

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 9, 1956

IN THE MATTER OF:

CASE NO. 1066

TRANSCRIPT OF PROCEEDINGS

NEW MEXICO OIL CONSERVATION COMMISSION
MABRY HALL - STATE CAPITOL
SANTA FE, NEW MEXICO

REGISTER

HEARING DATE May 9, 1956 TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION
D. E. Upchurch	Gulf Oil Corp.	74. Worth, Tex.
J. S. Walker	"	"
Dan Patton	"	SF
E. G. Hays	Kumble Oil & Ref. Co.	Farmington, N. M.
G. S. ...	OCC	SF
<u>ILLEGIBLE</u>		

BEFORE THE
OIL CONSERVATION COMMISSION

Santa Fe, New Mexico
May 9, 1956

Application of San Juan Gas Corporation)
for an order temporarily establishing)
320 acre drilling units for the proposed)
Gavilan Unit Area in the Pictured Cliffs)
formation for certain lands in Townships)
24 and 25 North, Range 2 West, Rio Arriba)
County, New Mexico, and for well spacing)
thereon.)

Applicant, in the above-styled cause,)
seeks an order temporarily establishing)
320 acre drilling units in the Pictured)
Cliffs formation in their proposed Gavilan)
Unit Area containing 30,244.18 acres; said)
unit area to consist of the following)
described properties:)

Township 24 North, Range 2 West)
All Sections 1 and 2)
E/2, E/2 W/2 Section 3)
E/2 Section 10)
All Sections 11 through 14, incl.)
E/2 Section 15)
E/2 Section 22)
All Sections 23 through 27, incl.)
S/2 Section 33)
All Sections 34 through 36, incl.)

Township 25 North, Range 2 West)
All Sections 1 through 30, incl.)
All Sections 33 through 36, incl.)

Applicant further seeks designation of each)
drilling unit to consist of either the E/2)
or W/2 of a standard section according to)
the U. S. Land Surveys and that no well be)
drilled closer than 990 feet to any outer)
boundary of the NW/4 or SE/4 of the section)
upon which it is located.)

CASE NO. 1066

BEFORE:

Warren W. Mankin, Examiner

TRANSCRIPT OF HEARING

EXAMINER MANKIN: Hearing will come to order. First case on the docket today is Case 1066, the application of San Juan Gas Corporation for an order temporarily establishing 320 acre drilling units for the proposed Gavilan Unit Area of the Pictured Cliffs formation and for certain lands in Township 24 and 25 North, Range 2 West, Rio Arriba County, New Mexico. On April 23, 1956, the Commission received a letter and a protest from the R & G Drilling Company, interested applicant in the area, in the form of a protest, which reads as follows:

"Comes now R and G Drilling Company, Inc., and enters its protest herein to the application of San Juan Gas Corporation for an order temporarily establishing 320 acre drilling units for the Pictured Cliffs formation for certain lands in Townships 24 and 25 North, Range 2 West, Rio Arriba County, New Mexico, now set for hearing before Warren W. Mankin, Examiner, May 9, 1956, and states:

"1. That protestant, R and G Drilling Company, Inc., owns or holds the right to drill and develop acreage in the area affected by the application.

"2. That protestant desires to present testimony in opposition to the application herein and desires that the matter be heard by the New Mexico Oil Conservation Commission.

"Wherefore, protestant respectfully requests that this matter be set for hearing before the Commission rather than before an examiner, in accordance with the statutes and rules and regulations of the Commission, and at which hearing protestant be accorded a full opportunity to cross-examine applicant's witnesses and offer testimony and evidence in opposition to said application. Respectfully submitted, R and G Drilling Company, Inc., by Jason W. Kellahin, Attorney."

As a result of this particular application, the Commission on April 27, 1956, wrote to San Juan Gas Corporation, Roswell, New Mexico, Attention Foster Morrel, Agent, as follows:

"Reference is made to your letter dated April 25, 1956, in which you had indicated you had received protest dated April 23, 1956, from R and G Drilling Company by their attorney Jason W. Kellahin in Case No. 1066. Case No. 1066 will come for hearing at the Examiner hearing on May 9, 1956, at Santa Fe but will be continued to the regular Commission hearing at 9 a.m. on May 16, 1956, at Santa Fe, New Mexico, signed A. L. Porter, Acting Secretary-Director."

On the basis of this protest and according to the rules and regulations of the Commission, this hearing will be continued to the next regular hearing of the Commission, which will be at 9 a.m. on May 16, 1956. Case is continued.

BEFORE THE
Oil Conservation Commission
SANTA FE, NEW MEXICO
May 16, 1956

IN THE MATTER OF:

CASE NO. 1066

TRANSCRIPT OF PROCEEDINGS

DEARNLEY-MEIER AND ASSOCIATES
COURT REPORTERS
605 SIMMS BUILDING
TELEPHONE 3-6691
ALBUQUERQUE, NEW MEXICO

I N D E X

	Page
<u>FOSTER MORRELL</u>	
<u>Direct Examination</u>	
By Mr. Bratton	3
<u>Cross Examination</u>	
By Mr. Kellahin.....	24
By Mr. Mankin.....	41
By Mr. Kendrick.....	46
By Mr. Russell.....	46
By Mr. Barnes.....	47
By Mr. Russell.....	48
<u>Redirect Examination</u>	
By Mr. Bratton.....	49
<u>Recross Examination</u>	
By Mr. Arnold.....	53
By Mr. Mankin.....	55
By Mr. Utz.....	55
By Mr. Kendrick.....	56
By Mr. Nutter.....	59
By Mr. Kellahin.....	61
 <u>ROBERT C. LARSON</u>	
<u>Direct Examination</u>	
By Mr. Bratton.....	62
<u>Cross Examination</u>	
By Mr. Mankin.....	74
By Mr. Barnes.....	75
By Mr. Kellahin.....	81
By Mr. Utz.....	85
By Mr. Kendrick.....	85
 <u>ALEX PHILLIPS</u>	
<u>Direct Examination</u>	
By Mr. Bratton.....	87
<u>Cross Examination</u>	
By Mr. Kendrick.....	90
 <u>FRANK BARNES</u>	
<u>Direct Examination</u>	
By Mr. Kellahin.....	92
<u>Cross Examination</u>	
By Mr. Bratton.....	106
By Mr. Larson.....	108
By Mr. Kendrick.....	114
<u>Redirect Examination</u>	
By Mr. Kellahin.....	114

I N D E X (Cont'd)

	Page
<u>WILLIAM C. RUSSELL</u>	
<u>Direct Examination</u>	
By Mr. Kellahin.....	116
<u>Cross Examination</u>	
By Mr. Bratton.....	122
By Mr. Mankin.....	125
By Mr. Larson.....	127

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 16, 1956

IN THE MATTER OF:

Application of San Juan Gas Corporation for an order temporarily establishing 320 acre drilling units for the proposed Gavilan Unit Area in the Pictured Cliffs formation for certain lands in Townships 24 and 25 North, Range 2 West, Rio Arriba County, New Mexico, and for well spacing thereon. Applicant, in the above-styled cause, seeks an order temporarily establishing 320 acre drilling units in the Pictured Cliffs formation in their proposed Gavilan Unit Area containing 30,244.18 acres; said unit area to consist of the following described properties:

Case 1066

TOWNSHIP 24 NORTH, RANGE 2 WEST, NMPM

All Sections 1 and 2
E/2, E/2 W/2 Section 3
E/2 Section 10
All Sections 11 through 14, incl.
E/2 Section 15
E/2 Section 22
All Sections 23 through 27, incl.
S/2 Section 33
All Sections 34 through 36, incl.

TOWNSHIP 25 NORTH, RANGE 2 WEST, NMPM

All Sections 1 through 30, incl.
All Sections 33 through 36, incl.

Applicant further seeks designation of each drilling unit to consist of either the E/2 or W/2 of a standard section according to the U. S. Land Surveys and that no well be drilled closer than 990 feet to any outer boundary of the NW/4 or SE/4 of the section upon which it is located.

BEFORE: Honorable John F. Simms, Jr.
Mr. E. S. (Johnny) Walker
Mr. A. L. Porter, Jr.

TRANSCRIPT OF HEARING

MR. PORTER: The next case is Case 1066.

MR. GURLEY: Case 1066 is the application of San Juan Gas Corporation for an order temporarily establishing 320 acre drilling units for the proposed Gavilan Unit Area in the Pictured Cliffs formation for certain lands in Townships 24 and 25 North, Range 2 West, Rio Arriba County, New Mexico, and for well spacing thereon. Applicant, in the above-styled cause, seeks an order temporarily establishing 320 acre drilling units in the Pictured Cliffs formation in their proposed Gavilan Unit Area containing 30,244.18 acres; said unit area to consist of the following described properties: Township 24 North, Range 2 West, NMPM, All Sections 1 and 2; E/2, E/2 W/2 Section 3; E/w Section 10; All Sections 11 through 14, inclusive; E/2 Section 15; E/2 Section 22; All Sections 23 through 27, Inclusive; S/2 Section 33; All Sections 34 through 36, inclusive. Township 25 North, Range 2 West, NMPM: All Sections 1 through 30, inclusive; All Sections 33 through 36, inclusive. Applicant further seeks designation of each drilling unit to consist of either the E/2 or W/2 of a standard section according to the U. S. Land Surveys and that no well be drilled closer than 990 feet to any outer boundary of the NW/4 or SE/4 of the section upon which it is located.

MR. BRATTON: Howard Bratton, representing San Juan Gas Corporation. We have three witnesses to present.

MR. PORTER: Are there other witnesses to testify in this case?

MR. KELLAHIN: Do you want me to enter an appearance to show who the witnesses are for?

MR. WALKER: The reason Mr. Porter asked is that I would like to swear them all in at once.

MR. KELLAHIN: I have Mr. Barnes and Mr. Russell.

MR. BRATTON: Before we begin, we have a number of exhibits which we would like to have marked for identification. Then we will identify them as we go along.

(Marked for identification San Juan Gas Corporation Exhibits Nos. 1, 2, 3, 4, 5, 6, and 7).

F O S T E R M O R R E L L,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. BRATTON:

Q Would you state your name, please?

A My name is Foster Morrell.

Q Your occupation?

A Petroleum consultant, Roswell, New Mexico.

Q Have you been employed by the San Juan Gas Corporation in connection with the matter under consideration?

A I have.

Q Have you previously testified before this Commission as an expert witness?

A I have.

MR. BRATTON: Are the qualifications of Mr. Morrell satisfactory to the Commission?

MR. PORTER: They are.

Q Mr. Morrell, are you familiar with the application which was filed in this case -- did you prepare it?

A I did.

Q Will you state the nature and the purposes of the application?

A The application of San Juan Gas Corporation dated April 9th, 1956, is for an order temporarily establishing 320 acre drilling units for the Pictured Cliffs formation for certain lands in Rio Arriba County embraced in Township 24 North, Range 2 West, and 25 North, Range 2 West. The purpose, in addition to establishing the spacing during the pendency of the unit agreement, is to afford the opportunity for drilling test wells under a uniform spacing, to determine actual reservoir conditions and final well spacing.

Q Mr. Morrell, I call your attention to the map on the board which has been marked San Juan Exhibit No. 1. That is the uncolored map here. I'll ask you if you prepared that map?

A I did.

Q What does it purport to be, Mr. Morrell?

A It shows the area of the proposed Gavilan unit, the status of lands and wells drilled thereon --

Q (Interrupting) Excuse me -- go ahead.

A -- within the Gavilan unit as proposed, there are 20,023.94 acres of Federal lands, representing 66.21% of the unit area, 320 acres of State land or 1.06%, and 9,900.24 acres of patented land, or 32.73%; a total of 30,244.18 acres.

Q I call your attention now to the map next to that, which has been marked San Juan Exhibit No. 2. That is the map which is, a portion of which is colored in yellow. I will ask you, did you prepare that map?

A I did.

Q What does that purport to represent?

A The yellow colored areas are those in which the San Juan Gas Corporation holds operating rights wholly or in part to the Mesa Verde formation in all lands within the area unless the ownership is shown otherwise. The black is the area that San Juan does not have operating rights at the present time.

Q What percentage of the total area does the yellow cover, that is, the San Juan operating rights?

A The San Juan operating rights embrace a total of 24,119.67 acres, or 79.75% of the unit area.

Q I call your attention to the map next to it which has been marked San Juan Exhibit No. 3; that is colored partially in green and red. I will ask you if you prepared that map?

A I did.

Q What does it purport to represent?

A The green areas are patented lands, the red are State lands, and those not colored are Federal lands.

Q I call your attention now to the map next to it which has been marked San Juan Exhibit No. 4, in which various areas have been colored in yellow and outlined in red and blue. I will ask you if you prepared that map?

A I did.

Q What does it represent?

A It shows the area of the southern portion of the San Juan Basin within Rio Arriba as now developed, the outline of the Gavilan unit in red, and the other unit agreements that have been approved by this Commission. Also shown on the map is the area

covered by a recent order of the Commission, R-794, for the Tapicito-Pictured Cliffs Pool.

Q That was in a spacing order, Mr. Morrell?

A Yes, it was.

Q Mr. Morrell, has the area under consideration, the proposed Gavilan area, has that been considered for a unitization under the Federal unit statutes?

A It has.

Q I hand you what has been marked San Juan Exhibit No. 5 and ask you if you can identify it?

A This is a unit agreement for the development and operation of the Gavilan unit area, Rio Arriba County, New Mexico.

Q That is a proposed unit agreement?

A This is the form of unit agreement that has been filed with the United States Geological Survey for approval as to form.

Q You are familiar with the contents thereof?

A Yes, I am.

Q Is the area in San Juan Exhibit No. 1, is that the area which is covered by the proposed Gavilan unit agreement?

A That is correct. I will enter for the record the description of the unit area. In Township 24 North, Range 2 West, Sections 1 and 2, all; Section 3, the east half, east half, west half; Section 10, the east half; Sections 11 through 14, inclusive, all; Section 15, east half; Section 22, east half; Sections 23 through 27, inclusive, all; Section 33, south half; Sections 34 through 36, inclusive, all. In Township 25 North, Range 2 West, Sections 1 through 30, inclusive, all; Sections 33 through 36, inclusive, all. A total of 30,244.18 acres.

Q You have been connected with the preparation of this proposed unit, have you, Mr. Morrell?

A I have.

Q Would you explain the history and the development and the status of that proposed unit agreement at this time?

A This unit agreement was proposed by San Juan Gas Corporation. Preliminary discussions were held with the Regional Oil and Gas Supervisor of the United States Geological Survey in Roswell. Shortly thereafter a conference was held in Washington, D. C., on March 8, 1956, attended by representatives of the Geological Survey, Mr. E. Alex Phillips, president of the San Juan Gas Corporation, and myself. At the conference in Washington, the conclusions reached by the parties attending that conference are as follows:

The unit area to embrace all of 24 North, Range 2 West, and 25 North, Range 2 West, outside of the Lindrith Unit Area.

The unit agreement shall provide for 320-acre drilling blocks to the base of the Mesaverde formation, to consist of the east half and west half of each Section, the exceptions thereto to be cited in the Unit Agreement.

The standard form of Unit Agreement shall apply for all formations below the Mesaverde.

