

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO

11 May 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Santa Fe Energy Oper- CASE  
ating partners, L.P., for compulsory 9372  
pooling, and a nonstandard gas prora-  
tion unit, Eddy County, New Mexico.

Application of Bass Enterprises Pro- CASE  
duction Company for compulsory pool- 9374  
ing, and two nonstandard gas prora-  
tion units, Eddy County, New Mexico.

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

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1 MR. CATANACH: Call next Case  
2 9372.

3 MR. ROYBAL: Case 9372. Appli-  
4 cation of Santa Fe Energy Operating Partners, L.P., for com-  
5 pulsory pooling and a nonstandard gas proration unit, Eddy  
6 County, New Mexico.

7 MR. CATANACH: Are there ap-  
8 pearances in this case?

9 MR. BRUCE: Mr. Examiner, my  
10 name is James Bruce from the Hinkle Law Firm in Santa Fe,  
11 representing Santa Fe Energy.

12 MR. CATANACH: Are there any  
13 other appearances?

14 MR. KELLAHIN: Mr. Examiner,  
15 I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kel-  
16 lahin & Aubrey. I'm appearing on behalf of Bass Enterprises  
17 Production Company.

18 We'd request at this time, Mr.  
19 Examiner, that you also call Case 9374, and that Case 9374  
20 and 9372 be consolidated for purposes of hearing.

21 MR. CATANACH: Okay, at this  
22 time we'll call Case 9374.

23 MR. ROYBAL: Case 9374. Appli-  
24 cation of Bass Enterprises Production Company for compulsory  
25 pooling and two nonstandard gas proration units, Eddy Coun-  
ty, New Mexico.

1 ty, New Mexico.

2 MR. CATANACH: And we've got  
3 the same appearances in both cases?

4 MR. BRUCE: That's correct.

5 MR. CATANACH: Okay, Case 9372  
6 and 9374 will be consolidated for the hearing today.

7 How many witnesses do you have?

8 MR. BRUCE: I have three wit-  
9 nesses, Mr. Examiner.

10 MR. KELLAHIN: I also have  
11 three witnesses, Mr. Examiner.

12 MR. CATANACH: Okay, can I get  
13 all the witnesses to stand and be sworn in at this time?

14  
15 (Witnesses sworn.)

16  
17 MR. CATANACH: Mr. Bruce.

18  
19 GARY GREEN,  
20 being called as a witness and being duly sworn upon his  
21 oath, testified as follows, to-wit:

22  
23 DIRECT EXAMINATION

24 BY MR. BRUCE:

25 Q Mr. Green, would you please state your

1 full name and city of residence?

2 A Gary Green, from Midland, Texas.

3 Q And what is your occupation and who are  
4 you employed by?

5 A I'm employed by Santa Fe Energy Company  
6 as a landman.

7 Q And have you previously testified before  
8 the Division as a landman and had your credentials accepted  
9 as a matter of record?

10 A Yes, I have.

11 Q And are you familiar with land matters  
12 involved in Santa Fe's application?

13 A Yes, I am.

14 MR. BRUCE: Mr. Examiner, are  
15 the witness' credentials acceptable?

16 MR. CATANACH: They are.

17 Q Briefly, Mr. Green, what does Santa Fe  
18 seek in its application?

19 A In Case Number 9372 Santa Fe Energy Oper-  
20 ating partners, L.P., seeks an order pooling all mineral in-  
21 terest from the top of the Bone Springs to the base of the  
22 Morrow formation underlying the east half, west half, and  
23 Lots 1 through 4 of Section 30, Township 21 South, Range 28  
24 East, Eddy County, New Mexico, forming a nonstandard 313.12-  
25 acre gas spacing proration unit for any and all formations,

1 a pool was developed on 320-acre spacing, to be dedicated to  
2 a well to be drilled at a standard location.

3 This application is a counter application  
4 to that of Bass Enterprises Production Company in Case 9374.  
5 In that case Bass seeks to force pool Santa Fe's acreage in-  
6 to a south half unit.

7 Q Would you please refer to what has been  
8 marked as Exhibit Number One and discuss its contents?

9 A Exhibit Number One is a land plat showing  
10 Santa Fe's proposed west half unit and well location. Santa  
11 Fe propcses a standard location 990 feet from the west line  
12 and 1980 feet from the south line of Section 30.

13 Santa Fe's acreage in Section 30 and San-  
14 ta Fe's acreage in the area is stippled.

15 In addition, Santa Fe's acreage in the  
16 Indian Draw Strawn and East Carlsbad Wolfcamp Area to the  
17 southwest is indicated.

18 Q What is the lease ownership in Section  
19 30?

20 A Santa Fe owns the fee leasehold in Lot 4  
21 of Section 30. The remainder of the section is under Fed-  
22 eral Lease NM-059365, owned by Bass.

23 Q And what parties does Santa Fe seek to  
24 force pool into its unit?

25 A Bass Enterprises Production Company and

1 Ralph Nix, an overriding royalty interest owner.

2 Q Was notice of Santa Fe's application sent  
3 to all other interest owners in the unit?

4 A Yes, and copies of the notices and certi-  
5 fied return receipts are submitted as Exhibit Two.

6 MR. BRUCE: Excuse me, Mr. Exa-  
7 miner, I think I marked them as Exhibit Three.

8 Q Mr. Green, referring to Exhibit Two,  
9 would you please describe the history of Santa Fe's efforts  
10 to drill a well in Section 30 and please refer to that exhi-  
11 bit?

12 A Exhibit Two is various correspondence be-  
13 tween Santa Fe and Bass concerning the proposal of this well.

14 Santa Fe initiated the proposal on Octo-  
15 ber 6th, 1987. Santa Fe sent a letter to Bass proposing the  
16 1280-acre working interest unit covering the east halves of  
17 Sections 24 and 25, Township 21 South, Range 27 East, and  
18 the west halves of Sections 19 and 30, Township 21 South, 28  
19 East.

20 The letter proposed the drilling of a  
21 12,200 foot Morrow test well located 990 feet from the west  
22 line and 1,980 feet from the east line of Section 30, Town-  
23 ship 21 South, Range 28 East.

24 Santa Fe requested that Bass and Santa Fe  
25 participate on an acreage contribution basis and working in-

1 terest unit or requested that Bass would farm out its ac-  
2 reage to the working interest unit.

3 Attached to this letter is a well cost  
4 estimate and a plat indicating the well location and the  
5 proposed working interest outline.

6 On February 16th, 1988, Santa Fe had a  
7 meeting with Bass in their office whereby Santa Fe again re-  
8 quested Bass to consider Santa Fe's working interest unit  
9 proposal of October 6th, '87, and also at that time we pro-  
10 posed to enter into an area of mutual interest agreement to  
11 protect our mutual interest outside the working interest.

12 On February 22nd, 1988, Santa Fe wrote a  
13 letter to Bass as a follow-up to that meeting requesting to  
14 form the working interest unit.

15 On March 18th, 1988, Bass sent a letter  
16 to Santa Fe turning down Santa Fe's working interest unit  
17 proposal and advising that because of Bass' geological eval-  
18 uation the east halves of Sections 24 and 25 were not pros-  
19 pective in the Strawn formation and the only basis to form a  
20 working interest unit would be for Santa Fe to reduce the  
21 size of the working interest unit whereby Santa Fe would own  
22 no more than 25 percent of the working interest.

23 This letter also proposed the drilling of  
24 a 12,100 foot Morrow test well located at 1980 from the west  
25 and 1980 from the south of Section 34, a south half prora-

1 tion unit.

2                   Santa Fe rejected this offer because San-  
3 ta Fe had offered to contribute a similar amount of acreage  
4 and have a -- share a similar amount of the cost of drilling  
5 the well. Santa Fe also believed that it would -- that the  
6 acreage that it would contribute to the working interest  
7 unit is prospective in the Strawn formation and also other  
8 zones.

9                   Santa Fe also advised Bass at this time  
10 it would contribute its original acreage from the working  
11 interest unit but reduce its participation from 56.34 per-  
12 cent to 50 percent working interest.

13                   On April 7th Santa Fe sent a letter to  
14 Bass proposing the drilling of a test well at a location 990  
15 from the west line, 1980 from the south line with the wor-  
16 king interest unit being reduced to just cover the west half  
17 of Section 30, because of Santa Fe's concern of the addi-  
18 tional risk of drilling a wet well in the Strawn formation  
19 at Bass' proposed location.

20                   On April 11th Santa Fe received notice of  
21 Bass' application to the OCD force pooling the west half of  
22 Section 30. Subsequent to that we received a correction  
23 notice changing the area to the south half rather than the  
24 west half.

25                   Santa Fe also received a letter from Bass

1 rejecting Santa Fe's offer to reduce the working interest  
2 percentage in the unit from 56 to 50 percent and the letter  
3 also indicated Bass' intention to proceed with drilling a  
4 test well at the proposed location.

5 There have also been some follow-up phone  
6 discussions resulting in no changes in the parties' posi-  
7 tions.

8 Q In your opinion has Santa Fe made a good  
9 faith effort to obtain the consent of Bass to join in the  
10 drilling of Santa Fe's proposed well?

11 A Yes.

12 Q And for the well what does Santa Fe pro-  
13 pose as an operating agreement?

14 A Santa Fe would propose a mutually accept-  
15 able 1982 AAPL Model Form 610 Operating Agreement. This  
16 form is commonly used by Santa Fe in Eddy County for wells  
17 of this type.

18 Q Would you please describe Santa Fe's  
19 drilling history in Eddy County for the past few years?

20 A From 1983 to present Santa Fe has drilled  
21 32 wells in Eddy County and all but one of these wells is  
22 drilled to the Morrow formation.

23 28 of these wells were successful in some  
24 formation.

25 Santa Fe also participated in 9 other

1 wells of which 8 were successful.

2                   Therefore, Santa Fe has drilled 41 wells  
3 total of which 36 were successful; thus Santa Fe believes  
4 that the geological -- the geology discussed by our next  
5 witness should be given extra consideration.

6                   Q           Who does Santa Fe request the Division to  
7 designate as operator in the forced pooling order?

8                   A           Because Bass has the larger working in-  
9 terest in the west half of Section 30 and because the well  
10 is within the Big Eddy Unit, Santa Fe would request that  
11 Bass be designated as operator if they participate in the  
12 drilling of the well.

13                   Q           In your opinion will the granting of  
14 Santa Fe's application be in the interest of conservation  
15 and the prevention of waste?

16                   A           Yes.

17                   Q           And were Exhibits One through Three  
18 prepared by you or compiled from company records?

19                   A           Yes.

20                   MR. BRUCE:   Mr. Examiner, at  
21 this time I'd move the admission of Santa Fe Exhibits One  
22 through Three.

23                   MR. CATANACH:   Exhibits One  
24 through Three will be admitted as evidence.

25                   Mr. Kellahin?

1 MR. KELLAHIN: Thank you, Mr.  
2 Examiner.

3

4

CROSS EXAMINATION

5 BY MR. KELLAHIN:

6 Q Let me use your Exhibit Number One, Mr.  
7 Green, as a reference point for my questions to you.

8 Were you the landman principally respon-  
9 sible for Santa Fe Energy's discussions with Bass in propos-  
10 ing various combinations of acreage for the development of  
11 the Strawn in this immediate area?

12 A No, I was not. I was the primary land-  
13 man. The proposals from various prospects in this area were  
14 presented by our former Exploration Manager, Bill (unclear).  
15 I was not privy to all the conversations.

16 Q You are the author of the October 6, 1987  
17 letter over Santa Fe Energy's letterhead to Bass proposing  
18 this 2-section working interest ownership?

19 A Yes, I am.

20 Q And that 2 sections was to include the  
21 east half of 24, the east half of 25, which is mostly Santa  
22 Fe acreage --

23 A That's correct.

24 Q -- and you were to combine that with the  
25 west half of 19 and the west half of 30, which is mostly the

1 Big Eddy Unit.

2 A That's correct.

3 Q The interest that Santa Fe Energy has in  
4 Section 30 is confined to the 40-acre tract in the southwest  
5 of the southwest of that section.

6 A That's correct, Lot 4.

7 Q And the balance, being some 600 acres, is  
8 operated by Bass pursuant to the Big Eddy Unit operations.

9 A That is correct.

10 Q And Santa Fe Energy acquired its lease,  
11 what, two years ago, perhaps?

12 A A year and a half to two years ago.

13 Q And you acquired that at a time that the  
14 Big Eddy Unit configuration was, as it is now, for this sec-  
15 tion.

16 A That's correct.

17 Q In fact the Big Eddy Unit has been in ex-  
18 istence for some 30 years or more, has it not, sir?

19 A That's correct; since the early fifties,  
20 mid-fifties.

21 Q You've talked about Santa Fe Energy's  
22 success with regards to its Strawn development in this area  
23 and believe that that factor ought to be taken into consid-  
24 eration by the Examiner in allowing Bass to be the operator?  
25 I don't understand the point of talking about your success

1 for Strawn completions in Eddy County.

2           A           I don't think we addressed specifically  
3 Strawn completions. I said, I think what we're trying to  
4 indicate, that we are a successful operator in the area.

5           Q           Despite that success, however, you  
6 propose that Bass ought to be the operator of the well  
7 drilled in Section 30.

8           A           We would propose to allow Bass to operate  
9 that well. Our concern is the location of the well. We  
10 feel that Bass is competent to operate the well; we have no  
11 problems with Bass operating it.

12           I think under the terms of the Big Eddy  
13 agreement, even if we were to drill the well, we would turn  
14 over operations of the well to Bass after it was completed.

15           Q           The proposed location you have told us  
16 about today that's on Exhibit Number One is a location that  
17 is off the Santa Fe Energy lease.

18           A           That is correct.

19           Q           Do you know, Mr. Green, that even if  
20 Santa Fe Energy was designated the operator of this spacing  
21 unit for this well, that you could not actually drill the  
22 well because of the terms and conditions of the Big Eddy  
23 Unit agreement with the Bureau of Land Management?

24           A           No, I was not aware of that.

25           Q           The -- looking at the east half of Sec-

1 tion 25, Santa Fe Energy, in the southeast quarter of that  
2 section, has drilled an attempt to produce from the Strawn  
3 formation, has it not?

4 A I am not familiar with that well and it  
5 would probably be best answered by our geologist or engine-  
6 er.

7 Q Does that dry hole represent one of Santa  
8 Fe Energy's success in Strawn attempts in the immediate  
9 area?

10 A No, it does not.

11 Q Your initial letter of October 6, 1987,  
12 as well as Exhibit Number One, poses a well location 1980  
13 from the west line and 19 -- I'm sorry, I misspoke.

14 It's 990 from the west line and 1980 from  
15 the south line.

16 A Yes, sir.

17 Q Bass, in their letter to you of April  
18 7th, I'm sorry, there's prior correspondence, of March 18th,  
19 1988 --

20 A Uh-huh.

21 Q -- Bass is proposing that the well be lo-  
22 cated 1000 feet farther to the east --

23 A Yes, sir.

24 Q -- which will put it at a 1980 from the  
25 west line location and a 1980 from the south line location.

1 All right? Agreed?

2 A Agreed.

3 Q And in that letter Mr. Hansen for Bass  
4 proposed that the orientation of the spacing unit be a south  
5 half orientation, is that not true?

6 A That is true.

7 Q And, in fact, Bass has never proposed to  
8 Santa Fe any other orientation for the initial well in Sec-  
9 tion 30, other than a south half orientation.

10 A No, that's true.

11 Q Okay. So the initial advertisement, or  
12 the application that we filed for Bass is simply a typo-  
13 graphical error. It was never understood by Santa Fe that  
14 Bass was proposing to agree with you for a west half orient-  
15 ation.

16 A No, it was not.

17 Q As of today, Mr. Green, does Bass -- I'm  
18 sorry, does Santa Fe Energy still maintain that it desires  
19 the orientation of the spacing unit to be a stand-up west  
20 half orientation?

21 A Yes. Yes, it does.

22 Q And in that orientation, then, Santa Fe  
23 Energy would have a 12-1/2 percent working interest?

24 A That is correct.

25 Q And under a laydown, as Bass proposed,

1 you would still have the same 12-1/2 percent interest.

2 A That is correct.

3 Q Your base lease that you acquired for  
4 that 40-acre tract is -- is that fee minerals?

5 A Yes, sir.

6 Q The balance of the Section 30 is Federal  
7 minerals?

8 A That's correct.

9 Q Is the fee tract, that 40-acre tract, is  
10 that under common ownership by one fee mineral owner?

11 A No, it is not.

12 Q You have undivided ownership?

13 A I have undivided ownership in that.

14 Q And you have obtained leases from all the  
15 undivided owners for that 40-acre tract?

16 A Yes.

17 Q And what is the net working interest that  
18 Santa Fe Energy has obtained under that tract?

19 A We have 100 percent of the working inter-  
20 est.

21 Q What is the -- what is the royalty burden  
22 on that 40-acre tract?

23 A The royalty burdens are -- they will vary  
24 from 3/16th to 1/6th and we possibly could -- I don't have  
25 that information -- we possibly could have a small interest

1 with a quarter royalty.

2 Q And those are all leases acquired about  
3 18 months ago?

4 A 18 to 12 months ago.

5 Q After acquiring the initial base leases  
6 for the 40-acre tract, Mr. Green, has Santa Fe Energy  
7 further burdened its interest by additional overriding  
8 royalty interest?

9 A No, it has not.

10 Q You have not sold any interest to any  
11 other working interest owner?

12 A No, we haven't.

13 Q Have you caused to be filed on behalf of  
14 Santa Fe Energy an APD with the Bureau of Land Management  
15 proposing your well location and the west half as the  
16 spacing unit?

17 A No, we have not.

18 Q Now, the initial proposal to Bass was to  
19 form this 2-section working interest ownership for those  
20 portions of the four sections that we've described.

21 A Right.

22 Q When did you first specifically  
23 correspond with Bass with regards to this specific 320-acre  
24 spacing unit and this particular well?

25 A The letter was written on April 7th.

1           Q           So it's the April 7th letter, then,  
2 represents the first correspondence from Santa Fe to Bass  
3 that is specific as to this particular 320.

4           A           That is correct.

5           Q           In that proposal you're proposing a  
6 Strawn/Morrow test to 12,200 feet and you are proposing a  
7 different location from the location that you have proposed  
8 on October 6th, 1987, and it's also a different location  
9 than you have picked on Exhibit Number One, is that not  
10 true?

11          A           That is -- that is true but I believe  
12 that to be a typographical error, 1990 from the west line  
13 and 1980 from the south line.

14          Q           The letter of April 7th, 1988, in fact,  
15 shows a proposed location, at least in this letter, of 990  
16 from the west and 1980 from the north line of Section 30.

17                    Are you with me, Mr. Green?

18          A           I'm, yeah, I'm with you now.

19                    That is correct and I think we did move  
20 that location a time or two, and this could be a proposal  
21 and then we conceded to move it down to the southwest  
22 quarter. You could be right that we did propose it in the  
23 northwest quarter and we have since conceded to move it to  
24 the southwest quarter.

25          Q           Am I clear now in understanding after

1 you've read through the letter that the April 7th, 1988 let-  
2 ter, when it locates the well 1980 from the north line, in  
3 fact is not a typographical error?

4 A No, that was -- it's not a typographical  
5 error.

6 Q You said what you meant to say at that --

7 A That said what I meant to say at that  
8 time.

9 Q Okay. Do you have subsequent correspon-  
10 dence or communication from Santa Fe Energy to Bass in which  
11 you amend your location and show that you're now returning  
12 back to the original proposed location?

13 A No, I do not.

14 Q Were you privy to any discussions between  
15 Mr. Jens Hansen and Mr. Bill Schaefer of Santa Fe Energy  
16 with regards to discussions about where to locate this well?

17 A Yes, I was.

18 Q Were you involved in discussions in which  
19 you were present between Mr. Hansen and Mr. Schaefer in Ap-  
20 ril of this year?

21 A March, not April of this year, March is  
22 when I believe we had our meeting. Mr. Hansen visited our  
23 office in Midland.

24 Q In that discussion in March did not Mr.  
25 Schaefer tell Mr. Hansen on behalf of Bass that Santa Fe

1 Energy proposed to move its location to the northwest quar-  
2 ter in order to move away from the water that he believed to  
3 be present in the section?

4 A He proposed to move as close to the west  
5 line, whether it be in the north or the south, to get away  
6 from the water in the east part of the section.

7 Q And based upon that desire to move away  
8 from the water, then he proposed the location 1980 from the  
9 north line, 990 from the west line.

10 A Yes.

11 Q When were you subsequently told by Mr.  
12 Schaefer that he was now returning to the original location  
13 in the southwest quarter?

14 A It had to do with discussions with the  
15 Bureau of Land Management concerning the acreage involved  
16 that they felt they would have enough acreage or they would  
17 have -- there was enough acreage in the lease to have a  
18 north half spacing unit if the well was there and they pos-  
19 sibly would have some trouble approving a communitization  
20 agreement covering the west half.

21 We took that into consideration. They  
22 advised us that unless we could convince them or show them  
23 that with our geological interpretation of the west -- east  
24 half of that section being wet, then they would, of course,  
25 approve it. Rather than risk that factor we agreed to move

1 it back to the south whether we got their approval or not.  
2 Our main concern was to get as close to the west line and a  
3 legal location and stay as far from the east half of Section  
4 30 as we could because we believe the Strawn to be wet.

5 Q I'm not sure I understood you, Mr. Green.

6 A Uh-huh.

7 Q Are you telling me that Mr. Schaefer's  
8 decision to pick a point high on the structure as he has in-  
9 terpreted it and to move to the northwest quarter, was al-  
10 lowed to be overridden because the BLM desired it in the  
11 southeaast quarter -- the southwest quarter?

12 A I probably shouldn't answer this ques-  
13 tion. It would probably be better to ask Mr. Eckerty, our  
14 geologist. I'll just leave it at that, our geologist --

15 Q As best you know, though, Santa Fe --

16 A I trust my -- as best I know, what I un-  
17 derstand, that there was not a great deal of difference be-  
18 tween the two locations and that's something that Mr. Ecker-  
19 ty can discuss.

20 Q Difference between what two locations,  
21 Mr. Green?

22 A Between 990 from the west line and 1980  
23 from the south line and 990 from the west line and 1980 from  
24 the north line.

25 Q Have you obtained information as a land-

1 man from the Bureau of Land Management as to whether or not  
2 they will give any consideration at all to using the west  
3 half as the spacing unit?

4 A Yes, we have.

5 Q And what was -- what answer did you get?

6 A The answer that we got was that we would  
7 have to present our case and show them that the east half of  
8 the section was wet and that we would be wasting -- it would  
9 be contributing to waste if we did not, you know, have a  
10 west half proration unit; that they would -- they would con-  
11 sider it if we could geologically show that we could drain  
12 the reservoir with one well in the west half.

