

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. 12,424

APPLICATION OF MURCHISON OIL AND GAS, )  
INC., FOR AN UNORTHODOX SECOND INFILL )  
GAS WELL LOCATION AND SIMULTANEOUS )  
DEDICATION, EDDY COUNTY, NEW MEXICO )

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MARK ASHLEY, Hearing Examiner

June 1st, 2000

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, MARK ASHLEY, Hearing Examiner, on Thursday, June 1st, 2000, 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.

\* \* \*

STEVEN T. BRENNER, CCR  
(505) 989-9317

00 JUN 15 AM 5:01  
OIL CONSERVATION DIV

## I N D E X

June 1st, 2000  
 Examiner Hearing  
 CASE NO. 12,424

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APPLICANT'S WITNESS:	
<u>MICHAEL S. DAUGHERTY</u> (Engineer)	
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\* \* \*

## A P P E A R A N C E S

## FOR THE DIVISION:

LYN S. HEBERT  
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Santa Fe, New Mexico 87505

## FOR THE APPLICANT:

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Santa Fe, New Mexico 87501  
P.O. Box 1056  
Santa Fe, New Mexico 87504

\* \* \*

1 WHEREUPON, the following proceedings were had at  
2 11:45 a.m.:

3 EXAMINER ASHLEY: The Division calls Case 12,424.

4 MS. HEBERT: Application of Murchison Oil and  
5 Gas, Inc., for an unorthodox second infill gas well  
6 location and simultaneous dedication, Eddy County, New  
7 Mexico.

8 EXAMINER ASHLEY: Call for appearances.

9 MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe,  
10 representing the Applicant. I have one witness.

11 EXAMINER ASHLEY: Additional appearances?

12 Will the witness please rise to be sworn in?

13 (Thereupon, the witness was sworn.)

14 MICHAEL S. DAUGHERTY,  
15 the witness herein, after having been first duly sworn upon  
16 his oath, was examined and testified as follows:

17 DIRECT EXAMINATION

18 BY MR. BRUCE:

19 Q. Would you please state your name, city of  
20 residence and occupation?

21 A. Michael S. Daugherty, Plano, Texas. I'm a  
22 petroleum engineer.

23 Q. And are you employed by Murchison Oil and Gas?

24 A. Yes, sir, that's correct.

25 Q. Are you familiar with the engineering and geology

1 involved in this matter?

2 A. Yes, I am.

3 Q. Are you a registered professional engineer?

4 A. I'm a registered professional engineer in the  
5 State of Texas.

6 Q. Have you previously testified before the  
7 Division?

8 A. I have.

9 Q. And were your credentials as an expert engineer  
10 accepted as a matter of record?

11 A. They were.

12 Q. What is your position at Murchison?

13 A. I'm vice president of operations.

14 MR. BRUCE: Mr. Examiner, I tender Mr. Daugherty  
15 as an expert engineer.

16 EXAMINER ASHLEY: Mr. Daugherty is so qualified.

17 Q. (By Mr. Bruce) What does Murchison seek in this  
18 case today?

19 A. Murchison Oil and Gas is seeking an exception to  
20 Rules 2.B and 4 of the special rules and regulations of the  
21 White City-Pennsylvanian Gas Pool. It seeks to drill a  
22 well at an unorthodox location 1650 feet from the south  
23 line and 660 feet from the west line of Section 34,  
24 Township 24 South, Range 26 East, as a third gas well on an  
25 existing 640-acre gas spacing and proration unit.

1 MR. BRUCE: Mr. Examiner, the White City-Penn Gas  
2 Pool is spaced on 640 acres, and I think the well locations  
3 are 1650 feet from the outer boundary of the well unit.  
4 And also, it covers the entire Pennsylvanian zone, not just  
5 one particular formation.

6 EXAMINER ASHLEY: Okay.

7 Q. (By Mr. Bruce) Have you prepared an exhibit to  
8 show the well's location and where you wish to drill?

9 A. Yes, Exhibit 1 is a structure map on top of the  
10 middle Morrow clastics. The proposed well location is  
11 indicated on the map. This map is color-coded to indicate  
12 the various correlative Morrow intervals in each well that  
13 is completed and shows the cumulative production from each  
14 well.

15 Q. Could you please explain why you are requesting  
16 these particular exceptions?

17 A. The proposed location allows the best structural  
18 position in the section. Also from a drainage viewpoint,  
19 we prefer to be located as far from the two existing wells  
20 as possible. We're asking for a location that would be a  
21 standard location under the New Mexico Oil Conservation  
22 Division Order Number R-11,231, amending Rule 104 as it  
23 pertains to well spacing.