The Unit Agreement shall include a drilling requirement of ten wells to test the Pictured Cliffs formation to be commenced during the first year from the effective date of the Unit Agreement, such wells to be so located as to determine the reserves of the Unit Area, with provision that, (a) not less than three wells are to be drilled within Township 24 North, Range 2 West, and (b) not less than five wells are to be drilled within Township 25 North, Range

2 West. With regard to the first ten obligation wells, the location of five of such wells shall be described by Section numbers.

Provision is to be included in the Unit Agreement that the second well shall be drilled on a drilling block to make the spacing of wells within the Unit Area equal to the density of wells offsetting the Unit Area, or at the election of the majority of working interest owners a second well may be completed on a Drilling Block if and when economic justification is determined for the drilling of wells to a density of one well per 160 acres.

A dry hole subsequently drilled on an intervening Drilling Block shall cause 160 acres on which the well is drilled to be withdrawn from the participating area.

It is intended to follow the spacing plan of one well located in the northwest quarter and one well in the southeast quarter of each Section, except for variations necessitated by topographic conditions or irregular Drilling Blocks.

San Juan Gas Corporation, an Oklahoma Corporation, will be the Unit Operator.

The form of Unit Agreement may follow the form used for the San Juan 27-5 Unit, amended as indicated above.

San Juan 27-5-1 unit is indicated on map Exhibit 4. These items were agreed to orally by the parties attending the conference in Washington. They are recognized as informal understandings subject to a filing of a formal application for preliminary approval for Unit Area and Unit Agreement by the Director of the United States Geological Survey.

The memorandum continues that it was explained during the conference in Washington that I had previously conferred in Roswell

with Mr. John A. Anderson, Regional Oil and Gas Supervisor, United States Geological Survey, on the subject unit during which Mr. Anderson expressed his preference to the use of the standard form of unit agreement for all formations. The proponents of the unit expressed their preference for the 320-acre Drilling Block type unit to the base of the Mesaverde and the representatives of the United States Geological Survey at the conference in Washington each expressed themselves as being in favor of such Drilling Blocks.

Under date of March 31st, 1956, a copy of this memorandum dated March 19th was forwarded to Mr. E. M. Pilkinton with a statement that "the memoranda were prepared from notes I made during conferences in Washington and are being forwarded to you so that we would all have the same basic understanding of the subjects discussed." We have had no reply in writing to indicate any difference in opinion as to the contents of this memorandum.

Q That memorandum from which you have just read in its entirety is marked San Juan Gas Corporation Exhibit No. 6. That was prepared by you?

A That is correct.

Q What have been the developments from the date of your conference in Washington to date, insofar as the progress towards the formation of a unit?

A The form of Unit Agreement has been completed, as well as Exhibit "A", the map as shown on Exhibit 1; and the Exhibit "B" which shows the status of lands and ownership and is submitted to the Commission as a part of and attached to Exhibit 5, the Unit Agreement.

Q Has the proposed Unit Agreement been forwarded to the

Geological Survey?

A By letter of May 9, 1956, San Juan Gas Corporation addressed the Director of the United States Geological Survey transmitting the Unit Agreement, together with Exhibits A and B.

Q That letter of transmittal to which you refer has been marked San Juan Exhibit No. 7?

A That is right.

Q And you prepared that letter?

A I did.

Q And forwarded it. Therefore, the proposed form of the Unit Agreement has been forwarded within the past ten days?

A That is correct.

Q Would you care to comment as to the features of the Unit Agreement which make it pertinent to the subject under discussion here, Mr. Morrell?

A I think that the features that are pertinent to the Unit Agreement are best expressed in the letter of transmittal. The area of the Gavilan Unit adjoins to the north and east the approved Lindrith Unit Area in which discoveries of gas in paying quantities have been made in the Pictured Cliffs formation and oil in quantities not sufficient to justify the establishment of a participating area was found in the Dakota formation.

"The subject lands are located on and are a part of a monoclinal dip slope to the west and northwest in the extreme southeastern portion of the geologic structural feature comprising the San Juan Basin."

MR. KELLAHIN: Is this memorandum being offered as an exhibit?

MR. BRATTON: Yes.

MR. KELLAHIN: What is the contents of it?

A 7.

MR. BRATTON: The memorandum is 6 and the letter is 7, Mr. Kellahin.

MR. KELLAHIN: Thank you.

A "There are no local geologic or geophysical anomalies apparent on which to delineate an area for unitization. The unit area has been selected on a township basis similar to other units in Rio Arriba County....."

"During the period from 1948 through 1952, a total of eleven wells were drilled within the unit area. Six wells, presently shut-in, were completed for gas production from the Pictured Cliffs formation in reported volumes ranging from 277,000 to 1,050,000 cubic feet of gas per day, generally after shooting. Two wells tested the Mesaverde formation and one well, the Dakota, and are temporarily abandoned. There is no market outlet for the gas and no further drilling was conducted in the area until March 1956 after concerted effort by San Juan Gas Corporation to obtain operating rights to warrant sufficient drilling to assure pipeline connections and to justify operations under a unit agreement. It is the opinion of San Juan Gas Corporation that with present day knowledge of completion practices, including sand-oil and sand-water fracing, production in paying quantities can be developed from the Pictured Cliffs formation, and if successful as anticipated, the Mesaverde will also be tested and developed....."

"Of the total of seventeen drilling-block units in Rio Arriba County, the Pictured Cliffs formation is now being developed on

such basis" -- that is, on a 320-acre well spacing unit -- "in the San Juan 28-7" -- I will point those out on the regional map as I read this -- "in the San Juan 28-7, San Juan 29-4, San Juan 30-4 Units and the Canyon Largo Unit and should shortly be developed within the San Juan 27-4 and 27-5 Units," the northwestern extension of the Tapicito Pool. San Juan Gas Corporation "is requesting only that it be afforded the opportunity to develop the Gavilan Unit on an equal basis. Furthermore, the Oil Conservation Commission of New Mexico by Order No. R-794 in Case No. 977, under date of April 19, 1956, approved the creation of the Tapicito-Pictured Cliffs gas pool in Township 25 North, Range 3 West, Township 26 North and 3 and 4 West, and established for a temporary period of one year 320-acre drilling units within said pool." The spacing of 320 acres was in the Tapicito Pool. Order also provided that the same spacing shall extend over an area two miles from the boundary of the defined pool. Thus -- "the area affected by the order extends to within one mile of the western boundary of the Gavilan unit area."

"In consideration of all the factors involved including those mentioned above, your applicant" -- the San Juan Gas Corporation-- has prepared and has filed the unit agreement, on the basis of 320-acre drilling blocks to the base of the Mesaverde formation..."

"As wells capable of producing unitized substances in paying quantities from the Pictured Cliffs formation have already been drilled, tested and completed within the unit area, no initial test well for discovery is provided for in the unit agreement,"but it is provided that the initial plan of development and operation shall include a provision for the ten wells to be drilled within

the one-year from the effective date of the unit agreement, "including wells commenced after March 1, 1956, (whether commenced before or after the effective date of the agreement).".....

It is anticipated that production from Pictured Cliffs formation "will be found at depths ranging from 3,400 to 3,800 feet."

Under the unit agreement, "the operator shall not be required to drill in excess of 4,000 feet in testing the Pictured Cliffs formation." Tests of existing wells show a stabilized shut-in pressure averaging 961 pounds per square inch to surface on the tubing. "It is the opinion of your applicant based on such well pressures and the study of electric logs and other well data now available to it that one well will draing 320 acres. However, it is recognized that a final decision as to effective well spacing can be made only after sufficient information is available from further drilling, testing and production. Accordingly, it is further provided in Section 11 of the unit agreement that a second well shall be drilled on a 320-acre drilling block if and when economic and reservoir conditions warrant. A second well shall also be drilled where necessary to protect unitized land from drainage by wells on land not committed to the agreement."

Those are in essential the essential points of the unit agreement, other than the exemptions that are stated in the agreement as to the exemption for drilling blocks and well locations.

Q Mr. Morrell, what is the history and the current status of development in the area under consideration; that is, when you have wells marked on Exhibit No. 1, when were those wells drilled?

A Eleven wells were drilled within the unit area from October, 1948 through June, 1952, located in Sections 9, 11, 14,

15, and 36 in Township 25 North, Range 2 West; and Sections 1 and 24 in 24 North, Range 2 West. Since March, 1956, nine wells have been drilled, six by San Juan Gas Corporation and three by R and G Drilling Company. These wells, together with two locations are shown on the map, on Exhibit 1, in red and include wells in Section 16, 26, 28, 33, 34, in Township 25 North, Range 2 West and in Sections 2, 3, 14, and 23 in Township 24 North, Range 2 West.

MR. PORTER: Pardon me just a minute. Mr. Morrell, since what date did you say those nine wells have been drilled?

A Since March, 1956.

Q Then the entire proposed unit area has been relatively untested up until the current exploration has started and is still relatively untested, is that correct?

A That is correct.

Q In your opinion, is this an appropriate time for a temporary 320-acre spacing order in this proposed unit area?

A It is an absolute necessity in order to prepare an appropriate exploratory development. As stated in the unit agreement, the exploration wells under the agreement have to be located more than one mile from each other and you will note that these locations in San Juan are in that order. In order to develop the entire area to ascertain the reserves, a well spacing program and temporary order is necessary so that, to avoid the drilling of unnecessary wells by others that would require immediate offsets on 160-acre basis. In that connection we want to avoid the situation that occurred in connection with the Gallegos Canyon Unit in which the Commission by Order No. 172 in Case No. 377, dated July 24,

1952, after due notice and hearing, approved a spacing of 320 acres for Pictured Cliff development. Subsequently, by Order No. R-172 (A) dated June 23, 1953, called on the operators to show cause why the spacing should be continued. By Order R-172 (B) also in Case No. 377, dated December 17, 1953, the Commission terminated Order R-172 and required that wells be developed thereafter on 160-acre spacing. The findings stated in Order R-172 (B) include the provision that one-half of the pool involving the Gallegos Canyon Unit had been developed on 160 acres, while the remainder was on the basis of 320 acres. It was in the best interest not to have different well spacing patterns in the same pool. In that connection, I would like to call the attention of the Commission that a definition of a pool is a temporary situation, but what is a pool today may be a part of some other pool tomorrow, and the Commission has under consideration right now such a proposition in the combining of the Fulcher-Kutz and the Ballard-Pictured Cliffs Pool. So with a maximum set up by the Commission in the Gallegos Canyon case, if you are on a productive trend and are successful in establishing sufficient basis for temporary order of 320 acres, any operator can come in on 160 acres elsewhere and if that turns out to be the same trend, the original order of 320 would be thrown out the window, because part of it would be on 160 and part on 320. The similar situation occurred in connection with the Amerada application involving land in Township 24 North, Range 5 West, where operators had already drilled wells on 160-acre basis, and the Commission denied the application of Amerada.

Q Has there been a similar situation to this in a relatively

untested area, Mr. Morrell?

A In the Tapicito area, the order was issued, R-794, and it is interesting to note from the testimony in that case that the delivery capacities of the well -- this is a quote from that testimony by Southern Union Gas Company, that the capacity of the well cited indicates that the well would drain 320 acres; it is a fact that if it won't, we can always go back in and re-drill additional wells. A year's time will give us a time to produce the wells and to get an idea of what the capacities are and what area they might drain. We can't undo drilling, we can't go back to the contractor and say "We want our money back, I drilled the well in the wrong place, I didn't need it." We can always go in and drill additional wells. It appears we would be spending a lot of additional money to drill on 160 until we know definitely that 160 acres is necessary. We may find down the years it would be necessary to do that. Right now it doesn't appear that is the case. That is in a pool adjoining the Gavilan Unit, and the opinion of San Juan Gas Corporation is exactly that as expressed by Southern Union.

Q Looking at the economics of this situation, Mr. Morrell, how deep are we talking about here? What are the depths of these wells?

A The depth range in the Gavilan area will be in the neighborhood of thirty-four to thirty-eight hundred feet; the cost of the wells in the neighborhood of 35,000 per well.

Q Is that similar to similar depths and similar costs to other areas where 160-acre spacing has been in effect on Pictured Cliffs production?

A No, it is considerably deeper than the majority of the Pictured Cliff formation within the San Juan Basin. In that connection, I would like to review for the benefit of the Commission briefly the first order setting up 160-acre well spacing in the San Juan Basin. That order is numbered 748 in Case 126 dated February 17, 1948, more than eight years ago. It involved the Fulcher Basin, Kutz Canyon, in which the initial reservoir pressures were 585 pounds. The first well was drilled about 1927. In April, 1947, the pressures averaged 385 pounds; that was the condition existing at the time of the order. The average porosity was testified to be approximately 20%, pay thickness of about 40 feet. Estimated recoverable reserves, 1,000,000.878 cubic feet per 160 acres, or net recovery declining from the initial pressure of 585 to a pressure of 150 pounds per square inch, estimated as one billion three hundred sixty-one million cubic feet per 160 acres. The well costs in that area at that time were in the neighborhood of fourteen to fifteen thousand dollars with total depths ranging from 1700 to 2300 feet. It is interesting to note that the Summit No. 1 at the time of the hearing had produced 1,500,000 cubic feet of gas, as of March, 1956 was still producing at the rate of a million and a half cubic feet per month. It has certainly exceeded any estimate of recoverable reserves from 160 acres, and therefore designed to show that one well will drain more than 160 acres. Similarly, the Summit No. 2, this is from the testimony in Case 126, had produced to 1948 a billion one hundred million. The Angel's Peak Well No. 9-B and 10-B had together produced 2,600,000,000, and the Cornell Wells No. 3 and 4, 1,000,000,000 -- together, 1,500,000,000 cubic feet through 1948. I might also add

that during that case I find that I had entered a statement which I still agree with, to the effect that the drilling of unnecessary wells does not proportionately increase the ultimate volume of recoverable gas.

Q Mr. Morrell, within the proposed unit area here, how many well locations would there be if they were drilled on 320-acre drilling units?

A On the basis of 320-acre drilling units, there would be approximately 95 wells drilled.

Q Assuming 160-acre drilling units and assuming total development, you'd be talking in terms of approximately 190 wells, then?

A That is correct.

Q Averaging those out on the average cost, estimated, in what terms are we talking about as far as expenditures?

MR. KELLAHIN: I object to this line of questioning on the grounds that unless it is going to be supported by reserve estimates and some pertinent testimony relating to the Gavilan Area as to pay-out on these wells, otherwise it is just items which they are grasping from the air and absolutely meaningless, and immaterial to this hearing.

MR. BRATTON: We propose to put in testimony as to estimated reserves, Mr. Kellahin.

MR. KELLAHIN: I will stand on my objection.

MR. BRATTON: I think the economics of the situation certainly are an item to be considered by the Commission, as to the cost of proposed wells in the area, in the Gavilan Unit Area.

MR. PORTER: We will withhold our ruling on your objection, Mr. Kellahin, until he has concluded his testimony.

Q Mr. Morrell, can you state as to the present exploration program of San Juan Drilling Corporation within the proposed Gavilan Unit Area?

A San Juan Gas Corporation proposes to drill between 30 and 35 wells within the next twelve months on the Gavilan Unit Area.

Q Talking now about the market, is there a pipeline into this area, Mr. Morrell?

A No, there is no pipeline market.

Q Are you in a position to state as to any prospects for a market in this area?

A San Juan Gas Corporation has been approached by two purchasers. We propose to develop and test the area to a point to find out what the reserves actually are, before making final commitments.