13 Q And when you discuss these kinds of mat-  
14 ters with the Bureau of Land Management, what particular in-  
15 dividual with the Bureau of Land Management do you deal  
16 with?

17 A I talk to Mr. Armando Lopez.

18 Q Any others, sir? Do you have a recommen-  
19 dation to the Examiner, Mr. Green, as to a proposed overhead  
20 rate on a monthly basis for a drilling well and a producing  
21 well?

22 A Probably, I think, in the area that Santa  
23 Fe would use \$5445 for a drilling well; 500 -- 10 percent of  
24 that, \$544 for a producing well.

25 Q If I told you that Bass will propose that

1 the drilling well rate be \$5500 a month and the producing  
2 well rate would be 10 percent of that, would you have any  
3 disagreement with that?

4 A No.

5 Q Were you involved in discussions with  
6 Bass that predate the October '87 proposal whereby the  
7 discussion initiated by Santa Fe Energy was one where you  
8 proposed a working interest unit or area of mutual interest  
9 that would include all of Section 19 and all of Section 30?

10 A No, I was not.

11 MR. KELLAHIN: Thank you, Mr.  
12 Examiner.

13

14 CROSS EXAMINATION

15 BY MR. CATANACH:

16 Q Mr. Green, I'm just trying to figure out  
17 here, what -- what portion of Section 30 lies within the  
18 unit itself?

19 A All of Section 30. If you'll look at the  
20 hatched line running up to the top of 13 all the way and  
21 coming back, all of that acreage falls within the Big Eddy  
22 Unit boundaries.

23 Q Including your 40-acre tract.

24 A Including our 40 acres.

25 Q Okay. That's all I have. You may be ex-

1 cused.

2 MR. BRUCE: Could I ask one --  
3 one -- a couple extra questions, Mr. Examiner?

4

5 REDIRECT EXAMINATION

6 BY MR. BRUCE:

7 Q Mr. Green, referring to your October 6th,  
8 1987 letter to Bass, the well location you proposed in that  
9 letter is the same that you are proposing today, is it not?

10 A That is correct.

11 Q And because only the west half of Section  
12 30 would have been included in the proposed working interest  
13 unit, it would be necessary have been stand-up west half  
14 unit.

15 A That's correct.

16 MR. BRUCE: That's all, Mr.  
17 Examiner.

18

19 DON ECKERTY,  
20 being called as a witness and being duly sworn upon his  
21 oath, testified as follows, to-wit:

22

23 DIRECT EXAMINATION

24 BY MR. BRUCE:

25 Q Mr. Eckerty, would you please state your

1 full name and city of residence?

2 A Donald Dale Eckerty, Midland, Texas.

3 Q And what is your occupation and who are  
4 you employed by?

5 A I am a Senior Geophysicist with Santa Fe  
6 Energy Company.

7 Q And have you previously testified before  
8 the OCD as a geophysicist?

9 A No, sir.

10 Q Would you please discuss your educational  
11 and work background?

12 A I have a BS in geology from Indiana  
13 University, 1965; an MA in geology from Indiana in 1968.

14 I have worked four years with Shell Oil,  
15 largely in the Northern Michigan Reef Trend.

16 I was Senior Geophysicist with Getty Oil  
17 in Midland, Texas for 7-1/2 years. I specialized in the  
18 Delaware Basin of west Texas and New Mexico; also worked the  
19 Valverde Basin of west Texas.

20 I had a year and a half with ARCO  
21 Petroleum as a project supervisor and geophysicist, working  
22 the east portion of the United States from the Williston  
23 Basin to the Gulf Coast, including west Texas.

24 I was Senior Geophysicist with Monsanto  
25 in Midland, Texas for one year and I worked the Midland and

1 Delaware Basins of west Texas.

2                   For the last four years I have been with  
3 Santa Fe Energy in Midland and I've -- almost the entire  
4 time I've worked the southeast New Mexico Morrow, and the  
5 last two years I have concentrated on the Strawn in Eddy and  
6 Lea Counties, doing largely geology.

7           Q           And are you familiar with the geology and  
8 geophysics involved in Santa Fe's application?

9           A           Yes, sir.

10                   MR. BRUCE: Mr. Examiner, at  
11 this time I would ask you if the witness' credentials are  
12 acceptable?

13                   MR. CATANACH: He is so quali-  
14 fied. How do you spell your last name, sir?

15           A           E-C-K-E-R-T-Y.

16                   MR. BRUCE: Before I move on,  
17 Mr. Examiner, I meant to move the admission of Exhibits One  
18 through Three previously, and I did not.

19                   MR. KELLAHIN: No objection.

20                   MR. CATANACH: Exhibits One  
21 through Three will be admitted into evidence.

22           Q           Mr. Eckerty, would you please refer to  
23 Santa Fe Exhibit Number Four and describe its contents for  
24 the Examiner?

25           A           Exhibit Number Four is a map of what we

1 feel is the primary Strawn reservoir in our La Huerta  
2 prospect, which is the name we give this -- this prospect.

3 We have in pink a reef developed within  
4 the Strawn. It is a tight reef. It's in Sections 25 and 26  
5 of Township 21 South, Range 27 East. Within what we feel --  
6 we call the second Strawn, which I will discuss at further  
7 length in the next exhibit, we have developed a pod of  
8 reservoir -- pod of porosity that extends partially around  
9 this reef. This is caused by -- well, it's development of  
10 porosity in carbonate detrital sands that spread around the  
11 reefs and sometimes lap over the reefs. In this case it is  
12 adjacent to the reef.

13 The yellow on this map is the reservoir  
14 above the water level and we have the water level right at  
15 the Bass 65 Well.

16 The contours on the map are the -- the  
17 structural contours are on top of this second zone of Strawn  
18 porosity that we see mapped in the area. We feel that this  
19 gas/water contact lies right at the midpoint of Section 30  
20 or within a short distance, and that the wells in this  
21 reservoir to the east have encountered wet porosity.

22 Q Would you please describe the cross  
23 section which is depicted on this map, which wells are  
24 included?

25 A The cross section B-B' starts at the

1 Champlin Toothman Well in Section 25 of 21 South, 27 East,  
2 through our previously mentioned Vernon Fed Com Well, also  
3 in Section 25, crosses to our location, then south to the  
4 Bass 65 Big Eddy Well in Section 31 of 21 South, 28 East,  
5 then north to the PanAm No. 2 Well in Section 19, and then  
6 east to the Bass No. 60 Well, I believe 60, in Section 20 of  
7 21 South, 28 East.

8 Q Will you please now refer to Exhibit Num-  
9 ber Five and discuss that cross section in greater detail?

10 A Yes, sir. Cross Section B-B', previously  
11 described, I will go through from west to east.

12 The Strawn, as we see it in Eddy County,  
13 is developed -- I'm talking about the Strawn developed up-  
14 dip from a Strawn shelf, carbonate shelf, in -- went across  
15 Eddy and Lea Counties.

16 Santa Fe, with our work largely concen-  
17 trated at this time in Indian Draw and then to the Carlsbad  
18 South, to the south of this prospect, and then along this  
19 basinal shelf edge to the northeast, has divided the Strawn  
20 into a series of sub-units which we feel are mappable over  
21 this entire region.

22 The -- there's a stray carbonate in this  
23 cross section we know as the Upper Strawn. This is of no  
24 interest to us. It occurs in this locality and then goes to  
25 the northwest.

1           The major units I'll discuss are the  
2 First Strawn, the Second Strawn, and our Third Strawn zone  
3 from top to bottom.

4           In this case, and in every reservoir we  
5 are familiar with, the porosity developed in the Second  
6 Strawn has contributed the bulk of hydrocarbon production  
7 from the Strawn.

8           In this case at the Champlin Toothman  
9 we've developed dense carbonate which we interpret as an in-  
10 ternal algal reef.

11          Our Vernon Well, moving to the east, is  
12 right on the edge of this reef. These reefs are very small  
13 in areal extent but can be very high, or they can be very  
14 tall, if you get in the right climate. In this case the  
15 reef is restricted to the Second Strawn.

16          As we come down dip on the section to the  
17 east of the reef, you can see by the time you get to the  
18 Bass 65 Well that you're picking up more internal structure  
19 within the Second Strawn. We have been able to classify  
20 this internal structure into two major zones which once  
21 again we're able to follow around the area, an upper zone A,  
22 a lower zone B.

23          In this area the Bass 65 Well has a major  
24 porosity developed in what we feel is Zone 2B, the second  
25 Strawn unit and the B reservoir -- the B unit in -- B zone,

1 excuse me.

2 In this area, as well as in our Carlsbad  
3 Field to the south, we see this porosity developed right up  
4 to the edge of the reef and this will -- I will refer to  
5 this again on a later exhibit.

6 In the Bass 65 Well we have a water level  
7 as shown. The, as I mentioned before, the oil above, oil  
8 and gas above the gas/water contact is shown in orange. The  
9 water-filled porosity is shown in light blue.

10 As we come further to the east we see  
11 that zones A and B can thicken and thin. This is largely  
12 due to the winnowing and reworking of carbonate sands along  
13 this shelf and around these reefs.

14 The PanAm Big Eddy Unit No. 2 Well shows  
15 some carbon -- hydrocarbon filled porosities that were tes-  
16 ted by PanAm in 1963. This well does have water saturations  
17 and bulk volume water calculations that would suggest it  
18 should produce. It produced a total of 1447 barrels of oil  
19 and was abandoned by PanAm.

20 We've had a Schlumberger log analyst, Mr.  
21 Steve Hansen in Midland, go over both the Bass 65 Well and  
22 the PanAm Big Eddy No. 2 Well. He feels that --

23 MR. KELLAHIN: Objection, Mr.  
24 Examiner, as to what this individual feels. It's hearsay.

25 MR. CATANACH: We'll disallow

1 that.

2           A           Okay. We feel, we believe that the poro-  
3 sities, largely in what I call Zone A in the PanAm Big Eddy  
4 2 Well, are noncommercial and cannot be connected to the  
5 porosity that we mapped in the Bass 65 Well.

6                   And the final well in the cross section,  
7 the Bass Big Eddy Unit No. 60, is well down dip on the  
8 structure. The water calculations that I have run indicate  
9 that it is in a transition zone, oil and water. We have put  
10 the water level in this zone right at the well. We feel  
11 that effectively this well is wet in all zones in the  
12 Strawn.

13           Q           Mr. Eckerty, from your calculations is  
14 the PanAmerican No. 2 Well wet?

15           A           The PanAmerican No. 2 Well, as I men-  
16 tioned, it calculates hydrocarbon productive but it was tes-  
17 ted noncommercial by PanAm in 1963.

18                   It was perfed to two zones in what I feel  
19 is -- what is the Zone A of the Second -- of the Second  
20 Strawn, one set of perfs shown on the cross section at the  
21 top of Zone B in a minor internal porosity developed in the  
22 Second Strawn that is also not connected to the Big Eddy No.  
23 65.

24                   It is our contention that none of these  
25 zones contribute a significant -- can be expected to contri-

1     bute a significant amount of hydrocarbons in any well drill-  
2     led at either of our proposed locations the west half of  
3     Section 30, and that the -- our argument is that we are  
4     trying to get as far above this water level depicted on the  
5     Bass 65 Well, as far above it as we can, and even 1000 foot  
6     move to the west from Bass' location to ours could result in  
7     significant gain in structure and still remain outside of  
8     the tight reef in the Second Strawn, which our Vernon Fed  
9     Com No. 2 Well encountered, and I intend to follow this up  
10    or back it up further with my next exhibit, which will show  
11    our Carlsbad South Strawn Field, an analagous situation.

12           Q           So, in other words, Mr. Eckerty, Santa Fe  
13    is attempting to move the well up dip from the Big Eddy Unit  
14    No. 65 Well in order to get as far away as possible from the  
15    gas/water contact?

16           A           Yes, sir.

17           Q           And in your opinion is Bass' proposed  
18    location, 1980 feet from the west line and 1980 feet from  
19    the south line, too close to the gas/water contact?

20           A           We are uncomfortable with the location  
21    that far to the east in this reservoir.

22           Q           And that is because your interpretation  
23    is that the entire east half of Section 30 is wet and  
24    nonproductive?

25           A           Yes, sir.

1 Q And you mentioned calculations on a Pan-  
2 American well, did you have your calculations confirmed by  
3 outside --

4 A Yes. That's where I was trying to go  
5 when I mentioned the log analyst and --

6 Q Okay. You mentioned Santa Fe's  
7 experience in the Carlsbad Strawn Pool. I believe this pool  
8 is indicated on Exhibit Number One by Santa Fe's acreage,  
9 oh, about four or five miles southwest of the proposed well?

10 A It is.

11 Q Would you please now refer to Exhibit  
12 Number Six and discuss the characteristics of the Carlsbad  
13 Strawn Pool?

14 A In the Carlsbad Strawn Pool I'm referring  
15 entirely to the wells that Santa Fe operates in Sections 22,  
16 27, 28, Township 22 South, 27 East.

17 Once again we have a Strawn reef shown in  
18 pink that is fringed by detrital carbonate sands.

19 Once we get out of this reef we get into  
20 our normal three Strawn units which we can map, the First,  
21 Second, and Third Strawn, once again from top to bottom. I  
22 mentioned earlier that these reefs can vary in size. This  
23 reef was developed basinward of our La Huerta prospect fur-  
24 ther down -- down the dip, and conditions at this particular  
25 place were favorable for reef growth throughout the Strawn,

1 but once again we see a very sharp contact between reef and  
2 off-reef material.

3           The analogous reservoir to the one I men-  
4 tioned earlier at the Bass 65, is what we refer to our Weems  
5 -- as our Weems/Neeley reservoir, which is also developed at  
6 the top of the lower zone of the Second Strawn, denoted as  
7 Zone B.

8           The same color scheme is in effect. The  
9 Weems/Neeley reservoir above the gas/water contact is in  
10 orange and below the gas/water contact is light blue.

11           I'd like to refer to the cross section  
12 and the map on this particular on interchangeably since they  
13 are in the same exhibit.

14           Santa Fe in 1985 drilled the well which  
15 we feel is analogous to the Bass 65. It was our Henry 2  
16 Well, the third well from the left on our cross section.  
17 It, as the Bass 64 Well did, encountered both hydrocarbon  
18 filled and water filled porosity in the Weems/Neeley zone.  
19 Unfortunately, this well, even though we perfed it only in  
20 the upper part of this zone, produced a lot of water and be-  
21 came noncommercial very quickly. We squeezed it off.

22           From 8-85 through 10-85 this well pro-  
23 duced 21-million cubic feet of gas, 547 barrels of oil, 4643  
24 barrels of water.

25           We then squeezed this off because the

1 wells to the west in the same reservoir were sufficient to  
2 -- to drain this.

3                   We then recompleted the Henry 2 up the  
4 hole in the Strawn at the perforations indicated between  
5 10,496 to 10,568. Even in these upper zones, the First  
6 Strawn perfs and the Zone A perfs, you can tell by the pro-  
7 duction that a rather minor amount of hydrocarbons are being  
8 produced; in fact, this well is for all practical purposes  
9 noncommercial in the Strawn.

10                   This is analogous to the situation that  
11 we see at the Bass 65 where a few -- that's referring back  
12 to a previous exhibit, can I do that -- where the bulk of  
13 the perforations produced gas, oil and water out of this  
14 Second Strawn Zone B of Exhibit Four.

15                   The scattered perforations up the hole  
16 contributed an insignificant amount of hydrocarbons and we  
17 don't feel that they are worth pursuing as an objective.

18                   Q           So in other words the second unit B Zone  
19 is the major producing element.

20                   A           The second unit B Zone is the major ele-  
21 ment and we see this at both these locations, our Indian  
22 Draw -- or our Carlsbad South and at the Bass 65 Well to the  
23 north.

24                   Q           And so looking at Exhibit Six in the  
25 Carlsbad South Pool, by moving west and up dip to the Weems

1 and Neeley wells, you encountered substantial porosity and  
2 productivity.

3 A Yes, sir. The Weems and or the Neeley  
4 well remained in the thick, porous zone and were above the  
5 gas/water contact.

6 Q And so Santa Fe hopes to avoid a Henry  
7 No. 2 or Big Eddy No. 65 situation.

8 A We -- we hope to avoid a Henry 2, where  
9 we want to stay above the water, and in this case we would  
10 say we want to stay as close to the reef as we can get with-  
11 out encountering it.

12 Now, our Henry reef is one of the reefs  
13 in this trend that does produce. In fact, I believe it has  
14 the -- the highest, or second highest calculated open flow  
15 in the state of 267-million cubic feet. This is an example  
16 of a reef that produces surrounded by fringing sands that  
17 also produce. We have other examples that we could bring up  
18 where the reef itself is tight while the fringing carbonates  
19 produce, such as we see at La Huerta.

20 We could have examples such as we see at  
21 other fields where both the reef and the fringing carbonate  
22 sands do produce but to reiterate, what we are trying to do  
23 is stay above the water and stay out of the tight reef.

24 Q And in your opinion will the drilling of  
25 the well at Santa Fe's proposed location prevent waste?

1 A Yes, it will.

2 Q And in your opinion would the drilling at  
3 Bass' location risk the chance of being at or near the  
4 gas/water contact or watering out too soon and thus  
5 requiring the drilling of a second well in the west half of  
6 Section 30.

7 A The structural information available to  
8 me indicates that the dip at the La Huerta prospect is from  
9 west to east and Bass' well would be down dip from our  
10 proposed location.

11 Q Now, Santa Fe's, and I believe Bass' pro-  
12 posed wells are both Strawn -- they're primarily targetted  
13 at the Strawn, is that correct?

14 A Yes, sir, both -- both of these wells  
15 have the Strawn as the major objective.

16 Q Does Santa Fe propose to drill the well  
17 or have its well drilled to test the Morrow formation?

18 A We do.

19 Q And would that well have a reasonable  
20 chance of being successfully completed in the Morrow at San-  
21 ta Fe's location?

22 A It has a reasonable chance.

23 Q But the Morrow is riskier than the  
24 Strawn.

25 A The Morrow is a riskier zone to test,

1 yes, sir.

2 Q Now, Bass has also applied to force pool  
3 160-acre units. To your knowledge are there any productive  
4 formations or pools in this area with 160-acre spacing?

5 A All of the pools of which I'm aware are  
6 for gas are on 320-acre spacing.

7 Q And what penalty do you recommend for  
8 nonconsenting interest owners?

9 A A normal nonconsent on a risky -- risky  
10 well, such as we're attempting to drill, would be a 200 per-  
11 cent penalty.

12 Q And you think that's justified by the  
13 geology of this area?

14 A Yes, sir, I do.

15 Q Were Exhibits Four through Six prepared  
16 by you or under your direction?

17 A They were.

18 MR. BRUCE: At this time, Mr.  
19 Examiner, I move the admission of Exhibits Four through Six.

20 MR. CATANACH: Exhibits Four  
21 through Six will be admitted into evidence.

22 MR. KELLAHIN: No objection.

23

24

25

## 1 CROSS EXAMINATION

2 BY MR. KELLAHIN:

3 Q Mr. Eckerty, if you'll go back to your  
4 Exhibit Number Four, you've qualified yourself as an expert  
5 witness before the Division not only as a geologist but as  
6 an individual with professional and educational qualifica-  
7 tions as a geophysicist. Have you applied any of the  
8 methods of the geophysicist to picking this well or deter-  
9 mining the orientation of the spacing unit?

10 A No, sir, we have not.

11 Q We don't have any seismic information to  
12 use as a tool in evaluating and picking a location?

13 A We have not used seismic in this area.

14 Q From a traditional geologic examination,  
15 if you will, applying that area of your expertise to this  
16 project, Mr. Eckerty, when did you first become involved in  
17 picking this particular location?

18 A This area has been a prospect or a lead  
19 for Santa Fe for I would say at least a year and a half.

20 Q I didn't make myself clear.

21 A Okay.

22 Q You personally, other than Mr. Schaefer,  
23 who is a geologist for Santa Fe Energy --

24 A Right.

25 Q -- and no longer is working this particu-

1 lar prospect.

2 A Oh, this -- this is a prospect that I de-  
3 veloped.

4 Q All right. That's what I'm asking you is  
5 --

6 A Fine.

7 Q -- whether you did the work or whether --

8 A Yes, sir.

9 Q -- Mr. Schaefer's done the work.

10 A No, sir. I did it.

11 Q This is your work.

12 A I developed this one.

13 Q All right. When we look at Exhibit Num-  
14 ber Four, let me see if I can't understand where you appro-  
15 ximate the various proposed locations to be on the structure  
16 portion of this display, and so that we're all looking at  
17 the same things, the heavier lines that run generally north  
18 to south, those are your interpretations of the structure.

19 A Yes, sir.

20 Q And when we look at the contour line for  
21 the structure immediately to the west of the red dot, which  
22 is your No. 1 location, if you'll bear with me, that contour  
23 line immediately to the west is at a -7450 feet, is that not  
24 correct?

25 A It is.

1 Q All right. That -- that's a structural  
2 line.

3 A It's a structural line.

4 Q When we look at your location number one  
5 --

6 A Uh-huh.

7 Q -- which is the one displayed with the  
8 red square, approximate for me what you think the structural  
9 depth is.

10 A It's approximately 7465 feet, there-  
11 abouts. We are saying that we are approximately -- we're  
12 talking 20 feet or so here of difference.

13 Q When we go 1000 feet farther to the east  
14 and look at the Bass location at 1980 from the west line,  
15 it's your opinion that that is going to be approximately  
16 7485?

17 A Not quite; somewhere in that range, yes,  
18 sir.

19 Q What is your best estimate of what it is?

20 A I would say that we should be between 15  
21 and 20 feet high at our location; very possibly a little  
22 more. Due to the effect of these zones at the edge of the  
23 reef, it's -- with just well control it's hard to be pre-  
24 cise, but as I mentioned before, definitely you are coming  
25 up dip to the west.

1           Q           I'm asking your best approximation. I  
2 realize that there is not enough subsurface control to be so  
3 specific.

4                        When we look now to the location that was  
5 described in Mr. Green's letter of April 7th in which at  
6 least an alternative location proposed by Santa Fe is one  
7 that was 990 from the west and 1980 from the north line --

8           A           Uh-huh.

9           Q           -- approximately what structural position  
10 does that put us in?

11          A           On this interpretation approximately  
12 7455; thereabouts, I'd say 8 or 10 feet different. The  
13 structure is almost north/south through here, the trend of  
14 the structure.

15          Q           The second proposed, if you'll bear with  
16 me, for Santa Fe's alternative location, would have gained 8  
17 to 10 feet of structure.

18          A           It's -- they're toss-ups, yes, sir, it  
19 was slightly -- slightly higher but very close.

20          Q           The structural interpretation on the dis-  
21 play shows a slight nosing of the structure to the east in  
22 Section 30? Am I reading this correct?

