

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY)
THE OIL CONSERVATION DIVISION FOR THE)
PURPOSE OF CONSIDERING:) CASE NO. 11,612
)
IN THE MATTER OF CASE NO. 11,612 BEING)
REOPENED PURSUANT TO THE PROVISIONS OF)
DIVISION ORDER NO. R-10,679-A, WHICH) ORIGINAL
ORDER PROMULGATED TEMPORARY SPECIAL)
RULES AND REGULATIONS IN THE EAST)
STALLION-DEVONIAN POOL IN LEA COUNTY,)
NEW MEXICO, INCLUDING A PROVISION FOR)
80-ACRE SPACING)

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

March 19th, 1998
Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MICHAEL E. STOGNER, Hearing Examiner, on Thursday, March 19th, 1998, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

I N D E X

March 19th, 1998
Examiner Hearing
CASE NO. 11,612

	PAGE
EXHIBITS	3
APPEARANCES	4
APPLICANT'S WITNESSES:	
<u>CARL W. BROWN</u> (Engineer)	
Direct Examination by Mr. Kellahin	6
Examination by Examiner Stogner	15
REPORTER'S CERTIFICATE	19

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E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	7	15
Exhibit 2	8	15
Exhibit 3	9	15
Exhibit 4	10	15
Exhibit 5	10	15
Exhibit 6	11	15
Exhibit 7	12	15
Exhibit 8	13	15

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Additional submissions by Fasken, not identified, offered or admitted:

Identified

Nunc pro tunc Order, Nomenclature	
Case No. 11,612, Order No. R-10,679-A	6

* * *

A P P E A R A N C E S

FOR THE DIVISION:

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FOR FASKEN OIL AND RANCH, LIMITED:

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By: W. THOMAS KELLAHIN

* * *

1 WHEREUPON, the following proceedings were had at
2 10:12 a.m.:

3 EXAMINER STOGNER: I guess at this time we're
4 ready to go on the third page, down at the bottom, and call
5 Case Number 11,612.

6 MR. CARROLL: In the matter of Case Number 11,612
7 being reopened pursuant to the provisions of Division Order
8 Number R-10,679-A, which order promulgated temporary
9 special rules and regulations in the East Stallion-Devonian
10 Pool in Lea County, New Mexico.

11 EXAMINER STOGNER: Call for appearances.

12 MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of
13 the Santa Fe law firm of Kellahin and Kellahin, appearing
14 on behalf of Fasken Oil and Ranch, Limited. I have one
15 witness to be sworn.

16 EXAMINER STOGNER: No objecting parties?

17 MR. KELLAHIN: No, sir.

18 EXAMINER STOGNER: Will the witness please stand
19 to be sworn?

20 (Thereupon, the witness was sworn.)

21 MR. KELLAHIN: Mr. Examiner, this is a one-well
22 Devonian oil pool.

23 Mr. Brown and I presented this case to Examiner
24 Catanach back in October of 1996. The request was to seek
25 an 80-acre oil spacing for this discovery well. It was

1 approved by Order Number R-10,679-A. I've given you a copy
2 of the order.

3 Mr. Brown is back before you again this morning
4 to ask that these rules now be made permanent.

5 As part of his presentation, we're going to
6 summarize what the technical position was back in 1976,
7 demonstrate for you what Mr. Brown has concluded concerning
8 the productivity of the single well, and then ask you to
9 approve these special pool rules on a permanent basis,
10 based upon his conclusions.

11 With that introduction, Mr. Stogner, we will ask
12 Mr. Brown to testify.

13 CARL W. BROWN,
14 the witness herein, after having been first duly sworn upon
15 his oath, was examined and testified as follows:

16 DIRECT EXAMINATION

17 BY MR. KELLAHIN:

18 Q. For the record, sir, would you please state your
19 name and occupation?

20 A. My name is Carl W. Brown. I'm a petroleum
21 engineer.

22 Q. Mr. Brown, on prior occasions and in the previous
23 hearing of this case, you qualified and testified as a
24 reservoir engineer, did you not?

25 A. That's correct.

1 Q. And pursuant to your employment by Fasken, you
2 have continued to study the reservoir engineering data that
3 surrounds this well?

