains wilderness values at that time. *See* Letter to S. Bloch, SUWA, from G. Carpenter, BLM, dated May 8, 2001 (Staff Exhibit "H"). This determination is not an appealable decision. To date, SUWA has not submitted additional North Cedar Mountain proposals to the BLM.

Q30. Does the FEIS address the characteristics of the area referred to by SUWA as the "NCMA" where the proposed Low Corridor rail line crosses it?

A30. (BNL, ABS, GPZ) Yes. Section 2.2.4.2 (page 2-49) of the FEIS describes the natural and wilderness characteristics of the "NCMA." The FEIS describes the characteristics of the "NCMA" as follows:

> the North Cedar Mountains contain no wilderness or wilderness study designation and contain no wilderness values or characteristics. In 1980, BLM considered the northern portion of the Cedar Mountains for designation as wilderness during its Utah land inventory process. The area was found to lack naturalness (i.e., it did not fit the attributes of being affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable); outstanding opportunities for solitude or a primitive and unconfined type recreation; and supplemental values (i.e., ecological, geological, or other features of scientific, educational, scenic, or historical value).

Q31. Do you agree with the foregoing assessment in the FEIS?

A31. (BNL, ABS) Yes.

Q32. Please summarize the basis for this conclusion in the FEIS.

A32. (BNL, ABS) This conclusion was based on the following considerations. The North Cedar Mountains, especially the eastern area traversed by the proposed rail line, already shows the impact of man through numerous motorcycle paths, livestock (both sheep and cattle) trails and grazing, and other extensions of routes used primarily by OHVs, including a route running north-south parallel to the proposed Low Corridor rail line corridor. Vegetation is primarily perennial and annual grasses, including intermediate wheatgrass seeding, and cheatgrass, which is an invasive, non-native species. Desert and semi-desert shrub communities may occur in the lower elevations. Vegetation in any given portion may consist of a mosaic of varying combinations of species, or be limited to monotypic stands of one of the species. Numerous wildfires have occurred in the area as well as associated fire rehabilitation projects.

Further, the following activities have occurred in the North Cedar Mountains subsequent to the 1980 wilderness intensive inventory: (1) Township 1 South (T.1S), Range 9 West (R.9W.), sections 3 and 4 have been drill seeded as part of an emergency fire rehabilitation project for both the Redlam and Tooele fires (1983, 1984); (2) T.1N., R.9W., section 33 was drill seeded as part of an emergency fire rehabilitation project for a wild land fire which occurred in 1983; (3) T.1S, R.9W., section 13 now has occurrences of non-native vegetation due to an emergency fire rehabilitation project; (4) T.1S, R.9W., section 29 now has a wildlife guzzler (a water catchment system providing drinking water for wildlife) and maintenance route in it; and (5) several mining claims now exist within the North Cedar Mountains.

Q33. Are you personally familiar with the natural state of the North Cedar Mountains?

A33. (BNL, ABS) Yes. We have observed various features in the North Cedar Mountains in the course of performing our official duties over the course of our employment with the BLM. In addition, in the course of preparing this testimony, we traveled to the North Cedar Mountains on February 28, 2002, and took a number of photographs, which show certain features that are discussed in our testimony below. These photographs are identified as Staff Exhibits "J" - "O", below. The location from which each photograph was taken is identified on Staff Exhibit "I", and on each individual photograph. The description of each photograph also identifies the direction of the view shown from the identified location.

Q34. Does the proposed Low Corridor rail line cross the area which SUWA designates as the "NCMA"?

A34. (GPZ) Yes, the Low Corridor rail line crosses the "NCMA" boundary, as designated in the maps provided by SUWA. The alignment of the proposed Low Corridor rail line with respect to the "NCMA" is shown in Figure 2.16 (page 2-50) of the FEIS. The proposed Low Corridor rail line alignment is also depicted on Staff Exhibit "G". The proposed rail line would intersect the

easternmost edge of the "NCMA," and would separate a parcel that is about 2.5 miles long (north to south) by 0.4 mile wide (east to west), from the remainder of the "NCMA".

Q35. Does the Low Corridor rail line cross any areas possessing wilderness characteristics?

A35. (BNL, ABS) No.

Q36. What is the basis for this conclusion?

A36. (BNL, ABS) The areas of the "NCMA" that the Low Corridor rail line crosses do not satisfy the second and third required elements in the Wilderness Act, identified above.

Q37. Please explain your conclusion that, with respect to the Wilderness Act's second criterion, the "NCMA" lacks "naturalness" *(i.e.*, affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable)?