23          A           There is a slight nose.

24          Q           And the nosing of that structure is what  
25 causes you to take the contour line at -7500 and put a lit-

1 tle wave in it, if you will, as we go into the east half of  
2 Section 30?

3 A Yes. I'm trying to -- I've to bring it  
4 in from the west down from Section 36 and 31; 36, 21, 27  
5 South; 31 of 21, 28 East, and then I've got to -- I've got  
6 to turn it north and then try to keep it in perspective to  
7 the Big Eddy Well in Section 19, the PanAm Well.

8 So I'm trying to come out of this re-  
9 entrant I see to the south and still form the contours in a  
10 reasonable manner through this Section 30.

11 Q When we look at the wells in 29, and  
12 let's put some numbers on them so we're all looking at the  
13 same ones, the north well is the Big Eddy 39 Well, is it  
14 not?

15 A It is.

16 Q All right, and the well in the southwest  
17 quarter of 29, that's the Big Eddy 54?

18 A Yes.

19 Q Are those control points for interpreting  
20 the structure in the Strawn?

21 A They are. We've -- we've also picked the  
22 top of this Second Strawn Zone B in those wells.

23 Q For picking the structure on the Strawn  
24 what have you used for the -- for the line of structure,  
25 what point? The top of the Strawn, the top pay?

1           A           No, sir. The contours on this map are on  
2 top of the Zone B. That is why you don't see any structural  
3 values in the reef because I don't recognize Zone B in the  
4 reef.

5           Q           That is where we were going because I  
6 didn't understand what you had done.

7           A           Okay.

8           Q           The top of the structure as you've dis-  
9 played here, I'm sorry, the structure you've displayed here  
10 is picked on the top of Zone B.

11          A           Yes, sir.

12          Q           Okay.

13          A           I should have made that clearer going  
14 through.

15          Q           In picking the structure we see with the  
16 Big Eddy 54 Well that we're at a -7571, correct?

17          A           Correct.

18          Q           The Big Eddy 39, then, is at a -7587.

19          A           It's slightly lower, yes.

20          Q           At the proposed Bass location you've ap-  
21 proximated for us a -7485. My concern is why you have not  
22 chosen to make a more significant nosing of the structure to  
23 honor the structural position for the control wells in 29.

24                    Would that not cause you to make a  
25 greater nose in the structure, if you will?

1           A           There could be more or less nosing. This  
2 was what I felt was the reasonable fit on this. In other  
3 words, the structure does not stay absolutely at the same  
4 gradient throughout.

5           Q           Yes, sir, I understand, and I know just  
6 enough about geology to be dangerous, Mr. Eckerty. What I'm  
7 asking you is within the range of -- of choices for your  
8 profession, whether or not it would be reasonable for a dif-  
9 ferent geologist to display a stronger nosing effect to the  
10 structure as he moved east with his interpretation through  
11 Section 30?

12          A           I suspect it would. This is a -- this  
13 was my -- what I felt was the most reasonable interpretation  
14 that I had on this particular prospect.

15          Q           Now taking you back to the earlier ques-  
16 tion, what have we defined here when we look at the second  
17 Strawn reef in the wells, I believe it's the Santa Fe Vernon  
18 Federal 1-Y Well?

19          A           Right.

20          Q           When we look at what you've identified as  
21 a Strawn reef, you have taken the Strawn reservoir to be  
22 tested with this well and you've curved and wrapped the re-  
23 servoir to the north around the second Strawn reef in the  
24 Vernon well.

25          A           And that as just to what we see at the

1 Carlsbad Field shown on Exhibit Six.

2 Q Within this immediate area, looking at  
3 Sections 19, 24 and 25, do we yet have any subsurface geol-  
4 ogy that will help us pick and define the reservoir?

5 A Not until we get a well into it.

6 Q At this point we lack that control.

7 A We do. This is -- this is what Santa Fe,  
8 what we feel, what I feel is the reasonable picture of this  
9 reservoir based on knowledge gained elsewhere in the Strawn  
10 trend.

11 Q Is it fair to call that an interpretation  
12 based upon what saw in the South Carlsbad reef situation?

13 A It is.

14 Q And at this point we don't have the sub-  
15 surface control to confirm that the reservoir itself has a  
16 size and shape as you've displayed it here.

17 A No, we do not.

18 Q Can you make a log analysis or examine  
19 the logs to satisfy yourself that the Vernon Federal Com  
20 Well from log analysis in fact shows a reef?

21 A We interpret it as being right at the  
22 edge of the reef. If you look at the Champlin Toothman Well  
23 --

24 Q I don't want to move ahead too far just  
25 yet, Mr. --

1           A           Oh, excuse me.

2           Q           -- Eckerty. What I'm looking for is the  
3 field data, if you will, the log data --

4           A           The log data.

5           Q           -- that you go to and say, "Ah, ha, this  
6 --"

7           A           This is a reef.

8           Q           "-- is a reef." All right. Where is  
9 that on the cross section, Number Five, for the Vernon well?

10          A           It's the second well in from the cross  
11 section edge, and when we -- when we see massive carbonates  
12 beginning to develop with the shale stringers decreasing,  
13 when they're adjacent to a massive well, such as we see at  
14 the Toothman to the west, we would put the edge of our reef  
15 right there at the Vernon.

16          Q           When you're looking at the Vernon log  
17 you're looking on the left side of the log here and you see  
18 this carbonate section --

19          A           Right.

20          Q           -- and that you've interpreted to be what  
21 you've identified as the Second Strawn reef?

22          A           And we -- we would interpret it to be  
23 edgy, right on the edge of the reef. We are starting to see  
24 some gamma ray character but it's still pretty much a mas-  
25 sive carbonate, although admittedly not as massive as we see

1 in the Champlin 2.

2 Q What is the vertical thickness there in  
3 feet, approximately, for the reef as you find it in the  
4 Vernon Well?

5 A The Vernon Well is approximately 90 feet.  
6 The Champlin Toothman, 145 feet.

7 Q In that South Carlsbad reef situation  
8 you've described for us, that well is in the immediate vici-  
9 nity of the Strawn Shelf, is it not?

10 A It's closer to the edge of the Strawn  
11 Shelf.

12 Q And approximately how distant is the  
13 Carlsbad Strawn from the edge of the shelf?

14 A Within two to three miles. You're --  
15 when you get off that edge right from our Henry Well and go  
16 to the southeast, within a couple of miles you're -- you're  
17 down to just ratty Strawn, such as you might see further  
18 basinward all the way into Texas. And we see the same  
19 phenomena at, well, locations such as Bass' Big Eddy Field  
20 itself, where we have the big reef developed right on the  
21 edge. If you go to the next wells to the southeast of  
22 there, you get no carbonate.

23 Q How far is this La Huerta prospect from  
24 the edge of the Strawn Shelf?

25 A It would be more like seven or eight

1 miles to the north of the shelf edge. That's why we see the  
2 Strawn carbonates thinner and the reefs more patchy and not  
3 as tall.

4 Q Where is the Burton Flats Pool? That's  
5 farther to the north and west of this location?

6 A Burton Flats is further to the north and  
7 just about due north another five miles, or so.

8 Q And do you see any of this Strawn reef  
9 occurrence in the Burton Flats Pool?

10 A It's been a long time since I looked at  
11 that particular pool. I think up there I see mostly the --  
12 the fringing material, the detrital carbonate, but I would  
13 have to -- I would have to say that I would need to look at  
14 some logs up there again before answering that. I've con-  
15 centrated down at our Carlsbad --

16 Q If the Second Strawn reef exists as  
17 you've interpreted it in the Vernon Well, this will be the  
18 first occurrence of a similar reef this far west of the  
19 shelf edge of the Strawn, will it not?

20 You're seven miles --

21 A This occurrence.

22 Q Yeah, you're --

23 A Six or seven, okay.

24 Q -- six or seven miles away from the edge  
25 of the shelf. Can you think of any others that will be this

1 far to the north and west of that edge?

2           A           The Coquina Nichols Well in Section --  
3 it's in Township 22 South, 27 East, Section 21. It's not  
4 indicated but it's -- it encountered a fairly strong build-  
5 up of carbonate in the Strawn; not as big as we see at the  
6 Henry but bigger than we see at the -- at the La Huerta.

7           Q           And that's an area down by the South  
8 Carlsbad --

9           A           Right.

10          Q           -- Field?

11          A           Right, it would be another, say, two  
12 miles north of our Henry Well.

13          Q           So the occurrence of this shelf in the La  
14 Huerta prospect is the one that thus far is the farthest  
15 away from the edge of the shelf.

16          A           I'm trying to think of some others. For  
17 right now I'd say yes, that I am aware of.

18                    We've concentrated on -- we've concen-  
19 trated on the shelf edge fields and then moving shelfward.

20          Q           Let's look at the Isopach portion of  
21 Exhibit Number Four. Do you find with any of the three well  
22 locations we've discussed, either the Bass location or the  
23 two Santa Fe Energy locations, all of those locations fall  
24 within a reservoir thickness mapped by you to be in excess  
25 of 30 feet?

1           A           They do. Once again, that's a reasonable  
2 interpretation of the way the porosity, I would expect, to  
3 fringe this build-up of this reef, based on analogy to what  
4 I see at Carlsbad.

5           Q           And as we move farther to the west, then,  
6 we're going to lose reservoir thickness. As you've inter-  
7 preted it, we will lose that thickness when we get over into  
8 Section 25 to the west.

9           A           We should, yes. I would not expect it to  
10 extend into Section 23 or 26. It could. I was trying to be  
11 conservative when I mapped it.

12          Q           When you look at the reservoir thickness  
13 for the Vernon Well in Section 25, what thickness in the re-  
14 servoir did you find in that well?

15          A           No reservoir in the Vernon Well.

16          Q           You got zero.

17          A           Right. In fact, as I said, I mentioned I  
18 couldn't even pick the zone in the Vernon Well.

19          Q           Have you proposed a well location in the  
20 northeast quarter of 25 for your company?

21          A           We would intend to -- to put a location  
22 in the west half of Section 30 where we're proposing it now  
23 and then step to the west.

24          Q           The idea would be use a location in the  
25 west half to test the reservoir further and then a subse-

1   quent development location would be located in the northeast  
2   of 25?

3           A           Certainly.  If we had the well there now,  
4   we would already know for sure whether the reservoir is in  
5   fact there.  We would rather -- we would rather test this in  
6   an orderly manner stepping out from the Bass 65, where we  
7   have the reservoir proven, but largely wet.

8           Q           When we look at the reservoir thickness  
9   for the 65 Well, which is in the northwest of 31, you've in-  
10  terpreted 36 feet of reservoir thickness?

11          A           That would be -- that would be reservoir  
12  greater than 4 percent, is our cutoff.

13          Q           You've used a 4 percent cutoff?  Does it  
14  make a difference if you'd used a 5 percent porosity cutoff?

15          A           Whichever -- whatever cutoff you use will  
16  certainly affect the amount of net thickness you come up  
17  with.

18          Q           If we use a 5 percent rather than a 4  
19  percent, what happens?

20          A           You would get a thinner reservoir.

21          Q           With 4 percent, then, we have a thicker  
22  reservoir than if at 5.

23          A           Certainly, and thinner than if at 2.

24          Q           All right.  You have interpreted using a  
25  4 percent cutoff, 36 feet of reservoir thickness.

1           A           This is based on what we see once again  
2 in our work around Eddy County, and based on our -- down at  
3 Carlsbad, if we get less than 4 percent, we realize that it  
4 could still produce but we like to use 4 percent as our,  
5 I'll say ballpark, when we map our reservoirs.

6           Q           Am I correct in your picking of the gas-  
7 water contact as you've identified it on your display, Ex-  
8 hibit Four, you have made the judgment that the 65 Well is  
9 all water.

10          A           No, sir. As shown on the cross section,  
11 there is approximately 4 feet of hydrocarbon-bearing zone  
12 above. In fact, the well did produce over 15,000 barrels of  
13 oil and 324-million cubic feet of gas along with approxi-  
14 mately 215,000 barrels of water and we think that the bulk  
15 of this production must have come from this zone.

16          Q           I guess I didn't understand you when you  
17 were talking on your direct examination when you said that  
18 the water level in the 65 Well was at all levels in that  
19 well. Maybe I didn't understand --

20          A           At all levels?

21          Q           Yes, sir. I had understood you to say  
22 that in picking the gas/water contact you were using the en-  
23 tire thickness as the water encroachment.

24          A           I do not recall stating it like that.

25          Q           Okay.

1           A           What I meant, if I -- if I did, what I  
2 meant to say was that the water level is high in that well.  
3 At the present time I would predict that the water is -- has  
4 in fact encroached to the top of that zone, but in fact if  
5 it had been wet all along, we would never have got the  
6 15,000 barrels of condensate and the third of a B of gas  
7 from it.

8           Q           How many feet of that reservoir thickness  
9 do you attribute to the gas volume in that well originally?

10          A           The original contact that our analyst  
11 showed was approximately 7488 subsea. As I said, that was,  
12 I think, around four, four to five feet of column above  
13 water originally in that well.

14          Q           When we look at the Big Eddy No. 2 Well,  
15 which is in the southeast of the southeast of 19?

16          A           Uh-huh.

17          Q           You've got that well significantly below  
18 the gas/water contact.

19                      The Big Eddy No. 2 Well originally  
20 produced some hydrocarbons?

21          A           It produced 1400 barrels of oil and we do  
22 not have the informaton on how much water or gas it produced  
23 because the State records don't have it; however, it's had,  
24 I believe, a GOR of -- I have it here somewhere, it's around  
25 18,700-to-1. Well, it's on here, it's 18,700-to-1 on the

1 cross section.

2           As I mentioned when I went through here,  
3 that well calculates to be hydrocarbon-bearing. In fact, it  
4 did produce some water -- or some oil, but that it -- that  
5 fact, once we see a water level at a higher level in the  
6 Bass 65, to me separates those perforations and those poro-  
7 sities from the major reservoir I'm seeing at the (unclear)  
8 and I believe I said, or meant to say, that we attribute no  
9 commercial potential at this point to those zones. In fact,  
10 we show them feathering up onto the structure in the cross  
11 section.

12           Q           Other than the Big Eddy No. 2 Well and  
13 the Big Eddy 65 Well, those are two best and only controls  
14 for the gas/water contact on this display, are they not?

15           A           They are, uh-huh. There's -- yes. If in  
16 fact, if in fact, well, what we are saying is that in this  
17 main reservoir a location anywhere in the west, and far to  
18 the west in Section 30, should have a good chance of still  
19 being in the good porosity and above the water. If in fact  
20 the east half were commercial, we wouldn't feel at all bad  
21 about Bass drilling 100 percent offset in the east half on a  
22 standup and draining it, but we feel that the west is where  
23 we want to be.

24           Q           When we look at the reservoir thickness  
25 on the isopach, we do have reservoir thickness throughout

1 all of the east half of Section 30.

2 A There is reservoir developed.

3 Q And the issue then for you is where is  
4 the gas/water contact within the east half of Section 30.

5 A It is the issue.

6 Q What information would cause you to move  
7 the gas/water contact farther to the east?

8 A A more -- it would take a more exact  
9 structure map for certain, or at least we would have to be  
10 convinced that the nose, in fact, was stronger. It might --  
11 someone would have to address why the well in Section 19,  
12 the PanAm well in fact failed to produce commercial quanti-  
13 ties of hydrocarbons and then why those zones indicated hy-  
14 drocarbon-bearing but in fact are separated, or seem to be  
15 separated from the Bass 65 due to the water, the level we  
16 see it.

17 Q The gas/water contact you believe is  
18 going to follow the lines of the structure?

19 A We think it will stay reasonably close to  
20 the lines of the structure.

21 Q And so whatever the structure is within  
22 Section 30, that gives us a good basis upon which to deter-  
23 mine whether -- where the gas/water contact is.

24 A On the structure on top of this particu-  
25 lar zone. You could make a structure map of units elsewhere

1 in the section, I'm sure, and come up with different struc-  
2 tural interpretations, but since we are convinced that this  
3 particular reservoir is in fact contained within our second  
4 zone, we would have to see proof that it in fact (not aud-  
5 ible).

6 MR. KELLAHIN: I'm not sure how  
7 you want to handle this, Mr. Examiner, I mean with regards  
8 to whether you want a lunch break or how do you want to han-  
9 dle it?

10 MR. CATANACH: We'll probably  
11 take a break after the applicant finishes its case.

12 MR. KELLAHIN: All right, let  
13 me take a moment and see if I can't shorten this.

14 Q Were you involved with the discussions  
15 between Mr. Schaefer and employees of Bass with regards to  
16 discussing various locations for the well in Section 30?

17 A No, sir, I was not.

18 Q Other than the interpretation that you've  
19 given us today, particularly Exhibit Number Four, have you  
20 had between October of 1987 and this, the date on this dis-  
21 play, other interpretations of this area?

22 A Originally I had another well, or I had a  
23 slightly different picture down dip in the porosity of this  
24 zone. When I -- we made more detailed well log analysis of  
25 the wells, we settled on this interpretation. In fact, we

1 have had an on-going -- an on-going program evaluating these.

2 Q The last of the subsurface geologic data  
3 available to you was the results from the drilling of the  
4 Santa Fe Vernon Well in, what was it, July of '85, the sum-  
5 mer of '85?

6 A Summer of '85, right.

7 Q Since then we don't have any new geologic  
8 subsurface data for this immediate vicinity.

9 A We have no wells drilled since then right  
10 in this vicinity. This is based on the analysis of the ex-  
11 isting well logs and production informaton available to us.

12 Q Am I correct in understanding that the  
13 second location Santa Fe proposed, which is in the northwest  
14 quarter, would be at a location on the structure that's 8 to  
15 10 feet higher and still would be within the 30-foot thick-  
16 ness of the way you've mapped the reservoir on the isopach.

17 A It would still -- it would still be with-  
18 in the reservoir and marginally higher than where we're at,  
19 but we feel that any location in the west half of Section 30  
20 at a reasonable distance above the water will drain the hy-  
21 drocarbons in Section 30.

22 Q Thank you, Mr. Eckerty.

23 MR. CATANACH: I have nothing.

24 Mr. Bruce?

25 MR. BRUCE: Just briefly, Mr.

1 Examiner.

2

3

REDIRECT EXAMINATION

4 BY MR. BRUCE:

5 Q From Santa Fe's experience in the Carls-  
6 bad South, I believe you said that Strawn reefs are not  
7 large in areal extent, is that correct?

8 A Very, very limited in extent, as a matter  
9 of fact.

10 Q And that forms the basis where you be-  
11 lieve on Exhibit Number Five that this Strawn reef will end  
12 just immediately to the east of the Vernon Well?

13 A Yes. In fact, due to its position in the  
14 -- only the Second Strawn, it could in fact be smaller than  
15 I've shown it. In any event, we feel that it does not ex-  
16 tend beyond the Vernon.

17 Q Thank you, Mr. Eckerty.

18 MR. CATANACH: No questions.  
19 The witness may be excused.

20 MR. BRUCE: A final and short  
21 witness, Mr. Examiner.

22

23

JOSEPH PARADISO,

24 being called as a witness and being duly sworn upon his  
25 oath, testified as follows, to-wit:

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## DIRECT EXAMINATION

BY MR. BRUCE:

Q Will you state your name and place of residence?

A Joseph Paradiso, Midland, Texas.

Q And what is your occupation and who are you employed by?

A Petroleum engineer with Santa Fe Energy.

Q And have you previously testified before the Division as petroleum engineer?

A Yes, I have.

Q And are you familiar with the engineering matters involved in Santa Fe's Case Number 9372?

A Yes, sir, I am.

MR. BRUCE: Mr. Examiner, are the witness' credentials acceptable?

MR. CATANACH: They are.

Q Mr. Paradiso, do you have an opinion as to the acreage which will be drained by a Strawn well located in the southwest quarter of Section 30?

A Yes, I do. I believe it will drain 320 acres, or greater.

Q And what is that opinion based on?

A It's based on the Santa Fe wells in the

1 Carlsbad Strawn Pool.

2 Q Referring to Exhibits Seven and Eight,  
3 Mr. Paradiso, would you please describe them briefly?

4 A Yes. These are our bottom hole pressure,  
5 better known as P/z curves versus cumulative, which we use  
6 to obtain a gross ultimate recovery, and these are the two  
7 wells that are comparable to the -- to the well location, of  
8 the same zone as compared to the one in the La Huerta.

9 Q And briefly what do they show to be the  
10 ultimate production from these two wells?

11 A We have an ultimate production -- recovery  
12 of 5.4 BCF in the Neeley and 7 BCF on our Weems.

13 Q And would you please now refer to Exhi-  
14 bits Nine and Ten and discuss them briefly?

15 A Okay. Exhibit Nine just shows a basic  
16 formula that we use for the volumetric reserve calculations,  
17 in which I take the gross ultimate recovery from the P/z  
18 curve with the other data and then solve for the acreage  
19 drainage, do a drainage calculation and solve for the acre-  
20 age.

21 Q And what are the results of your calcula-  
22 tions on the Neeley and Weems?

23 A Okay, the Neeley, we estimate it will  
24 drain 572 acres and the Weems, we estimate it will drain  
25 347.

1           Q           And both those are Strawn completions,  
2 are they not?

3           A           That's correct.

4           Q           Based on these calculations, what is your  
5 opinion regardng the drilling of a well in Section 30?

6           A           I believe that one Strawn well in Section  
7 30 will drain at least 320 acres and since the east half we  
8 believe is wet and does not contribute to production, only  
9 one well is needed today in the west half of Section 30;  
10 therefore, drilling a well with a south half unit will re-  
11 quire two wells in Section 30 and cause the drilling of an  
12 unnecessary well and cause an economic waste of approximate-  
13 ly \$1-million.

14           Q           In your opinion will the granting of San-  
15 ta Fe's application and the denial of Bass' application be  
16 in the interest of conservation and the prevention of waste?

17           A           Yes, I do.

18           Q           And were Exhibits Seven through Ten pre-  
19 pared by you or under your direction?

20           A           Yes.

21                           MR. BRUCE: Mr. Examiner, at  
22 this time I move the admission of Exhibits Seven through  
23 Ten.

24                           MR. CATANACH: Exhibits Seven  
25 through Ten will be admitted in evidence.

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## CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Paradiso, if you'll take Exhibit Number Nine for me, let's go through the parameters for your volumetric calculation so that I can simply clarify for myself out of the calculation what values you've used.

For reservoir thickness what has you picked?

A 22 feet. Are you referring to the Neeley, now?

Q Whatever was done to get the calculation for Exhibit Number Ten and let's use the one for the Neeley Well, if you will, please.

A Okay, that would be 22 feet.