Q Under the proposed exploration program of San Juan Drilling Corporation within the unit area, would it include a limited portion of the area, or does it include most of the area, Mr. Morrell?

A The drilling program?

Q Yes.

A It would be extended throughout the area. We have already testified over an area of seven miles north and south.

Q That is with the purpose of attracting a market into the proposed Gavilan Unit Area?

A That is correct.

Q I hand you what has been marked San Juan Exhibit No. 8 and ask you if you can identify that document.

A This is a tabulation of unit agreements that have been approved in Rio Arriba County both by the Oil Conservation Commission

of New Mexico and the United States Geological Survey.

Q Are these the unit agreements which you have shown on Exhibit No. 4?

A They are all the units that are shown on Exhibit 4 plus the additional units that extend to the Colorado line. Only eleven are shown on Exhibit 4; the tabulation shows a total of 20 units.

Q Is there any indication on there whether those units are drilled on 320-acre drilling units?

A Of the 20 units shown on the tabulation, Exhibit 8, 17 --

MR. KELLAHIN: (Interrupting) I will object to that question unless it is confined to drilling on 320-acre units under an order issued by the Commission. The unit operating agreement has no bearing on that.

A Can I answer that?

MR. BRATTON: Mr. Morrell asked if he can answer that.

A I would answer that by saying that the Commission approved an order for that when they approved the unit agreement, because the spacing was provided in the unit agreement which they approved.

Continuing, 17 of these 20 unit agreements specifically provide for the drilling of wells on the basis of 320-acre drilling blocks to the base of the Mesaverde, which includes the Pictured Cliffs. So the operators of those units are afforded the opportunity of developing the Pictured Cliffs on 320-acre drilling blocks. These units total or cover an area totaling more than 450,000 acres within Rio Arriba County. You will note also from the tabulation that of the three that are not drilling block units, namely, Rosa, Lindrith, and Rincon, were approved during the period '48 to February '52. All the unit agreements approved in Rio Arriba

County subsequent to February of '52 are on a drilling block basis. Also it should be stated that in the Lindrith unit it is, I am informed that the unit operator intends to develop that unit on the basis of 320 acres.

Q Mr. Morrell, what period of time would you recommend to the Commission that the proposed temporary order cover?

A I would suggest that the temporary order cover a period of one year.

Q What factors lead you to recommend that period of time?

A That will allow us to drill enough additional wells to determine the recoverable reserves in the area and to assure a market outlet.

Q In the interim, you seek the order requested here so that at the conclusion of that year's time the situation would not be confused by some development on 160-acre spacing and some on 320-acre spacing, is that correct?

A That is correct.

Q Do you have any other information pertinent to this matter which you desire to give the Commission?

A I would like to suggest that on the basis of the statutes where the Commission is empowered to prevent economic loss by prevention of drilling unnecessary wells, that every well spacing unit is a potential proration unit. This area is not now under proration and we are not accordingly seeking proration because there is no market, but I think in considering any spacing unit we should consider the present conditions and those expected in the immediate future. Today we have a limited market outlet within the San Juan Basin of approximately 4,000,000 cubic feet a day.

By early 1957 the market outlet is proposed to be increased with pipelines now being built and proposed to about a billion to a billion two cubic feet per day, or a ratio of two and a half to one of the present market.

One of the things that we want to do on our exploratory program in the Gavilan Area is to develop reserves and proof of reserves and deliverability so that we can have a size of pipeline into the area that will be sufficient to take care of any increased demand in the future. If we have a pipeline coming in with a limited connection, we will have a limited size line. If we know what the reserves are when the line comes in, it will be made sufficiently large to take care of any future increased deliverability or market, with the expanded market outlet available and the extension of proration throughout Rio Arriba County because it is certainly reasonable to assume that the area is now being developed and subject to proration will be extended. It is my opinion that the operator should be afforded the right to receive twice the 160-acre allowable for wells drilled on 320 acres where deliverabilities and pressures are sufficient, not unlike the principle now used in southeast New Mexico.

With the method of proration on the basis of 320 acres, the setting of spacing units in excess of 160 acres would no longer be necessary. It would be my recommendation that the Commission give consideration to an order for 320-acre drilling units for all of Rio Arriba County.

You will notice from the map the western boundary of Rio Arriba County is the western limits of the units that do have 320 acres. This Canyon Largo is being developed on 320 acres. The

eastern extension of the South Blanco- Pictured Cliffs is being developed on 320 acres, within the 28-7 is being developed and Tapicito, now a portion of which may extend into the Gavilan Area.

If the productivity of the Pictured Cliffs pools is also a pertinent part of this picture with respect to the Gavilan, the production average production per day as of March, 1956 in the Fulcher-Kutz field was 2,522,000 cubic feet per day. In the West Kutz-Pictured Cliffs pool it is 3,824,000 m.c.f. per day. In the South Blanco-Pictured Cliff pool it was 3,180,000 m.c.f.; in the Blanco-Pictured Cliff pool East, located in 30 North, Range 4 West, the production during March, 1956 was 6,022,000 per day. The Otero-Pictured Cliff Pool in 24 - 5 was 9,636,000 per day. Tapicito had an average well production of 14,406,000 m.c.f. per day. The Ballard-Pictured Cliff was 10,259,000 m.c.f. per day. These productions indicate not only that the productivity of the wells to the eastern portion of the Basin toward the Gavilan Unit together with the increased pressures will make a well of higher deliverability and justify an allowable based on 320 acres, or drilling units on 320 acres prior to establishing proration.

That order will also provide on the basis of my recommendation for exemptions to drill 160-acre units, but if and when the area becomes subject to proration they will then follow a 160-acre allowable or one-half the 320-acre allowable. Order 520-R-50 of the Oil Conservation Commission for the southeast New Mexico sets the well spacing at 640 acres. Any area attributed to a well of less than 640 is given a proration based on a proportion of that acreage over 640. It was the thought that that same principle

could be adopted for Rio Arriba County where the majority of the acreage is subject to being developed on 320 to the Pictured Cliff.

Q Mr. Morrell, in your opinion would an order such as proposed here tend to prevent waste and protect correlative rights?

A In my opinion it would, sir.

MR. BRATTON: I would like to move the admission of San Juan Exhibits 1 through 8, inclusive.

MR. KELLAHIN: I would like to ask the Commission to defer a ruling until after cross examination.

MR. PORTER: Sustain the motion. Any questions of Mr. Morrell?

MR. KELLAHIN: Jason Kellahin, representing R and G Drilling Company, Elliott Hall, both companies have acreage within the proposed unit area or immediately adjacent thereto. Also representing the following fee owners who own acreage either within the proposed unit area or immediately adjacent thereto: Joseph J. Daniell, R. J. Palmer, W. O. Hughes, G. W. Leeson, Ben Leeson, L. J. Ingram, Jr., Lee D. Dallas, E. J. Hooten, Fred Davis, B. Hardy, E. L. Browning, G. E. Boring.

CROSS EXAMINATION

By MR. KELLAHIN:

Q As I understand your testimony, Mr. Morrell, you have the operating rights on some 30,000 acres?

A No, that is not correct. On 24,119.67 acres out of the total of 30,244.18 within the unit area.

Q What is the nature of the operating rights? Do you have a farmout on them?

A Farmout agreements.

Q Sir?

A Farm-out agreements.

Q On all that acreage?

A That is right.

Q Are those farm-out agreements dependent on the approval of this application?

A No.

Q Did I understand you correctly that some 66% of the acreage within the proposed unit is Federal acreage?

A That is correct.

Q Now under the terms of the unit agreement, the development program calls for ten wells?

A A minimum of ten wells within the first year.

Q In addition to that, you propose to drill some 20 or 25 more wells?

A We may do so.

Q You may do so?

A That is right.

Q There is no commitment to do so?

A No.

Q Now, Mr. Morrell, you testified in reference to a memorandum which I believe has been marked as Exhibit No. 6. Who drew that up?

A That is my memorandum.

Q Is that your conclusions reached during the conference?

A The conclusions reached was taken from notes that I made during the conference during which Mr. Pilkinton was present, the copy of which was sent to Washington, and no response has been made.

Q Mr. who?

A Mr. E. M. Pilkinton.

Q Who is he?

A He is administrative assistant to the chief of the Conservation Division and the party who conducted the hearing or the meeting, conference.

Q Did he send you any memorandum on the hearing?

A No, he did not.

Q Was he under any duty to refute any statements that you may have made as a result of the conference?

A He was under no duty; if there was to be an understanding different to this, it would seem obvious he would so advise me.

Q Is it your position, then, because he has not denied the contents of your memorandum, that they are his opinion, too?

A I would say that they are his opinions as expressed at that time. This is a report of a meeting of a particular conference.

Q Mr. Morrell, you testified that there have been nine wells drilled since March, '56, six by San Juan and three by R and G Drilling Company. Are you familiar with those wells?

A I am familiar with those wells. Three have been drilled and there is one additional location, I will point out those to you on the map if you would like, for the benefit of the Commission.

Q If you want to, for the benefit of the Commission.

A For the benefit of the Commission, three wells have been drilled by R and G, 101 in southwest-southwest of Section 2; 102 in the northeast-southwest of Section 28, I do not have the record of the number or the exact 40-acre tract, but there is another well drilled in the southeast quarter, section of 3.

A location has already been made, possibly surface pipe set, I don't know specifically, in the southwest-northeast quarter of Section 2.

Q Have you examined the three logs on the wells drilled by R and G Drilling Company?

A I have seen them -- no, I have seen a log on one well.

Q You are aware of the fact that they were furnished to San Juan?

A Yes, we have a geologist here to testify as to the logs.

Q Do you know the result of the completion of the wells?

A My information is only hearsay. I would leave that to the geologist to testify to.

Q Do you know yourself?

A I know of no record of any production from them.

Q In fact, you know there wasn't any, don't you?

A I do not know it, I am so informed. I have been told so. I only know what I experience.

Q I don't think that hearsay should interfere with your testimony at this stage, Mr. Morrell. As to the six wells drilled by San Juan, are you familiar with them?

A I am, in a limited extent.

Q Are we to understand that those wells have been completed?

A They have been drilled to total depth.

Q I understood at one point in your testimony you said they had been completed.

A I said drilled.

Q In the memorandum or the letter of transmittal which you sent to the Commission, marked as Exhibit 8, do you not say that

they have been completed?

A 8, did you say?

Q 7, Mr. Morrelli.

A 7.

Q Yes. In the last paragraph, Mr. Morrell, I believe you stated that as completed to date, four wells.

A None of which have been tested.

Q Yes, sir. Have they been completed?

A Drilling completed.

Q Drilling completed. There has been no fracing or any other operations performed on them?

A They haven't been completed for production, no.

Q Then you don't mean to infer they have been completed for production?

A That is a matter of terminology. We use drilling started and drilling ceased.

Q In addition to these nine wells, I believe you testified there have been some eleven wells drilled. Are those drilled on 160-acre units?

A They are not necessarily located on 160-acre units, except for the two wells drilled in 1, 160 in Section 1. The other wells are in the east half and west half of 9, and the east half of 11, the east half and west half of 14, and the east half and west half of 14, and the west half of 24 - 2.

Q They could not conform?

A They could conform with noted exceptions to the 320-acre spacing units.

Q Have you made any calculations of the number of offset

obligations you would have in the event this application was denied, insofar as the spacing is concerned?

A I have noted on the basis of the R and G holdings which total approximately 2484.84 acres that R and G has 11 160-acre locations that could be drilled on 160-acre spacing; 10 wells would have to be communitized to drill even 160-acres to complete drilling on R and G's property. The offset requirement then would be in the neighborhood of two to one compared to the wells drilled by R and G.

Q That is, of course, assuming that all of them are productive?

A That is right.

Q And in the absence of prorationing, your drilling obligations would be merely the offset, would it not?

A That is correct. I might also add to that that the R and G property is so located that it not only causes offset by San Juan Gas Corporation within the Gavilan Unit Area, but also causes offset obligations to the operator of the Lindrith Unit Area.

Q That would be true in any pool where it is offset by another unit, is that not correct?

A That is right.

Q You gave some extensive testimony as to Fulcher-Kutz Pool, Mr. Morrell. Do you have any interference tests on that pool?

A There were no interference tests that I know of, if you will recall the history of that order, it was based and required because operators at that time were endeavoring to drill on forty and eighty acre tracts. We are talking in entirely different characteristics of wells so far as the economics are concerned.

Q The question of drainage, you don't have any information on

that?

A Not specifically here, but it was definitely stated in the hearing that one well would drain more than 160 acres.

Q Do you know upon what that statement was based?

A On such statements that I have made here as to the productivity of the Summit Wells 1 and 2, Angel's Peak 9-B and 10-B, and Cornell 4.

Q But that drainage would be in the external rather than radial drainage, would it not?

A When we speak of drainage we speak of drainage of an area, engineeringly, it might go out in the form of a star.

Q Have you anything to indicate that the reservoir conditions in the Fulcher-Kutz and the Gavilan Area are the same?

A I find this, that the porosity and permeability as indicated from electric logs would be somewhat comparable.

Q Do you have core information in the Gavilan Area to substantiate that the San Juan Drilling Corporation cored any wells?

A I don't know what the geologist is going to testify to.

Q You have no information that was made available to you?

A I have none, no personal knowledge.

Q Have you tested any wells on the Gavilan Area?

A I was present and tested several wells, one with almost unfortunate results.

Q What wells were those?

A We tested the Palmer Well, in Section 1; the Green Briar Stevenson Well No. 1, Section 1, 24 North, 2 West; the Green Briar Stevenson Well No. 1 in Section 9, 25, 2; and the Gardner-Hill Well in the northeast quarter of Section 15, 25, 2.

Q What kind of test did you conduct on those wells?

A We made no lengthy tests; we observed shut-in pressures after opening the valves and found the pressures ranged in the neighborhood of 960 pounds on the tubing and 1100 to 1140 on the casing, except for the Palmer well. The Palmer well apparently has considerable water in the hole, I think the pressure on the casing on the Palmer was around 750.

Q Did you get any information on the gas volume by peto tube or otherwise?

A We did not.

Q How long did you have the wells open?

A Merely long enough to show what the build-up pressure was and by blowing in a matter of five minutes and shutting it, they would come right back up to the pressure as originally observed on the spring gauges attached to the wells.

Q You blew them no longer than five minutes?

A No.

Q What results did you find on the Green Briar and the Gardner wells?

A They responded immediately to the pressures as we found them after being shut in for an indefinite period of time. Those tests were not made for the purpose of testing, that was merely to be present so that if you asked me a question had I been on the ground, I could say yes.

Q I appreciate that, Mr. Morrell. I want a little more information than that, however.

A You will have to get that from the geologist.

Q Have you any estimate on the volumes?

A I have only estimated volumes as reported by the records of the United States Geological Survey.

Q Do you know on what those estimates are based?

A I would assume they were based on the reports as submitted to the Survey by the operators.

Q Now you testified that you had tested an area of some seven miles, as I understand you, Mr. Morrell.

A We had drill test wells in that area.

Q Sir?

A Let's make it we had drill test wells in that area.

Q You had drill test wells?

A Yes.

Q That includes these wells about which you have been testifying?

A The ones that had the productive tests or about the necessary pressures were wells drilled prior to 1952. The wells drilled subsequently by San Juan Gas Corporation have had no tests.

Q And is that the testing which you referred to in regard to this seven-mile test area?