4 A. Yes, I have.

5 Q. You reside in Midland, Texas, do you not, sir?

6 A. That's correct.

7 Q. The presentation we're going to make today
8 represents your work product and your conclusions and
9 opinions?

10 A. Yes, it does.

11 MR. KELLAHIN: We tender Mr. Brown as an expert
12 witness.

13 EXAMINER STOGNER: Mr. Brown is so qualified.

14 MR. KELLAHIN: Mr. Brown, let me have you turn,
15 sir, and let's look at Exhibit 1 -- it's a locator map --
16 and identify for the Division the subject well that we're
17 talking about this morning.

18 A. The subject well is the Fasken-operated Grande
19 Number 1, located in Section 3 of Township 13 South, Range
20 38 East.

21 Q. Identify for us the other Devonian pools that you
22 have located on the map.

23 A. To the west -- or the east, is a Bronco-Siluro-
24 Devonian Pool.

25 And to the -- about three miles west, is the

1 Bronco West-Devonian and the Stallion-Devonian field.

2 And up to the north and east -- north and west,
3 is the Gladiola-Devonian.

4 Q. Okay. Let's set the locator map aside, and we'll
5 come back to it again in a moment.

6 At the prior hearing, we submitted to the
7 Division what is again marked as Exhibit 2. Would you
8 identify that for us?

9 A. This is a type log, a compensated neutron, litho-
10 density log, showing the completion interval as 12,210 feet
11 to 12,218 feet, perforated interval.

12 Q. Let's turn to the structure map, now, Mr. Brown.
13 This is also a reproduction of the same structure map that
14 was presented to the Division back in 1996?

15 A. That's right, it is a structure map developed
16 from three-dimensional seismic data by our in-house
17 geologist, David Brown.

18 Q. Mr. Brown, in all reasonable probability, is this
19 going to be a one-well pool?

20 A. Yes, I believe it is.

21 Q. Give us a summary of the characteristics of this
22 reservoir.

23 A. At the testimony originally in 1996, we presented
24 the information about -- from the drill stem test
25 permeability in the zone, is around 236 millidarcy perm.

1 The radius of investigation of the pressure
2 buildup data on the drill stem test was calculated to be
3 1400 feet, which is a 143-acre circle.

4 And the productivity index at the time was --
5 with the drill stem test, it was excellent. We have --
6 since have production established with approximately 200 or
7 almost 200 barrels a day of total fluid production, with
8 only 200 p.s.i. drawdown, indicating excellent productivity
9 in the reservoir, and capable of draining beyond the 80-
10 acre spacing.

11 Q. What type of reservoir is this?

12 A. This is a carbonate water drive reservoir.

13 Q. When we look at Exhibit 3, for purposes of your
14 engineering work, have you made an assessment of where the
15 oil-water contact might be?

16 A. We have estimated the oil-water contact very near
17 to minus 8450 subsea contour, which is the outermost
18 contour that encloses the whole feature.

19 The mud log and electric log shows indicate oil-
20 water contact was at -- below the 8450 level, and I've
21 included that in my volumetric analysis.

22 Q. Have you made an assessment of what you estimate
23 to be the original oil in place within the feature above
24 the minus 4850 (*sic*) contour lines?

25 A. I did make an estimate of the ultimate recovery,

1 based on the recovery factor.

2 Q. Okay, and what was that estimate?

3 A. It would be 331,000 barrels, assuming a 5-percent
4 porosity, a 40-percent water saturation and a 35-percent
5 recovery factor, typical of some water drives. If the oil-
6 water contact was 8450, then we conceivably could produce
7 331,000 barrels, ultimately.

8 Q. You show that summary calculation on your Exhibit
9 Number 4?

10 A. Yes, I do.

11 Q. Let's turn now to the production information on
12 the specific well involved. If you'll turn to Exhibit 5,
13 identify and describe that display.

14 A. Exhibit Number 5 is a production plot of a
15 monthly oil and water and gas rate versus time. And the
16 oil rate in -- monthly oil rate is in green.

17 And I've also established a production forecast,
18 a hyperbolic forecast, that starts from an initial decline
19 rate of 45 percent per year and ending at a 15 percent per
20 year.

21 This forecasted decline results in an estimated
22 ultimate recovery for these current conditions of 71,000
23 barrels of oil a day -- of ultimate recovery.

24 Q. What's your engineering basis for concluding that
25 the decline curve for this well is going to take this

1 hyperbolic shape that you've shown on Exhibit 5?