A37. (BNL, ABS) The imprint of man's work is substantially noticeable in the North Cedar Mountains. The cumulative effect of many minor and some large impacts are considerably evident within this relatively small unit. Some interior hillsides are untrammeled by man and are affected by the forces of nature. However, because of the openness and exposure to other imprints, a feeling of sublime naturalness is lacking. Therefore, the area lacks the necessary condition of "naturalness."

Specifically, during BLM's 1979 intensive inventory and evaluation of this area, 27 impacts or activities were identified; and a cumulative network of over 11 miles of "ways" (routes created and maintained solely by the passage of vehicles) were recorded within the unit's boundaries. One of these, Lee's Canyon way, follows a drainage and cuts a six-mile path through the southeast end of the "NCMA," impacting in its course the 5,000 acre parcel making up that end of the unit. Other activities along this access route include quarries, livestock trails, motorcycle paths, heavy sheep grazing, and other minor extensions of ways used primarily by OHVs.

Other imprints of man's work are demonstrated mainly around the perimeter of the unit. These are impacts that may be relatively small in scale, but are considerably large in their effect upon the quality of a once untouched ecosystem. Ways, sheep pens, man made dikes for water improvements and storage, borrow pits, and much off-road vehicle traffic is quite noticeable from unit borders and adjacent unit hillsides. Topographic features do conceal certain spots of naturalness from these affected areas within more centralized locations of the unit. However, even from within this screened environment, man's works are often evident due to outside influences and activities that occasionally penetrate into the unit.

The recent photographs which we have taken depict the current state of the area near the proposed rail line. For example, Staff Exhibit "J" (Photo 71) shows the terrain looking south from the road boundary of the "NCMA," which is representative of the eastern bench of the Cedar Mountains. The picture shows evidence of livestock use, noxious weeds, and cheatgrass invasion. (Cheatgrass is an invasive, non-native species.) Several other photographs show examples of "ways," as follows. Staff Exhibit "K" (Photo 74), looking east, shows a view of vehicle tracks 20 feet south and parallel to a road, within the "NCMA." Staff Exhibit "L" (Photo 75), looking west from the north boundary road of the "NCMA," is another representative photo showing the condition of the bench areas; it also shows new routes being established south of the main road. Staff Exhibit "M" (Photo 76), looking south, shows an OHV route running north-south inside the "NCMA," approximately 1/4 mile west of the main road. Similarly, Staff Exhibit "N" (Photo 79), looking west into the "NCMA," shows tracks made by OHVs. Also, Staff Exhibit "O" (Photo 85), in section 10 looking west, shows an access road to reach private land.

Collectively, these photographs show that current conditions in the area near the proposed rail line are consistent with the BLM's original determination regarding lack of naturalness. Thus, the "NCMA" identified by SUWA lacks the condition of "naturalness" required for it to be designated as a "wilderness area."

Q38. With respect to the Wilderness Act's third criterion, please explain your view that the "NCMA" lacks "outstanding opportunities for solitude or a primitive and unconfined type of recreation"?

A38. (BNL, ABS) Limited portions of the "NCMA" may meet this criterion, but only in part. With respect to solitude, the upper elevations and inner portion of the unit provide scattered opportunities for solitude. Occasional vegetative covering, mountainous topography, and lack of penetrating roads, are evident. However, the lower, outside portions of the unit (including the area near the proposed Low Corridor rail line) lack outstanding opportunities for solitude, due to the sparse vegetative cover, relative open terrain and the cumulative effect of many impacts in the unit.

Certain opportunities for a primitive and unconfined type of recreation exist in the North Cedar Mountains, in the form of hunting, horseback riding, hiking, wildlife observation and sightseeing. However, in and of themselves, these opportunities may not be described as "outstanding," based on the following considerations. Wildlife populations and numbers are few. Terrain for hiking and horseback riding is not unique in nature and does not provide outstanding potential for these recreation types. Also, sightseeing is encumbered by the many outside activities and interior impacts of man.

Q39. With respect to the Wilderness Act's fourth criterion, does the "NCMA" contain any "supplemental values" (ecological, geological, or other features of scientific, educational, scenic, or historical value)?

A39. (BNL, ABS) Rock windows, sawtooth ridges and small caves carved in cliffs and terraces are common throughout the northern section of the unit. These are displays cut by either the Bonneville or Provo levels of ancient Lake Bonneville, and are considered to be typical geological formations, common to the Bonneville Basin, and characteristic to all 14 units (including the "NCMA" unit), for which an intensive inventory was performed in the Salt Lake District. Thus, these geological features are not unique to the NCMA and are not particularly significant.