A I said that the testing within seven miles would be drilling of test wells within an area of seven miles.

Q Well, perhaps I don't quite understand you, Mr. Morrell. The test wells you are referring to, are those the 11 wells which were drilled prior to March, 1956?

A Are you talking in terms of testing for the productivity of the well or drilling of a test well?

Q I am trying to find out what you mean by testing in this seven-mile area?

A We have drilled seven test wells.

Q Seven test wells?

A Wells to test the formation.

Q Who drilled those wells?

A San Juan Gas Corporation.

Q Who were they tested by?

A By the driller.

Q What type of test did you make?

A Schlumberger log.

Q You merely got an electric log?

A That is all.

Q That is all?

A That is all.

Q When were those wells drilled?

A Since March, '56, through May 12th, according to the tabulations I have. They will be filed later.

Q Mr. Morrell, you testified as to a number of other units which have been proved within this area and in response to an objection made by me, you stated that the Commission had approved the spacing when they approved the unit agreement?

A That is correct.

Q In other words, you don't need a spacing order where you have a unit agreement?

A That is correct.

Q Why are you seeking one?

A Because we don't have a unit agreement at the present time.

Q You are submitting one?

A We are submitting one, but that is the very crux of this

application. We were aware that there was potential additional drilling to be done on 160-acres on fee land over which the United States Geological Survey has no control. The application for the unit agreement must be cleared by the United States Geological Survey as to form before we could proceed. That will take a matter of three to six months. During that time wells could be drilled on 160 acres to a density that would entirely eliminate any opportunity for San Juan Gas Corporation to establish 320 acres.

Q Well, now, in connection with these other units, do you know if there was any objection to the spacing program called for in the unit agreement at the time, before this Commission?

A I wonder if you would repeat the question.

Q Mr. Morrell, do you know if there was any objection to the spacing provisions in the unit agreements to which you referred?

A What do you mean "objections to spacing"?

Q I mean did anyone appear before the Commission at the time the unit agreement was under consideration and object to the spacing program set up in the unit agreements?

A No, not before this Commission.

Q Or anywhere else that you know of?

A They didn't appear.

Q There was no objection, then, as far as you know?

A I knew other, had other factual information, and that was by virtue of contractual obligations then being prepared, particularly the farm-out for Gulf Oil Corporation which would require one well to be drilled on 160 acres. I discussed the matter with the officials of Gulf Oil Corporation and the District Office in Durango through Denver, and they admitted that they had made a

mistake --

Q (Interrupting) Well, now, Mr. Morrell, you are not answering my question. I am not referring to the Gavilan Unit. I am referring to the other units about which you testified.

A You asked me as to why --

Q No, sir.

A -- no one had appeared before the Commission objecting to our proposed 320.

Q I am not referring to the Gavilan Unit, you misunderstood me. I am referring to the spacing set up by the other unit agreements. Do you know if there was any objection made to that spacing?

A At the respective hearings?

Q Yes, sir.

A They were each separate hearings. I will have to pull back on my memory a little. I can't testify.

Q You don't know?

A I don't recall.

Q Is it your contention that all of the area located, for example, in that Canyon Largo Unit is under the unit agreement?

A No, it is not.

Q They have a situation similar to the Gavilan Unit, do they not?

A That is correct.

Q And they have no order on 320 acre spacing within that unit?

A Within the 320 unit spacing as to all lands committed there-
to.

Q That is by terms of the unit agreement?

A By terms of the unit agreement for all formations.

Q Then they have been able to operate that without any special order from this Commission on 320 acres, have they not?

A Because all the operators so far have followed the spacing as set forth in the unit, there are no exceptions to my knowledge.

Q You gave some testimony as to the average production from various pools in the San Juan Basin. That production is dependent upon the pipeline capacity, is it not?

A I would say it would depend more on the nominations of the purchasers.

Q In other words, the market demand, then?

A The market demand.

Q It has nothing to do with respect to the wells produced?

A Inevitably it is also a measure of the capacity of the wells to produce, because six of these are prorated pools.

Q They are connected to different pipelines, however, the individual wells, are they not?

A There are two pipelines.

Q It is your position that they are taken ratably with El Paso and Southern Union Gas?

A It is my opinion they are so doing at the present time.

Q Have you any deliverability tests made in the Gavilan Area?

A We have no deliverability from the wells of San Juan Gas because they haven't been completed for production.

Q Do you have any deliverability tests on any of the other wells?

A I am not prepared to testify as to that.

Q Mr. Morrell, referring to Exhibit No. 7, on the second page, the beginning of the second complete paragraph, you have a statement

here that "Six wells, presently shut-in, were completed for gas production from the Pictured Cliffs formation in reported volumes ranging from 277,000 to 1,050,000 cubic feet...." On what do you base that information?

A That is from the records of the United States Geological Survey.

Q You have no records of your own available on that?

A No.

Q In the third complete paragraph you state in effect that representatives of the Washington office at a meeting expressed themselves as preferring the township or so-called drilling block type of unit agreement. Did that include the spacing, too?

A That is definitely spacing when you are talking about 320-acre drilling blocks.

Q Who expressed themselves as being in favor of that?

A The three parties, representatives who were present. Mr. E. M. Pilkinton, Mr. R. E. Spratt, and Mr. E. A. Finley. One of the reasons for that preference, I might add, is the difficulty of establishing a participating area, particularly for Pictured Cliff production, which up to date has been located on trends some of which are developed later to be wider than originally thought, and would avoid the situation that has had to come before this Oil Conservation Commission on several occasions in the Gallegos Canyon and also for the establishment of a participating area in the Huerfanito Unit which has been recently held and the present difficulty now being incurred under a standard form of unit in the Huerfano as establishing the participating area. A participating area under a standard form of agreement is based

on geologic inference; if you have a few wells down here and some here and some here and some there, you have got a difficulty of outlining what is that participating area. If you have a 320-acre drilling block, you agree in advance that when a well is completed capable of producing in paying quantities on the 320, that 320 becomes participating, each block on which there is a well capable of producing in paying quantities, then becomes a part of the participating agreement.

Q The same type of agreement made on the 160 as a basis, could it not?

A Theoretically it could, yes.

Q In the fourth paragraph you state that "your applicant is requesting only that it be afforded the opportunity to develop the Gavilan Unit on an equal basis." Do you find that in the statement? Equal to what?

A On an equal basis to the rights of the operators of these other units. All operators in these approved units have the right to drill on 320 acres to the Pictured Cliffs without requirement for the drilling of a second well or offset, other than to offset lands not committed to the unit agreement or adjoining.

Q You have the same rights under your unit agreement?

A Under a standard form of unit agreement.

Q Under the form of unit agreement involved in this case?

A The 320-acre drilling block as applied for, yes.

Q Mr. Morrell, you have no figures or estimates on reserves in the Gavilan Area?

A I have none, I am not prepared to testify on reserves, that is to be testified to later by the geologist.

Q You did testify on the reserves, Mr. Morrell?

A I testified on the reserves as shown --

Q (Interrupting) Your testimony, as I recall, to refresh your recollection, that the reason you want this order is in order to determine what the reserves are.

A That is right.

Q Then you don't know what they are now, do you?

A That is correct. So far as I am concerned, except for estimates.

MR. KELLAHIN: That is all the questions that we have.

MR. PORTER: I don't believe that we will be able to complete the cross examination of this witness this evening. I think we had better recess until in the morning at 9:00 o'clock.

MR. WOODWARD: If the Commission please, before it adjourns we are not sure of our time schedule for tomorrow and would like to enter a brief statement in the record. I wonder if we can make that statement now.

MR. WALKER: We are not sure of our schedule either, but you can make the statement.

MR. WOODWARD: El Paso is the operator and principal owner in the Lindrith Unit and at the present time is privileged to develop that unit on 320-acre basis and proposes at the present time to do so. We are generally in favor of 320-acre spacing at the stage of development in which the Gavilan Field has now been developed, particularly in situations where there is a question as to the economics of 160-acre development, and there is a possibility that the field will get frozen into position where 320-acre spacing is much more difficult administratively to manage.

Our thinking has been that if the wells are actually draining the 320 acres and it is so discovered after a reasonable amount of development, then of course there is no justification for drilling the second well on the half-section. If it is not actually draining that much acreage, the gas is still there and can be recovered by infield drilling if it appears economically feasible to do so. For that reason we don't see that anybody is injured in a reasonable delay during which the field is tested, the spacing is set at a maximum until such information can be developed.

MR. PORTER: We will recess until 9:00 A.M. in the morning.

MR. KELLAHIN: I would like to make a very brief statement, if it please the Commission. I do want to state R and G Drilling Company's position. We are in need of an immediate order for the reason we have leases in escrow in the bank in Albuquerque which must be picked up tomorrow which are valueless to us if the order is approved. We hope that the Commission can reach a speedy decision, otherwise, we will lose the leases.

MR. PORTER: The hearing will adjourn.

(Recess).

* * * * *

The hearing was resumed at 9:00 A.M. on Thursday, May 17, 1956.

MR. PORTER: The meeting will come to order, please. We will proceed with Case 1066.

MR. KELLAHIN: I did have one further question I would like to ask the witness.

MR. PORTER: Mr. Kellahin.

CROSS EXAMINATION (Continued)

By MR. KELLAHIN:

Q Mr. Morrell, the units which you have testified to in San Juan Basin, I believe you have listed all of them on Exhibit 8, have you not?

A That is correct.

Q Are those units all Mesaverde units, Pictured Cliffs units, or in what proportion are they?

A Those units cover all formations to the base of the rocks.

Q All formations.

MR. KELLAHIN: That is all.

MR. PORTER: Mr. Mankin.

By MR. MANKIN:

Q Mr. Morrell, referring again to this, I believe it is your Exhibit 8 which lists all the unit agreements in Rio Arriba County, you indicated that those unit agreements specified or allowed 320-acre drilling and spacing units, is that correct?

A That is right. They are called "drilling blocks" in the unit agreement.

Q You are not inferring that any of these are prorated or are being spaced according to any particular specific pool rules that would allow 320-acre proration units within the Pictured Cliffs, are you?

A I don't know that that question can be specifically answered until the problem arises. However, take the fundamental principle of the drilling agreement; the drilling block is established of 320, comprising the east half or the west half or in some places the north half and south half, for all formations down to the base of

the Mesaverde; in that agreement the parties committed thereto agree that any well completed in any formation above the base of the Mesaverde, that the entire 320 acres will be participating. So they in effect agree so far as drainage is concerned that it would be effective drainage for that 320, by agreeing that it will be a participating area. The participating areas are established in that manner as each well, productive well is completed, productive well in paying quantities is completed on a drilling block, that drilling block then becomes a part of the participating area. That is approved by the Commission and by that approval I would assume that they held that that method of well spacing is that the well spacing, the well spacing subsequently becomes a proration unit.

Q It is true that none of the 20 units are under proration, is that correct, as far as Pictured Cliffs production is concerned?

A I can't say specifically. Your records would show better than mine. If Elvis Utz were here he could tell me if the 27-8-7 area is under proration. I think it is in the South Blanco.

Q A portion of it is in the South Blanco?

A Yes.

Q It is likewise 160 spacing proration, even though it is 320-drilling unit?

A I would not agree with the spacing. The spacing has been set by the unit approved by the Commission. If and when allowables should be granted to 320-acre spacing units or proration units I think that they would be entitled to the 320-acre allowable within that unit area.

Q Isn't it also a fact that the South Blanco is prorated on 160 acres?

A It is being prorated so at the present time.

Q Even though there are 320 acres --

A (Interrupting) That is right.

Q (Continuing) -- drilling units previously approved?

A That is correct. There is no basis for multiple allowables in the San Juan Basin at the present time.

Q But you did indicate, I believe, by your testimony yesterday, that if this was granted, 320 acres that they would be, they should have double allowable, did you not?

A If 320-acre allowables are allowed anywhere in the Basin they should be.

Q Although in South Blanco where you had a similar situation it was not allowed?

A There is no 320-acre allowable in the San Juan. There is a very definite reason it hasn't been up to date and that is the limited market that is now available.

Q Referring to Exhibit No. 1 on the wells that have been drilled since March, 1956, has San Juan Gas Corporation drilled those wells, those new wells, on the pattern, that is, a well in the northwest and a well in the southeast, as was recommended by you?

A That is correct.

Q There have been some other wells which have been attempted recompletions that have not worked to that pattern, is that not correct?

A I don't know what you are speaking of, you say "attempted recompletions"; San Juan has not attempted to recomplete any old well.

Q They have all been new wells?

A That is correct.

Q They have complied with the pattern that you indicated?

A That is correct. We propose under our suggestion for the temporary spacing order that any well that does not fit the pattern as suggested would be granted an exception. There are no wells drilled to date that do not cause two wells to be on the same 320.

Q You are not stating that these wells drilled by R and G fit the pattern?

A No, but they can be granted as exceptions.

Q In some cases there is three wells to a Section already?

A No, there is three locations, one is a location. The well in the northwest quarter of Section 2 is not completed to total depth.

Q It is your recommendation that those wells be exceptions to the order?

A That is right. That is the same procedure as used in Tapicito.

Q Also there has been a number of wells drilled in the old original Gavilan Area. What would be your recommendation in regard to those wells?

A Where they do not fit, they should be granted exceptions.

Q Where they do not fit the pattern?

A That is right.

Q What about dry holes that were recompleted or abandoned?

A They should be granted an exception, and it would not be economical to drill a second well if the present well could not be

recompleted.

Q How would the Commission know that?

A Under the temporary order, after one year we would come in with all the facts, drilling and testing and actual production, into the pipeline, because we can talk about deliverability and porosity and permeability and so forth, but we do not know what the capabilities of the wells are until they actually produce into the pipeline. We propose to drill a sufficient number of wells to get the line in sufficiently in advance of the one-year term to assure a time of production that will give the Commission some concrete information.

Q San Juan Gas Corporation be agreeable to some type of interference test to prove that this would drain 320 acres?

A There would be no objection whatsoever.

Q You feel that other operators would be also, or could you speak for them?

A I don't believe I could speak, but for our own company. What we want to do is develop the area and find out the reserves and put them on production and come in with facts. It may be at the end of the year we will come back and ask for 160. We want to develop the entire area to see where the trends are as soon as possible to evaluate, and we may find that the trends are sufficiently narrow that 160 is the most economical and most practical. We can't get on one trend and stay on it with 160 and thereby develop the entire area. We merely want the opportunity to explore on a 320-acre basis, come back to the Commission at the end of the year and then present facts.

MR. PORTER: Does anyone else have a question of the witness?

MR. KENDRICK: A. R. Kendrick, Oil Conservation Commission.

By MR. KENDRICK:

Q You say you want to explore this acreage and prove reserves; by the word "prove" do you mean core and have core analyses and arithmetic figures as to the reserves?

A I would judge with the number of wells to be drilled in the area that some should be cored. The core analysis from previous drilling in the San Juan Basin has not proved entirely satisfactory, but it is a good indicative point.

Q Well, by "prove the reserves", you mean if you encountered sand you prove gas present?

A We prove gas present and also prove and establish, if you prefer that word, reserves. In other words, in addition to the completion, the electric logs and four-point back pressure tests and so forth, you get the deliverability, but even a calculated deliverability is not always correct and a well has to be on production generally for a length of time in order to clean itself and establish that it will actually do what it is calculated to do.

MR. KENDRICK: That is all.