Q You've got 22 feet. What have you used for porosity?

A 7.2 percent.

Q And your water saturation?

A Well, I have the gas saturation plugged in there. That would be 38, approximately, water saturation, which --

Q Where in the calculation did you plug that in?

A That's the 622.

1 Q Okay.

2 A One minus the water saturation would give  
3 you your gas saturation (unclear).

4 Q Okay. And what have you used for your  
5 reservoir pressure?

6 A 5600 pounds.

7 Q And where does that reservoir pressure  
8 come from?

9 A That was measured from a build-up extra-  
10 polated like we do --

11 Q Was that an early build-up test in the  
12 well?

13 A Yes, sir.

14 Q Was that the first build-up test --

15 A Yes.

16 Q -- you had?

17 A Yes, sir.

18 Q In your opinion does that represent ori-  
19 ginal reservoir pressure for that area?

20 A Yes.

21 Q What did you use for your reservoir tem-  
22 perature?

23 A That would be -- I'd like to refer to  
24 these so I don't make a mistake.

25 It would be 180 (not clearly understood)

1 -- I should have listed those, maybe -- if I've not made a  
2 mistake.

3 It's 640 minus the -- it would be -- 460  
4 degrees would change the (not clearly understood).

5 Q Okay. What have you used for the com-  
6 pressibility factor?

7 A .93.

8 Q And what have you used for your recovery  
9 factor?

10 A .8.

11 Q That would be 80 percent recovery?

12 A Yes.

13 Q This is not, then, a water drive  
14 reservoir, is it?

15 A Not that we know of yet.

16 Q Okay. Not for the Neeley Well and you  
17 don't attribute any of the potential for production in the  
18 La Huerta prospect to be a water drive reservoir, do you?

19 A I think that it could be a, I would say,  
20 how would I phrase that, not a very active water drive,  
21 slight water drive.

22 Q Have you conducted any engineering  
23 studies to determine whether or not this La Huerta prospect  
24 may be a water drive reservoir?

25 A No.

1 Q You haven't taken any flowing tubing  
2 pressures versus time and analyzed that to see what results  
3 you get?

4 A In La Huerta?

5 Q Yeah, on La Huerta?

6 A No.

7 Q And you haven't taken any gas/water  
8 ratios versus cumulative gas production to see what effect  
9 that has?

10 A No.

11 Q The calculation of the volumetrics for  
12 the Neeley Well shows you using those parameters that you've  
13 got 572 acres?

14 A Yes, sir.

15 Q And under the Weems Well you've got 347  
16 acres?

17 A Yes, sir.

18 Q Now your conclusionary summaries with  
19 regards to Mr. Bruce's questions, are predicated and assume  
20 that the geology is correct, do they not?

21 A That's correct.

22 Q And if the geology is wrong, then you're  
23 going to need two wells in the section, is that not true?

24 A That's correct.

25 Q And doing the volumetric calculation is

1 not going to tell you how many wells you ought to drill in  
2 Section 30.

3 A It may or it may not. If the geology is  
4 correct, it does; if the geology is not correct, it doesn't.

5 Q And the engineering calculations that  
6 you've done are not going to tell you how to orient the  
7 spacing unit in the section independent of the geology?

8 A That's correct.

9 Q When you were -- on your earlier dis-  
10 plays, on Seven and Eight, I need to ask you some informa-  
11 tion on these.

12 These are your decline curves on the  
13 Neeley Well and the Weems Well?

14 A P-z curves.

15 Q Yeah.

16 A What were you using for abandonment pres-  
17 sure?

18 A We used 500 pounds.

19 Q Do you use a 500 pound abandonment pres-  
20 sure on all your wells, Strawn wells?

21 A Typically we'd use 10 percent, around 10  
22 percent of the original bottom hole pressure.

23 Q 10 percent of the original pressure, it  
24 was -- we were working about 1560 -- I'm sorry, 5600?

25 A Right, yeah.

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Q Okay, and you're using 10 percent.

A It was somewhere round (not understood).

Q Would it be unreasonable for an engineer to use 1000 pounds as the abandonment pressure?

A Not in some cases.

Q That will simply give you less reservoir

--

A Yes.

Q -- will it not?

A Yes.

Q It would be a more conservative analysis of what would be the reserves attributable to the well.

A Right. Yes.

Q If I understand the calculation, your recovery factor is 80 percent.

A Uh-huh.

Q If you're using an abandonment pressure of 10 percent, would that not equate to a 90 percent recovery?

A Well, not necessarily; and this is -- this is conservative.

Q Okay.

A I think typically these will range from 70 to 90 percent recovery factor.

Q Okay, so -- so the recovery factor could

1 fluctuate --

2 A Some.

3 Q -- within 70 to 90 percent.

4 A That's possible.

5 Q A choice of recovery factor within that  
6 range in your opinion as an engineer would be reasonable?

7 A Uh-huh, it would not change a whole lot  
8 the drainage (not understood) when you go through the calcu-  
9 lations.

10 Q Thank you.

11 MR. CATANACH: Mr. Bruce, any-  
12 thing else?

13 MR. BRUCE: Yes.

14

15 REDIRECT EXAMINATION

16 BY MR. BRUCE:

17 Q Mr. Paradiso, based on your calculations  
18 only if most of the east half of Section 30 is dry would a  
19 second well be needed to drain the section, is that correct?

20 A Uh-huh, that's correct.

21 MR. BRUCE: Nothing further.

22 MR. CATANACH: Okay, let's take  
23 about a twenty minute break.

24

25 (Thereupon a recess was taken.)

1 MR. CATANACH: Okay, we'll re-  
2 convene the hearing at this time.

3 Mr. Kellahin.

4 MR. KELLAHIN: Thank you. Mr.  
5 Examiner, at this time we'll call Bass' geologic expert, Mr.  
6 George Hillis. His last name is spelled H-I-L-L-I-S.

7

8 GEORGE A. HILLIS,  
9 being called as a witness and being duly sworn upon his  
10 oath, testified as follows, to-wit:

11

12 DIRECT EXAMINATION

13 BY MR. KELLAHIN:

14 Q Mr. Hillis, you were one of the witnesses  
15 sworn this morning, were you not, sir?

16 A Yes, sir.

17 Q And have you previously testified before  
18 the Oil Conservation Division as an expert petroleum geolo-  
19 gist?

20 A On two previous occasions.

21 Q Would you summarize for us what it is  
22 that you do for Bass Production Company?

23 A With Bass Production Company I work in  
24 both the exploration and development ends of their company  
25 and I am heavily involved in the petrophysical studies.

1 Q Have you made a specific study of the  
2 geologic facts surrounding Bass' proposed development of  
3 Section 30 with regards to the Strawn-Morrow test that is  
4 the subject matter of this hearing?

5 A Yes, I have.

6 Q Would you give the Examiner a little of  
7 your background and personal involvement in not only this  
8 project but in the immediate area in developing Strawn pros-  
9 pects?

10 A I first was exposed to southeast New Mex-  
11 ico in 1981 when I joined Bass and since that time have been  
12 responsible for the exploration and development within the  
13 Bass Federal Units within the Eddy and Lea Counties.

14 With respect specifically to the Strawn  
15 formation I have been involved in a one-half to two year  
16 regional study of the Strawn across the area, and with  
17 respect specifically to Section 30 of 21 South, 28 East,  
18 selected this prospect back in the latter part of 1985.

19 Q Do the recommendations and positions that  
20 Bass has taken with regards to the development of the Strawn  
21 in Section 30 represent your personal opinions and recommen-  
22 dations?

23 A They do.

24 Q Do you agree with the Santa Fe geolo-  
25 gist, Mr. Eckerty, do you agree with his presentation of how

1 Section 30 ought to be developed with regards to well loca-  
2 tions and to the orientation of the spacing unit?

3 A Absolutely do not agree with it.

4 Q Where, in your opinion, Mr. Hillis, did  
5 Mr. Etcheverry go wrong?

6 A Eckerty.

7 Q Did I say it wrong? Eckerty, I'm -- I'm  
8 having a terrible time with his name. Mr. Eckerty, where  
9 did he go wrong?

10 A In several areas, but his primary area of  
11 being wrong is in the correlations between the wells invol-  
12 ved in that adjacent area. His correlations are incorrect,  
13 specifically the correlation between the Bass Big Eddy Unit  
14 65 Well and the PanAmerican Big Eddy Unit No. 2 Well.

15 Q What has he done that you would do dif-  
16 ferently and in fact have done differently?

17 A He in his exhibits has indicated that  
18 the reservoir rock contained within the PanAmerican No. 2  
19 Well is not correlative to the reservoir development within  
20 the Big Eddy Unit 65. This is opposite to what actually oc-  
21 curs. The reservoirs in both these wells are correlative.

22 Q In what other areas do you disagree with  
23 the Santa Fe presentation of geology?

24 A That is the basic one. From it comes  
25 correlation problems on other logs, especially the logs from

1 the two wells in Section 29 with the incorrect structural  
2 pick in those wells it makes in my opinion the structural  
3 interpretation here incorrect.

4 The analagous situation of this area, the  
5 La Huerta prospect, to the Carlsbad Strawn South Area that  
6 Santa Fe have dealt with today, I do not believe you can  
7 compare these two areas directly. They are two different  
8 depositional areas within the Strawn Shelf; one being, the  
9 one to the south being along the shelf edge of the Strawn,  
10 where immediately you go into a basinal facies to the south  
11 of that, as compared to the area in Section 30 where you're  
12 six or seven miles back from the shelf edge and you have  
13 several miles of shelf edge before you come to that basinal  
14 facies.

15 Q Let's focus on the Unit 65 Well for a mo-  
16 ment. Mr. Eckerty used that well as a control well in pick-  
17 ing his gas/water contact.

18 Where do you and Mr. Eckerty disagree on  
19 that issue for that well?

20 A Mr. Eckerty basically says that in the 65  
21 Well the top three or four feet are up in a transitional  
22 type zone of gas and water with the remaining reservoir  
23 rock, approximately 30 to 32 feet below that, being within a  
24 water zone.

25 My disagreement with him there is that

1 the top three or four feet in the Big Eddy Unit 65 Well are  
2 within the gas column of the field and the lower 32 feet are  
3 in the transitional zone of gas and water.

4 Q Were you asked by your company to make a  
5 complete and thorough geologic study of this immediate area  
6 to advise them how to orient the spacing units and where to  
7 pick well locations for the development of the Strawn poten-  
8 tial in this section?

9 A Yes, sir.

10 Q Would you summarize for us the types of  
11 information and the methodology that you've used to make  
12 that study?

13 A Very simply, the study of Section 30 was  
14 done along with a regional study, which involved several  
15 prospects. Spacing with regard to Section 30, based on the  
16 reservoir trends going through Section 30, and understanding  
17 and examining existing producing fields and spacing, I have  
18 always felt from day one that Section 30 is better developed  
19 on a south half/north half proration unit basis; whereas, by  
20 drilling the low risk well of the south half proration unit  
21 would then allow us to select that second location in the  
22 north half and not be restricted to a northwest quarter or a  
23 northeast quarter if we had taken a west half or east half  
24 proration unit.

25 Q Does Mr. Eckerty's geologic interpreta-

1 tion give you the opportunity to fully develop the section?

2 A No, it does not.

3 Q Is this something you were asked to do  
4 and evaluate after Santa Fe proposed the formation of the  
5 two-section area of mutual interest in October of 1987?

6 A No, the prospect in-house at Bass, as I  
7 said, was originated in the latter part of '85. The loca-  
8 tion, the first location was set up as the location we pres-  
9 ent today on the south half proration unit basis.

10 Q Do you have a geologic opinion as to  
11 whether the east half of Section 30 is potentially produc-  
12 tive and will contribute hydrocarbons for development in the  
13 Strawn reservoir?

14 A Without a doubt the east half has re-  
15 coverable hydrocarbons within it.

16 Q Do you have an opinion as to whether or  
17 not there is sufficient reservoir present in Section 30 to  
18 geologically support the drilling of two wells?

19 A Yes.

20 Q And what is that opinion?

21 A My opinion is that there is adequate hy-  
22 drocarbons and which will be best recovered using two well  
23 locations.

24 Q Do you have a geologic opinion concerning  
25 the orientation of the spacing units?

1           A           Ask me that again, please?

2           Q           Yes, sir. Do you have a geologic opinion  
3 as to what orientations of the spacing units in Section 30  
4 is the most reasonable?

5                       Do you want laydowns or standups?

6           A           Well, laydowns, yes.

7           Q           And why, sir?

8           A           As I explained, the Section 30, as used  
9 will demonstrate with our maps of the reservoir later in our  
10 testimony, is clearly going to be better developed on a  
11 laydown pattern with the first well being in the south half  
12 proration unit and the second well being in the north half  
13 proration unit.

14           Q           You've had the opportunity to listen to  
15 Mr. Eckerty's presentation of geology, his interpretation  
16 and his discussions of the three well locations, the Bass  
17 location, the first Santa Fe Energy location, which is 1000  
18 feet to the west of your location, and then the second Santa  
19 Fe alternative location, which is up in the northwest  
20 quarter of the Section 30.

21                       Do you have a geologic opinion as to  
22 which location represents the least risk to the working  
23 interest owners in the section?

24           A           Without a doubt the Bass location.

25           Q           Do you have a recommendation to the Exa-

1 miner as to what percentage risk factor penalty to apply  
2 against Santa Fe Energy should they choose not to join you  
3 in the drilling of the well?

4 A We are -- we believe, we find our loca-  
5 tion to be of the lowest risk and are prepared to assess a  
6 150 percent penalty.

7 Q Let's turn, Mr. Hillis, to the specifics  
8 of your study, sir, and let's commence with Exhibit Number  
9 One.

10 Some of the basic data, obviously, has  
11 been covered by the Santa Fe witnesses this morning and I  
12 don't propose that we cover the same things.

13 Let's take a moment and simply orient the  
14 Examiner as to what you have done with Exhibit Number One.

15 Q Well, Exhibit Number One for a 25 square  
16 mile area centered on Section 30 of Township 21 South,  
17 Range 28 East, I have shown the production from the Bone  
18 Springs and deeper formations within that area.

19 I have also indicated in Section 30 Bass'  
20 proposed location for the Big Eddy Unit 102, and I've also  
21 indicated unique well numbers to six of the wells in the im-  
22 mediate vicinity of Section 30.

23 Q Let's take a moment and identify the six  
24 key wells that you have focused on in your study and I think  
25 for continuity, we'll try to use the same identification

1 that Mr. Eckerty used this morning.

2 But if you'll start with the well that's  
3 numbered No. 1 on Exhibit One, that's the Big Eddy 65 Well,  
4 is it not?

5 A That is correct. The well, Unique Well  
6 No. 1 is the Bass Big Eddy Unit No. 65 Well, which is lo-  
7 cated in Section 31 of Township 21 South, Range 28 East.

8 Q Your No. 2 Well is the Vernon Well in the  
9 east half of 25?

10 A Yes, sir.

11 Q Okay. The No. 3 Well is the PanAmerican  
12 No. 2 Well we've discussed earlier today?

13 A Yes, sir, located in Section 19, 21  
14 South, 28 East.

15 Q No. 4 goes into Section 20 and picks up a  
16 unit well. What's the unit number for that well?

17 A Big Eddy Unit No. 60.

18 Q Okay. And we drop down into 29 now and  
19 we pick up No. 5 Well, which is the Big Eddy 39?

20 A Yes, sir.

21 Q And then south of that is the Big Eddy  
22 54?

23 A Yes, which is Unique Well No. 6.

24 Q Your primary objective in drilling this  
25 well is to test the Strawn formation, is it not?

1           A           It is, sir.

2           Q           All right. Do you intend to drill this  
3 to a sufficient depth to also test the Morrow?

4           A           Yes, we do.

5           Q           And in the unlikely event there is  
6 shallow gas production above the top of the Wolfcamp, you're  
7 proposing to accomplish in this pooling order the pooling of  
8 all parties for those shallow gas zones if we're so lucky to  
9 find any.

10          A           That is correct.

11          Q           But the primary objective remains the  
12 Strawn development that has occurred in the immediate area.

13          A           Yes.

14          Q           Have you determined, sir, whether or not  
15 geologically there is any advantage to your location in terms  
16 of stacking the potential to encounter all of these various  
17 reservoirs that you've identified on Exhibit Number One?

18          A           I do. The Strawn is our primary  
19 objective and the location has been primarily selected based  
20 on the Strawn regional mapping; however, we have three  
21 secondary objectives.

22                        Going from top to bottom, the first one  
23 is a Bone Springs sand which is correlative to the sand  
24 producing three miles to the northeast, Avalon Field, in  
25 which we had a gas show in the Big Eddy Unit 65 and we

1 anticipate in the Big Eddy 102 to be approximately 50 feet  
2 high structurally to the 65 Well.

3 Below the Strawn our next secondary ob-  
4 jective is the Atoka sand, which is found productive also in  
5 Unique Well No. 1 and further to the east of Section 30.

6 And finally, our third secondary objec-  
7 tive are the Morrow Clastics which are productive both in  
8 Unique Wells No. 1, 5, and 6 in close proximity to our  
9 location.

10 Q All right, sir, let me show you what is  
11 marked as Exhibit Number Two and have you identify Exhibit  
12 Number Two.

13 A Exhibit Number Two is a tabulation of the  
14 production data presented on Exhibit One on a per well basis  
15 and if one well is produced from more than one zone, then  
16 all zones are given separately.

17 Q It simply affords anyone that cares the  
18 opportunity to check the data that you've utilized in order  
19 to compile Exhibit Number One.

20 A That is correct, sir.

21 Q And what is the source of the data that's  
22 been utilized to prepare Exhibit Number Two?

23 A The source is from Petroleum Information  
24 Corporation and accessed using computer data, computer ac-  
25 cess.

1                   And this is basically a xerox of the ori-  
2 ginal computer printout.

3                   Q           Let's go now, sir, to talking about the  
4 Strawn structure and the structure map itself.

5                   I have before me what you've shown me to  
6 be a type log for the Big Eddy Unit No. 65?

7                   A           Yes, sir.

8                   Q           Let's talk about that one first so that  
9 we have a point of reference to talk about the structure.

10                  A           This is Unique Well No. 1. It's a copy  
11 of the porosity log run in this well and for your  
12 convenience, using color tabs, I have indicated the primary  
13 objective opposite the blue tab. This is the Strawn  
14 interval which produced in the Unique Well No. 1.

15                   Our secondary objectives, going from the  
16 top down, the green tab is indexed opposite the East Avalon  
17 Bone Springs sand.

18                   The orange tab is located opposite the  
19 Atoka sand secondary objective, which was perforated and  
20 produced for a short time in Well No. -- Unique Well No. 1.

21                   And, finally, the yellow tab is indexed  
22 across from the Morrow Clastics which have produced in  
23 Unique Wells 1, 5 and 6.

24                   Q           I believe I misspoke, Mr. Hilis, when I  
25 identified that as Exhibit Two. In fact it's Exhibit Number

1 Three. If you'll correct your copy then we'll be straight.

2 Let's turn now to Exhibit Number Four.

3 Is Exhibit Four an exhibit that you've prepared?

4 A It is, sir.

5 Q Does this represent your own personal in-  
6 terpretation of the structure regionally for the top of the  
7 Strawn?

8 A Yes, sir.

9 Q Describe for us the method that you have  
10 used to pick the marker by which you then have mapped the  
11 structure in the top of the Strawn.

12 A This is best illustrated on the exhibit  
13 by the type log on the lefthand side of the exhibit and this  
14 is taken from the porosity log over the Strawn interval on  
15 Unique Well No. 1. The top of the Strawn is indicated at a  
16 depth of 10,350, approximately, and is correlative to the  
17 New Mexico State recognized top of the Strawn in this area.

18 Q You've also identified by arrows in the  
19 center portion of the display the proposed location which is  
20 the Bass location in 30 and then the Well 65 immediately to  
21 the south as the type log well.

22 A That is correct.

23 Q In making your regional study of the  
24 structure for the Strawn, Mr. Hillis, what have you been  
25 able to conclude?

1           A           I have concluded on the regional Strawn  
2 and this is just a part of the regional mapping we have done  
3 on the Strawn, that within Section 30 we recognize a subtle  
4 structural west trending to east nose, based on the well  
5 control we have available to us. We also recognize that  
6 this nosing occurs elsewhere in the area. For example, in  
7 the southeast quarter of Township 22 South, 27 East, over  
8 the Carlsbad Strawn Field. We recognize a very significant  
9 west to east nosing based on the well control that is avail-  
10 able in that producing area.

11           I strongly feel that within Section 30  
12 that we may also find our west to east nose is a little bit  
13 ore extreme towards the east, but with the well control I  
14 have available at this time until we drill in Section 30, I  
15 can only honor the data in front of me.

16           Q           You have Mr. Eckerty's structure map be-  
17 fore you. It's Exhibit Number Four, Mr. Hillis?

18           A           Yes, sir.

19           Q           We're going to come to a more specific,  
20 site specific copy of your structure map but generally look-  
21 ing within this area, do you have an opinion as to whether  
22 Mr. Eckerty has been too conservative in the way he has at-  
23 tempted to draw the structure as it comes across and noses  
24 in Section 30.

25           A           Yes, I do.

1 Q And what is that opinion?

2 A My opinion is that even though the east-  
3 ern wells in Section 20 and 29 have been incorrectly cor-  
4 related and thus the structural tops presented on Exhibit  
5 Four are wrong, even taking those into account, the contour-  
6 ing of the data on Exhibit Four is very conservative, espe-  
7 cially the gap, the spacing between the -7500 and the -7600  
8 foot contours.

9 Q You talked about a gap. Don't you find  
10 that the contour lines on the structure map are evenly and  
11 uniformly displayed on that exhibit?

12 A No, they are not; not through that speci-  
13 fic area. They are evenly displayed west of the -7500 foot  
14 line and east of the -7600 foot line.

15 Q Can you draw a corollary to any other  
16 structural feature within the area mapped on the Strawn map  
17 to show us a similar nosing effect in the Strawn that you  
18 have interpreted for Section 30?

19 A Yes. On the map in front of us, Exhibit  
20 -- our Exhibit Four, based on our well control we recognize  
21 a west to east trending structural nose.

22 Q And can we see a similar example of that  
23 nose if we look at the South Carlsbad Strawn Pool?

24 A Very much so, although --

25 Q I'm sorry, I misspoke. It is the Carls-

1 bad Strawn as opposed to the South Carlsbad Strawn.

2 A Yes, it is the Carlsbad Strawn and not  
3 Strawn South.

4 Q There's a structural nose feature in that  
5 pool, is there not?

6 A A very extreme structural nose, correct.

7 Q Mr. Eckerty made reference to the fact  
8 that he thought there was a Strawn reef that he had  
9 interpreted in the Carlsbad Strawn Pool and therefore he  
10 equated it to his evaluation of the Vernon Well and  
11 therefore has wrapped his reservoir, if you will, to the  
12 north of the Vernon Well, around the top of Section 25 on  
13 this reef feature.