Modern history, too, has left its imprint upon the unit. Hastings Pass, which is located between the two Cedar Mountain units (*i.e.*, the "NCMA" and the existing Cedar Mountains Wilderness Study Area) was once the route taken by a number of pioneers attempting to shorten their journey to California. Those interested in historical trail interpretation might find this portion of the Hastings Cutoff somewhat intriguing. The Hastings Cutoff is discussed in FEIS § 5.6.1.1, and has been treated in accordance with the National Historic Preservation Act. The Hastings Cutoff does have some supplemental values, but is south of the "NCMA," is not included in SUWA's proposal, and, therefore, does not add "supplemental value" to SUWA's proposed area.

Mining operations have been digging Aragonite (a mineral $CaCO_3$) along the south end of the unit since 1895. Old buildings, pits, and assorted prospects remain as a legacy to past ambitions. While the modern historical imprints and mining operation imprints have some supplemental value, they also reflect the presence of man in the area.

In sum, any supplemental values in the "NCMA," in the absence of satisfaction of the two wilderness criteria described above, are not sufficient to warrant consideration of the "NCMA" for wilderness (study area) designation.

Q40. What is your conclusion as to whether the "NCMA" contains wilderness characteristics?

A40. (BNL, ABS) The "NCMA," where the proposed Low Corridor rail line crosses it, lacks naturalness and lacks outstanding opportunities for solitude or a primitive and unconfined type recreation, as previously determined by the BLM. Therefore, it lacks wilderness values or characteristics necessary for it to be designated as a wilderness study area.

D. "Fire Buffer" Evaluation

Q41. In Contention SUWA B, SUWA asserted that there has been a failure to "develop and analyze a meaningful range of alternatives" to the "fire buffer zone" that is "associated" with the Low Corridor rail line (SUWA Contentions at 5). Did the Staff consider any such alternatives?

A41. (ABS, GPZ) As set forth above, construction of the rail line would include elements that may serve as a "fire buffer," consisting of the 17-foot wide area of rock ballast that would be cleared of vegetation, the surrounding area filled with sub-ballast, and such additional portions of the 200-foot wide right-of-way that are cleared during construction of the rail line and then revegetated with fire-resistant vegetation. The Staff did not consider alternatives to these elements with respect to establishing a fire buffer zone independently from the consideration of the alternative rail routes with which the fire buffer would be associated.

Q42. Did the Staff consider minimizing the width of the right-of-way relative to either the proposed alignment or any alternative alignment in order to reduce the impacts to the area?

A42. (GPZ) No. The 200-foot wide right-of-way, as described in Section 2.1.1.3 (page 2-14) of the FEIS, is intended to accommodate the construction vehicles and workforce necessary to construct the 40-foot wide rail bed. Inasmuch as the staffs of the Cooperating Federal Agencies have determined that the rail alignment alternatives (including the west valley rail alternative) would not result in any significant reduction in impacts to the alleged wilderness characteristics of the adjacent land when compared to the Applicant's proposed Low Corridor rail alignment (*see* FEIS, page 2-51), it is not apparent how any modifications to the proposed right-of-way could reduce impacts to the alleged wilderness character of the North Cedar Mountains.

Q43. Do you believe that the Staff's consideration of a 200-foot wide right-of-way was appropriate?

A43. (APS, GPZ) Yes. The width of the right-of-way would be specified in the BLM's right-of-way grant. By evaluating the largest potential width in the FEIS, all potential impacts would be identified. Accordingly, while the final grant may specify a right-of-way width equal to or less than the width proposed by PFS, any adverse impacts would be no greater than the impacts considered in the FEIS.

II. Evaluation of Alternatives Originating North of Interstate-80

Q44. Please describe the NRC Staff's evaluation of an alternative new rail line to the proposed PFS Facility, that would originate from the existing Union Pacific main rail line at the northern end of Skull Valley and north of I-80, to the east of the proposed Low Corridor rail line.

A44. (GPZ) The Staff's evaluation of this alternative is set forth in Section 2.2.4.2 of the FEIS, at page 2-47. Building a new rail line from any location in the northern portion of Skull Valley other than Skunk Ridge would involve the construction of a new rail siding north of I-80, thereby creating an unresolved problem as to how the rail line would be able to cross the interstate to reach the Reservation to the south, as there is no existing rail line crossing the interstate in such areas. Also, construction of a new rail line in the eastern portion of Skull Valley, parallel to Skull Valley Road, would create the likelihood for construction activity to directly impact wetlands (at Horseshoe Springs), existing houses and ranches, and traffic on Skull Valley Road. This alternative was determined not to be superior to the proposed Low Corridor rail line.