MR. PORTER: Would you identify yourself?

MR. RUSSELL: W. C. Russell, R and G Drilling.

By MR. RUSSELL:

Q You say you want a temporary order for one year?

A That is correct.

Q Go back at the end of one year and decide then whether to drill on 160. Are you aware that the R and G Drilling Company has, out of some 22 locations, would have only three locations if we

drilled on 320-acre spacing, and further that we have a 50% drilling obligation the first year? I don't see how we could meet our drilling obligations.

A Any drilling obligations -- you have three locations on 320's?

Q That is right.

A Which are full 320's?

Q That's right.

A But if a 320-acre spacing order is put out, any 160 that you have that is within a drilling block on which a well is drilled is a half well, you would pay half the cost and get half the benefits?

Q We are not asking half wells.

A Half wells add up to whole wells, you communitize that and it satisfies all obligations from the legal standpoint. Even the State of New Mexico under State leases communitizes its leases and validates the leases accordingly.

MR. PORTER: Anyone else have a question?

MR. BARNES: Frank Barnes, R and G.

By MR. BARNES:

Q Mr. Morrell, supposing that you drilled on 320-acre spacing, let's assume that Mr. Russell went along with that and communitized his locations instead of drilling 160, and drilled 320. What would happen if it became obvious at a later date that better production could be obtained by dropping back to 160 -- how would that affect his holdings?

A The leases are validated, at the end of the one-year we would then come in and have that brought out and agree to 160.

Q Who would then own the 160?

A The 160 remains the property of R and G Drilling.

Q He would still own half of the other well that he communitized?

A The communitized well is a matter of financial adjustment then. It could be worked either way. If San Juan had the half of the first well, they could pay the half of the second or reimburse half the cost of the first well.

Q Wouldn't it depend to some extent on the type of lease that he had?

A No, I see no reason that the type of lease would have any bearing. I would suggest that any lease that R and G may have taken is certainly subject to the rules and regulations of the Oil Conservation Commission.

Q But it could get pretty complicated?

A No, I see no reason.

By MR. RUSSELL:

Q Would you people be interested in coming in and communitizing the three wells we have already drilled down here on the 160 acre location?

A For the 320?

Q Paying half the cost and dedicating another 160?

A I would say communitization should be made before the well is commenced.

MR. RUSSELL: Yes.

MR. PORTER: Anyone else have any questions?

A I would like to correct an error I made in my testimony yesterday if I may, Mr. Chairman.

MR. PORTER: Surely.

A I referred to production from some 10 or 11 wells in the

San Juan Basin and it was called to my attention that I gave the figures as average daily production per well. It is average daily production per well per month. For instance, in the South Blanco Pool, the average daily production per well per month was 3,180,000.

MR. PORTER: Does that 3,000,000 represent a month's production?

A A month's production from one well. That means the production of 100,000 cubic feet per day average. It is the opinion of the major pipeline purchasers in the San Juan Basin --

MR. KELLAHIN: (Interrupting) I object to the witness testifying as to his opinion from somebody else --

A If the Commission please, the party asking that question asked me to testify on hearsay information yesterday.

MR. WALKER: If there is objection we don't want the hearsay, so the motion is sustained.

MR. BRATTON: I have some questions if the cross examination is completed.

MR. PORTER: Mr. Bratton.

REDIRECT EXAMINATION

By MR. BRATTON:

Q Mr. Morrell, Mr. Russell was asking you if San Juan would care to go in and pay half the cost of wells that have already been drilled. I believe you already testified that San Juan's suggestion is for an exception as to those wells?

A That is correct.

Q That they be granted 160-acre exception?

A My statement was exception as to the location.

Q I believe Mr. Russell was further questioning you as to the

possibilities of communitization and who would own the well if in a year's time or reasonable time it was determined that 160 acres was a more appropriate spacing unit. That is purely a matter of contractual agreement in the communitization agreement?

A That is correct.

Q It can either provide that in that eventuality each party owns one-half interest or it can provide that the party on whose acreage the well is located becomes the owner of that well upon payment of the reimbursement to the other party of the half of the cost?

A That is correct.

MR. BRATTON: I have no further questions. I would like at this time to move the admission of San Juan Exhibits 1 through 8, inclusive.

MR. PORTER: Any objection to the introduction of these exhibits?

MR. KELLAHIN: If the Commission please, we have objection to the introduction of three of the exhibits. We object to the admission of Exhibit No. 6 on the grounds it is nothing but a self-serving declaration based on hearsay. The Exhibit 6 is a memorandum of a conference which Mr. Morrell has testified was held in Washington and states merely his conclusions or results of that conference and purports to show conclusions reached by persons not present at the Commission or subject to cross examination. It purports to show that some agreement was reached with officials of the United States Geological Survey in regard to the size of these drilling blocks. There are representatives of the United States Geological Survey present in the hearing room avail-

abel for testimony. If any such agreement has been reached the testimony should properly come from an official who knows what the policy of the United States Geological Survey is and the exhibit is hearsay and it is also immaterial to the proceedings in this case, in that the policy of the United States Geological Survey can certainly not govern this Commission in setting a spacing order. It would go only to the effect of the unit agreement in the event it is approved. All we have in force at the present time is a present unit agreement and action by the United States Geological Survey undoubtedly will be taken and has not yet been taken, is the testimony.

We object to Exhibit 7, being the letter of transmittal, in that it again is hearsay and immaterial and self-serving declaration stating conclusions that are not supported by the testimony of the witness who wrote the letter. Neither exhibit should be admitted or allowed as competent evidence.

We object to No. 8 on the grounds it is likewise immaterial. Exhibit No. 8 is a list of units which have heretofore been approved by this Commission and is offered, I assume, to show past action of the Commission which in no wise ties in with the size of the drilling blocks involved in this case. Each case and each unit agreement must stand on its own feet. We object to the introduction of that exhibit.

MR. BRATTON: If the Commission please, going back to Exhibit No. 6, the memorandum prepared by Mr. Morrell. Mr. Kellahin has missed the point of that exhibit. We don't purport to say that that memorandum, that the facts reflected in that memorandum represent any agreement or policy as to what the United

States Geological Survey will do. We don't know what the United States Geological Survey will do until they take final action. We are merely attempting to show by that memorandum and by the testimony of Mr. Morrell the basis on which San Juan is proceeding in preparing and proposing its unit agreement. We have not introduced the memorandum as evidence of the truth of the facts stated in the memorandum. They are merely Mr. Morrell's, and he acting for the San Juan, they are the memorandum of the basis on which he is proceeding, his beliefs and the San Juan's beliefs in the matter. The letter of transmittal of the unit agreement to Washington is introduced for the same reason. It shows the action which San Juan has taken in this instance, that we have prepared a proposed unit agreement and have forwarded it to the Washington office. We are showing our course of action and the reasons on which, the basis on which we are operating.

Exhibit No. 8, I didn't fully understand Mr. Kellahin's objection, other than that he says that each individual area in San Juan Basin must stand on its own feet. We realize, of course, that the facts presented in this hearing are the facts before the Commission for its determination. Nonetheless, we are again proceeding on the basis of what has happened in the Basin and our anticipated development in there. That is the reason that we believe you cannot take an isolated instance and say that you disregard everything that has happened everywhere else in the Commission's thinking in matters heretofore presented for it.

All told, gentlemen, I believe that the exhibits are certainly relevant for the consideration of the Commission; if they, upon consideration, determine there is more chaff than wheat in there

I know that in its final decision the Commission will disregard them. Nonetheless, I believe they are proper to be admitted for the consideration, such consideration as the Commission may decide to give them.

MR. WALKER: Mr. Kellahin, your motion has been overruled. However, let the record show that admission of these exhibits was opposed to, and the Commission will certainly take cognizance of this and consider the exhibits for what they are worth.

MR. BRATTON: Are there any further questions or is Mr. Morrell excused?

MR. ARNOLD: I would like to ask Mr. Morrell a question.

REXCROSS EXAMINATION

By MR. ARNOLD:

Q I understood that you said yesterday that the Canyon Largo unit had been approved for 320-acre drilling blocks?

A That is right.

Q You mean by that that you thought the Oil Conservation Commission had approved 320-acre spacing in the Canyon Largo unit?

A So far as the unit is concerned, when they approved the unit they certainly established the spacing as set forth in that unit.

Q It hasn't been our interpretation that 320-acre well spacing was in effect in the Canyon Largo unit. That was merely a development clause, they could develop on 320-acre spacing, however, they can also drill on 160-acre spacing, I believe.

A So far as the spacing unit, that brings an analogy to your 40-acre allowable on oil. Under 40-acre you can drill as many wells as you want, but you can have one allowable.

Q I don't believe that has been the interpretation of the Commission in the Canyon Largo unit; at any rate, that hasn't been the understanding of the District Office.

A I think it would be well, then, to re-read the agreement. The agreement provides that it requires the drilling of one well on 320 because that 320 becomes participating and is allocated.

Q Don't you think that as of now the Canyon Largo unit if you set up proration under the pool rules as they are now written, you would get an acreage factor of one under the present circumstances?

A Under the present proration you would. However, as far as the acreage unit and the spacing, that one allowable would be distributed over 320 acres both as to State and private lands that are committed to the agreement.

Q But actually it is 160-acre drilling blocks?

A No, it is 320-acre drilling blocks.

Q So long as a man can drill on either 160 or 320 it appears to me that 160-acre spacing is in effect and affects one allowable for that well.

A When you say 160-acre spacing, you imply with it a legal obligation to offset on 160-acre basis. With that legal requirement in the unit agreement, I would not say it is 160-acre spacing.

MR. ARNOLD: I would like the record to show that I disagree with Mr. Morrell's conclusions.

A Difference of opinion makes a good horse race.

Q The reason I brought the point up is we are involved in approving drilling blocks in Canyon Largo unit. We are going under the presumption that we have 160-acre spacing there.

A Have you approved any wells on such within the Canyon Largo?

Q We insist that the operator file a plat dedicating 160 acres to each well.

A So far as your drilling program is concerned, that is perfectly proper, but under the unit agreement it is not, because you have no other course under present proration, because your dedication of acreage is for a proration unit.

MR. ARNOLD: I guess we understand each other.

By MR. MANKIN:

Q There is no proration in Canyon Largo, there is no field?

A Any spacing unit is a potential proration unit and should be recognized as such.

Q At the time such a hearing goes on we will decide whether it is 320 --

A (Interrupting) We are not asking for proration, but we have to recognize they are potential proration units.

MR. PORTER: Mr. Utz.

By MR. UTZ:

Q Mr. Morrell, do you feel that by virtue of the fact that the Commission approved those 320-acre drilling blocks in the Canyon Largo unit -- we will use that as an example -- do you feel they have obligated themselves to 320-acre proration units?

A To this extent; a piece of State land in the southwest quarter of the Section and Federal in the northwest on a 320-acre drilling block, the well is drilled on in the northwest quarter. It does not require a communitization agreement to allocate production to the southwest quarter to that State lease.

Q Insofar as your unit agreement is concerned, and your division of production within the unit?

A Yes, but that has always been approved and subscribed to by the Oil Conservation Commission and the Commissioner of Public Lands. In the absence of that unit agreement, you would have to drill a well in the southwest quarter. Getting back to Mr. Arnold's question, raises the same question. If you approve a well on 160 acres in the Largo and another 160 acres is in the unit agreement, the geological survey should require that the 320 acres be unitized if there is no well in that half Section on committed land, because they cannot, they can only develop on the unitized acreage on the 320-acre block basis.

Q But until we approve the 320 proration units in the event of proration, we are allowed to allow only 160 allowable to that well?

A That is correct, that is on the basis of State-wide.

MR. PORTER: Mr. Kendrick.

By MR. KENDRICK:

Q Mr. Morrell, you seem to be quite familiar with the other unit agreements in Rio Arriba County?

A Yes, I am.

Q Is it not true that these unit agreements for 320-acre development blocks were agreed upon by the operators?

A Not 100%, no. There was only one unit that I know of personally that had 100% commitment.

Q Well, you mean that in the other units there are operators that do not care for the 320-acre development blocks, is that correct?

A Or did not join the unit.

Q Since precedent has been set by that, do you not think that

the same situation could exist in the proposed Gavilan Unit?

A As far as that is concerned, I would say that the requirement for unitization is that there be sufficient commitment to attain effective control. As to those parties who do not join the other agreement, the situation would be analagous to the Gavilan Unit.

Q What would be effective control? I understand San Juan controls or has an interest in some 70% of the proposed unit?

A Some 79, practically 80%.

Q Isn't that sufficient acreage for control?

A Percentage-wise it varies. You may require 85 to 95 percent. The principal thing that the Survey wishes to do is to determine where the location of the non-committed land is. If that should happen to be in the middle of the block or a structure, then it wouldn't be considered effective control. In this particular instance, the acreage is off to one side of the unit in the majority. In further answer to your question as to these other units and how they would affect the Gavilan, we must admit that the other units to which I have testified were designed primarily as to the drilling block and keep in mind that below the Mesaverde it is a standard form of unit agreement for all formations. Those earlier units were based primarily for the development of the Mesaverde formation. In very few instances, in 30 North, 6 West, where there was a Fruitland -- were there any shallower formations? -- however, the 320-acre drilling blocks do include all formations to the base of the Mesaverde, so it could be argued that the other units do not similarly affect the Gavilan, because they were based primarily for development of the Mesaverde formation which was then issued

by the Commission Order on 320-acre basis. On the other hand, the Gavilan Unit is in an area in which the Commission has already established temporary order for the 320-acre spacing units for the Pictured Cliffs formation and therefore there is justification for the 320-acre drilling block unit in the Gavilan to keep it on the same spacing as the Commission has already acted on in an adjoining area within one mile of this unit.

Q In other words, your testimony concerning, as you say, the majority of the other units as being developed primarily from Mesaverde does not necessarily affect this particular unit as far as the Pictured Cliffs formation is concerned?

A I say it does affect them directly because Pictured Cliffs is going to be and it is already being developed on those units. Recently I spoke of development in 27-5; there are two locations that offset the units. When those offset wells within the unit are drilled, they would be drilled on a drilling block, not as 160-acre offset but on a diagonal offset on the drilling block to which the well would be as described under the unit agreement. So we have Pictured Cliffs now being developed. In other words, the Mesaverde was the thing to establish the reserves for then in order to get pipeline outlets for the San Juan Basin, but they will be equally effective as to the Pictured Cliffs, but the same principle as applies on the Gavilan Unit, because here we have the Tapicito, on that order, two miles beyond the defined limit, comes within one mile of the Gavilan Unit. Also wells are being drilled within three miles of the unit on the 320 well spacing units established by the Commission in the Tapicito Pool.

MR. PORTER: Mr. Nutter.

By MR. NUTTER:

Q Mr. Morrell, I had one question a minute ago, but you pretty effectively answered it, that those other unit agreements in Rio Arriba County, the prime target was the Mesaverde formation at that time?

A I would say the initial, I wouldn't say necessarily the prime. That was the purpose for development of that at that time.

Q There was no Pictured Cliff development in the area at the time that the unit agreements were formed, was there?

A There was some Fruitland-Pictured Cliff in the north part of 37 and on the east side of 30 North, 6, and a well in Section 19, 30 North, 4 West. There is now in this 34 North, 4 West, a defined pool by the Commission that is being developed on 320 acres, but prorated on 160, but there is no proration.