14 Do you see that kind of reef feature if  
15 you look at the Carlsbad Strawn Pool?

16 A The Carlsbad Strawn of Santa Fe to the  
17 south?

18 Q Yes, sir.

19 A I recognize development of the skeletal  
20 sand within that reservoir zone on the eastern and  
21 southeastern and northern edges of that field.

22 Q And where is that feature in reference to  
23 where you have mapped the edge of the Strawn Shelf?

24 A It is within one mile of the shelfal  
25 (sic) edge of the Strawn.

1 Q Do you see any other Strawn pool or  
2 feature like that that is farther removed from the Strawn  
3 Shelf than your proposed development in Section 30?

4 A Yes, I do.

5 Q All right, show me one.

6 A Several miles northwest of the Carlsbad  
7 Strawn is also the Carlsbad Strawn Field. It's located.  
8 three wells in Sections 8 and 17 of 22 South, 27 East.

9 Further to the north in the Burton Flats  
10 Strawn Field in Township 21 South, Range 28 East, I  
11 recognize production from the same reservoir.

12 Q My question is, though, do you see the  
13 reef feature, that thick carbonate reef that Mr. Eckerty's  
14 discussed with us, do you see that as being a major geologic  
15 feature for the development of the Strawn reservoir in  
16 Sections 25 and 30?

17 A No.

18 Q Why not?

19 A The Section 30 prospect area is very like  
20 the Burton Flats Strawn, the northernmost Carlsbad Strawn  
21 field, and they are located a significant distance away from  
22 the shelfal (sic) edge.

23 Specifically in Section 30 we recognize  
24 carbonate reefing trending northeast/southwest for several  
25 miles and in front of that where higher energy has occurred

1 on the -- on the shelf, we find deposition of this skeletal  
2 sand reservoir. The reason for that skeletal sand to be  
3 there, as I say, is because of the high energy on the  
4 basinward side of the carbonate build-up, a reefing area,  
5 and that high energy is not evident, it is more dissipated  
6 on the western side of the carbonate and I would not expect  
7 it to be developed there in a widespread fashion.

8 Q I direct your attention now, Mr. Hillis,  
9 to Exhibit Number Five and identify that exhibit for us,  
10 please.

11 A Exhibit Five is a xerox of a computer  
12 printout for Petroleum Information of the production from  
13 the Strawn wells and fields represented and tabulated on Ex-  
14 hibit Four.

15 Q Again this is just the supporting data  
16 that you have compiled and tabulated so the Examiner or any-  
17 one else can check the accuracy of the prior exhibit.

18 A It is, but in addition, for example, in  
19 Burton Flats Strawn Field and several of the other fields  
20 where we have a multi-well field on Exhibit Four, I have  
21 given the field total.

22 The printout of the computer production  
23 will also break that down on a per well basis.

24 Q This next display, Mr. Hillis, is a lit-  
25 tle large. I think we'll put it on the wall here and give

1 us an opportunity to discuss it in that fashion.

2 Mr. Hillis, does Exhibit Number Six also  
3 represent your work product?

4 A It does, sir.

5 Q Before we go into the detail about each  
6 of the parts to the display, give us a quick summary of what  
7 you have depicted on this exhibit.

8 A On this exhibit, Exhibit Number Six, I  
9 have depicted once again the type log from Unique Well No. 1  
10 as illustrated on previous exhibits and specifying the C  
11 carbonate reservoir zone, I have for that reservoir fairway  
12 built a collage going from left to right.

13 From left there's a structural map on top  
14 of the C carbonate zone.

15 In the center is a net (unclear) isopach  
16 map of the reservoir using porosity equal to or greater than  
17 5 percent porosity per foot of rock and another format of  
18 that is shown in the final on the righthand side, which is a  
19 porosity (unclear) map, which is simply taking the porosity  
20 on a per foot basis and adding it up to show the distribu-  
21 tion of the reservoir fairway.

22 Q In order to pick a location for the well  
23 in Section 30, is it important to you as a geologist to  
24 first of all accurately map and interpret the structure,  
25 then to accurately map and interpret a net pay isopach, and

1 then to integrate the two?

2 A Without a doubt that's yes.

3 Q Let's start with the structure map.

4 A The structure map, unlike that shown in  
5 the previous exhibit, which was on the top of the Strawn, is  
6 on the top of the C carbonate, which is illustrated on the  
7 type log on this exhibit.

8 Here we also recognize --

9 Q Refresh my memory now, did Mr. Eckerty  
10 map on top of the C zone? I have forgotten.

11 A What Bass is obviously calling the C re-  
12 servoir in this hearing, Santa Fe are referring to as the  
13 Strawn -- the Strawn B. The Second Strawn.

14 Q Mr. Eckerty mapped his structure on the  
15 top of the B Zone, I believe.

16 A That is correct.

17 Q Now what did you use as the top of the  
18 structure?

19 A I used a more correlative regional mar-  
20 ker, which is a shale marker, approximately in Unique Well  
21 No. 1 about 20 feet above the actual commencement of poros-  
22 ity.

23 Q Why, in your opinion as a geologist, is  
24 it more appropriate to use the top of the C carbonate as the  
25 marker as opposed to the top of the B?

1           A           Because on a regional investigation of  
2 the structural configuration of the C carbonate, this is by  
3 far a more correlative pick. We do later on show locally a  
4 mapping on the actual top of the reservoir porosity, speci-  
5 fically in the Section 30 area, but that would not be pos-  
6 sible in a regional sense.

7           Q           All right, continue on with your explana-  
8 tion of your interpretation of the structure.

9           A           The structure map is on a contour inter-  
10 val of 50 feet. This is a 1-to-2000 foot scale map.

11                   And then, as (not clearly understood)  
12 has, we saw on the top of the Strawn map a subtle, west to  
13 east trending nose across Section 30. It demonstrates that  
14 Bass' proposed location would be approximately 60 to 65 feet  
15 structurally higher to Unique Well No. 1.

16           Q           Do you share with Mr. Eckerty his concern  
17 that it is of material significance that the well needs to  
18 be located a distance to the west where he can gain approxi-  
19 mately 20 feet of structure?

20           A           No, I do not.

21           Q           Why not?

22           A           Because you would be creating off very  
23 little structure for having the reservoir or not having the  
24 reservoir.

25           Q           Well, let's go now to the second panel of

1 the display and discuss how you have mapped the reservoir.

2           A           This is the net H isopach map. It shows  
3 the reservoir fairway, as I call it, the Carlsbad Strawn  
4 East reservoir fairway, trending northeast/southwest. The  
5 specific well control where we have reservoir rock develop-  
6 ment, these wells are colored in orange on the display.

7           Where we do not have reservoir develop-  
8 ment for wells around the fairway, these are indicated in  
9 green on the exhibit. These are zero points.

10           Basically, here we find that the proposed  
11 location by Bass will be within the reservoir fairway and  
12 will have approximately 20 feet of reservoir rock.

13           The Santa Fe Energy proposed location, as  
14 known to me from the April 7th letter, that location being  
15 1980 from the north, 990 from the west, would be not in the  
16 reservoir.

17           Q           Is a reservoir thickness of 20 feet,  
18 based upon your net pay map, is that a sufficient enough  
19 thickness to give you a commercial well?

20           A           It is, sir.

21           Q           If you project the Santa Fe Energy loca-  
22 tion down to the location they gave us today, which is the  
23 original one from October, giving you 1000 feet to the west  
24 of your proposed location, can you approximate for us what  
25 would be the point of the reservoir thickness that that

1 would encounter?

2 A I have approximated where I believe that  
3 location is with an X here. That location would plot right  
4 on the edge of the reservoir, but severely past the up-dip  
5 limit of the reservoir.

6 Q If you go back to the structural display  
7 do you gain significant structural advantage if you move to  
8 the west under your interpretation?

9 A No, I do not. I believe over the past  
10 location we would gain perhaps five, possibly up to ten,  
11 feet of structure.

12 Q Is that going to make a material  
13 difference to you as a geologist in deciding how to locate  
14 the well to avoid contact with the gas/water contact?

15 A It is going to make me, when I consider  
16 the balancing of structure being high enough to model the  
17 gas/water or gas transition zone versus being in the reser-  
18 voir or not being in the reservoir, very much in favor of  
19 the Bass location.

20 Q Do you have other displays that map your  
21 interpretation of the gas/water contact?

22 A Yes, I do.

23 Q Let's continue on with the -- the isopach  
24 in the center.

25 Do you have an opinion, sir, as to

1 whether or not, based upon your mapping of the reservoir, as  
2 to whether or not the entire Section 30 has a reasonable po-  
3 tential for production from a well -- well, let me start  
4 over again.

5                                    If we do the orientation of the south  
6 half --

7                    A                Yes, sir.

8                    Q                -- would that orientation in the south  
9 half give you an orientation that will maximize your ability  
10 to produce out of that reservoir? We are not significantly  
11 integrating potentially nonproductive acreage by that orien-  
12 tation.

13                   A                No, we are not.

14                   Q                Conversely, if we stand up the spacing  
15 units, what is your opinion about the issue of putting in  
16 potentially nonproductive acreage in either the west half or  
17 the east half orientation?

18                   A                I feel the west half proration unit we  
19 would be putting in a little bit more of your nonproductive  
20 acreage on that extreme western half.

21                   Q                By orienting the spacing units where they  
22 are laydowns, in your opinion, then, do you maximize the po-  
23 tential for having two wells in the section?

24                   A                Without a doubt in my opinion it's the  
25 proven way to develop the field.

1 Q Let's go to the third panel on Exhibit  
2 Number Six and have you explain and describe that display.

3 You might turn 180 degrees here, if you  
4 will --

5 A Okay.

6 Q -- and stand to the wall so you don't  
7 have to talk with your back to us. Go ahead.

8 A This is the porosity H isopach map of the  
9 reservoir fairway and this primarily is taken from the  
10 porosity of each single foot of rock shown on the net H map,  
11 and add it together to get the total porosity H, primarily  
12 for use in determining the volumetrics of the reservoir.

13 Here we find the Bass location, Big Eddy  
14 102, would have a porosity H of approximately 2.0. This  
15 would, with the 20 feet of reservoir rock, give us an average  
16 porosity of around 10 percent, of 10 percent in the  
17 reservoir, which is well above the porosity cutoff.

18 The proposed location as known to me of  
19 Santa Fe's up until today, once again would lie outside the  
20 reservoir limit, and the Santa Fe location given to us this  
21 morning at the hearing, a location 990 from the west and  
22 1980 from the south, would like within the reservoir but  
23 have a very low porosity value; probably in the order of 25  
24 percent or less of the Bass location.

25 Q Mr. Hillis, let's turn now to Exhibit

1 Number Seven, if you will, please, and identify that exhibit  
2 before we describe what it is.

3 A Exhibit Seven?

4 Q Yes, sir.

5 A That is a tabulation of --

6 Q I've confused you. Seven is the strati-  
7 graphic cross section.

8 A Okay, Exhibit Seven is a stratigraphic  
9 cross section. Two cross sections are shown on it, both  
10 trending from west to east, the most northerly one going  
11 through Section 30 and a southerly one located approximately  
12 2-1/2 miles to the south, through the reservoir fairway in  
13 that area.

14 Q Why would you do this? Why would you  
15 prepare such a display?

16 A I wanted to confirm from my mapping the  
17 up dip limit of the reservoir in a more visual type under-  
18 standing of it.

19 For example, on the north cross section,  
20 on an index map here, which is the porosity H map which we  
21 have given in the previous exhibit, the only difference here  
22 being it shows the traces of the two cross sections. The  
23 most north cross section A-A', starting from the west is the  
24 Santa Fe Vernon Well, Unique Well No. 2, where the C carbon-  
25 ate reservoir is not developed, projected then, as we move

1 eastwards, is the Santa Fe proposed location and then the  
2 Bass proposed location. This shows Santa Fe's location to  
3 be beyond the reservoir limit and the Bass location to be  
4 within the reservoir limit.

5 And then projected in on this relative  
6 porosity H trend is the Bass Big Eddy 65, Unique Well No. 1,  
7 showing the productive interval.

8 As we go across to the eastern side of  
9 the fairway, we pass through the Big Eddy 39 Well, where we  
10 have still some reservoir development. In this particular  
11 case this well was down dip and wet. And then the Big Eddy  
12 Unit 60, Unique Well No. 4, projected in at the end of A-A',  
13 shows the C carbonate reservoir to not be developed.

14 The cross section to the south, B-B', I  
15 find has two analogous wells, two wells we have presented on  
16 the cross section to the north; specifically the Santa Fe  
17 Energy Chase State 2 No. 1 Well, which was drilled in the  
18 southwestern quarter of Section 2, Township 22 South, 27  
19 East, is to me a very much a look-alike to the Santa Fe  
20 Vernon Well presented on cross section A-A'.

21 In a similar fashion, located in the  
22 northeast quarter of Section 11 of Township 22 South, 27  
23 East, we have the Western Oil Producers Bass No. 1 in which  
24 the C carbonate reservoir is developed and is very  
25 analogous in its format and log appearance to that

1 encountered in Unique Well No. 1 on the cross section to the  
2 north.

3                   Unlike the cross section to the north,  
4 where we don't have any wells between the Santa Fe Vernon  
5 and the Big Eddy Unit 65 at present, the area to the south  
6 enjoys the luxury of having an actual wellbore between the  
7 two, along which I would, from my mapping of the porosity H,  
8 recognize the location to be outside of the reservoir, and  
9 this well in effect is a well drilled by TXO, the Delta Phi  
10 No. 1, is located in the southeast quarter of Section 2 of  
11 22 South, 27 East, and within that wellbore the C carbonate  
12 porosity as a reservoir quality is not developed. There's a  
13 little porosity, they have a couple of feet, getting up to 2  
14 percent.

15                   I would compare this TXO well very much  
16 so to what a well would look like if it was drilled at Santa  
17 Fe's proposed location in the northwest of Section 30.

18                   Q           Mr. Hillis, I show you now what's marked  
19 as Exhibit Eight and ask you to identify that exhibit.

20                   A           Exhibit Eight is a tabulation for the net  
21 H and porosity H data illustrated on Exhibit Six on a per  
22 well basis and it gives the depth interval, the footage in-  
23 volved in that depth interval, and the porosity H value at-  
24 tributed to that depth.

25                   Q           We've marked this next display as Exhibit

1 Number Nine, Mr. Hillis.

2 A Okay.

3 Q Again, before you go through your inter-  
4 pretation, identify for us what it is that you've depicted  
5 on various portions of the display.

6 A Exhibit Nine is primarily designed to il-  
7 lustrate the reservoir zonation within the Carlsbad Strawn  
8 East fairway within Section 30; specifically defining a gas  
9 zone, a gas plus water transitional zone, and a water zone,  
10 and this is done with several inserts to the exhibit.

11 In the upper left, a structural cross  
12 section and going across the area in the lower left Pickett  
13 plot and a bulk volume water plot.

14 Q Let's go back just a little bit, Mr.  
15 Hillis, is both the Pickett plot and the bulk volume water  
16 plot typical methods of analyzing reservoirs so that you can  
17 get a greater understanding in terms of what will happen  
18 with a gas/oil contact that is known to exist in this reser-  
19 voir?

20 A Well, with gas/water contact --

21 Q I'm sorry.

22 A -- yes, they do.

23 Proceeding just to summarize the exhibit  
24 while I was on it, center -- central half we have 5-inch  
25 porosity logs on Unique Wells No. 1, 3, 5 and 6, of which we

1 indicated within the C carbonate reservoir any drill stem  
2 test data and/or perforations.

3 And finally, on the righthand side and  
4 taken from the previous exhibits, we have insets of the top  
5 of the C carbonate structure map, the net H isopach map, and  
6 the porosity H isopach map, and the only difference in this  
7 instance from the other exhibits is that here we have also  
8 indicated the actual probable porosity itself on the struc-  
9 ture map, and we have indicated on each one the up dip limit  
10 of the reservoir as we have defined previously and the down  
11 dip limit of the reservoir which we defined with this exhi-  
12 bit.

13 Q On which of the displays in that exhibit  
14 have you shown us where the gas/water contact is? Have you  
15 shown that on one of the structure maps?

16 A I've shown it on the structural cross  
17 section and I can point it out to you on the structure map.  
18 The contact of gas with the transitional zone would be at -  
19 70 -- sorry, -7487. It would be parallel to the 20 percent  
20 water saturation line shown.

21 Q Now let's make sure we're all understand-  
22 ing what you're saying. The base of the gas, if you will,  
23 and the top of the gas/water transitional zone, which is the  
24 top of that yellow line on the cross section?

25 A It's this line here. Of the three zones

1 it's the contact between Zones 1 and 2, the gas zone and the  
2 gas/water zone.

3 Q That -- that top of the transitional zone  
4 where you have gas and water is located where on the struc-  
5 tural portion of the display in the top right? It's found  
6 at what line?

7 A It's found at a structural level of -7487  
8 on the structural contours for the reservoir porosity, top  
9 of the reservoir porosity, and in effect it's shown as a  
10 dotted line labeled the 20 percent water saturation line,  
11 and primarily engulfs, with the exception of a few acres in  
12 the southeast quarter and the northeast quarter of Section  
13 30 engulfs the eastern half of Section 30.

14 Q When we look at that point in the struc-  
15 ture where we are now low enough that we're going to produce  
16 100 percent water, and we can no longer recover any percent-  
17 age of hydrocarbons, can you find that point for us on the  
18 structure map?

19 A That point is indicated in a dash-dot  
20 line and everything up dip from it is colored red on the ex-  
21 hibit, and it is located at approximately a level of -7519  
22 in the southern part of the field and rises to approximately  
23 -7508 in the upper part of the field.

24 Q If we look to the west or to the left of  
25 that area, well, the area shaded in pink, or the red, all

1 that area, when we are at the right margin of that area  
2 where it turns all white on the display?

3 A Yes.

4 Q No, the other margin. There you go,  
5 okay, going from there to the west, as we go through that  
6 area that's shaded in pink, are we in an area where we have  
7 recoverable hydrocarbons?

8 A That we are.

9 Q Notwithstanding the fact that a certain  
10 portion of that area is a transition zone where you also  
11 produce water.

12 A That's correct. We will also produce hy-  
13 drocarbons

14 Q How did you determine the limit or the  
15 extent at which you can no longer produce hydrocarbons?

16 A (Unclear) limit and as a conservative  
17 limit, we will demonstrate that in the Big Eddy 65, Unique  
18 Well No. 1, the basal 32 feet in that well are transitional;  
19 however, the based of the reservoir in that well is a -7519,  
20 and thus I have been conservative in letting that be the  
21 down dip limit; in other words, making an assumption that  
22 right below that would be wet.

23 This is conservative because it probably  
24 would be lower than that.

25 Q Let's look at the log on the No. 65 Well,

1 which is shaded in the yellow on the display.

2 A That one?

3 Q Yes, sir, that one right there.

4 A The porosity over 5 percent is shaded in  
5 yellow.

6 Q All right. Using that display, now, Mr.  
7 Eckerty's argument about the gas/water contact for that well  
8 was what, sir?

9 A Mr. Eckerty's argument in here was that  
10 the top, upper three to four feet were a transitional zone  
11 of gas and water overlying water.

12 Q And do you agree with that?

13 A Not at all.

14 Q What, in your opinion, is occurring?

15 A The upper three to four feet in the well  
16 are actually within the gas column. The water saturation  
17 within that interval calculates at 17 percent water satura-  
18 tion. I term that in the gas column and not a transitional  
19 zone.

20 The lower portion, another 30, 32 feet of  
21 reservoir rock in the wellbore, the water saturation aver-  
22 ages 32 percent. I term that transitional and would point  
23 out that although it is an average, it does not increase to-  
24 wards the bottom of the unit, it is relatively constant.

25 Q Let's focus now on the other key well

1 that Mr. Eckerty used in picking the gas/water contact, and  
2 that was the Big Eddy No. 2 Well, the PanAm Well just to the  
3 north.

4 A Yeah, that is correct.

5 Q All right.

6 A Unique Well No. 3.

7 Q What was his argument about that well?

8 A His argument was a little weak. I really  
9 didn't understand it because he did not have a lot of data  
10 from the production on the well.

11 He basically had shown it to be in a sep-  
12 arate reservoir from the 65 Well and maybe had given it less  
13 regard.

14 He mentioned there had been log analysis  
15 done on it; likewise I have done petrophysical work on the  
16 well. It is a 1963 vintage well and unfortunately it was  
17 drilled with fresh water and as result had a dual induction  
18 log run for resistivity. This is in comparison to all the  
19 other wells in the area which have a duolateral log (not  
20 clearly understood). The dual induction is inferior for  
21 reading the resistivities within these thinner zones and to  
22 top that, the microlog on this well indicates extreme wash-  
23 out through the reservoir interval. Now this effectively  
24 means, the bottom line is that that induction log is of very  
25 poor qualify and you cannot be real qualitative with the

1 water saturation in it.

2 I have made an attempt to correct it and  
3 I calculate water saturations in the 45 to 50 percent range.

4 We do, however, have data from PanAmeri-  
5 can on the well. We agree that the well cumed in '63 1447  
6 barrels of condensate prior to abandonment, and agree that  
7 there is no public information of water or condensate, I  
8 mean water and gas, but for a two week test prior to aban-  
9 donment, the well produced 7,280 MCF, 360 barrels of conden-  
10 sate, and 379 barrels of water. This oil/water ratio would,  
11 I feel, tend to support my 45 to 50 percent water satura-  
12 tion.

13 The well was, like I pointed out, drilled  
14 in '63 and perhaps to date the well may have been produced a  
15 little longer. I feel overall the well is towards the edge  
16 of the reservoir and the lower production and the noncommer-  
17 ciality is because of the reservoir beginning to get tight in  
18 that area.

19 As a result of the reservoir lensing into  
20 three different zones, and being a finer grained skeletal  
21 sand, I find it has -- probably has (unclear) water struc-  
22 turally higher within there, lending, thus, for a tilt of  
23 the contact between the transitional zone and the water  
24 zone of approximately 10 feet.

25 Q Let's go to your petrophysical data to

1 support the location of the down dip hydrocarbon limit and  
2 you can pick either the Pickett plot or the bulk volume  
3 water plot to start with, whichever is your choice.

4 A Okay. I like Pickett plots --

5 Q Let's do it.

6 A -- so I'll go with them first.

7 The Pickett plot is a log/log plot on  
8 log/log paper, where on the X axis you plot the resistivity,  
9 corrected resistivity of the formation; on the wide Y axis,  
10 the porosity.