Q45. Please describe the problem of crossing I-80.

A45. (KEM) Since the Union Pacific Railroad mainline is on the opposite side of I-80 from the proposed PFS Facility, a grade separation would be required to extend a new alternative rail line to the south, if a connection were made to the Union Pacific mainline anywhere east of Low. This could be accomplished in either of two ways: (1) I-80 could be raised and bridged over the new alternative rail line, or (2) the alternative line could cross over I-80 using a bridge. (Lowering the rail line to pass under I-80, or vice versa, is not a practicable solution because of the level of the water table in that area.)

To construct a highway overpass of a rail line, approximately 3600 feet of I-80 would have to be reconstructed to pass it over the alternative rail line, in addition to the construction of a four lane 50 foot span bridge. This would require extensive detours of a major interstate highway while an overpass structure was being built. Alternatively, in order to construct a rail line that passes

over the highway, a very long distance would be needed to raise the rail line over the highway, because the maximum railroad grade can be no more than 1.5 percent. Where topography is relatively flat, approximately 4800 feet of rail line track would need to be built at a 1.5 percent grade to obtain sufficient clearances to cross over I-80.

Q46. What is your conclusion with respect to a new alternative rail line to the proposed PFS Facility, originating from somewhere along the existing Union Pacific main rail line at the northern end of Skull Valley and north of I-80?

A46. (GPZ, KEM) Such an alternative involves an unresolved problem in how to cross I-80 to reach the Reservation to the south, and would entail significant environmental impacts beyond those involved in the Low Corridor rail line. Accordingly, no further evaluation of such an alternative is warranted.

III. Evaluation of Alternatives Originating East of the Stansbury Mountains

Q47. Please describe the Staff's evaluation of an alternative new rail line to the proposed PFS Facility, originating from an existing rail line east of the Stansbury Mountains?

A47. (GPZ) The Staff's evaluation of this alternative is set forth in Section 2.2.4.2 of the FEIS, at page 2-47. A new rail line originating east of the Stansbury Mountains (*i.e.*, alternative No. 2, above) would require a new rail corridor around the northern end of these mountains (*i.e.*, between the mountains and I-80), which would then continue south along Skull Valley Road. This option would result in significant construction impacts to the wetlands, houses, ranches, and traffic along Skull Valley Road, as well as substantial excavation at the northern end of the Stansbury Mountains because of the proximity of the mountains to the interstate at this location. In addition, operation of the rail line close to existing wetlands, houses, and ranches in Skull Valley would result in operational impacts that exceed the impacts of operating the Low Corridor rail line.

Q48. What is your conclusion with respect to an alternative new rail line to the PFS Facility, originating from an existing rail line east of the Stansbury Mountains?

Q48. (GPZ) Based upon its significant impacts to wetlands, houses, ranches and traffic, and significant excavation impacts, no further evaluation of this alternative is warranted.

IV. Evaluation of West Valley Alternative

Q49. Did the Staff consider an alignment that would originate at Low (Skunk Ridge), but which would not traverse the "NCMA"?

A49. Yes. As described in Section 2.2.4.2 (pages 2-47 to 2-51) of the FEIS, the Staff considered a "west valley rail alternative" that would follow the alignment of the Applicant's Low Rail Line, except for a segment of about 6.5 miles where it would deviate to the east to avoid the area referred to by SUWA as the "NCMA."

Q50. Please describe the Staff's understanding of the west valley rail alternative.

A50. (KEM, GPZ) The west valley rail alternative was first presented in the attachments to the Applicant's Motion for Summary Disposition of Contention SUWA B, filed on June 29, 2001. This rail alignment is similar to the Low Corridor rail line with the following exception. At the point where the rail line curves away from I-80, the curvature would turn less sharply so this alternate would move more to the east, away from the Cedar Mountains, than the proposed Low Corridor rail line. After proceeding southeast for about 2 miles, the alternate rail line would curve south for about 3 miles, then southwest for one mile to a point where it would rejoin the proposed Low Corridor rail line alignment. The result is an alternate alignment 2000 to 3000 feet east of the proposed Low Corridor rail line alignment for a length of about 6.5 miles. This alternate avoids the area referred to by SUWA as the "NCMA" and the mud flats that lie further to the east.

Q51. Please identify the environmental impacts that are associated with the west valley rail alternative, as discussed in the FEIS.