Q How many of those various unit agreements that you had listed on Exhibit 8 contained Pictured Cliff wells as being in the obligation wells to be drilled under the terms of the unit agreement?

A There is no obligation wells to the Pictured Cliffs.

Q They were all to the Mesaverde?

A The obligation wells were Mesaverde wells. In our Gavilan Unit agreement we propose also to develop the Mesaverde. As submitted, it does not contain a Mesaverde obligation, but we have in mind the possibility of some Mesaverde obligation wells in addition to the Pictured Cliffs.

Q Notwithstanding the fact that the Tapicito-Pictured Cliffs Pool is nearby and has temporary 320-acre spacing order in it, do you feel that a unit agreement which contains 320-acre drilling

blocks binds the acreage which is not committed to the unit agreement to be developed on 320-acre spacing, also?

A No, that is the reason we were asking for an order from the Commission, so that we would cover the acreage that might not be committed. Actually our request is, you might say, analagous withdrawal in aid of legislation, as Mr. Walker is familiar with in connection with this transfer of lands. All we are asking for is a Commission order for a temporary period during which we will see what we can get into the unit. We don't know until we try, and we might get 100% commitment. We may be able to do a sufficient selling job. It is a selling job as far as unitization to get the other party to join, so we want to stop any spacing that would be adverse to the principle of unitization.

Q However, 320-acre drilling blocks in a unit agreement apply only to the acreage that is committed to the agreement?

A That is right, but we don't say that only one well will be drilled on 320; the unit agreement does provide for the drilling of a second well on the 320 when economic and reservoir conditions warrant, so that even if we come up with 320-acre drilling block order and approved unit agreement, we come back at the end of the one-year period determination of the temporary order and show the Commission that 160-acre development should be done. We have a unit agreement which will provide for it and not make any installment on it.

Q What is the State-wide gas spacing rule, how many acres are dedicated to a well?

A The State-wide?

Q Yes.

A I would say it is 160 except for Lea County, certain pools in Lea County where it is specified 640.

Q There are special pool rules and the State-wide is 160?

A That is right. What I was suggesting yesterday, that there be some special pool rules for San Juan Basin.

MR. NUTTER: That is all I have.

MR. KELLAHIN: Mr. Kendrick raised a question I would like to clarify if I could.

MR. BRATTON: Go ahead.

By MR. KELLAHIN:

Q Mr. Morrell testified that in the area the Commission had approved 320 units; I assume you are referring to Tapicito?

A Spacing units.

Q Are you aware there are two applications for two exceptions pending in that pool?

A I have not seen any general rule to any spacing rule where exceptions were not requested.

Q Are you aware of the fact that the applications are pending?

A Yes, they are to be held in an Examiner hearing in Hobbs.

Q Do you know where the well locations are in those applications?

A I have it around here somewhere.

Q Let's put it this way: Are they in the area most immediately adjacent to the proposed Gavilan?

A The reasons for exception was to have the second well on the same Section in which the exception had been previously given.

Q I am not referring to the reason. Mr. Morrell, do you know if they are at the side of the Tapicito Unit most adjacent to the

proposed Gavilan unit?

A To my knowledge they are not. I'll check it for you right now. In Case 1077 to be heard by Examiner hearing on May 23rd in Hobbs, Southern Union has asked for exception to drill the Jicarilla Well No. 5-E in Section 16, 26, 4, in the southeast of the northwest quarter, which would be some nineteen miles from the Gavilan unit.

The second well is the Jicarilla Well No. 3-D in the southeast quarter; it is in the northwest of the southeast quarter, I beg your pardon, southwest-southeast quarter Section 32, 26, 3. In both of these cases there are wells in the same Section, in the case of 32 there is an existing well in the northwest quarter, and in the case of 16 there is already a well in the southeast quarter. The nearest exception is five miles from the Gavilan unit.

MR. KELLAHIN: That is all.

MR. PORTER: Any more questions of Mr. Morrell? The witness may be excused.

(Witness excused).

MR. BRATTON: I would like to call Mr. Larson.

R O B E R T C. L A R S O N,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. BRATTON:

Q Will you state your name?

A Robert C. Larson.

Q Where do you live?

A Oklahoma City.

Q What is your occupation?

A I am a geologist.

Q Will you state your educational background?

A I graduated from the University of Oklahoma with a B. S. in 1949.

Q In what did you major at Oklahoma?

A Geology.

Q What occupation have you followed since that time, and will you list your experience, Mr. Larson?

A As petroleum geologist; after graduation, I went to work for Continental Oil Company and worked for them for three years.

Q In what capacity?

A As geologist. At the end of three years I resigned from Continental and was employed by Eason Oil Company in Oklahoma City for one year as geologist, and at that time I resigned from Eason and became an independent geologist, after which I was an independent for approximately six months, and at that time I became associated with Alex Phillips as a geologist. Since the first of January of this year, we incorporated the San Juan Gas Corporation, of which I have been vice-president, of the San Juan Gas Corporation.

Q After you left -- was it Eason?

A Eason Oil Company.

Q After you left them you became associated with Mr. Phillips?

A Yes, I did.

Q Who is now the president of San Juan?

A Yes, I did.

Q What have you been doing during that time?

A Well, approximately three years ago we became interested in the Gavilan Area and at that time I began to do the preliminary research as far as geology goes on the area of the southeast portion of the San Juan Basin, and particularly the Gavilan Area as to the geology and the possible production of gas from the Pictured Cliffs and other formations in this area, and have been actively engaged in geological research for the past three years in the Gavilan Area.

Q You are now the vice-president of San Juan Gas Corporation?

A Yes, I am.

Q What are your responsibilities in that position?

A I am in charge of the geology and development of the San Juan Gas Corporation operations.

MR. BRATTON: I will ask the Commission if the witness's qualifications are satisfactory to the Commission?

MR. PORTER: They are.

Q Mr. Larson, I call your attention to a map which has been marked San Juan Exhibit No. 9 and ask if you will explain what that is?

A That is a structure map contoured on top of the Pictured Cliff sand throughout. It covers the southeastern portion of the San Juan Basin. The Gavilan Unit is outlined in red, the proposed Gavilan Unit, and this map was prepared to show the location of the Gavilan Unit in regards to the structural situation of the San Juan Basin.

Q Did you prepare this map, Mr. Larson?

A Yes, I did.

Q What sources of information did you use and what factors did you consider in preparation of this map?

A This map was prepared from study of electric logs, sample logs, scout ticket information, throughout this area.

Q Are the wells noted on there on which you base your information?

A Yes.

Q Your analyses?

A Yes, the wells of the top of the Pictured Cliffs indicated on the map, they are indicated in red on this; in photostats they will not be, but those are the wells that I actually had the study of those particular wells in preparation of this map.

Q This map is your analysis prepared from the investigation which you have made?

A Yes, it is. The purpose of this investigation was to indicate the structure and as I might indicate, we have a very well-developed Pictured Cliff sand condition that is existing through the South Blanco unit. If you will notice, between the contour interval of plus 3500 to plus 3800 feet, we have a line-- the northwest-southeast alinement of a well-developed Pictured Cliff pool in this area. As you bring the contour around on the southeast flank of the Basin, a plus 3500 and plus 3800 unit it will come up through the Gavilan Unit. This is strictly theoretical, if this production is due to deposition of sand around the original flank of the Basin, then we could conceivably have the same type of sand conditions present in the Gavilan-Lindrith Unit that are present in the South Blanco Unit. By that way of observation, it is conceivable that we will have well-developed sands throughout

the Gavilan Unit.

Q Does your analysis as indicated by this map show anything else with relation to the Pictured Cliffs sands in the Gavilan Unit, as you view them?

A Yes, in my opinion we are on the eastern flank of the San Juan Basin and it should be noted that we actually have the outcrops, in fact we have granite outcrops some twelve to fourteen miles east of the area. The Cebolletas were apparently a positive area back as early as Pennsylvanian time, it is my opinion due to the fact we were on a near-shore facies we have an excellent chance of having well-developed Pictured Cliffs sands. This is indicated by the fact we have kaolinitic materials in the upper portion of the Pictured Cliffs throughout the wells that San Juan Gas has drilled, which is not present over much of the Basin. By this it is my opinion that we will get correspondingly -- due to the fact that we were on a near-shore facies of sand development that the kaolinitic and bentonitic shale particles that cause low permeability and porosity throughout much of the Basin will not be present in the same degree in our area -- that we will very possibly have a better and cleaner sand in our area than in some other portions of the Basin further to the west.

Q Does this Exhibit reflect depths at which you might anticipate the Pictured Cliffs in the proposed Gavilan Unit?

A Yes, it does. If you will note approximately at a plus 3600 feet on top of the Pictured Cliffs will be the lowest wells encountered, while approximately plus 4300 will be the highest wells encountered. That is plus on the above seal level on top of Pictured Cliffs sand.

Q The wells that you have drilled in this area have encountered the Pictured Cliffs at those approximate depths?

A Yes, they have.

Q What has been the cost of those wells?

A Those wells have not been completed at the present time and we have run casing and we still have to perforate, frac and run tubing. We estimate at that the wells will cost approximately \$35,000.00.

Q Now, Mr. Larson, I will call your attention to a graph which has been marked San Juan Exhibit No. 10 and ask you if you can identify that.

A Yes, I can. That is a cross-section that I made extending from the Green Briar-Palmer well which was drilled in Section 1 of 24, 2 West to the R and G Drilling Company's No. 102 well in 28 of 25 North, 2 West, which on the map would be from this portion of our area up into this portion. It is a northwest-southeast cross-section.

Q If you will identify that on the map by more or less Sections, Mr. Larson.

A That is the furthest well to the northwest, which is R and G Well in 28 of 25, 2 West. This is San Juan Gas Corporation's Well No. 34C in Section 34, 25, 2 West, San Juan Gas Corporation No. 2-B Federal in Section 2 of 24 North, 2 West, and the Green Briar-Palmer Well in the Section 1 of 24 North, 2 West.

Q Those are running from left to right on the exhibit?

A They are running from left to right on the exhibit.

Q What does your cross-section, what does your analysis show with relation to the Pictured Cliffs sands in this area?

A This cross-section was made to show that we have in a northwest-southeast direction through the Gavilan Area, the four wells indicated on this cross-section show that we have a well-developed Pictured Cliff sand section and that it is fairly uniform on that particular line of section, that sand development, it is well developed, and I have personally watched the drilling, drilling time and was on the well when the well was drilled and examined samples as they came up, both San Juan Gas Corporation wells and I can testify that the sand was a well-developed sand with a good staining and odor. This cross-section also should be noted that it is running in a direct line from Section 1 up through 28, if this line of section was continued it would bisect the Tapicito Area. It is a possibility that if the production, as I previously stated, does not come around the Basin this way, that the Tapicito Area may extend down at least into a portion of the Gavilan Area.

Q When you are pointing to the map, will you explain for the record to which areas you are pointing and in what direction so that it will reflect that?

A I was referring to the Tapicito Area in Township 26 North and 3 West and extending the Tapicito trend of production to the southeast into 25 North, 2 West, and 24 North, 2 West.

Q You would anticipate that the Tapicito, the same sands might run into the Gavilan Area?

A I anticipate that it is a possibility that the sand may extend at least into a portion of the Gavilan Unit.

Q Which portion?

A I would say that they would come in at least into the western boundaries of 25 North and 2 West; from the cross-section

it is quite possible they may extend as far as Section 1 of 24 North, 2 West.

I think it should be noted that the sands are very well-developed on these four wells that actually run diagonally through the Gavilan Unit.

Q Is there any further information reflected on these two exhibits that would show your analysis of the Pictured Cliffs sand in the Gavilan Area?

A No, I think that the two exhibits have been fully explained.

Q I hand you six exhibits which have been marked San Juan Exhibits 11 through 16, inclusive, and ask you if you will state what they are.

A These are the electric logs on the six wells that have been drilled a total depth and logged, that were drilled by San Juan Gas Corporation since the first of March of this year.

Q Those logs were made for San Juan Gas Corporation?

A Yes, these are the Schlumberger logs that were run on San Juan Gas Corporation wells.

Q What information do those logs reflect as you analyze them, Mr. Larson, relating to the Pictured Cliff sands?

A I think that the six logs will show that the San Juan Gas Corporation in our development of this area have tried to develop the greatest portion of the Gavilan Area as possible in the shortest period of time, with the fewest number of wells, and therefore we have spread our locations as widely as possible to develop and get an idea of what the reserves are that we may possibly expect in this area in the shortest period of time. These six wells extend approximately seven miles from north to south

direction and three to four miles in an east-west direction. I think that it can be seen from the study of the logs that the Pictured Cliff sand is present in all six wells and that from my personal observation of being on the wells and watching samples, I can testify that the samples also looked promising in all six wells. I think a study of the electric logs will show that the sands are very well developed through the Gavilan Area.

Q As you analyze the information in the logs, do they reflect any indication as to permeability of the Pictured Cliff sand?

A No. I don't feel that permeability can be arrived at from a study of electric logs. I think that from a study of electric logs and samples, all you can say is that a formation is possibly slightly permeable or non-permeable. I would say from a study of the logs and from samples, I would say this is a permeable sand, but I would not have enough information at the present time to say what the permeabilities would be.

Q Do you have any information, Mr. Larson, as to the shut-in pressures of the wells which have been drilled in the proposed Gavilan Unit Area?

A Yes, I do.

Q When did you obtain this information?

A This information has been obtained over the last three years, but as recently as two weeks ago I went onto all the locations of the shut-in wells in this area and recorded pressures that were indicated on the spring gauges on the well-heads.

Q Will you go through well by well and give the nature of the test or the nature of your examination and the results thereof?

A A. G. Hill well in the center of the northeast of Section

15, 25 North and 2 West; this well was a Pictured Cliff well producing from an interval from 3478 to 3555. The status of this well is now a shut-in gas well. This well was completed originally for 600,000 cubic feet a day after a shot and the present tubing pressure on the well, shut-in tubing pressure is 950 pounds; the present shut-in casing pressure is 1175 pounds. These were taken, as I stated previously, from the spring gauges on the surface or on the well-heads.

The A. G. Hill well in the southwest of the northwest of Section 36, 25 North and 2 West is producing from Pictured Cliffs in an interval from 3418 to 3482, the present status is a shut-in gas well. This well was completed for 600,000 cubic feet a day after shot. The present shut-in tubing pressure is 960 pounds; the present casing shut-in pressure is 1125 pounds.

MR. PORTER: What is the number of that well?

A That is the No. 1. The Green Briar No. 1 Well in the southeast-southeast of Section 9, 25 North, 2 West, this well was completed from the Pictured Cliffs from the interval from 3562 to 3621. This well is now a shut-in gas well. It was tested for 600,000 cubic feet a day and the present shut-in tubing pressure is 960 pounds, the present shut-in casing pressure is 1100 pounds.

The Green Briar No. 1 Palmer is in the southwest of the southeast of Section 1 of 24 North and 2 West. This well is completed from the Pictured Cliffs in interval from 3390 to 3432. Its present status on the geological survey will be temporarily abandoned, though casing is in the hole and a surface choke on the casing is present. The casing pressure is 750 pounds on the well. The well is standing with a water load in the well. There is water

present in this well.

The next well is the A. G. Hill No. 1 located in the south-west-southwest of 24, Section 24, Township 24 North, Range 2 West. It is producing from the Pictured Cliffs from the interval 3203 to 3325. The present status of this well is a shut-in gas well. This well completed for 1,050,000 cubic feet a day, natural. The present shut-in tubing pressure is 1,000 pounds, present shut-in casing pressure is 1175 pounds.