11 They are designed primarily for people to  
12 point -- plot points from well data and then establish what  
13 they would call a line drawn through the most southwesterly  
14 plotted points and extend that line to the 100 percent poro-  
15 sity, and this at that point, the RT of that point is what  
16 we call the RW, the water resistivity, which you use in cal-  
17 culations from water saturations.

18 I work with Pickett plots the opposite  
19 way around, when I can. In this instance I've done so. The  
20 RW is not extrapolated from my Pickett plot in this exhibit.  
21 It is taken from water, measured water depth, specifically  
22 DST water on the Big Eddy Unit 65 Well, produced water from  
23 the Strawn carbonate on the Big Eddy Unit 64, located one  
24 and half miles to the southeast, and three other wells lo-  
25 cated within the vicinity to the north and west from the

1 same reservoir rock, and we have good control in this RW.

2                   Basically, then, on the Pickett plot,  
3 using colors, red, green, yellow, and blue, we demonstrate  
4 that for the wells with a red circle, these are wells, pri-  
5 marily, the three of them being from the Santa Fe production  
6 area to the south, these are wells which are gas productive  
7 and make very little water.

8                   They plot in the 10 or 15, up to 30  
9 percent water saturation range.

10                   Going to the blue triangle symbol, these  
11 are wells which in the Strawn reservoir have tested wet. We  
12 have actually five wells represented and of those five three  
13 were tested wet by DSTs, have no perfs, and two of them were  
14 judged wet solely on the log analysis, because we calculated  
15 nearly 90 percent water, and these are illustrated with  
16 having a range of water saturation from 50 percent through  
17 to the mid-90's.

18                   Q                   Are you satisfied that you have  
19 sufficient information and have analyzed it thoroughly and  
20 carefully from which to reach a conclusion using the  
21 Pickett plot method of analysis to locate the gas/water  
22 contact and then the gas/water transition zones?

23                   A                   Yes, we have, and the final plots  
24 demonstrate this. These are coded as a square green/yellow.  
25 The green is production from the Santa Fe Henry No. 2, which

1 Santa Fe has mentioned in their testimony, and also from the  
2 Santa Fe Ferguson No. 1 in that area to the south. The yel-  
3 low are the actual points from the Big Eddy Unit 65 Well,  
4 and we find that these are wells which emit gas but with  
5 significant water production. They plot between wells with  
6 letter water and wells which are coded wet (unclear) transi-  
7 tion zone. Moreover, the upper points from the Big Eddy 65,  
8 which we classify in the gas column, plot up there with  
9 these (unclear) substantiating that the top three or four  
10 feet is in the gas column and that the bottom 30 approximate  
11 feet are within the transitional zone.

12 Q Without going through the details of the  
13 bulk volume water plot, tell us, first of all, what is the  
14 purpose of the plot?

15 A Basically the purpose of the plot is to  
16 determine how constant the bulk volume water value, which is  
17 obtained by multiplying the porosity versus the water satur-  
18 ation on a fractional basis remains.

19 Q Why do you want to know that?

20 A The lower the number and the more consis-  
21 tent it stays will tend to tell you you are more the irredu-  
22 cible water saturation and that you will not have very much  
23 water. In that instance the wells indexed by red, the wells  
24 with little water production, form an ellipsoid in the lower  
25 half of the plot. The wells with the blue triangle, which

1 are wet, form an ellipsoid in the upper left, whereas the  
2 wells we have demonstrated to be gas productive with signi-  
3 ficant water production plot as an ellipsoid in between;  
4 once again an indication of the transitional nature of those  
5 wells, which includes the Big Eddy Unit 65 Well.

6 Q When we integrate the structure with the  
7 reservoir size, shape, and thickness, plus factor in your  
8 opinion of where the gas/water transition zone is, what is  
9 your opinion, then, about the optimum location in Section 30  
10 to drill this initial well?

11 A The optimum location is to locate that  
12 well within the gas column, purely from the mechanical and  
13 economic point of view producing the gas from the reservoir,  
14 and Bass Big Eddy 102 location serves that purpose. It's 20  
15 feet of net pay. The base of that we anticipate to be ap-  
16 proximately 40 to 45 feet high to the contact between the  
17 gas column and the transition zone, well above our needs.

18 In the same context the transitional zone  
19 gas, as the reservoir pressure is drawn down from the deple-  
20 tion gas drive, will come out of solution and move upward  
21 towards the wellbore. So we will more economically recover  
22 the gas in the transitional zone, whereas, if we, like we  
23 see in the Big Eddy 65, have a well which penetrates very  
24 little gas column and a lot of transition zone, we're going  
25 to see a very high water cut from that well, and we are not

1 going to efficiently produce the hydrocarbons which are pre-  
2 sent in the area as well as the well on the western half in  
3 the gas column.

4 Q In your opinion are -- do we have enough  
5 structural position in Section 30 to stay out of the -- the  
6 water zone in the section?

7 A More than adequate.

8 Q And if we we go higher in the structure  
9 then your concern is that we simply move ourselves out of  
10 the reservoir.

11 A Very much so.

12 Q I show you what we've marked as Exhibit  
13 Number Ten, Mr. Hillis. What is that, sir?

14 A Exhibit Ten is a tabulation of the forma-  
15 tion water resistivity data, the RW which I discussed pre-  
16 viously on Exhibit Nine with respect to the Pickett plot.  
17 And for the upper three wells, these are taken from a publi-  
18 cation which is quoted, the reference, and we have with us  
19 today.

20 Exhibit Number Eleven is a tabulation per  
21 well of the data used on the Pickett plot and the bulk vol-  
22 ume water plot. Each well is indicated alphabetically, A,  
23 B, C, as it is on the central table on this illustration,  
24 and also the alphabetical indicators on the bulk volume  
25 water and the Pickett plot as a cross reference, and this is

1 the raw data used from log analyses to get these plots.

2 MR. KELLAHIN: That concludes  
3 my examination of Mr. Hillis, Mr. Catanach.

4 We'd move the introduction of  
5 his Exhibits One through Eleven.

6 MR. CATANACH: Exhibits One  
7 through Eleven will be admitted into evidence.

8 Mr. Bruce?

9 MR. BRUCE: A few questions.

10

11 CROSS EXAMINATION

12 BY MR. BRUCE:

13 Q Mr. Hillis, what is the production  
14 history of the Big Eddy Unit No. 65 Well?

15 A The production history?

16 Q From the Strawn formation.

17 A If you give me a moment I can look that  
18 through for you.

19 Q Okay.

20 A The Big Eddy Unit 65 is recognized as  
21 being in the Carlsbad Strawn East Gas Field and its  
22 production from 1981 to its abandonment in 1986 was a total  
23 of 324,609 MCF, 15,726 barrels of condensate, and 214,994  
24 barrels of water.

25 Q Was it a commercial well?

1           A           That I do not know. I do not work in  
2 that engineering department.

3           Q           Why was it eventually -- why was the  
4 Strawn eventually shut-in?

5           A           It was shut-in, I'm not real clear on the  
6 background, but all -- we had a large problem, which you may  
7 know, in litigation with Natural Gas Pipeline in this area  
8 and a lot of wells were shut-in and curtailed at that time.

9           Q           Did water production have anything to do  
10 with it?

11          A           No, it did not. The water production in  
12 the final months was very similar to the water production  
13 that we saw after about 9 or 10 months into the well life.  
14 It may have had a lot to do with it with respect to trying  
15 to get the well to perform again after it had been shut in  
16 for awhile.

17          Q           Looking at your Exhibit Number 9, Mr.  
18 Hillis --

19          A           Uh-huh.

20          Q           -- particularly at the plots on the  
21 righthand side of it of structure and the porosity, am I  
22 correct in drawing the inference from that, that a well  
23 could also be drilled in the southeast quarter of the sec-  
24 tion?

25          A           A well could be drilled in the southeast

1 quarter but would it encounter a gas column and transitional  
2 zone, and as I explained in my testimony, that would not be  
3 the best way to economically recover the hydrocarbons within  
4 Section 30.

5 It is better to drill in the gas column.

6 Q How far above the transitional zone would  
7 a well, say, in the northwest quarter of the southeast quar-  
8 ter be?

9 A How far -- when you give me a question to  
10 answer, --

11 Q Okay. I'm not quite sure I understand  
12 all the dotted and dashed lines, looking at the top.

13 A I can go through them and look through  
14 where you have a problem.

15 Q I see one line at 7450 that's dotted; is  
16 that just a structure line?

17 A This -7450 is a dashed line?

18 Q Yes.

19 A That is the structure on top of the poro-  
20 sity itself, the reservoir, this point here, -74 -- correl-  
21 ative to -7483 in the Unique Well No. 1.

22 Q Where is the -- which line designates  
23 your -- the edge of the transition zone?

24 A The edge of the transitional zone? The  
25 final edge of the transitional zone -- there are two edges.

- 1 Q Okay.
- 2 A The up-dip edge of the --
- 3 Q The up dip edge.
- 4 A -- transitional zone will be approximate-
- 5 ly on this contour here at -7451/52.
- 6 Up dip from that you will totally be in
- 7 the gas column.
- 8 The line that limited the transitional zone
- 9 will be this dotted line labeled 20 percent water saturation
- 10 line.
- 11 So in other words, between that 20 per-
- 12 cent water saturation line indicated by the dots and up-dip
- 13 to the -7450 contour line, within that area if you drill a
- 14 well, you will have gas column and transitional zone.
- 15 Q Do I understand you to say that you do
- 16 not want to drill in that transitional zone?
- 17 A We do not want to drill in that transi-
- 18 tional zone, as I explained, because of the high water cuts
- 19 that we will have and thus would not be enabling to ade-
- 20 quately develop the reservoir to its best efficiency.
- 21 Q Why don't you sit down again, Mr. Hillis.
- 22 A Okay.
- 23 Q Does Bass -- well, what number, A, B or C
- 24 carbonate, does Bass consider productive in the Strawn?
- 25 A We consider, like Santa Fe, the C zone to

1 be the dominant one. The reason, if you would like me to  
2 continue, why this is on the top of the Strawn is because  
3 the top of the C carbonate is difficult to pick in wells  
4 such as the Santa Fe Henry No. 1, located in Section 26 of  
5 22 South, 27 East.

6 We do have an in-house map with us on the  
7 top of the C carbonate, which I'll be glad to go through  
8 with you; it mimics this map, very much so; it conforms to  
9 that structural configuration.

10 Q If the top of the C carbonate varied  
11 within the Strawn, then a top of the Strawn map would not  
12 necessarily accurately reflect the C carbonate structure.

13 A No, that's incorrect. Like I said, in  
14 the Santa Fe Henry No. 1 you can't pick it because of the  
15 reefal (sic) clean-up and build-up within it. In other  
16 words, the C carbonate has pinched out. The shale marking  
17 the C carbonate top has pinched out laterally into the reef.

18 So you're going to have unique wells  
19 within there, not very many, but ones which have that reefal  
20 (sic) build-up along the shelfal (sic) edge where you cannot  
21 go through and say this is the top of a C carbonate.

22 Q So you're saying that the Henry No. 1 was  
23 in the Strawn reef.

24 A Pardon?

25 Q You are saying that Santa Fe's Henry No.

1 l Well was in the Strawn -- is in a Strawn reef?

2 A It isn't within a clean carbonate build-  
3 up or Bass' A, B and C carbonates, all three together in the  
4 sense we don't have any shale. We, unlike Santa Fe, would  
5 interpret the lower porosity zone in the Santa Fe Henry No.  
6 l to be within the C reservoir.

7 Q How do you interpret the Santa Fe Vernon  
8 Well, and for your ease of reference, look at Santa Fe Exhi-  
9 bit Number Five.

10 A The Vernon Well, as we have indicated, is  
11 outside of the reservoir development. There is no reservoir  
12 development within the C carbonate.

13 Q You do not consider it to be in a Strawn  
14 reef?

15 A It depends on what people call reefs. In  
16 fact, I think all of us today are wrong in this hearing to  
17 be even using the word "reef". These tend to be more bio-  
18 hermal, biostromal, carbonate accumulations and not true or-  
19 ganism-building type reefs, such as the Capitan Reef would  
20 be or the Great Barrier Reef would be.

21 So we're using the word "reef" purely in  
22 the colloquial sense, and if you're asking me if I would  
23 compare it to the Henry No. l, in this particular instance,  
24 no.

25 Q Why not?

1           A           Because the shaliness within the Vernon  
2 Fed depicts to me an A, B, C zone differentiation, which  
3 cannot be made in wells such as the Henry No. 1 with a lot  
4 of confidence, because of the lateral pinchout of the shales  
5 into that.

6           Q           Is Mr. Eckerty's interpretation a reason-  
7 able one on the Vernon and the Henry No. 1 Wells?

8           A           To compare the two?

9           Q           Well, not to compare the two. Is his in-  
10 terpretation of the producing zone a reasonable interpreta-  
11 tion, ar I understand the Vernon is not productive, is it?

12          A           Right. I don't understand your question.  
13 You're going to have to --

14          Q           Well, I'll call a reprise in a little  
15 while.

16          A           Okay.

17          Q           Getting back to your Exhibit Number Four,  
18 I understand that looking at your 70 -- 7200 foot line --

19          A           7200 foot line? Yes, sir.

20          Q           -- it noses -- in Section 30 you have a --  
21 quite a substantial nose to the east.

22          A           I have it nosing towards the east, that's  
23 correct.

24          Q           Could it also be moved westward?

25          A           Not in my opinion. It is coming out to

1 honor the well control data east of Section 30.

2 Q But it is possible that it could be  
3 moved to the west?

4 A No, I don't -- I would not move it to the  
5 west. I would draw your attention, if you would like to  
6 look in 22, 27, on the eastern side of the nose I have de-  
7 picted at that point the very extreme tightness of the con-  
8 tours. If I incorporate that tightness on the eastern edge  
9 of where I begin to lose this reservoir east of Section 30,  
10 contrary to moving the nose to the west, I would move it to  
11 the east; however, I can't do that until I have that one  
12 more well.

13 Q Your Exhibit Number Six, based on that  
14 exhibit wouldn't the two best locations for wells in Section  
15 30 be in the southeast quarter and the southwest quarter of  
16 Section 30?

17 A No. Are you referring to the structure  
18 or the --

19 Q The isopach.

20 A The net H map?

21 Q The net H.

22 A Okay, would you ask your question again  
23 now?

24 Q Based upon your interpretation of the  
25 net H map --

1           A           Okay.

2           Q           -- aren't the two best locations for  
3 wells in the southeast quarter and the southwest quarter of  
4 Section 30?

5           A           In the southwest quarter of Section 30?

6           Q           In the -- one well in the southwest quar-  
7 ter and one well in the southeast quarter.

8           A           Oh, no, not at all, because you cannot  
9 look at one ingredient to pick your well location. You have  
10 to take a group of factors. The two primary group of fac-  
11 tors in here are the limits of the reservoir in its up-dip  
12 position and the second factor is the transitional zone lo-  
13 cation, where you want to keep the perforations in the well-  
14 bore away from the transitional zone. You want both of them  
15 to be within the gas column.

16                        So in that context, the best location the  
17 best location was within the gas column in the southwest  
18 quarter of Section 30; then, after the evaluation of that  
19 well is complete, a north half location would be drilled in-  
20 corporating that data, and it at that time could be drilled  
21 in the northeast or the northwest quarter, depending on the  
22 data from the low risk location.

23           Q           But you do want to move up-dip from the  
24 water transition --

25           A           Yes, of course.

1 Q -- at the -- Bass' proposed location in  
2 the north half unit.

3 A At this time our proposed location is on  
4 record as being a location 1980 from the west line and 660  
5 feet from the north line. Now this is purely a tentative  
6 second location. We prefer to pick our second locations af-  
7 ter we've drilled our first locations.

8 Q How many wells has Bass drilled in the  
9 last three or four years in Eddy County?

10 A In Eddy County in the last --

11 Q To the Strawn or Morrow formations?

12 A To the Strawn or Morrow formation, prob-  
13 ably two based solely on the fact of curtailment and a cur-  
14 rent litigation with the gas pipeline company.

15 We have a lot of locations pending.

16 Q Well, despite -- other than legal issues  
17 with gas pipelines, Bass was still free to go out and drill  
18 wells, was it not?

19 A Not when -- if you were a little bit more  
20 familiar bit more familiar with the particular gas contract  
21 in the Big Eddy Unit, you probably wouldn't make that state-  
22 ment.

23 Q (Unclear) considerably more wells in Eddy  
24 County in the last several years to test the Pennsylvanian  
25 age --

1           A           Oh, yes, they have been very active.

2                           MR. CATANACH: Mr. Kellahin?

3                           MR. KELLAHIN: No, sir.

4

5                           CROSS EXAMINATION

6 BY MR. CATANACH:

7           Q           Mr. Hillis, just one thing, if I could  
8 get you to draw in on my map the upper limit of the  
9 transition zone.

10           A           Okay.

11                           MR. CATANACH: Let's take about  
12 a ten minute break here.

13

14                           (Thereupon a recess was taken.)

15

16                           MR. CATANACH: Okay, we'll  
17 reconvere the hearing at this time.

18                           Mr. Kellahin?

19                           MR. KELLAHIN: Thank you, Mr.  
20 Catanach.

21                           Our next witness is Wayman, W-  
22 A-Y-M-A-N, Gore, G-O-R-E. Mr. Gore is a consulting  
23 reservoir engineer who has been retained to make an  
24 engineering presentation for Bass.

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WAYMAN T. GORE, JR.,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Gore, for the record would you please state your name and occupation?

A My name is Wayman Gore and I'm a consulting petroleum engineer.

Q Mr. Gore, would you summarize for us what is your educational background?

A Yes. I graduated from the University of Texas in 1980 with a Bachelor of Science degree in petroleum engineering.

Since graduation I have worked in the industry, first for Tenneco Oil Company in Houston as an area engineer; next for Sanchez- O'Brien Oil and Gas Corporation as a production and reservoir engineer in charge of their producing operations covering approximately a 7-state area; and since May of 1984 I have been employed by Platt, Sparks and Associates in Austin, Texas, as a consulting petroleum engineer.

Q Have you been retained by Bass Explora-

1 tion and Production Company to -- I'm sorry, Bass Enter-  
2 prises Production Company, to make a study of the engineer-  
3 ing -- well, to make an engineering calculation of the re-  
4 coverable reserves that underlie Section 30?

5 Q Yes, sir, I have.

6 A In addition, have you had an opportunity  
7 to examine the calculations made by Mr. Paradiso during his  
8 testimony earlier today?

9 A Yes, sir, I have.

10 MR. KELLAHIN: We tender Mr.  
11 Gore as an expert consulting petroleum engineer.

12 MR. CATANACH: He is so quali-  
13 fied.

14 Q Mr. Gore, let me show you what we propose  
15 to use as the first of your exhibits.

16 The first exhibit is Number Twelve? This  
17 one?

18 MR. KELLAHIN: And before we do  
19 that, Mr. Examiner, I was unable to mark this, I'll have to  
20 attach a sticker to this to mark this as an exhibit. I  
21 would like to mark it as Exhibit Twelve-A. Obviously it's  
22 an overlay, and you have your own copy there, Mr. Gore?

23 A Yes.

24 Q What I'd like you to do, Mr. Gore, is to  
25 commence and have you describe what information you have ob-

1 tained from Mr. Hillis, the Bass geologist, so that you  
2 could make an engineering evaluation of the necessary  
3 reserve parameters to make further engineering calculations  
4 about the recoverable reserves within the section.

5 In doing so, would you describe to what  
6 use you have put the overlay that we've marked as Exhibit  
7 Twelve-A?

8 A Yes. First of all, for my engineering  
9 study I have relied upon Mr. Hillis' geologic interpretation  
10 and his petrophysical work, his log analysis data, in  
11 describing the three separate zones, these three zones being  
12 the gas column, or 100 percent gas column; the transition  
13 zone; and the 100 percent water production, or wet zone.

14 The overlay, if I could turn to Mr.  
15 Hillis' Exhibit Number Six, actually goes with Exhibit  
16 Number Six.

17 Exhibit Twelve-A, the overlay, actually  
18 goes with Mr. Hillis' Exhibit Six, the porosity H map, and  
19 as you can tell from the overlay, I have shown the Section  
20 30, the section in question, and if we overlay onto Mr.  
21 Hillis' porosity H map, you will see that the overlay is  
22 divided into three separate colored zones.

23 The red zone is the gas column, 100  
24 percent gas, which, as Mr. Hillis testified, the bottom of  
25 which is located at a subsea depth of 7451, and it is so

1 marked with the dashed line.

2           The yellow zone, the bottom of which is  
3 marked a -7487, is the portion of the reservoir that con-  
4 tains both gas and transition zone, the bottom being the  
5 structural level before you go into 100 percent water.

6           And then, of course, the blue colored  
7 area as denoted in the area of the Bass Big Eddy No. 65  
8 Well, is denoted by -7519. This is the structure level be-  
9 low which you get into the 100 percent water productive  
10 area.

11           For my calculation of volumetric gas in  
12 place for Section 30, I planimetered the areas and deter-  
13 mined the porosity acre feet within each of the colored  
14 areas. You will notice on my Exhibit Twelve I show three  
15 different water saturations and three different porosity  
16 acre feet numbers.

17           The average water saturation, which is  
18 entitled SW-1, is the average water saturation in the 100  
19 percent gas-bearing formation or the area colored in red on  
20 the overlay.

21           I have determined from Mr. Hillis' work  
22 that a very conservative estimate of water saturation for  
23 this area of the reservoir is 20 percent.

24           Average water saturation labeled SW-2 is  
25 the water saturation for the yellow area. This is the por-

1 tion of the reservoir which will contain both 100 percent  
2 gas column and transition zone.

3 We know from Mr. Hillis' work that the --  
4 this particular area, if a well was drilled in the yellow  
5 area, it would encounter both gas column and transition  
6 zone, with the transition zone water saturation varying from  
7 a low of 20 percent up to a maximum of 35 percent.

8 So for the average saturation in this  
9 yellow area I have used an average saturation of 27-1/2 per-  
10 cent.

11 Then for the blue area, the blue area  
12 again is a portion of the reservoir which will have transi-  
13 tion zone plus 100 percent water-bearing rock. A well drill-  
14 led in the blue zone would encounter both transition zone  
15 and 100 percent water.

16 This area, I have determined that, from  
17 Mr. Hillis' work and testimony, that the average water  
18 saturation, again a very conservative estimate, is 35 per-  
19 cent.

20 We know that the transition zone water  
21 saturation varies from 20 upwards of 35 percent with any-  
22 thing greater than 35 percent being 100 percent wet, so I've  
23 use a very conservative estimate of 35 percent water satura-  
24 tion for the blue zone.

25 Q In making your volumetric calculation you

1 have utilized only that portion of the exhibit that's inclu-  
2 sive within Section 30.