A51. (GPZ) Section 2.2.4.2 (page 2-49) of the FEIS describes the potential environmental impacts of the west valley rail alternative. The alignment of the west valley rail alternative would follow undulating terrain and, over most of its 6.5 mile length, would be constructed on land with an elevation approximately 100 to 150 feet lower than the Applicant's proposed Low Corridor rail line alignment. The west valley rail alternative would have to be built almost entirely on fill material because of the constraint imposed by a 1.5 percent grade limitation due to locomotive braking and safety considerations. The rail bed of the west valley alternative route would therefore have to be built to elevations up to 20 feet above existing grade levels. This raised rail bed would have a visual impact and could interfere with the access to existing roads and grazing allotments, the movement of wildlife, and the fighting of wildfires in the Cedar Mountains and in the western portion of Skull Valley. These impacts would exceed the impacts of the proposed Low Corridor rail line.

In addition, as discussed in more detail below, the Applicant has estimated that the west valley rail alternative would require the emplacement of approximately 560,000 cubic yards of fill material and raised rail bed, of which about 260,000 cubic yards would have to be imported to the construction site from other locations.

Q52. Has the Staff reviewed the Applicant's cut and fill analysis for the west valley rail alternative?

A52. (KEM) Yes. At the request of STB, acting in its role as a Cooperating Federal Agency with respect to the proposed PFS Facility, I reviewed the plan, profile and cross sections shown in the Applicant's Motion for Summary Disposition of Contention SUWA B, dated June 29, 2001.

Q53. Based on your analysis, do you agree with the Applicant's conclusions regarding the quantities of cut and fill necessary to construct the west valley alternative shown in the Applicant's Motion for Summary Disposition of Contention SUWA B?

A53. (KEM) Yes.

Q54. What are the quantities of cut and fill necessary to construct the west valley rail alternative?

A54. (KEM) For the portion of the west valley rail alternative that deviates from the proposed Low Corridor rail line, the Applicant's analysis shows that the amount of material excavated (cut) is about 560,000 cubic yards less than the amount of material that would be needed for use as embankment (fill) material. As stated above, there would be approximately 255,000 cubic yards of excess material that is excavated for the Low Corridor rail line. However, if the 6.5 mile length of the Low corridor rail line that is bypassed by the west valley alternative is deleted from the earthwork analysis, there would be a net loss of approximately 40,000 cubic yards of such excess excavated material. Assuming that the remaining excess cut material is available for use as fill for the west valley alternative, as much as 340,000 cubic yards of additional material would need to be brought into the site from another location in order to construct this alternative. Importation of this fill material would be very expensive, and would require on the order of 34,000 truck trips along I-80 and local roadways to bring this material to the site. In addition, the source of this fill material would need to be identified, and could result in separate environmental impacts. These impacts would exceed the cut and fill impacts of the proposed Low Corridor rail line.

Q55. Do you agree with the Applicant's conclusion that the west valley rail alternative would result in greater earthwork impacts than the proposed Low Corridor rail line?

A55. (KEM) Yes, greater earthwork impacts will occur if the west valley alternate rail alignment were to be used. The PFS site is located at an elevation of about 4480 ft (ranging from 4450 ft to 4490 ft), as described in the FEIS (page 2-3). As stated above, the Low Corridor rail line generally follows the 4380 ft elevation (generally ranging between elevations of 4360 ft to 4410 ft). In contrast, the west valley alternative would dip from an elevation of about 4410 ft to about 4260 ft, before rising to rejoin the Low Corridor rail line at an elevation of 4360 ft. It would continue to rise gradually from there to about the 4480 ft elevation where the line enters the proposed PFS site.

Thus, the west valley alternate rail alignment would drop to grade elevations as much as 130 feet lower in elevation in some places than the proposed Low Corridor rail line alignment, because this alternate alignment more closely approaches the valley floor. The result is that this alternate alignment must drop down and then proceed back up to tie back into the proposed alignment. This causes the profile grade to be placed on embankments in excess of 20 feet in three locations totaling about 5500 feet in length. By comparison, the embankments for the Low Corridor rail line have a maximum height of about 10 to 12 feet. The embankments would be constructed with a 3 : 1 slope, which means that as the embankment becomes higher, the footprint of the rail line, or area directly impacted, becomes greater. Inasmuch as the west valley rail alternative would require larger earthwork emplacements that the Low Corridor rail line, as described above, it would have much greater environmental impacts than the Low Corridor rail line.