On the remaining wells, I do not have pressures.

Q Those tests were all made within the past ten days?

A Yes.

Q Mr. Larson, have you estimated the recoverable reserves per acre foot in the proposed Gavilan Unit Area?

A Yes, it is my opinion that approximately 320,000 cubic feet of gas to the acre foot will be recovered from the Pictured Cliffs sand in the Gavilan Area.

Q What factors did you use in making that computation?

A That computation was made from a study of the electric logs, samples, taking these in comparison with producing wells in the older portions of the San Juan Basin where you have a cumulative production history on the wells, comparing those wells with the electric sample logs on our area; also coupled with study of the electric logs to indicate the percentage of connate water present in the Pictured Cliffs sand and also taking into consideration the pressures encountered in this area.

Q Have you estimated the recoverable reserves per 320 acres in the Gavilan Unit Area in the Pictured Cliffs?

A Yes, it is my opinion that on 320-acre spacing in the

Gavilan Area approximately 2,000,000,000 cubic feet of gas will be recovered to each 320-acre Pictured Cliff well.

Q Will you explain what factors you used in making that computation and how you arrived at it?

A Yes, that was arrived at from taking the wells in the Gavilan Area and arriving at what I consider to be average Pictured Cliff net effective pay in the Pictured Cliffs throughout this area. I arrived at this being approximately somewhere from 20 and 25 feet, taking 20 to 25 feet of Pictured Cliffs sand, say we will have 22 feet average of net effective pay in the Pictured Cliffs in our area, by the 320-acre spacing times the 320,000 cubic feet to the acre foot, you arrive at approximately 2,000,000,000 feet to the 320-acre spacing.

Q Based on the present information which you have, Mr. Larson, is it your estimate that one well will efficiently and economically drain 320 acres in the Pictured Cliffs in the proposed Gavilan Unit Area?

A Yes, it is my opinion that the Pictured Cliff sand in the Gavilan Area will be drained by 320-acre spacing; however, San Juan Gas realizes that information is still lacking in this area and that it is our desire to have our one-year temporary spacing so that we can adequately test these Pictured Cliffs throughout this area. We would like to be able to core several of the wells and to arrive at a more accurate opinion on whether the wells may be adequately drained on 320-acre spacing. We do not feel like we can make a definite statement that they will be drained on 320-acre spacing at the present time, because information is lacking.

Q Your information is meager at this time, but with your proposed drilling program you would anticipate that within a year you would have more accurate information upon which a more reliable estimate could be made as to a permanent order, is that correct?

A That is correct. San Juan Gas for our own personal use would very much like to know what our reserves are going to be in this area. We therefore intend to adequately test these wells in regards to core analysis, micro-log analysis, and all means that are available to us as to what the actual sand conditions in respect to porosity and permeability and recoverable factors would be.

Q Would you be willing to run such reasonable tests as might be required by the Oil Conservation Commission during the year, if a temporary order were issued as requested?

A Yes, we would.

MR. BRATTON: I have no further questions at this time.

MR. PORTER: Mr. Mankin.

CROSS EXAMINATION

By MR. MANKIN:

Q Mr. Larson, in figuring your recoverable reserves, what did you utilize for your initial pressures and your abandonment pressure?

A On our initial pressures I used a thousand pounds. For abandonment pressures I took the abandonment pressures down to actual depletion, in fact, down to zero pressures.

Q Is that a realistic abandonment pressure?

A Well, may not be, but if we have a gasoline plant in the area, it would be an actual figure in my opinion.

Q Ordinarily, though, isn't it taken down to some figure like 150 to 200 pounds, or at least, say in the neighborhood of 150?

A Ordinarily it is, yes.

MR. PORTER: Mr. Barnes.

By MR. BARNES:

Q What was the porosity, the average porosity factor when you computed those reserves?

A An average porosity that I used in computing these reserves was approximately 23 to 24 percent.

Q How did you arrive at that figure, what was it based on?

A The 23%?

Q Yes, the 23% porosity, how did you arrive at that figure?

A I arrived at that through the courtesy of R and G. They ran a micro-log on their well in Section 28. My interpretation of the micro-log of the average porosity ranging from 22 to 26 percent.

Q Did that average porosity, did you use that throughout the net pay zone?

A I used that throughout what I termed as net effective pay zone.

Q Was that borne out by the micro-log, or did the micro-log indicate that the entire pay zone had that?

A That is what I say. Now what I call net effective pay may not be what someone else would call net effective pay, but throughout the zone that I call net effective pay, it ranges from a low of 22 to a high of 26.

Q What did you use for the net pay?

A I used, throughout the area I used a basis of around 22 feet.

Q What connate water factor did you use?

A I used the connate water factor of 30%.

Q You testified that you thought, on examination of the electric logs and samples in that area, that you thought the Pictured Cliff reservoir represented good sand conditions, is that right?

A Good sand conditions as far as Pictured Cliff sands go.

Q Are you familiar with what happens to the Pictured Cliffs just east of that area in the outcrop?

A Yes, the Pictured Cliffs sand is not present in this area in the outcrop.

Q Is that borne out by well logs to the east?

A Yes, it is.

Q You said that you thought that near-shore conditions prevail in this area. What do you mean by near-shore conditions?

A I mean that I think that the Pictured Cliffs sands in this area were deposited close to the positive area which furnishes part of the source material for the Pictured Cliffs sands.

Q Do you think that is borne out by examination of the cuttings from the wells?

A Yes, I do.

Q You also stated that the Pictured Cliffs sand conditions improved toward the east side of the Basin. Would you mind explaining what you base that premise on?

A Well, I base that upon the porosities that are present. I think that as you go over the good portion of the Basin you will find that porosity is below 20%. I think that you will find that we have several wells in our area that the porosities are as high as 26%.

Q That is according to electric log analysis?

A That is according to electric log analysis.

Q Not by core analysis?

A Not by core analysis.

Q Do you mean that the electric log analysis in this area or in San Juan Basin is entirely reliable as an index to porosity?

A No, I don't.

Q Do you believe that the statement that you have good reservoir sand conditions in this area is borne out by records of any of the completed wells?

A Yes, in my opinion the older wells in the area have good potentials in respect to how they were completed. Remember this was prior to the days of water frac or sand frac that these wells were completed. I think that when you get a well that has a potential as high as 1,050,000 cubic feet a day, naturally that is the good potential for the San Juan Basin.

Q You arrived at those well potentials by your own tests, or was this based on records that have been turned in?

A This is based on records that have been turned in.

Q Do you know how those tests were conducted?

A I assume they were conducted by the orders and by the methods that are subscribed to by the United States Geological Survey.

Q You don't know how long the wells were blown or what time interval was used in arriving at those open-flow potentials?

A No, I could not make any definite statement as to how long these wells were blown.

Q You didn't make any tests of your own, that is, you didn't

or the company didn't, to determine --

A (Interrupting) Not to open-flow blown down tests, we have made no tests.

Q The tests you were talking about were just pressure ratings?

A Pressure ratings, and those were arrived at by opening the wells and letting them blow for a short period of time and closing the wells and waiting and seeing what the build-up pressures were, where they settled back down to.

Q Suppose you had blown some of those wells and they didn't live up to expectation, suppose the volume was way down, would you say that still indicated good sand conditions?

A Yes, I would say so. My opinion is that gas wells that will not blow down are pretty seldom.

Q You don't find very many of them that won't. Have you tested or have you studied the tests of Pictured Cliff wells in some of these other developed areas? Do you know if they will blow down to the same degree that the ones in the Gavilan Area will?

A I cannot testify as to how wells will blow down in other areas.

Q In testifying as to the reservoir or sand conditions in there, of course, when you say you have a good reservoir or bad reservoir, and good or bad sand, that is relative, is that correct?

A That is correct.

Q In other words, if you said you had a good sand condition, you would mean relative to some other area in the San Juan or some other portion of the country --

A (Interrupting) I would say relative to Pictured Cliffs as throughout the San Juan Basin.

Q Based on studies of electric logs, or have you actually examined core analysis samples in other Pictured Cliffs pools and compared them with the Gavilan?

A I have examined samples in the other pools.

Q Did you say that you compared these with the samples in the Gavilan Area?

A Samples, now will you --

Q (Interrupting) Or core in the Gavilan Area.

A We have no cores. I have never seen a core in the Gavilan Area. This is -- our information, as we stated previously, is rather meager. Our studies have been made entirely upon electric log characteristics and samples through the Gavilan Area, plus comparing these with samples outside the Gavilan Area. I have never seen cores in the Gavilan Area.

Q Have you had a chance to study samples from some of the bigger wells in the Basin where you would have really optimum well conditions and compared them with the Gavilan?

A No, I have not.

Q Are you familiar with the fact that one well that was drilled in the Gavilan Area was drilled with gas or that they attempted to drill it with gas by typing into some of the other wells?

A Yes, I am.

Q Are you familiar with the story of that effort?

A Yes, I am.

Q What happened?

A It so happened that we have purchased the well that I assume that you are talking about now. I am not sure. We may have

separate stories. The Gardner well in Section 14 of 25 North and 2 West, completed for an original potential of 277,000 cubic feet a day; this well was used to drill subsequent wells, using the gas from this well to drill some other wells in the area. At the completion of the drilling of those other wells, this well was then tested with an open-flow potential and tested approximately a million and a quarter cubic feet a day, an increase of some five times the original open-flow potential.

Q Which well was that?

A The Gardner-Dunham Well in Section 14, 25 North, 2 West.

Q That was the Dunham? You stated that in studying the electric logs of the wells that have been drilled by San Juan you thought that they were pretty good wells. What do you base that statement on?

A From samples and electric log characteristics.

Q You haven't completed the wells?

A Those wells have not been completed. They have pipe set on the wells and they have not been perforated or tested.

Q Would you care to estimate for the record what those wells will make when they are completed?

A I am afraid I cannot. If I could testify before those wells are completed what they would make, I'd be very proud of myself.

Q Well, I thought that perhaps with some of the other statements that you have made about the wells that you might have enough data of the electric logs that you could go that far.

A I'd say that our wells will average five to six million cubic feet a day. That is over the Gavilan Area which is a broad

statement. I don't think I can get caught on that.

Q On how long a gauge?

A However long that you want to gauge on an open-flow potential. I think open-flow potentials in San Juan Basin are possibly a little fictitious due to the fact there is not any standard procedure on which to judge open-flow potentials.

MR. BARNES: Thank you.

MR. PORTER: Mr. Kellahin.

By MR. KELLAHIN:

Q Mr. Larson, do I understand that you testified in connection with Exhibit 9 that your structure map was based on information obtained from logs and did you say scout checks?

A From electric logs and scout tickets, yes, sir.

Q And what?

A Scout tickets.

Q What do you mean by scout tickets?

A Every major company has a person they call a scout. They have scout checks in which they meet to compare information on wells that are actively being drilled. As these wells were taken from such, the tops were taken from such information, a portion of the tops were taken from such information.

Q Did you attend any such meeting?

A No, that is, scouts only attend those. That information is available to the members of the oil industry.

Q Do you have any reason to believe that is reliable?

A I have reason to believe it is reliable, yes. I say that some of it may be unreliable, but I feel like --

Q (Interrupting) You have used it in connection with your

exhibit?

A I have used it in my exhibit.

Q To what extent is that exhibit based on scout tickets and to what extent on information from logs?

A I couldn't give you a percentage breakdown on it.

Q How many logs did you have available to you?

A I would say I had a good portion of the logs available to me.

Q What do you mean by a good portion?

A Well, now, we'd have to go back to my files and count them to be able to tell you.

Q I don't want that, if you can give me a rough estimate.

A Well, I couldn't even give you a rough estimate.

Q I believe you stated that you could possibly have the same sands in the Gavilan Unit Area as you found in the South Blanco; on what information do you base that?

A I base that, that statement I think was qualified when I said it in the fact I said it was possible.

Q Yes.

A Now, then, if the San Juan Basin was a depositional basin at that time, it is possible that the contours that passed through the South Blanco Area turn and come back up through ours in the north-south direction. In other words, we are structurally on about the same datum as the South Blanco unit.

Q In connection with the drilling of your wells, Mr. Larson, do I understand that you were out there and observed the drilling of at least some of the wells?

A I observed the drilling of all the wells.

Q Of all the wells?

A Yes.

Q Could you give us the drilling time on your wells when you encountered the Pictured Cliffs formation, the rate of drilling?

A I think that varies considerably with the well and with how much footage you have on the bit by the time you hit the top of the Pictured Cliffs sand.

Q Your footage was fairly uniform on the drilling of the wells?

A The drilling time?

Q The footage on the well.

A Oh, the depth. What I refer to as footage, if you go into the top of the Pictured Cliffs with a bit made 600 feet, it is not going to hit as fast if you run a new bit with sharp teeth on it. Our drilling time varied from half a minute up to four minutes.

Q Per foot?

A Per foot.

Q Does that indicate a tight sand to you?

A No.

Q Four minutes per foot?

A Four minutes to the foot, as I qualified my statement previously, four minutes to the foot was drilled with a bit with all three cones locked on it. In other words, we were drilling with a bit that was actually the same as the fish-tail but it didn't have the fish-tail. We were just drilling with the knobs on it.

Q In connection with the wells that you tested, the A. G. Hill and the Palmer and the Green Briar, you used the expression

they were producing 600,000 cubic feet; did you mean producing?

A No, their original test.

Q You don't know how the tests were made, do you?

A No, just in compliance with the United States Geological Survey regulations, I would assume.

Q Are you familiar with the results that were achieved on the wells drilled by R and G Drilling Company?

A No, I am not.

Q You were furnished with logs on all those wells, were you not?

A No, I was not.

Q They were available to San Juan Drilling?

A They may have been, I don't know. I did receive a log on the well in Section 28.

Q You have used one in your exhibit?

A That is the well in Section 28.

Q That is the only one you have seen?

A That is the only one I have seen. I would like to see the others.

Q Are you at all familiar with the efforts to complete the well?

A No.

Q Do you know if it was fraced?

A I have no idea what you have done on it.

Q In connection with your test, you said you would like to know what the reserves are; the completion of the well would be a good test of that, would it not?

A Yes, a successful completion would be.

Q You haven't completed any?

A No, we have not.

Q Do you know of any others that have been completed since March, 1956?

A No, I do not.

MR. KELLAHIN: Thank you.

MR. PORTER: Are there any other questions of the witness?

MR. UTZ: I have one.

By MR. UTZ:

Q Mr. Larson, are you familiar with the New Mexico Oil Conservation Commission Order R-333 (C) and (D)?

A No.

Q That order is the testing order for the San Juan Basin setting out standard procedures of testing, of absolute open-flow and deliverability test. That possibly is the reason for your statement that there was no standard procedure set out for testing, is that right?

A Yes, it is.

Q Do you have any permeability information at all on this area?

A No, I cannot testify as to the permeability of these sands.

MR. UTZ: That is all.

MR. PORTER: Mr. Kendrick.

By MR. KENDRICK:

Q Mr. Larson, I notice on the docket this case was continued from Examiner hearing on May 9, which was one week ago. How long have you known that this case was coming up, or that San Juan had applied for this unit?