3 A That is correct.

4 Q There are certain portions of your over-  
5 lay that obviously extend beyond the section but you have  
6 not factored that into your calculation in determining the  
7 reserves in place as shown on Exhibit Twelve.

8 A That's correct.

9 Q What did you calculate, Mr. Gore, as  
10 being the gas in place underlying Section 30 in the Strawn  
11 formation?

12 A The gas in place as determined using the  
13 average water saturations that I've just outlined, and the  
14 results of my planimentering of these areas, the gas in place  
15 calculates to be 13,414,000 MCF.

16 Q The next step in your study is to make an  
17 investigation to determine how much of the original gas in  
18 place you can expect to recover.

19 A That's correct.

20 Q And have you made a calculation to deter-  
21 mine volumetrically what were the recoverable reserves in  
22 the section?

23 A Yes, sir, I have.

24 Q I direct your attention to what I have  
25 marked as Exhibit Fourteen. There is no thirteen, I have

1 simply lost the ability to count above twelve, so forget  
2 thirteen, we're working with Fourteen.

3                   You've got one of those?

4           A           Yes.

5           Q           All right, let's go through the informa-  
6 tion that you've utilized to determine what the recoverable  
7 reserves were -- are, are for the section.

8           A           Okay. First of all, we have calculated  
9 that the gas in place is approximately 13.4 BCF.

10                   The initial reservoir pressure in the  
11 Strawn in this particular reservoir is 5,603 psia. This was  
12 determined from a bottom hole pressure build-up ran in the  
13 Big Eddy Well No. 65 upon initial completion. This compares  
14 very favorable -- favorably with the 5600 pounds, I believe  
15 was testified to in the Carlsbad Strawn Field to the south.

16           Q           In fact Mr. Paradiso was using the -- al-  
17 most the same pressure, initial reservoir pressure that you  
18 utilized?

19           A           Yes.

20           Q           The -- I have used an estimated abandon-  
21 ment reservoir pressure of 1000 psia. Normally a rule of  
22 thumb, not knowing anything about the reservoir, an abandon-  
23 ment pressure would be approximately 100 psi per thousand  
24 foot of depth.

25                   We're at approximately 11,500 feet here,

1 so we would expect a normal abandonment pressure to be ap-  
2 proximately 1100 psia.

3                   So my utilization of 1000 psia I feel is  
4 a very liberal estimate and will result in the calculation  
5 of the maximum amount of recoverable reserves under Section  
6 30.

7                   Q           In contrast, Mr. Paradiso used 500 pound  
8 abandonment pressure?

9                   A           Yes, he did.

10                  Q           And in his calculations, then, it will  
11 result in a larger recoverable reserve volume?

12                  A           Yes, it would. If -- if you use a 500  
13 pound abandonment pressure you will calculate larger re-  
14 coverable reserves.

15                  Q           So if you use 1000 you've got a smaller  
16 number than he will calculate if all the other parameters  
17 were the same.

18                  A           That's correct.

19                  Q           All right. What else did you use?

20                  A           Secondly, I determined the gas compres-  
21 sibility or gas deviation factor of the particular gas in  
22 this reservoir at initial conditions and abandonment condi-  
23 tions.

24                               At initial conditions, an initial pres-  
25 sure of 5,603 psia, the gas deviation factor is approximate-

1 ly 1.0372.

2 At an abandonment pressure of 1000 psia  
3 the gas deviation factor calculates to be 0.8746.

4 Utilizing these parameters, I then calcu-  
5 late a recovery efficiency. The recovery efficiency is de-  
6 fined to be the amount of gas which will be recovered as a  
7 percentage of the gas in place and this is calculated as  
8 shown by the formula on Exhibit Fourteen, which is one minus  
9 the abandonment pressure times the initial gas deviation  
10 factor divided by the initial pressure times the abandonment  
11 gas deviation factor, and the recovery efficiency calculated  
12 using an abandonment pressure of 1000 is 0.796, or approxi-  
13 mately 80 percent.

14 Therefore the recoverable reserves calcu-  
15 lated under Section 30 is 80 percent of the 13.4 BCF of gas  
16 in place or approximately 10.7 BCF.

17 Q Having gotten to the point where you now  
18 have established a recovery of 13.4 BCF, did you then go on  
19 to study the economics of drilling a well such as this to  
20 see whether or not it would be profitable to drill such a  
21 well?

22 A Yes, I did.

23 Q I'd turn your attention to what is marked  
24 as Exhibit Number Fifteen, Mr. Gore, and have you identify  
25 that exhibit.

1 A Yes, I have.

2 Q All right, what is that exhibit?

3 A That exhibit is a comparison of the esti-  
4 mated well costs as submitted and prepared by Bass Enter-  
5 prises Production Company and Santa Fe Energy Company and  
6 I've shown, broken these estimated costs into intangible  
7 well costs and tangible well costs.

8 The bottom line is Bass is estimating a  
9 completed well cost to be approximately \$995,000 and Santa  
10 Fe is estimating a completed well cost to be approximately  
11 \$845,233.

12 Q In analyzing the AFE's can you identify  
13 for us the reasons there is a cost differential between the  
14 two AFE's, whereby the Bass AFE is about \$150,000 more?

15 A Yes. There are approximately three areas  
16 that make up the majority of the differential in well costs.

17 MR. BRUCE: Mr. Examiner, you  
18 know, I have no questions about the well cost and I thought  
19 we had agreed previously that well cost wouldn't be an issue  
20 at the hearing.

21 MR. KELLAHIN; Certainly. I'm  
22 going to a different direction, Mr. Examiner. We have not  
23 told you but it is true that Mr. Bruce and I have stipulated  
24 that either of these well costs are reasonable.

25 The purpose of Mr. Gore's tes-

1 timony as to take the well cost calculation and to determine  
2 what is the range of expectations for those costs, apply it  
3 to the recoverable reserves, and see if it's reasonable to  
4 drill a well. That's what we are doing.

5 MR. CATANACH: Okay. You may  
6 proceed, Mr. Kellahin.

7 Q All right. The principal difference,  
8 then, between the two AFE's is found in the areas of the  
9 logging and formation evaluation? In other words, the log-  
10 ging program proposed by one company over the other?

11 A Yes. As you will notice on the exhibit,  
12 that Bass is estimating approximately \$127,000 for logging  
13 and formation evaluation.

14 Santa Fe is estimating approximately  
15 \$47,000.

16 Q And then there's a difference of about  
17 \$20,000 additional on a stimulation proposal that Bass has  
18 over the Santa Fe Energy proposal.

19 A That's correct.

20 Q All right, and then the other big differ-  
21 ence is, I think, a transportation difference?

22 A Yes, approximately \$20,000 difference in  
23 the estimated transportation costs.

24 Q What number did you apply in your econo-  
25 mic analysis for a well cost?

1           A           The well costs that I have used for my  
2 economic calculations are the estimated costs of Bass Enter-  
3 prises of \$995,000, and this is the higher of the two esti-  
4 mated well costs.

5           Q           Have you made an economic analysis, then,  
6 by which you can conclude that using the highest of the two  
7 AFE's, whether or not it will be reasonable to drill a well  
8 in Section 30?

9           A           Yes, I have.

10          Q           Let me turn your attention now to Exhibit  
11 Sixteen, Mr. Gore. This represents your work product?

12          A           Yes, sir, it does.

13          Q           What have you found?

14          A           First of all, the first sheet is a cover  
15 sheet. If we could turn to page two, this is the reserves  
16 and economic data. The third page is essentially the input  
17 data, which I would like to go over first.

18          Q           Okay.

19          A           Again we have already stated that a well  
20 cost of \$995,000 was used. A projected initial rate for the  
21 proposed Bass Big Eddy Well No. 102 was determined to be  
22 2500 MCF per day. This figure was arrived at by reviewing  
23 the 4-point test on the Big Eddy No. 65 Well, the only well  
24 to really produce any amount of gas from the subject reser-  
25 voir.

1                   The highest rate on the 4-point test for  
2 the Big Eddy No. 65 was 2,456 MCF per day, so I have uti-  
3 lized as an initial rate for the proposed well 2500 MCF per  
4 day.

5                   Again we have shown that the recoverable  
6 reserves under Section 30 is approximately 10.7 BCF. For  
7 this economic analysis I have then taken one-half of the re-  
8 coverable reserves under Section 30 and this is essentially  
9 5.37 BCF and have based my economic evaluation on this re-  
10 coverable gas figure for the one well.

11                   Utilizing an initial gas rate of \$1.30  
12 per MCF, an initial condensate price of \$15.00 per barrel, I  
13 have left these prices flat for 1988 and escalated at 5 per-  
14 cent, which I feel is very reasonable, if not conservative,  
15 and ran out the economics. The results, using an initial  
16 rate of 2500 MCF per day and a recoverable reserve figure of  
17 5.37 BCF yields a well life of 26 years, which is high-  
18 lighted on the previous page, and results in a yearly de-  
19 cline rate of 15-1/2 percent, which is very comparable to  
20 the Santa Fe wells to the south.

21                   Then if we could flip back one page, I  
22 have highlighted some information in yellow. The bottom  
23 line using these prices and well cost data is that the dis-  
24 counted payout for a well of this kind is a little over half  
25 a year, between six and seven months. The net income to in-

1 vestment ratio discounted at 10 percent is 8.97-to-1. In  
2 other words, Bass should realize a return on their invest-  
3 ment, discounted at 10 percent, of 9-to-1.

4 Q The investors that participate, then, in  
5 the drilling of the well will get their money back plus 8  
6 times?

7 A That's correct. The total revenues, gen-  
8 erated for this particular well that I've analyzed is  
9 slightly over \$17-million. The present worth of this total  
10 revenue discounted at 10 percent is highlighted and is ap-  
11 proximately \$7,928,000.

12 Q If Mr. Paradiso is correct on his calcu-  
13 lations of the drainage areas affected by his wells in the  
14 Carlsbad Strawn, do we have enough profitability in this  
15 economic analysis to justify the drilling of more than one  
16 well in the section?

17 A I'm not sure I follow you. Could you re-  
18 peat that?

19 Q Sure. Mr. Paradiso has shown us with his  
20 calculation that he's got a well that drains in excess of  
21 320 acres. It appears that the wells will in fact drain 320  
22 acres.

23 Are the economics such in your opinion  
24 that it can be fully developed with one well or is there  
25 enough economic incentive here to justify and support with

1 these recoverable reserves the drilling of two wells?

2 A The economics show that it would be more  
3 than profitable to drill two wells in Section 30 and I think  
4 the recoverable reserves which we have shown in Section 30  
5 show that two wells will be necessary to efficiently drain  
6 Section 30.

7 Q You've made that calculation on the  
8 assumption that Mr. Hillis' geologic interpretation is  
9 correct.

10 A Yes, I have.

11 Q Have you also had the opportunity today  
12 to make similar engineering calculations using the geologic  
13 interpretation that Santa Fe Energy has introduced today?

14 A Yes. I have reviewed their map and Santa  
15 Fe presented no figures for recoverable reserves under  
16 Section 30, so I have reviewed their map and made some  
17 ballpark estimates of recoverable gas based upon their geo-  
18 logy.

19 Q Based upon their geology what do you  
20 find, Mr. Gore?

21 A Utilizing again, I believe, the porosity  
22 in the No. 65 Well is approximately 11 percent, I believe  
23 the average water saturation that was presented by Santa Fe  
24 is approximately 35 percent, looking at their isopach map,  
25 it appears that they're showing approximately 400 acres pro-

1 ductive in Section 30, slightly over half of the section. I  
2 have estimated it to be approximately 400 acres.

3 And using, again, reviewing their isopach  
4 map, a good portion of Section 30 they show to have 30 feet  
5 or greater thickness. So utilizing an average thickness in  
6 Section 30 of 32 feet, and using my initial gas formation  
7 volume factor, the recoverable gas is approximately 10.6 BCF  
8 based on the Santa Fe geology.

9 I'm sorry, I've run out several different  
10 scenarios. Using the 11 percent average porosity, the re-  
11 coverable -- first off, the gas in place will be 12.3 BCF.  
12 Using an 80 percent recovery factor the recoverable reserves  
13 under Section 30, according to Santa Fe's maps, will be ap-  
14 proximately 9.8 BCF.

15 So even under Santa Fe Energy's opinion  
16 of the geology, there should be sufficient enough recover-  
17 able reserves to justify and economically support the drill-  
18 ling of two wells.

19 A Yes. As you'll recall, Santa Fe esti-  
20 mated that the recoverable reserves for their Neeley No. 1  
21 is 6.4 BCF and the recoverable reserves for the Weems No. 1  
22 is 7 BCF.

23 I have estimated based on their geology  
24 that the recoverable reserves under Section 30 alone is 9.8  
25 BCF.

1 Q As an engineer who's evaluated this area  
2 from an engineering perspective, how would you recommend  
3 that the section be developed in Section 30?

4 A My --

5 Q Have you formulated an opinion?

6 A Yes, sir, I have.

7 Q And what is that opinion?

8 A My recommendation is that Section 30  
9 should be developed as Bass proposes. There is sufficient  
10 recoverable reserves in Section 30 to warrant two wells  
11 being developed. I feel, from looking at the geological  
12 presentations, that the less risky location is the Bass lo-  
13 cation.

14 Once that well is drilled with the infor-  
15 mation that it will provide, I feel a second well will be  
16 necessary in the northern 320 and there will be sufficient  
17 reserves to warrant the drilling of that second well.

18 So my opinion is that we should have a  
19 laydown 320-acre unit.

20 Q In applying the engineering to the geol-  
21 ogy that Mr. Hillis has presented to you, as an engineer  
22 trying to confirm how you want to place the well within the  
23 geology that he's given you, if the units are stood up where  
24 you have an east half and a west half unit, and a well is  
25 drilled in the west half, are you in a position then where

1 you're precluded from drilling a well in the east half, not-  
2 withstanding the fact that east half does have recoverable  
3 reserves that will be contributing to the well in the west  
4 half?

5 A Now, are you talking about a standup unit  
6 now?

7 Q Yes, sir, in that situation.

8 A Yes. In that situation I think you would  
9 be precluded from drilling a well in the northern 320 if you  
10 had standup units, due to the fact that you would want to  
11 locate a well probably in the northeastern corner of the  
12 northwest quarter very near where a well in the standup unit  
13 would be located.

14 I feel it would be better from a reser-  
15 voir engineering standpoint to lay down this 320 acre unit  
16 and thus provide flexibility in locating the second well in  
17 the northern half of Section 30.

18 Q Were Exhidddd Twelve, Twelve-A, through  
19 Sixteen compiled under your direction and supervision?

20 A Yes, sir, they were.

21 Q And the opinions and conclusions you have  
22 expressed today are your own opinions and conclusions that  
23 you've derived based upon your study?

24 A Yes.

25 MR. KELLAHIN: That concludes my

1 examination of Mr. Gore.

2 We move the introduction of Ex-  
3 hibits Twelve, Twelve-A, through Sixteen, except for thir-  
4 teen.

5 MR. CATANACH: Exhibits Twelve,  
6 Twelve-A, through Sixteen will be admitted as evidence.

7 Mr. Bruce.

8 MR. BRUCE: Just a few ques-  
9 tions, Mr. Examiner.

10

11

CROSS EXAMINATION

12 BY MR. BRUCE:

13 Q I believe you said that your calculations  
14 are based on the geology presented by Mr. Hillis.

15 A Yes, they are.

16 Q So if that geology is not accurate, then  
17 your calculations are not correct?

18 A Certainly the calculations will vary as  
19 the geology varies, yes.

20 Q Looking at your Exhibit Twelve-A, I just  
21 want to clarify something.

22 Did your calculations of recoverable re-  
23 serves only include the pink and yellow areas or did they  
24 include anything in the blue area?

25 A With reference to Section 30 only --

1 Q With reference to Section 30 only.

2 A Yes. The blue area does contain recover-  
3 able gas; therefore the blue area was included.

4 As I stated before, this blue area will  
5 contain transition zone plus 100 percent water.

6 Referring back to my Exhibit Twelve, the  
7 porosity acre feet as determined for the blue area under  
8 Section 30 was determined to be 148.0. Knowing that this is  
9 transition zone plus water, only approximately half of the  
10 blue zone will be productive, or will contribute to gas pro-  
11 duction on Section 30.

12 So in the actual calculation of gas in  
13 place, you will notice that of the total 148 porosity acre  
14 feet, I have only utilized 74 porosity acre feet and this  
15 would account for the half of the blue area which is transi-  
16 tion zone that does contain recoverable hydrocarbons.

17 Q Okay, and referring once again to Exhibit  
18 Twelve-A, does your -- the extreme western edge of Section  
19 30 is indicated blank; it doesn't have any color on it.

20 A That's correct.

21 Q Did you attribute any reserves to that  
22 area?

23 A There are no recoverable reserves in the  
24 western portion of Section 30 that is not colored.

25 Q Now, if Santa Fe is correct and the en-

1     tire east half is nonproductive of gas, the east half of  
2     Section 30, would two wells be necessary to drain the west  
3     half of Section 30?

4             A             Well, I believe that in my review of the  
5     Santa Fe isopach map, they show approximately 400 acres pro-  
6     ductive. This calculates to approximately 9.8 BCF of recov-  
7     erable reserves.

8                     By your own witness' testimony, the two  
9     wells to the south, which (not clearly understood) if a  
10    second well was not drilled, so yes, I think a second well  
11    would be necessary, and the economics would justify drilling  
12    the second well.

13            Q            Well, I'm not sure I followed that all,  
14    but if the east half is nonproductive, would two wells be  
15    necessary to drain the west half?

16            A            Again, in my review of your geologic map,  
17    which shows the eastern half to be nonproductive, so there-  
18    fore, only the western, or approximately 400 acres --

19            Q            All right, assume 320 acres.

20            A            Well, your own map shows greater than 320  
21    acres. I can assume 320, if you would like.

22            Q            Yeah, I would like you to assume.

23            A            All right. Assuming 320 there would be  
24    approximately 7.8 BCF of recoverable gas in Section 30.  
25    Again, the most recoverable reserves you show from the wells

1 to the south is 7 BCF, so there'll be approximately a BCF of  
2 gas located in the western portion of Section 30 that would  
3 go unrecovered.

4 And in order to recover that approximate-  
5 ly one BCF of gas, a second well would have to be drilled.

6 Q Do you know if this is a water drive  
7 reservoir?

8 A Yes, sir, I feel I do know whether it is  
9 or it isn't a water drive, and my opinion is that it is not.

10 Q Just a minute ago you compared the Santa  
11 Fe Neeley and Weems Wells, to, say, a southwest quarter -- a  
12 well in the southwest quarter of Section 30, but did not Mr.  
13 Hillis say that the south -- or the Carlsbad Strawn was not  
14 comparable to the well in Section 30?

15 A Well, I believe what I testified to was  
16 that your testimony was that the Weems and the Neeley Wells  
17 should compare very favorably with a well in Section 30, and  
18 that's the direction that my testimony was aimed.

19 MR. BRUCE: That's all of this  
20 witness.

21 MR. CATANACH: I have no  
22 questions of Mr. Gore.

23 MR. KELLAHIN: Just a couple of  
24 follow-up questions, Mr. Catanach.

25

1

2

## REDIRECT EXAMINATION

3

BY MR. KELLAHIN:

4

Q Mr. Bruce was talking with you about the

5

Neeley and the Weems Wells, Mr. Gore.

6

If you'll specifically take Mr. Paradi-

7

so's Exhibit Number Seven, which I think is the Neeley Well,

8

and that's his P/z curve, do you have that before you?

9

A Yes, I do.

10

Q If you take your estimated recovery per-

11

centage of 80 percent and adjust it to an abandonment pres-

12

sure of 1000 pounds as opposed to 500, what have you calcu-

13

lated to be the recoverable reserves?

14

A The recoverable reserves based on 1000

15

psi abandonment pressure, using the Santa Fe Exhibit Number

16

Seven, which again I have calculated an 80 percent recovery

17

factor, does equate to a 1000 psi abandonment pressure.

18

Using this on the P/z curve shown on Ex-

19

hibit Number Seven, the recoverable gas would be approxi-

20

mately 5.75 BCF.

21

I believe Santa Fe's estimate using a 500

22

psi abandonment pressure was 6.4 BCF, so we've got -- we've

23

reduced the recoverable reserves by approximately 7-to-

24

800,000 MCF.

25

Q When we do a similar calculation on the

1 Weems Well, and take that P/z curve, have you had an oppor-  
2 tunity to plug in an 80 percent recovery factor and use 1000  
3 pounds abandonment pressure?

4 A Yes, I have.

5 Q All right, what did Mr. Paradiso say was  
6 our recoverable reserves under his calculation?

7 A Under his calculations he estimated 7  
8 BCF.

9 Q And you have recalculated that to be?

10 A I have recalculated that to be, based on  
11 1000 psi abandonment pressure, 6.25 BCF, so we have a dif-  
12 ference again of approximately 3/4ths of a BCF of recover-  
13 able reserves.

14 Q In calculating the recoverable reserves  
15 using Mr. Eckerty's interpretation of the isopach, you came  
16 up with what number?

17 A Using Mr. Eckerty's map, the recoverable  
18 reserves that I estimated in Section 30 is 9.8 BCF.

19 MR. KELLAHIN: I have nothing  
20 further.

21 MR. CATANACH: The witness may  
22 be excused.

23 MR. KELLAHIN: Mr. Examiner, at  
24 this time I'd like to call Mr. Jens Hansen. Mr. Hansen is  
25 a landman with Bass Enterprises Production Company. He re-

1 sides in Ft. Worth and has been previously sworn as a  
2 witness.

3  
4 JENS HANSEN,

5 being called as a witness and being duly sworn upon his  
6 oath, testified as follows, to-wit:

7  
8 DIRECT EXAMINATION

9 BY MR. KELLAHIN:

10 Q Mr. Hansen, for the record would you  
11 please state your name and occupation, sir?

12 A My name is Jens Hansen. I'm a landman  
13 for Bass Enterprises Production Company.

14 Q Mr. Hansen, have you previously testified  
15 before the Oil Conservation Commission of New Mexico and had  
16 your qualifications as a petroleum landman accepted and made  
17 a matter of record?

18 A Yes.

19 Q And are you familiar with the Bass opera-  
20 tions in the Big Eddy Unit in Eddy County, New Mexico?

21 A Yes.

22 Q And you have been involved for a number  
23 of years on behalf of your company in dealing with other  
24 companies to propose and work out on a voluntary basis the  
25 drilling of wells in and around the Big Eddy Unit?

1 A Yes.

2 Q And were you the landman and the princi-  
3 pal employee responsible for discussions and negotiations  
4 with Santa Fe Energy in an effort to work out on a voluntary  
5 basis the drilling of this well?