Q56. Did you identify any possible modifications to the west valley rail alternative that could reduce the amount of cut and fill while still avoiding the proposed "NCMA"?

A56. (KEM) Yes. I considered modifying the profile grade line to try to obtain a more balanced condition between excavation and embankment. The result was a reduction in embankment of about 50,000 cubic yards. This would still leave a fill requirement of over 500,000 cubic yards. In addition, the profile grade I selected contained about 9,000 feet more of rail at the maximum grade allowed of 1.5 percent than was described by the Applicant in the west valley rail alternative. This increase in the amount of rail line at the maximum 1.5 percent grade would result in increased operating costs because the trains would need to run for a longer time under load up these grades.

Q57. Does the west valley rail alternative cross areas possessing wilderness characteristics?

A57. (BNL, ABS) No.

Q58. How do the proposed Low Corridor rail line and the west valley rail alternative compare, with respect to wilderness characteristics?

A58. (BNL, ABS) ~~There are native greasewood stands near the west valley rail alternative that tend to lend that area an aspect of naturalness that the Low Corridor rail line lacks.~~ Both areas have single-track motorcycle trails, although there are more motorcycle trails and motorcycle use on the west valley rail alternative. On balance, however, there do not appear to be any significant differences in the current condition between the proposed Low Corridor rail line route and the west valley rail alternative, with respect to wilderness characteristics, due to the close proximity of these two routes. As set forth in the FEIS in Section 2.2.4.2, the impacts to wilderness values from the proposed Low Corridor rail line do not differ significantly from the impacts expected from the west valley rail alternative; this is due to the fact that none of the areas located near the two routes, including the area referred to by SUWA as the "NCMA," have any wilderness or wilderness study area designation, and do not contain wilderness values or characteristics.

Q59. What conclusion was reached by the Staff regarding the environmental impacts of the west valley rail alternative?

A59. (GPZ) Section 2.2.4.2 (pages 2-47 and 2-51) of the FEIS discusses the Staff's conclusions about the west valley rail alternative. The west valley rail alternative was eliminated from detailed evaluation because the Staff concluded that the environmental impacts from this alternative's increased excavation and rail bed fill requirements would exceed the impacts of the Applicant's proposed Low Corridor rail line. In addition, the FEIS concludes that the west valley rail alternative would not result in any significant reduction in impacts to recreation or wilderness characteristics of the adjacent land, when compared to the proposed Low Corridor rail line. Therefore, with respect to the potential environmental impacts, the west valley rail alternative offers no obvious advantage over the Applicant's proposed Low Corridor rail line.

Q60. Do you agree with the assessment in the FEIS regarding the alternative rail alignments?

A60. (BNL, ABS, GPZ) Yes.

Q61. What is the basis of your conclusion in this regard?

A61. (BNL, ABS, GPZ) This conclusion is based upon the observation that each of the alternatives to the proposed Low Corridor rail line possesses some negative characteristic (from the perspective of presenting or creating potentially adverse environmental impacts) which causes it to appear less desirable than the Applicant's proposed Low Corridor rail line. That is, each of the alternatives appears to offer a set of adverse environmental impacts and would offer no advantage over the Applicant's proposed rail line, as addressed in detail in Chapter 5 of the FEIS.

V. SUWA Alternative

Q62. Has SUWA identified any rail alignment alternative not discussed above?

A62. (ABS, GPZ) Yes. In the "Second Declaration of Jim Catlin for Petitioner [SUWA]" ("Catlin Declaration"), attached to the "Reply of [SUWA] to Staff and Applicant Responses to SUWA's Petition to Intervene, Request for Hearing and Contentions," dated December 8, 1998, SUWA generally described an alternative that might run "two miles to the east" of the proposed Low Corridor rail line (*Id.*, ¶ 9). In the absence of additional information, such an alternative would appear to run through the mud flats that begin approximately one mile to the east of the proposed Low Corridor rail line, as is indicated on Staff Exhibit "G". Such an alternative would appear to pass through lands that are owned, managed, or held in trust by the State of Utah. While a question exists as whether the State would allow such lands to be used by PFS for a rail line to its proposed Facility, the Staff has considered the cut and fill implications associated with that alternative without regard to the issue of whether PFS would be granted permission to utilize those areas.

Q63. Assuming that this is the area intended by SUWA, what would be the effect of such an alternative with respect to cut and fill considerations?

A63. (KEM) The entire length through the area of the mud flats would require placement on imported fill material. In contrast, very little, if any, cut would be required in this area. As a result, construction of this alternative would probably require in excess of 500,000 cubic yards of imported fill material.