24 The special rules for the White City Pool allow  
25 one optional well, which results in 320-acre spacing.

1 Since the new order allows for two wells on 320-acre  
2 proration units, we are asking for an equal and similar  
3 treatment in this unit well.

4 Q. At this time are you asking to amend the pool  
5 rules for the entire White City-Pennsylvanian Gas Pool?

6 A. No, not at this time, this is the only well that  
7 we plan on drilling. However, the results of this well may  
8 cause us or other operators to consider such a change.

9 Q. Will this well, in your opinion improve the  
10 overall recovery of gas from this pool?

11 A. I believe that it will.

12 Q. Could you explain to the Division what evidence  
13 you have prepared to justify your opinion?

14 A. I have prepared an east-west cross-section, which  
15 I have labeled Exhibit 2, with four wells on it showing the  
16 Morrow formation. The wells on this exhibit, from east to  
17 west, are as follows: the Strong Federal Com Number 1 in  
18 Section 34, the Strong Federal Com Number 1E in Section 34,  
19 the White City Com Number 1 in Section 33, and the New  
20 Mexico "DD" State Com Number 1 in Section 32.

21 This cross-section is shown on Exhibit 1, there's  
22 a red line connecting the four wells that are on the cross-  
23 section.

24 This cross-section shows that the Morrow  
25 formation is about 750 to 800 feet thick, and it can be

1 divided up into seven correlative intervals which have  
2 porosity and contain producible gas.

3 The exhibit demonstrates the relative  
4 discontinuousness of the Morrow series. If you refer to  
5 Exhibit 1, you can see that the cumulative production from  
6 all the wells in the immediate area are very dissimilar and  
7 suggest reservoir heterogeneity.

8 It is my opinion, after reviewing this cross-  
9 section and map, the Morrow reservoir in this pool is  
10 comparable to other Morrow reservoirs in New Mexico that  
11 are now being drilled on 160-acre spacing. It should be  
12 recognized that the Morrow City-Penn Pool [sic] effectively  
13 combines the Morrow, Atoka, Strawn and Cisco/Canyon groups.  
14 In most areas, these zones are split up into separate pools  
15 and would be developed separately, which could result in  
16 more wells per section.

17 Q. Have you estimated the gas in place in this  
18 section and compared that to cumulative production?

19 A. Yes, I have prepared Exhibit 3, which lists the  
20 porosity and the number of feet of porosity logged in 13  
21 wells located in the nine-section area of Section 3,  
22 Section 4, Section 5 of Township 25 South and Range 26 East  
23 and Sections 27, 28, 29, 32, 33 and 34 of Township 24  
24 South, Range 26 East.

25 By weight-averaging the porosity in each well, I

1 have calculated the average porosity greater than four  
2 percent to be seven percent and the average feet of  
3 porosity greater than four percent was 49 feet per well.

4 At this time, I would like to Exhibit Number 4,  
5 which shows the calculated original gas in place to be 20  
6 BCF of gas per section. I've estimated that up to 15 BCF  
7 of gas could be recovered per section. However, the  
8 cumulative gas produced per section is 3.8 BCF of gas.  
9 This suggests that the current well density is not  
10 sufficient to recover a significant percentage of the  
11 recoverable gas.

12 Q. Have you made any other studies of well density  
13 versus well recoveries in this pool?

14 A. Yes, Murchison Oil and Gas the Ogden State Number  
15 3 in 1997, which was the third well on a 640-acre section.

16 Q. Is that well in -- Where is that? In Section 2?

17 A. That well is located in Section 2 on this map.

18 The average porosity greater than 4 percent was 7  
19 percent, and the average feet of porosity greater than 4  
20 percent was 61 feet.

21 Let me introduce Exhibit Number 5, which shows  
22 the original gas in place in Section 2 was determined to be  
23 25 BCF of gas and 18.9 BCF of gas recoverable.

24 The cumulative production to date is as follows:  
25 4 BCF from the Ogden State Number 1, 2.3 BCF of gas from

1 the Ogden Number 2, and .3 BCF of gas from the Ogden Number  
2 3 for a total of 6.6 BCF of gas.

3 The Ogden Number 3 is the third well in Section 2  
4 and was drilled and completed in 1997. The Ogden Number 1  
5 and 2 wells were drilled and completed in 1977 and 1982,  
6 respectively.

7 The original reservoir pressure was about 5200  
8 pounds in this pool, and the measured bottomhole pressure  
9 in the Number 3 well, when it was drilled, was 3958 pounds  
10 after a 72-hour pressure buildup.