2 A. It's by analogy from the Bronco West-Devonian and
3 the Stallion West-Devonian.

4 Q. Okay. Before we leave Exhibit 5, would you come
5 back and explain to us what has occurred with this wellbore
6 in 1997 to explain the dramatic change in production during
7 that period of time?

8 A. Okay, initially the well was flowing. In 1996 we
9 did begin cutting water, and it wouldn't flow any longer.
10 We had indication we might have some behind-pipe channeling
11 and did some remedial squeeze work. I think that's a
12 minimal contribution of our water now, but we did put it on
13 a rod pump in early 1997.

14 Q. So that change in production is not a reflection
15 of the productivity of the well, it's simply attributed to
16 other issues.

17 A. Yes, it's a production method.

18 Q. Okay. Now, let's talk about your analogy. If
19 you'll turn to your Exhibit Number 6, identify and describe
20 what we're looking at here.

21 A. Exhibit Number 6 is a water-oil ratio-versus-
22 cumulative-oil plot, and I've extrapolated to approximately
23 70,000 barrels of ultimate recovery along this trend
24 currently, which agrees with the decline forecast.

25 Q. Do you have plans, then, to increase the pump

1 capacity of this well and to also obtain additional water
2 disposal facilities in order to move more fluids through
3 this wellbore?

4 A. Yes, we wanted to see how the well produced under
5 the initial pumping conditions at the -- We have a pumping
6 fluid level around 2000 feet from the surface, and we can
7 increase our total fluid production, but we do need an
8 additional disposal and reduce our disposal costs, before
9 we do that.

10 Q. All right. Let's look at your two analogies now.
11 If you'll turn to Exhibit 7, before we discuss that
12 specific display identify for us the well, and then let's
13 go back to Exhibit 1 and locate for the Examiner where that
14 well is.

15 A. Okay, Exhibit 7 is a production-rate-versus-time
16 plot of the Stallion-Devonian field. It's a one-well
17 field. That's located to the west, approximately three
18 miles from our Grande Number 1.

19 Q. That's a well that Fasken operates?

20 A. No, it's not. It's operated by Fagadau Energy
21 Corporation.

22 Q. Okay. Give us the conclusions, then, from
23 Exhibit 7 as we look at the decline curve for this well.

24 A. Well, initially it was producing at a high oil
25 cut and at a steeper decline. And then as the well has

1 matured, water production in a water-drive reservoir
2 similar to -- in Devonian, it's flattening from 40-percent
3 decline to a 14-percent decline later in life.

4 Q. The Stallion-Devonian Pool exhibits similar
5 reservoir characteristics as the subject pool that we're in
6 now?

7 A. Yes.

8 Q. Okay. And the well producing in the Stallion
9 Pool west of the subject well exhibits this hyperbolic
10 decline where after a few years the 40-percent decline rate
11 changes, and, as shown on this display, it averages about
12 14 percent?

13 A. That's correct.

14 Q. What accounts for that?

15 A. Whether a reservoir is a natural water drive or
16 being water-flooded, the more permeable rock provides
17 earliest and highest oil rate production, as well as the
18 earliest water breakthrough.

19 And then through time, the lower-permeability
20 zones will provide a greater portion of the total oil-
21 production rate, and that results in a flattening of the
22 curve over time.

23 Q. All right, let's look at your last analogy. If
24 you'll turn to Exhibit 8, again identify the well for us
25 and then show where the well is located on Exhibit 1.

1 A. Okay, this is a production-rate-versus-time plot
2 of oil, water and gas of the Bronco West-Devonian Pool,
3 which is a four-well summary.

4 It does indicate also a steep 18-percent
5 production rate decline early in its life and flattening to
6 a five-percent decline --

7 Q. Does Fasken operate any of the wells in this
8 pool?

9 A. No, we do not.

10 Q. Summarize for us, then, what you see from an
11 engineering perspective concerning the summary of the four
12 wells and their decline curve.

13 A. Well, I believe this is indicative of water-drive
14 reservoirs and how they will perform in a hyperbolic
15 decline fashion.

16 Q. So based on those analogies from the pools to the
17 west, you've come back to your Exhibit 5, and you have
18 forecast the same type of hyperbolic decline for the
19 subject well?

20 A. Yes, I have.

21 Q. Do you have an opinion at this point as to
22 whether these rules should be made permanent and thereby
23 adopting 80-acre spacing for the production from this well?