Q64. How would these cut and fill effects compare to those associated with the west valley rail alternative?

A64. (KEM) The west valley rail alternative would require as much as 340,000 cubic yards of fill to be imported to the site. This other alternative, located two miles east of the west valley alternative, would require approximately 1.5 times that amount, or approximately 500,000 cubic yards.

Q65. What is your conclusion with respect to this additional SUWA alternative?

A65. (KEM) Inasmuch as other alternatives could be constructed with either less imported fill (*e.g.*, the west valley alternative) or no imported fill at all (*e.g.*, the Low Corridor rail line), this additional alternative proposed by SUWA would result in greater adverse impacts than such other alternatives, and does not appear to warrant further consideration.

VI. Overall Conclusion

Q66. Please summarize your views with respect to the concerns raised in Contention SUWA B.

A66. As more fully described above, in Section 2.2.4.2 (page 2-47) of the FEIS, the Staff considered and analyzed two alternative rail alignments (both on the eastern side of Skull Valley, away from the Cedar Mountains), in addition its consideration of the Low Corridor rail line. In addition, section 2.2.4.2 (pages 2-49 to 2-51) of the FEIS documents the Staff's consideration and

analysis of the west valley alternative, an alternative rail alignment that would completely avoid the area referred to by SUWA as the "North Cedar Mountains Area."

As discussed in Section 2.2.4.2 (page 2-49) of the FEIS, BLM has concluded, for the reasons described above, that the area described by SUWA as the "North Cedar Mountain Area" contains no wilderness values or characteristics. Because the area lacks such values or characteristics, no alternatives need to be developed to avoid or minimize the potential for adverse impacts to such asserted values or characteristics.

In sum, the Staff has considered and evaluated a range of alternatives to the proposed Low Corridor rail line, and has adequately described the environmental impacts of each alternative considered. In addition, the FEIS considered alternative rail alignments and the concern expressed by SUWA with respect to the alleged wilderness character and potential wilderness designation of the "North Cedar Mountains Area," and appropriately concluded that a rail alternative that avoids such area would not be environmentally preferable to the Low Corridor rail line.

Q67. Has the Staff considered an appropriate range of reasonable alternatives to the proposed Low Corridor rail line?

A67. Yes. The FEIS addresses an appropriate range of reasonable alternatives to the proposed Low Corridor rail line. Although an almost infinite range of routes and alignments could be hypothesized over every part of Skull Valley, we believe the range of alternatives evaluated in the FEIS and discussed above considers all such types of alternatives.

Q68. Does this conclude your testimony?

A68. Yes.

JUDGE FARRAR: Are they ready for cross-examination?

MR. WEISMAN: I believe we're ready for cross-examination.

MR. SILBERG: Excuse me, the testimony I believe refers to a number of exhibits. I thought I saw that, photographs.

MR. WEISMAN: Yeah, the exhibits are also not attached. We will -- we do have copies of those, and we will put those together with the professional qualifications after lunch.

JUDGE FARRAR: And then you would have them -- you would ask at that point that they be admitted attached as exhibits?

MR. WEISMAN: Yes, Your Honor. I apologize for the oversight.

JUDGE FARRAR: That's all right. Mr. Silberg, will you have any examination of these witnesses?

MR. SILBERG: I have a few brief questions.

JUDGE FARRAR: Can you do those without having the exhibits admitted and the qualifications in front of us?

MR. SILBERG: I guess I'd prefer to have

the qualifications in the record first. I can do it, but I think it would help.

(Judges conferred off the record.)

JUDGE FARRAR: What we'll do then is use the lunch break, Mr. Weisman, to get the exhibits and qualifications in. It's five after now. If we start at one, is that -- will that give you sufficient time?

MR. WEISMAN: I believe that should give us sufficient time. Thank you, Your Honor.

JUDGE FARRAR: All right. Mr. Silberg, how long will your questioning take?

MR. SILBERG: My guess is 10, 15 minutes.

JUDGE FARRAR: Ms. Walker, how much examination will you have for these people? And let me tell you the purpose of the Board's inquiry. Some time ago, you all estimated how long each of these issues would take and how long the entire proceeding would take. You all thought this could be done in a day. We have these witnesses and then SUWA's witness, and are we going to finish today?

MR. SILBERG: Well, I don't know how much cross Ms. Walker has of the Staff's witnesses. I probably have an hour or two of Dr. Catlin's. I

think we can finish today, but it depends on how much Joro has.

MS. WALKER: Boy, I have a lot, and I thought this morning wouldn't take very long. You know, I mean I thought -- I thought I would have been done a long time ago.