11 The buildup analysis showed evidence of crossflow  
12 within the well. It is my opinion that at least 75 percent  
13 of the original gas in place had not been recovered after  
14 15 years of production. It is likely that some of the  
15 perforated intervals had even higher pressure than measured  
16 in the buildup analysis because of the crossflow in the  
17 wellbore.

18 Q. Does the Ogden State Well Number 3 produce gas  
19 which would not otherwise have been produced from the other  
20 wells?

21 A. Yes, the Number 3 well, Ogden State Number 3, did  
22 not have as good a sand development as we had hoped, and it  
23 proved to have low permeability. The well is now a  
24 marginal producer, and it will require a long time for it  
25 to pay out, but production data does not suggest any

1 evidence of interference in the offset well, the Ogden  
2 State Number 1.

3 The Ogden State Number 2 is now producing from  
4 the Atoka and would not experience interference.

5 Q. In your opinion, does the evidence show that  
6 wells should be drilled in a denser fashion than one well  
7 per 320 acres?

8 A. Yes, I believe that the White City-Penn Pool has  
9 significantly more gas in place than is now being recovered  
10 by existing wells. I'm not sure how much more gas could be  
11 recovered economically, but the evidence definitely says  
12 that increased density will result in a higher percentage  
13 of recovery of gas in place. The ultimate answer will have  
14 to be determined by drilling and analyzing the results of  
15 the new wells.

16 I believe that approval of this Application will  
17 provide an excellent opportunity to gather further data  
18 which may ultimately determine whether the pool rules  
19 should be amended to provide for denser spacing.

20 Q. Do you have any further testimony in this matter?

21 A. I do not have any further evidence, but I would  
22 like to request an expedited ruling in this matter if it's  
23 possible. If the OCD is receptive and so wishes, Murchison  
24 will have a proposed order prepared for the OCD's  
25 consideration in the case. Murchison is willing to assist

1 in any way possible to facilitate the earliest order and  
2 would very much appreciate the consideration and assistance  
3 of the OCD.

4 Q. One final matter, Mr. Daugherty. Referring to  
5 Exhibit 6 and then looking at Exhibit 1, Exhibit 1 also  
6 identifies the offset operators to the well location, does  
7 it not?

8 A. That's correct.

9 Q. Okay. Now, when notice was mailed out, looking  
10 at your location in Section 34, Section 4 to the southwest,  
11 that is Murchison-operated, correct?

12 A. Yes, sir, that -- well, three -- Everything  
13 that's colored gray, both shades of gray, is operated by  
14 Murchison on this map --

15 Q. Okay.

16 A. -- so we operate 34, 35, 2, 3, 4 and Section 10.

17 Q. Now, the lighter gray, Murchison does not own the  
18 full working interest?

19 A. That's correct.

20 Q. So when you're looking at Exhibit 6, the first  
21 two letters attached to Exhibit 6, the affidavit of notice,  
22 are to Bristol Resources and Pearson-Sibert. Are they  
23 working interest owners in Section 4?

24 A. That's correct.

25 Q. Okay. And then also included in this exhibit,

1 you did notify Texaco to the west, Chevron to the northwest  
2 and Matador to the north, did you not?

3 A. That's correct.

4 Q. And then there is one final letter attached to  
5 this, which is a letter dated May 8th to Margaret Ann Bond  
6 and certain other people. Those persons are actually  
7 working interest owners in your Section 34, are they not?

8 A. That's correct.

9 Q. Just to let them know what you were doing?

10 A. Yes, sir.

11 Q. Okay. So notice was provided to all offset  
12 operators or working interest owners where applicable; is  
13 that correct?

14 A. Yes, that's correct.

15 Q. In your opinion, is the granting of your  
16 Application in the interests of conservation and the  
17 prevention of waste?

18 A. Yes, sir.

19 Q. And were Exhibits 1 through 6 prepared by you,  
20 under your direction, or compiled from company business  
21 records?

22 A. Yes, sir.

23 MR. BRUCE: Mr. Examiner, I'd move the admission  
24 of Murchison Exhibits 1 through 6.

25 EXAMINER ASHLEY: Exhibits 1 through 6 will be

1 admitted as evidence.

2 EXAMINATION

3 BY EXAMINER ASHLEY:

4 Q. Mr. Daugherty, can you tell me what kind of  
5 acreage these wells are draining?

6 A. It's difficult to put acreage -- put a drainage  
7 radius. I know that is a commonly used method of  
8 demonstrating what wells are recovering.