24 A. Yes, I believe the 80-acre spacing should be made
25 permanent.

1 I believe the productive capacity of the well and
2 the permeability and the area it can drain is beyond 80
3 acres and can be drained efficiently and effectively.

4 Q. Do you see any useful purpose to have spacing
5 reduced to 40 acres and therefore require -- or at least
6 afford the opportunity for another well in this little
7 reservoir?

8 A. No, I do not.

9 Q. That would be wasteful in your opinion?

10 A. In my opinion, it would be wasteful.

11 MR. KELLAHIN: That concludes my examination of
12 Mr. Brown, Mr. Stogner.

13 We move the introduction of his Exhibits 1
14 through 8.

15 EXAMINER STOGNER: Exhibits 1 through 8 will be
16 admitted into evidence at this time.

17 EXAMINATION

18 BY EXAMINER STOGNER:

19 Q. In referring back to Exhibit Number 5, now, you
20 refer to a remedial squeeze work that was done to it. When
21 was the pump actually put on line? In June or --

22 A. I believe that's probably around May or -- April
23 or May.

24 It's where the production rate, water and oil,
25 increase dramatically there in approximately May, 1997.

1 Q. When you were doing your research for your
2 Exhibits 8 and 7, were those wells or any of those wells --
3 Did they have a similar show initially? Did they flow, or
4 did they put the pump on them already.

5 A. I believe -- I do not know for sure on the Bronco
6 west.

7 I think the evidence shows that the -- and I'm
8 assuming the Stallion-Devonian field, one-well field,
9 flowed originally for a few -- at least a year or so.

10 Q. Was that prior to 1986, or is that included in
11 that?

12 A. I would think it would have -- it may have flowed
13 up until the water started increasing there, and I'm sure
14 they had to put it on artificial lift eventually there.

15 Q. Is that one well -- and I'm assuming -- Let me
16 make sure that I've got the right well, per your Exhibit
17 Number 5.

18 That's the one in the northwest quarter,
19 northwest quarter, Section 7?

20 A. Not Exhibit 5, that -- Exhibit 5 is the well in
21 question, Stallion East.

22 Exhibit 7 is the one you're referring to.

23 Q. Exhibit 7. And that is the right well; is that
24 correct?

25 A. Yes, in Section 7.

1 Q. Okay. Is that reservoir similar to yours?

2 A. It's similar in the way it produces as a Devonian
3 carbonate water drive reservoir, although it is much more
4 prolific.

5 Q. Does it have the same properties as far as
6 permeability and porosity, or were you able to study that?

7 A. I have not studied that, I do not know. But it
8 exhibits approximately 500,000 barrels of ultimate recovery
9 or better.

10 Q. And what's the gas-oil ratio on your particular
11 well at this time?

12 A. Oh, it's --

13 Q. Roughly.

14 A. -- very minimal. We're looking at, oh, 150 MCF
15 of gas and around 1200 or 1400 barrels of oil, so that's
16 maybe a .3, or 300 to 1.

17 Q. So you're well within your gas-oil ratio
18 limitation?

19 A. Yes, sir.

20 Q. Of about what? A thousand MCF a day, is your
21 casinghead gas allowable?

22 A. Yes, I think we're producing only about 7 or so.

23 EXAMINER STOGNER: I have no other questions of
24 Mr. Brown.

25 You may be excused.

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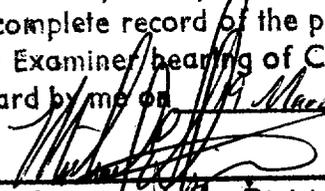
Anything further, Mr. Kellahin?

MR. KELLAHIN: No, sir.

EXAMINER STOGNER: If there's nothing further in Case Number 11,612, then this matter will be taken under advisement.

(Thereupon, these proceedings were concluded at 10:30 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11612 (Reopened) heard by me on 11 March 1998.

_____, Examiner
OH Conservation Division

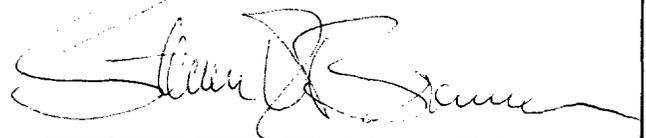
CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
 COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL March 22nd, 1998.



STEVEN T. BRENNER
 CCR No. 7

My commission expires: October 14, 1998