JUDGE FARRAR: Does the Staff or the company have any thoughts on balancing the desirability of finishing today versus the desirability of making sure everything is covered as thoroughly as possible?

MR. WEISMAN: I believe, Your Honor, that -- I mean the amount of cross-examination that the Staff has for Dr. Catlin should not be more than two hours. I would certainly hope it would be less than that. I believe that we can finish and have a complete record for the Board today. We might have to go a little bit later. I don't know when we plan on stopping.

MR. SILBERG: I do have a problem if we go later because I need to be prepared for tomorrow on a different issue. I think we can finish today. I think if the parties are disciplined in their treatment on cross-examination and prepared, the questions, I think we can move ahead promptly.

But, you know -- and there's no reason why we shouldn't be able to finish this in a day.

JUDGE FARRAR: And if we don't finish today, Dr. Catlin, are you available Thursday?

DR. CATLIN: I am.

JUDGE FARRAR: Mr. Silberg, are you available? You weren't going to be here for the Thursday arguments on the other issue?

MR. SILBERG: Oh, I will be here.

JUDGE FARRAR: You will be here. Mr. Weisman, you're not involved in the Thursday -- the other Thursday matters?

MR. WEISMAN: I am involved in one matter on Thursday. That would be the oral argument on the Contention SS.

JUDGE FARRAR: Let's break for lunch. Everybody get their cases organized and let's finish tonight. Back at 1:00.

(The lunch break was taken.)

JUDGE FARRAR: Let's get the afternoon session started. I see not all the witnesses have returned from lunch, but we want to see lead counsel up here at the court reporter's station.

We've had some thoughts on how to keep things moving this afternoon. Let's make a couple

of suggestions.

Ms. Walker, you started today. On the transportation across the Rockies, on cross you don't have to lay a foundation. You can just ask them. You were trying to go through the thing to show that they had all these rail lines coming from all over the country. There's nothing wrong with you saying -- on cross you don't have to build a foundation, you can just say, are the trains coming across the Rockies, how are they getting through the Rockies, through the pass, what's the grade.

He's going to say one of three things: I don't know, or he's going to say one and a half percent or he'll say 10 percent. If it's 10 percent, then you're off on your point. If he says one and a half, that tells you we're getting nowhere. If he says I don't know, then say, who does know.

So in terms of moving things along, you don't need -- now, if strategically you want to, you can, but you don't need to build to the question. You know, it is cross-examination.

MR. SILBERG: Ask the direct question.

JUDGE FARRAR: Just ask the direct question, and I think that's a way to save time

without cutting into your ability to pursue your points. So don't hesitate to just hit it with a question. On cross-examination you don't have to lay a foundation. Just ask them, where are the trains coming from -- boom, boom, boom. Did I say that on the record?

MR. WEISMAN: As long as it's not a compound question, something like that.

JUDGE FARRAR: Just don't hesitate to ask a question. Okay, let's get started and we'll go along.

All right, we've got the witnesses in place, and Mr. Weisman, I believe you had some business to finish up?

MR. WEISMAN: Yes, I did. Yes, I do.

CONTINUED EXAMINATION

BY MR. WEISMAN:

Q. You now have before you a statement of your professional qualifications as well as the exhibits to your testimony. Do you recognize that?

MR. McFARLAND: Yes, I do.

MR. ZIMMERMAN: Yes, I do.

MS. STEPHENSON: Yes, I do.

MS. LAUB: Yes, I do.

Q. Do you have any corrections, revisions, additions or deletions that you'd like to make to your statement of professional qualifications?

MR. McFARLAND: No.

MR. ZIMMERMAN: No.

MS. STEPHENSON: No.

MS. LAUB: No.

Q. Is that -- are the professional qualifications true and correct, to the best of your information, knowledge and belief?

MR. McFARLAND: Yes.

MR. ZIMMERMAN: Yes, they are.

MS. STEPHENSON: Yes.

MS. LAUB: Yes.

MR. WEISMAN: If the Staff could now move to combine the professional qualifications and the exhibits that are attached to the --

JUDGE FARRAR: Let's deal with the qualifications first. Any objection to them being admitted as if read?

MR. SILBERG: No, sir.

MS. WALKER: No objections.

JUDGE FARRAR: Those will be bound into the record as if read.

(QUALIFICATIONS OF KENNETH E. McFARLAND, GREGORY P. ZIMMERMAN, ALICE B. STEPHENSON, AND BRITTA N. LAUB FOLLOW.)