9 But if you'll look at the cross-sections and look  
10 at the number of different pay horizons, the things that  
11 are perforated, they're not -- there are so many different  
12 pays, each -- I'm of the opinion each perforation has a  
13 different drainage radius, because they're separate  
14 reservoirs. And it's hard to come up with an overall  
15 drainage radius on a particular well, because I don't know  
16 whether one of these sets of perforations and one of these  
17 sets of pays -- I don't know what the percentage of the gas  
18 that each zone is contributing.

19 So it's possible one zone may have a lot bigger  
20 drainage radius than any of the others. And to compile it  
21 into an average I think is misleading, so I have not tried  
22 to do that.

23 My approach has been to try and calculate the  
24 amount of gas within 640 acres by averaging it over a nine-  
25 section area and to see how much gas is really in place

1 that may be recoverable and then look at the recoveries  
2 from the well that exists, and the numbers are quite a bit  
3 different. I'm showing 4 to 6 BCF of gas being recovered  
4 to date, and the wells are basically in the latter stages  
5 of depletion. So if there's 15 to 20 BCF of gas  
6 recoverable, there's a lot of gas that has not been  
7 recovered.

8 I don't know what density of wells it would take  
9 to get all the recoverable gas, and it probably wouldn't be  
10 economic. But as long as people are willing to drill the  
11 extra wells, I believe that they're going to recover gas  
12 that wouldn't otherwise have been recovered.

13 Q. You mentioned that some of these wells have been  
14 here awhile?

15 A. Yes, most of the wells in the field have been  
16 here 15 to 20 years.

17 The only new well in this nine-section area --  
18 Actually, it's not in the nine-section area. The only new  
19 well is in Section 2, which is out of the -- kind of the  
20 nine sections up in the northwest part of my exhibit, and  
21 that was the well we drilled in 1997, and that was the  
22 Ogden State Number 3. And it's not a particularly good  
23 well. It's in the dark gray section, and it's the well  
24 that's the southwest well.

25 Q. Of Section 2?

1           A.    Yes, sir.  It's still making 250, 300 MCF a day,  
2   and it has a very flat decline.  It will continue to  
3   produce, then -- With new gas prices being what they are  
4   today, it's probably going to be economic.  But we weren't  
5   geologically successful in the well, and we just found thin  
6   sands.

7           Q.    You're also asking for an exception to Rule 5, if  
8   I understand this right, as far as unorthodox well  
9   locations, because that's -- you don't want the location  
10  for topographic reasons, you want it for geologic reasons?

11          A.    That's correct.

12          Q.    Okay.  You didn't receive any objections from any  
13  of the parties that you notified?

14          A.    No, Texaco and Matador and Chevron all waived  
15  objections on this well.

16          Q.    Have any of the wells out here ever been  
17  recompleted to a shallower zone, other than the Penn?

18          A.    Yes, I believe that we have recompleted some  
19  wells from the Morrow to the Atoka.  It's all within the  
20  Pennsylvanian pool, but we have added perforations in the  
21  Atoka in certain wells.

22          Q.    But nothing outside of the Pennsylvanian  
23  formation?

24          A.    No, I'm not -- Not that I'm aware of.

25          Q.    Okay.

1           A.    I believe there is some Delaware production,  
2 shallow, 2000 to 3000 feet, in this general area. I'm not  
3 prepared to testify to where they are.

4           Q.    And you're prepared to provide a draft order for  
5 this --

6           A.    Yes, sir.

7           Q.    -- for this case? Okay.

8           EXAMINER ASHLEY: Mr. Bruce?

9           MR. BRUCE: We'll have it to you in a couple of  
10 days.

11          EXAMINER ASHLEY: Okay, I have nothing further.  
12 Thank you.

13          THE WITNESS: Thank you.

14          EXAMINER ASHLEY: Mr. Bruce, could you give me a  
15 date for that draft order?

16          MR. BRUCE: I'll have to you by Monday.

17          EXAMINER ASHLEY: Monday, okay. Is that it?

18          MR. BRUCE: Yes.

19          EXAMINER ASHLEY: There being nothing further in  
20 this case, Case 12,424 will be taken under advisement.

21          (Thereupon, these proceedings were concluded at  
22 12:03 p.m.)

23                   I hereby certify that the foregoing is  
24                   a complete record of the proceedings in  
25                   the Examiner hearing on Case 12,424  
                  heard by me on 6-1-2000.

*Mark T. Brenner*  
Examiner

ON Conservation Law

STEVEN T. BRENNER, CCR  
(505) 989-9317

## 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 June 11th, 2000.



STEVEN T. BRENNER  
CCR No. 7

My commission expires: October 14, 2002