6 A Yes.

7 MR. KELLAHIN: We tender Mr.  
8 Hansen as an expert petroleum landman.

9 MR. CATANACH: He is so quali-  
10 fied.

11 Q Mr. Hansen, let me direct your attention  
12 to what we've marked as Exhibit Number Seventeen. Did you  
13 cause this exhibit to be prepared?

14 A Yes, I did.

15 Q And what does it depict, Mr. Hansen?

16 A This exhibit depicts -- the acreage under  
17 lease by Bass Enterprises Production Company is that colored  
18 yellow.

19 The oil and gas leases owned by Santa Fe  
20 Energy is shown in blue.

21 The Big Eddy Unit boundary, the western  
22 boundary of the Big Eddy Unit is shown in orange with the  
23 partially dotted line.

24 In Section 30 of Township 21 South, Range  
25 28 East, we have shown the proposed well location by Bass

1 with a red dot with the accompanying proration unit being  
2 the south half of the section.

3 We've also shown the proration unit pro-  
4 posed by Santa Fe Energy as that being outlined in green,  
5 which is the west half of Section 30, with two locations,  
6 two well locations, the first being 990 feet from the west  
7 line and 1980 feet from the south line, which was proposed  
8 in their October 6th letter, and that's shown in blue, as a  
9 blue dot, and a green dot with a location of 990 feet from  
10 the west line, 1980 feet from the north line, and that was  
11 proposed in their April 7th, 1988 letter.

12 Q In your negotiations and discussions with  
13 Santa Fe Energy, were you dealing with Mr. Green, the land-  
14 man for Santa Fe Energy?

15 A No, I was not.

16 Q With whom were you dealing when you were  
17 discussing their proposal and your counter-proposal for the  
18 development of Section 30?

19 A Mr. Bill Schaefer.

20 Q And to your knowledge what was Mr. Schae-  
21 fer's capacity during this time with that company?

22 A Mr. Schaefer had the capacity of being  
23 Exploration Manager for that Division.

24 Q Were you responsible for your company's  
25 response to the letter that Santa Fe Energy wrote to Bass on

1 October 6th, 1987?

2 A Yes.

3 Q Were you able to work out an arrangement  
4 with Santa Fe Energy for the formation of the 2-section  
5 working interest unit?

6 A No, we were not.

7 Q And what was the reason that you were un-  
8 able to successfully form a voluntary working interest unit?

9 A Well, there were four major, fundamental  
10 flaws to the proposal.

11 First, when you combine into a working  
12 interest unit a Federal, Federal unit acreage, and non-Fed-  
13 eral unit acreage, you initiate a problem created when you  
14 develop the area and specifically with disproportionate re-  
15 duction to the unit owners should you have the expanding  
16 participating area procedure that is quite prevalent in  
17 these Federal units.

18 That was -- that's number one.

19 Number two, is we believed, and still be-  
20 lieve, that to include portions of Santa Fe's acreage with  
21 portions of our Federal unit dilute Section 30 with nonpro-  
22 ductive acreage.

23 Third, the 40 acres within this Federal  
24 unit that Santa Fe Energy has leased is not dedicated to the  
25 Big Eddy Unit and as a result there is an attempt to dictate

1 unit operations with a minor interest that's not dedicated  
2 to the unit.

3 And fourth, we believe that one well in  
4 the west half of Section 30 would result in the non-recovery  
5 of unitized substances.

6 Q Santa Fe Energy proposed to you a revision  
7 from the original proposed well location. The first location  
8 is the blue dot in the southwest quarter of the section?  
9

10 A That's correct. That was the first proposal.  
11

12 Q And then in March and April of '88 Mr. Schaefer  
13 proposed to you an alternative location?

14 A Yes. What was the discussion about moving  
15 the location, then, to the northwest quarter of the section?  
16

17 A Mr. Schaefer called me on April 6th,  
18 1988, advised me that they had made a decision to move the  
19 location to the northwest quarter and that we would be receiving  
20 a letter proposing that new location.

21 That proposal was received by Bass under  
22 their April 7th, 1988 letter.

23 Q When did you first learn, Mr. Hansen,  
24 that Santa Fe Energy now proposes to return back to the original  
25 location originally proposed in October 6th of '87?

1 A I learned that today.

2 Q From Bass' perspective does that make a  
3 difference to you in determining how the section ought to be  
4 developed?

5 A No, it does not.

6 Q There is still a disagreement about the  
7 well location?

8 A Yes.

9 Q Let me turn your attention now for just a  
10 minute to what is the underlying basis for the approval of  
11 the Big Eddy Unit itself, Mr. Hansen, when we look at Sec-  
12 tion 30, exclusive of the 40-acre tract on the southwest of  
13 the southwest. Let me direct your attention, sir, to what  
14 I've marked as Exhibit Number Eighteen.

15 What have you -- what have you compiled  
16 and proposed as Exhibit Number Eighteen, Mr. Hansen?

17 A This exhibit is a copy of the unit agree-  
18 ment for the development and operation of the Big Eddy Unit  
19 Area, dated April 10th, 1952.

20 Also attached to the Big Eddy Unit agree-  
21 ment is a copy of Order No. R-152 by the New Mexico Oil Coo-  
22 peration. -- excuse me, New Mexico Oil Conservation Commis-  
23 sion that ratifies and confirms the Big Eddy Unit as a plan  
24 of development.

25 Q Under the plan of development and the or-

1 der entered by the Commission, what are the constraints on  
2 Bass as operator for the development of the interest in  
3 Section 30?

4 A The constraints and charges are found on  
5 Page 8, I direct you to Page 8. It's been outlined there  
6 for you in a pink color and I'll read:

7 "Rights and Obligations of the Unit Opera-  
8 tor. Except as otherwise specifically provided herein, ex-  
9 clusive right, privilege, and duty of exercising any and all  
10 rights of the parties hereto, which are necessary or conven-  
11 ient for prospecting (sic), producing, storing, allocating  
12 and distributing the unitized substances are hereby dele-  
13 gated to and shall be exercised by the unit operator as  
14 herein provided."

15 Q Under the obligations and constraints of  
16 the order, as well as the operating agreements approved by  
17 the BLM, is anyone other than Bass entitled to or required  
18 or obligated to develop and drill on the unitized acreage?

19 A No. The unit operator is given the dis-  
20 cretion to discern which operations should and should not be  
21 conducted and under that charge Bass Enterprises Production  
22 Company has, since 1952, carried out the unit operations of  
23 this unit.

24 I'd also like to direct you to Page 14 of  
25 that same unit agreement, provision number 13, which is en-

1 titled, "Development or Operation of Nonparticipating Land  
2 or Formations. Nonparticipating land or formations in this  
3 provision refers to areas outside participating areas." So  
4 it's unitized acreage outside the participating areas, and  
5 it states, "Any party hereto owning or controlling the work-  
6 ing interest in any unitized land having thereon a regular  
7 well location may with the approval of the Supervisor as to  
8 Federal lands, the Commissioner as to State land, and the  
9 Commission as to privately owned land, at such parties sole  
10 risk, cost, and expense, drill a well to test any formation  
11 for which a participating area has not been established."

12 In this particular situation the well  
13 proposal that Bass has proposed is on Federal acreage. The  
14 Supervisor has approved this operation and under 13 we are  
15 -- we are obligated to conduct that operation.

16 Q If Santa Fe Energy wants to drill either  
17 one of the locations they've proposed on the Big Eddy Unit,  
18 what are the things that they must do?

19 A First they must obtain a designation of  
20 agent, which the operator must execute under the BLM rules  
21 and regulations, and we would then have to file an amended  
22 plan of development that changes the well location to their  
23 prescribed location, and then they would be entitled to  
24 drill the well after they had an approved APD.

25 Q Under the terms of this, the structure of

1 the unit, is under -- is Bass under any obligation or re-  
2 quirement to designate Santa Fe Energy or anyone else as an  
3 operator or an agent to drill this well?

4 A No, and especially under conditions where  
5 we do not deem that the operation is a prudent operation.

6 Q In addition to having Bass consent to  
7 have Santa Fe Energy drill the well on the unit acreage,  
8 what else must they have? An approved APD, must they not?

9 A Yes.

10 Q All right. To the best of your knowledge  
11 has Santa Fe Energy obtained an approved APD for the west  
12 half of Section 30?

13 A No.

14 Q Mr. Hansen, have you caused the necessary  
15 forms to be filed with the Bureau of Land Management propos-  
16 ing the well as Bass proposes it, showing a south half  
17 orientation for the spacing unit and filed that as an appli-  
18 cation for permit to drill with the Bureau of Land Manage-  
19 ment?

20 A Yes, we have.

21 Q And has that permit been fully complete  
22 in terms of the requirements that Bass must fulfill in order  
23 to have that permit processed?

24 A No, we also filed an amended plan of de-  
25 velopment, which is also -- which was approved.

1 Q All right, so you have, in fact, com-  
2 pleted all the requirements that the Bureau of Land Manage-  
3 ment's placed upon Bass to have your Application for Permit  
4 to Drill, dedicating the south half of Section 30, using  
5 your proposed location 1980 from the west and the south  
6 lines.

7 A That's correct.

8 Q Let me show you what is marked as Exhibit  
9 Number Nineteen, Mr. Hansen, and ask you if you can identify  
10 that?

11 A This is the Application for Permit to  
12 Drill that was filed by our Midland office for the drilling  
13 of the Big Eddy Well No. 102, to be located 1980 from the  
14 south line and 1980 from the west line.

15 Q And would Bass, you on behalf of Bass,  
16 have dealt with what individuals at the Bureau of Land Man-  
17 agement concerning your application?

18 A The application was sent to the Carlsbad  
19 office of the BLM, a Mr. Shannon Shaw, I believe is his  
20 name, handled that through our office in Midland, who -- who  
21 -- at which office one of our personnel handled it on that  
22 level.

23 Q Have you obtained from the Bureau of Land  
24 Management, Mr. Hansen, the approval of Bass' Application  
25 for Permit to Drill for this well, dedicating the south half

1 of the section to the well?

2 A Yes.

3 Q And what is the date of that approval?

4 A The date of that approval is April 21st,  
5 1988.

6 Q And that's shown as the last entry on the  
7 cover sheet to Exhibit Number Nineteen?

8 A That is correct.

9 Q Let me show you what is marked as Exhibit  
10 Number Twenty, Mr. Hansen --

11 A Uh-huh.

12 Q -- and ask you to identify that exhibit.

13 A This is -- this is the first amendment to  
14 the 1988 plan of development for the Big Eddy Unit that we  
15 filed on -- that we sent on April 21st, 1988, to the Bureau  
16 of Land Management, Commissioner of Public Lands and the New  
17 Mexico Oil Conservation Division.

18 Q And this is one of the items necessary in  
19 order to complete the processing for your permit to drill  
20 the well?

21 A That is correct.

22 Q As of this time, Mr. Hansen, do you have  
23 an opinion as to whether or not Bass has taken all the  
24 necessary requirements to obtain necessary approvals from  
25 the Bureau of Land Management for the drilling of the well?

1 A Yes.

2 Q And you have?

3 A Yes, we have.

4 Q In the event Santa Fe Energy elects not  
5 to participate with its 40-acre interest in the spacing  
6 unit, do you have a recommendation to the Examiner as to  
7 what the overhead rates ought to be applied against that  
8 interest on a monthly basis for a producing well or a  
9 drilling well rate?

10 A Yes.

11 Q And what --

12 A \$5500 for a drilling rate, \$550 for an  
13 operating rate per well.

14 Q When does Bass propose to commence the  
15 well, Mr. Hansen?

16 A Bass proposes to commence the well at  
17 such time as we have a release from the gas -- our gas  
18 company, who -- under this section for release to the  
19 contract, gas contract, NGPL, Natural Gas Pipeline Company.

20 Q And is that being processed?

21 A Yes, and we believe that will be  
22 forthcoming within thirty to sixty days.

23 MR. KELLAHIN: That concludes  
24 my examination of Mr. Hansen.

25 We'd move the introduction of

1 Exhibits Seventeen through Twenty.

2 MR. CATANACH: Exhibits Seven-  
3 teen through Twenty will be admitted as evidence.

4 Mr. Bruce?

5 MR. BRUCE: Just a few brief  
6 questions.

7

8 CROSS EXAMINATION

9 BY MR. BRUCE:

10 Q When did Bass first propose the south  
11 half unit to Santa Fe?

12 A Let's see, formally, are you talking  
13 about formally or through conversation?

14 Q Formally.

15 A I believe it was our March, March 18th  
16 letter, I believe. Yes, March 18th, 1988. That was our  
17 first well proposal.

18 Q And on what date did Bass apply to the  
19 BLM for the APD?

20 A Let's see, I believe that's March 22nd,  
21 1988.

22 Q So in essence there was really no room  
23 for negotiation with Santa Fe in there.

24 A No, that wasn't the case at all. We had  
25 negotiated up until about March the 18th to try to find some

1 way to resolve this thing, if we could.

2 Q Exhibit Eighteen, the OCD order and the  
3 Big Eddy Unit Agreement --

4 A Yes.

5 Q -- of course that has no applicability  
6 to Santa Fe's acreage, does it?

7 A That's correct.

8 Q One last question. If Bass does not get  
9 a release from Natural Gas Pipeline Company of America from  
10 its contract, will it drill the well?

11 A We may; depends on gas marketing.

12 MR. BRUCE: Nothing further.

13 MR. CATANACH: I have no ques-  
14 tions.

15

16 REDIRECT EXAMINATION

17 BY MR. KELLAHIN:

18 Q Mr. Hansen, Mr. Bruce has made inquiry  
19 about the first written proposal of Bass to Santa Fe Energy,  
20 which was March of this year.

21 Are you satisfied that you've done all  
22 you can do in order to try to formulate on a voluntary basis  
23 the development with Santa Fe Energy for the drilling of the  
24 well in Section 30?

25 A Yes, with the inherent problems that fol-

1 low a working interest unit of unitized and non-unitized ac-  
2 reage. We have done everything we can do within what we  
3 consider minimizing the risks to work a deal with Santa Fe,  
4 and it -- we just couldn't work a deal.

5 Q In fact, Mr. Schaefer of Santa Fe is a  
6 good personal friend of yours, is he not?

7 A Yes, very good friend.

8 Q And you fellows have talked for months  
9 trying to figure out some solution to getting this section  
10 developed, did you not?

11 A That's correct, and a big part of the  
12 problem is the 40 acres that is not dedicated to the Big Ed-  
13 dy Unit and when you have a small acreage interest like that  
14 in a Federal Unit that does not participate, they are doing  
15 one of two things: They are either going to develop their  
16 minerals on -- on their own basis, or they will be included  
17 within unit operations on some manner and not participate in  
18 the participating area procedure. That's their only two op-  
19 tions and they cannot -- they have not been and cannot dic-  
20 tate unit operations.

21 Q There certainly is no dispute that either  
22 Santa Fe Energy or Bass are both competent professional  
23 operators at all levels of their operations.

24 A Not in my mind, no.

25 Q How did we ever get where we are with

1 this case, Mr. Hansen?

2 A It's just two oil companies that could  
3 not make a deal because one of the companies was making a  
4 proposal that had fundamental flaws to it, and possibly did  
5 not understand Federal units.

6 MR. KELLAHIN: Nothing further.

7 MR. CATANACH: I have no ques-  
8 tions. The witness may be excused.

9 Would counsel like to make  
10 closing statements? Mr. Kellahin?

11 MR. KELLAHIN: Mr. Examiner, we  
12 do appreciate the time that you've given us today and in  
13 fact a good part of the whole day you've devoted to this  
14 case. It is not a case that we've taken lightly. There has  
15 been considerable effort by both companies to work out a re-  
16 solution of this issue in order to determine how best to de-  
17 velop the section.

18 From my own perspective,  
19 though, I think there are a few essential points, or at  
20 least points that I think are essential that stick out in my  
21 mind as a lay person, as the nontechnical person that has  
22 seen these displays for the first time yesterday afternoon,  
23 and from my own perspective I would like to urge you to take  
24 into consideration some of those points.

25 For Bass this is a forced pool-

1 ing case in the traditional, logical sense of the word. We  
2 have done all that is necessary or could be done to formu-  
3 late a voluntary basis for providing a spacing unit for the  
4 well.

5 I think it is significant that  
6 out of 640 acres we control all but 40 acres. In basic  
7 fairness it appears to me that the interest owner, with some  
8 87-1/2 percent of that interest, ought to be the party that  
9 determines how to spend the money and where to locate the  
10 well.

11 Santa Fe Energy, on the other  
12 hand, has 12-1/2 percent. They want to tell the operator  
13 with an overwhelming majority of not only the money to spend  
14 but the responsibility for developing the section where to  
15 locate their well.

16 From Santa Fe Energy's perspec-  
17 tive, it does not matter how that unit is oriented, if you  
18 look only at Section 30. If it's a laydown, it's still 12-  
19 1/2 percent. If it is the west half, it's still 12-1/2 per-  
20 cent.

21 What in the world is there to  
22 gain for Santa Energy wanting to take a small, minority in-  
23 terest and determine and go to great lengths to argue over  
24 where this well is located?

25 Mr. Hillis has provided you

1 with voluminous research on how he has convinced himself,  
2 persuaded Bass, and I hope convincingly shown you how to lo-  
3 cate the well.

4 This is not a forced pooling  
5 case for Santa Fe Energy. They've got an entirely different  
6 objective in mind when it comes to developing this section  
7 and Mr. Eckerty told us what it was.

8 If you'll look at his Exhibit  
9 Number Four, you can see how he has turned the reservoir in  
10 the north half of Section 25, he has got greater structural  
11 position in the north half of 25, acreage outside the unit,  
12 controlled by Santa Fe Energy. He's got better structural  
13 position. He's got just as much or more of the reservoir  
14 volume for a well. He is farther removed from the gas/water  
15 contact that gives him so much concern, and yet why doesn't  
16 he drill his location over here first?

17 It's obvious. He told us. He wants to  
18 take his minority interest in the west half of Section 30  
19 and dictate then where Bass explores and develops not the  
20 unit, no, the offsetting acreage, and that's exactly what  
21 they're trying to do. They want to force a well located  
22 close to their property in 25 to explore and develop and  
23 prove up their reserves, thereby minimizing the risk in a  
24 spacing unit where they will have the majority of the in-  
25 terest.

1                   And that's exactly why we're  
2 here today.

3                   Their application must be  
4 denied, Mr. Examiner. There is nothing else that you can do  
5 with their application. As a matter of fact, I'll be very  
6 candid with you, if you grant their application, they still  
7 can't drill the well. The unit provisions and the approval  
8 by the Bureau of Land Management absolutely preclude Santa  
9 Fe Energy from drilling on the unit.

10                   There are two conditions that  
11 they must have in addition to an Examiner pooling order, and  
12 that is they must have an approved APD from the Bureau of  
13 Land Management. Not only have they not filed it, Mr. Green  
14 says they haven't filed one.

15                   It doesn't matter. Bass has  
16 got an approved one. We already have a south half already  
17 approved. They cannot in any way get an APD approved. That  
18 is precluded to them.

19                   The other pre-condition they  
20 must have is they must have a designation of operator or  
21 agent by Bass to drill on the unit. Mr. Hansen has told us  
22 there's no way they're going to get it. They cannot get it.  
23 Bass wants to drill the well where they've picked to drill  
24 the well. They can't do it.

25                   In my mind you're within your

1 rights to dismiss the application of Santa Fe Energy as a  
2 matter of course, because under the pooling statute they  
3 must, as a pre-condition to filing their application have  
4 the right to drill, and they are proposing to drill at a lo-  
5 cation in which they have no right at all.

6 But you can decide this on the  
7 merits and I suggest that you may do so with full confidence  
8 and comfort that Mr. Hillis has found a location with in-  
9 finite patience and tremendous detail and analysis, and  
10 found a location that will not only protect Bass and the  
11 tremendous investment they have in the unit, but will cer-  
12 tainly protect and benefit Santa Fe Energy, and we would  
13 suggest, sir, in closing, that you approve the forced pool-  
14 ing that Bass has filed and that you correspondingly deny  
15 the Santa Fe Energy application.

16 MR. CATANACH: Thank you, Mr.  
17 Kellahin.

18 Mr. Bruce?

19 MR. BRUCE: Mr. Examiner, you  
20 see quite a difference in the geological information regar-  
21 ding this area, but Santa Fe's information is based on the  
22 analogous Carlsbad Strawn Field to the southwest, and based  
23 on that Mr. Eckerty's Number Four Exhibit, we believe cor-  
24 rectly depicts the geology in this area and further shows  
25 that the entire east half of Section 30 is wet and nonpro-

1 ductive.

2 For that reason a well at Bass'  
3 proposed location runs an undue risk of being noncommercial  
4 and being shutdown too soon, just like the Big Eddy Unit No.  
5 65 Well in Section 31.

6 For that reason Santa Fe's lo-  
7 cation should be approved because it has a higher probabilit-  
8 ity of resulting in a good commercial well.

9 In addition, the best evidence  
10 shows that one well will drain at least 320 acres and the  
11 only result in drilling at Bass' location will be to spend  
12 another million dollars in the northwest quarter or the  
13 northeast quarter of the section, probably in the northwest  
14 quarter, as Mr. Hillis said, drilling an additional, un-  
15 necessary well.

16 We believe that the economic  
17 waste requires that Bass' application be denied and that  
18 Santa Fe's application be granted.

19 As was noted, Santa Fe's inter-  
20 est in the unit basically remains the same; there is little  
21 variation because of the acreage, but Santa Fe is willing to  
22 leave Bass as operator and, of course, Bass' interest  
23 doesn't change, either.

24 Now, Mr. Kellahin talks about  
25 Santa Fe's only reason for drilling the well in Section 30

1 is to prove up it's acreage in Section 25. It should be  
2 noticed that, I think even Mr. Hillis would agree, that the  
3 first well logically should be a step out from the Bass or  
4 the Big Eddy Unit No. 65 Well rather than traversing more  
5 than a mile or so territory to drill somewhere in Section  
6 25, especially considering the fact that the Santa Fe Vernon  
7 Well is already a dry hole in Section 25.

8 Now Bass should not be allowed  
9 to cause waste merely because it's the majority working  
10 interest owner in Section 30. We believe that upon  
11 reviewing the data Bass' application should be denied. Mr.  
12 Hansen said one company made a proposal with a fundamental  
13 flaw. We think he's right. We think Bass' proposal is  
14 flawed because it will result in a noncommercial well.

15 Thank you.

16 MR. CATANACH: Anything further  
17 in Case 9372 or 9374?

18 MR. KELLAHIN: No, sir.

19 MR. CATANACH: If not, they  
20 will be taken under advisement.

21

22 (Hearing concluded.)

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C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 9372 <sup>9376</sup> heard by me on May 14 1988.  
David R. Catarol, Examiner  
Oil Conservation Division