A Well, we applied for this unit several months ago. This hearing, I would say for the last thirty days I have. We have known we were going to ask for spacing for the last several months, but actually filing for the hearing has been a matter of the last thirty days, I would say.

Q When did you reach your final depth in your last well that you have drilled to date in this Gavilan Area?

A Last Wednesday, a week ago yesterday.

Q I believe that with thirty-days notice for this case, and then having only reached total depth in drilling at the rate of a quarter of a minute to four minutes per foot, you think you might not have been able to obtain a core on the last wells, to have more definite information to bring in?

A The reasons we have not cored any of these wells to date, like any company we would like to be able to operate efficiently with as little lost time as possible. In the process of trying to develop this idea of what the reserves would be over the whole area of ours as rapidly as possible, every one of these wells is a definite geological wildcat. In fact, the United States Geological Survey has us carry the wells as wildcat wells. It is my opinion that it is a little difficult to core on a wildcat well. I would prefer to take our cores when we come back in and begin some of the infield drilling. I feel that at that time we can take a core of the complete Section.

Q Then you do not feel it is economically feasible to core and get the information of the area on the first well. You would rather drill four or five dry holes and then core?

A No, because we are satisfied these are not dry holes.

MR. KENDRICK: That is all.

MR. PORTER: Anybody else have any questions of the witness? If not, the witness may be excused.

(Witness excused).

MR. BRATTON: I would like to move the introduction of San Juan Exhibits 9 through 16, inclusive.

MR. PORTER: Is there objection to the entrance of those exhibits. The exhibits will be received.

We will take a short recess.

(Recess).

MR. BRATTON: I would like to call Mr. Phillips.

A L E X P H I L L I P S,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. BRATTON:

Q Will you state your name, please?

A Alex Phillips.

Q Where do you live, Mr. Phillips?

A Tulsa, Oklahoma.

Q Are you the president of the San Juan Gas Corporation?

A That is correct.

Q Mr. Phillips, could you explain briefly to the Commission your development program, the status of your development here, why you have progressed in the manner you have and your anticipated program within the next year?

A Well, our program to date, of course, is going to be continued, activity and integrating facts and contracts for the purpose

of putting this unit together, make it a worthwhile unit, one that would be attractive for us to come in on a regular development schedule. We have, of course, spent most of our time in setting forth preliminary investigation and preliminary work in deriving contracts with various companies from whom we have taken farm-outs that we feel we can live by; and naturally, in a thing of this nature, why, certain groups will want activity and they will want attention all at the same time. That attention was being thrust upon us, seemingly, all in one big dose just about the first of the year. So in going into this from the standpoint of the administrative end of our company, why, we have attempted to clear ourselves so that we can go in on a normal and advantageous development program. Our academic results here might seem to be a bit on the deficit side at the moment, but again we are new in the area. We can't be expected to come in here and overnight have the knowledge of certain other companies that have been in here and have the basic background that they have built over the years, to make what I consider good, thorough academic completions.

Now the thing we are trying to do here, of course, is to give ourselves the full advantage of what meager knowledge we can pick up at the front end of our operation and still at the same time expose ourselves to as much general field information as we can and general field interpretation from other companies that we consider have more know-how in attempted completions than we have. It is a situation where we have obligated ourselves to a fair-sized expenditure from the standpoint of the actual overall economic picture, and we feel that justifiably when we go into this completion picture, that we want to give ourselves the best ratable

return that we can possibly get and we feel at the moment that we have not had access nor have we had time to study the proper, what we consider proper field completions and field analysis. We think that probably at the moment we have had sufficient time, we have been in the area now for probably two months with the development program of our own, and we have some general knowledge of what we are doing; so it is just a matter of exact corrective necessity as far as the academic policy is concerned there in our development work.

Q Therefore, within a reasonable time, a year, for example, you feel that you will have completed a sufficient number of wells so that you can come before this Commission with sufficient information upon which a more accurate determination could be made?

A I feel that we can come in and we then will feel justified, with our analysis, in presenting the analysis at that time that we will have to present to the Commission, that it will merit their attention and their consideration.

Q That is, for a permanent order?

A For a permanent order or for any order of course, that they can, whereby they can look at our analysis and give some exact consideration as to what they feel we should do.

Q During that period of time would you be willing to make such reasonable tests as the Commission might desire?

A We definitely would be and by contract we are obligated to make reasonable tests between now and that time not only for the Commission but for certain other parties from whom we have taken these leases; and in doing so, I think that the results will prove to the Commission that our program is one that they

will see at that time will be fully advantageous to everyone.

MR. BRATTON: I have no further questions.

MR. PORTER: Anybody have any questions of Mr. Phillips?

MR. KENDRICK: I have one question.

MR. PORTER: Mr. Kendrick.

CROSS EXAMINATION

By MR. KENDRICK:

Q Mr. Phillips, do you know whether or not all the leaseholders in the proposed Gavilan Unit Area have been contacted and approached as participating partners in the unit?

A Now as far as the Federal leasehold rights are concerned, we have approached the full 100% of Federal leasehold rights.

As far as fee leasehold rights are concerned, we haven't as yet had a chance to present our program and our ideas to them. We have to the degree, I would say, of approximately 50% of the general fee ownership in the area.

MR. KENDRICK: Thank you.

MR. PORTER: Are there further questions? The witness may be excused.

(Witness excused).

MR. BRATTON: We have no further evidence. San Juan rests.

MR. PORTER: Does R and G plan to put on testimony?

MR. KELLAHIN: At this time we would like to move for dismissal of the application on the grounds that there has been no evidence presented to the Commission which would support the application. As it was brought out, not once but several times by the applicant in this case, when you are dealing with spacing you are also dealing with potential proration units. As a matter

of fact, the provisions covering both spacing and proration units are set out in the same sections of our New Mexico statutes. I will not bother the Commission with reading the sections which they are thoroughly familiar with, but I would like to point out there has been no evidence offered to this Commission to show drainage in the Gavilan Unit Area; there has been no effort made on the part of the applicant to produce before this Commission any completion data or any other information upon which they could base and order.

The Commission, I feel, is bound to consider the factor as to whether one well will drain 320 acres. I submit there has been no proof of any nature submitted to the Commission on that score.

Further, the same statute provides that the orders of this Commission shall entitle the owners within the reservoir the right to produce the gas underlying their area. There is no evidence there is any gas underlying the area, aside from the old wells on which they made a five-minute blow down test. I submit there is no evidence to show there is any recoverable reserves available within this entire area.

MR. BRATTON: Does the Commission desire any statement in opposition to that?

MR. PORTER: Just a minute. Mr. Kellahin, your motion is overruled. Do you desire to go on with testimony?

MR. KELLAHIN: Yes. We would like to call Mr. Barnes.

(R and G Drilling Company
Exhibits Nos. 1 and 2 marked
for identification.)

F R A N K B A R N E S,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. KELLAHIN:

Q Would you state your name, please?

A Frank Barnes.

Q Where do you live, Mr. Barnes?

A In Santa Fe, New Mexico.

Q Mr. Barnes, have you testified before this Commission as a petroleum engineer and had your qualifications accepted?

A Yes, sir, I have on numerous occasions.

MR. KELLAHIN: Are the witness's qualifications acceptable to the Commission?

MR. PORTER: They are.

Q Mr. Barnes, are you familiar with the area involved in this application?

A Yes, sir, I am.

Q Does R and G Drilling Company own any acreage in there that you know of?

A Yes, sir, they do.

Q What experience have you had in this area?

A I have done considerable work in the Lindrith-Gavilan Area dating back to 1947. At that time Mr. James H. Gardner of the Gardner Petroleum Company, who was one of the original leaseholders and developers of the area, was interested in the gas possibilities of the Lindrith-Gavilan Area based on some work he had done as a young man, back in 1911. At that time there had been almost no

gas development along the east side of the Basin. The only Pictured Cliffs test was about 35 miles north on the Jicarilla Apache reservation, drilled by the Florence Drilling Company, and No. 1 Jicarilla, in that particular well they had hit an unusually thick sand development; and in line with some of Mr. Gardner's ideas, it was desirable to see if the sand development might extend further south into the Lindrith Gavilan Area, and I did some mapping and made some outcrop studies along the northeast and the southeast side of the Basin.

Q How did you make those outcrop studies?

A With a good pair of leather boots and a jeep and a rock pick. At that time there was very little literature available, there was one, maybe, the United States Geological Survey had made, and there were no wells in the area. The only way you could study the formation was to get out on your two legs and walk up and down and try to develop your ideas from that, combined with wells that were maybe 30 or 40 miles away.

Q Have you tested any wells in the Gavilan Area?

A When the Gardner-Dunham was completed, for some time that was the only well in the area. When the El Paso Natural Gas Company made their original application for permission to build a pipeline out of San Juan Basin well, that was a key well as far as the extent of eventual production in the San Juan Basin. At that time I was with the State Oil Commission and I made some preliminary tests on that well which were just intended to determine that it was there and that it would make some gas. However, at a later date I tested other wells in the area and by 1952 I had tested every well in the area, with the exception of any of the

Magnolia wells which had been drilled by the end of 1952. I have not tested any wells in the area since 1952.

Q Did the tests that you made include the eleven wells drilled prior to March, 1956, within the Gavilan Unit Area?

A There was approximately ten wells involved. It included all the wells drilled by Gardner, Cypress, Green Briar, and Hill.

Q What kind of test did you make on those wells?

A The tests that were made on the wells were side-static and pito-tube tests. Using a pito tube and side static tester or mercury or water manometer, the wells were blown in most cases in accordance with the New Mexico Oil Conservation Commission regulations of that time, which called for a three-hour continuous blow down. In some cases in order to determine some kind of a curve as to what the wells would actually make, some tests were taken of 15 minutes, 30 minutes, 45 minutes, one hour, hour and a half, so on, at 30-minute intervals for a full three hours. Actually some of the wells in one or two cases, I let the wells blow three or four and a half hours taking readings all along the line.

Q What were the results of the tests?

A Without going into the individual figures that came out of the wells, it became apparent that all the wells had one thing in common, that they had high initial pressures but extremely low volume. With the high pressures and the size and the length of the casing, all the wells would make considerable gas in the first hour. In the first 15 minutes some of them would make as much as five million cubic feet. After the first hour the flow volume fell off rapidly and they began to stabilize after two or two and

a half hours. Most of them had stabilized to some extent after three hours and in practically all cases by the end of a three-hour blow down from either the casing or tubing, the pressures were down to either zero or one or two pounds and the volume was down to anywhere from fifty to one hundred fifty, two hundred thousand cubic feet. What would happen if you blow the wells for five or six hours I don't know, but actually they were still declining, all of them, at the end of three and three and a half hours.

Q What did that indicate to you, Mr. Barnes?

A That would indicate to me that the reservoir had rather poor permeability and that the gas had some difficulty in getting into the well bore. Admittedly all those wells that were tested were wells that had been completed under older completion practices. They had either been shot or they had been in one or two cases completed naturally.

Q Have you had any experience in the fracing of wells in the Pictured Cliffs formation?

A Yes, I have. As a matter of fact, when the sand-oil fracing started in the San Juan Basin, I was one of the first ones to use this method of completion. It was used on the Kingley Locke in one of the Kingley Locke wells in the Largo Canyon area, and as a matter of fact it was made as a joint test with the El Paso Natural Gas Company, if I remember right. I think they paid for the oil or they paid for the trucks or some phase of the operation, and they had an engineer out there when we tried the first well.

Q Has the use of fracing made any difference in the productivity?

A It certainly has. It has had a very profound effect on

wells in certain areas where it works. It doesn't always work. It increases the production, oh, several times over what you would expect to get by just shooting or using some of the older methods.

Q Mr. Barnes, I believe you have testified that you are familiar with the Pictured Cliffs. Are you familiar with the Pictured Cliffs formation generally throughout the San Juan Basin?

A In the course of working in the San Juan Basin I have had occasion to map the Pictured Cliffs and study the outcrop in connection with drilling programs and general mapping and also various other formations on, I would say, on practically all sides except the west side. I am not too familiar with the outcrop on the west side of the Basin.

Q Based on your experience and your examination of information available to you, what is the general nature of the Pictured Cliffs formation?

A One of the things that impressed me in studying the Pictured Cliffs as far as the outcrop goes, and of course this is substantiated by the action of the wells that have been drilled in the Basin by the electric logs, is the fact that it is extremely irregular. It has short range facies changes in it, changes from sand to silt and to shale and back to sand again over intervals of as small as, say, 50 or 100 feet. Out of curiosity on several occasions I have taken outcrops of the Pictured Cliffs sandstone and marked off a place and said, "This looks like a pretty good sand. What would happen if I drilled a well down here a hundred yards away or a half a mile?" and paced it off and gone up with the jeep and looked at it again. It is surprising what can happen

in a very short distance. If you look at the Pictured Cliffs wells that have been drilled in the San Juan Basin, that is borne out by the production. You will find wells that make six or seven million cubic feet offset by wells that make a couple of thousand. You will find wells where in general the average of this well tends to be comparatively small near other areas where the production stands to be relatively large. That is a reflection of the short range and long range facies changes in the sand body itself.

Q In your opinion does that condition prevail on the east side of the Basin?

A Yes, it certainly does. As a matter of fact, as has been brought out in previous testimony, along the east side of the Basin many of the United States Geological Survey maps show the Pictured Cliffs as missing. Actually it isn't missing; I have examined the outcrop where it should have been east of the Lindrith-Gavilan Area, and actually the Pictured Cliffs is there but it is extremely shaly. It doesn't have a good sand development in it and it is covered by shale tailus and it just would be very difficult to map it. Some wells that have been drilled east of there, particularly the Bolack well drilled by the Cypress Oil Company, also indicate there is a thinning of the sand, changed from a predominantly sand to predominantly silt or shale facies as you go toward the east edge of the Basin.

This seems to be reflected in some of the wells that I have acted as geologist on. It was my impression from examining the Pictured Cliff sandstone in those wells that the sand was rather hard and tight, and under the completion practices that existed

at that time that it was not a particularly good reservoir. I thought that probably with this recent sand-oil fracing that that might change the situation, but apparently insofar as some wells go over there, that isn't true. This is also substantiated by the tests that I have made on the wells over there, the fact that they will blow down in some cases to almost nothing within a comparatively short time.

Q Have you run any interference tests in the Pictured Cliff formation, Mr. Barnes?

A No, actually I haven't, not along the east side of the Basin. There were some tests one time in an area in the Largo Canyon Area that might be indicative of lack of interference. I don't think they would constitute conclusive interference tests, but--

Q (Interrupting) Were those in the Pictured Cliff formation?

A Yes, sir, they were.

Q What was the result of those tests?

A One of those wells was the Kingley Locke Oil Company in Kingley Locke No. 1-3, Section 6, 26 North, 7 West. That well was completed during the early development of the Largo Canyon Pictured Cliff Area, and there were a lot of things we didn't know and a great many experiments that I conducted out there on some of the wells. Some were beneficial, some I would rather not talk about, but this particular well was tested on March 3, 1952, and it had a pressure of 867 pounds and it made an open flow after three hours of 872,000 cubic feet. The well was left open until April the 7th, 1952, after blowing continuously at that time it had about nine-pound pressure on the tubing and was making 450,000 cubic feet. This well is a direct offset to the M.K.L. No. 2 which is a half-

mile to the west, and during the period that this was blown, a continuous check was kept on the pressure on the M.K.L. No. 2, and there was no pressure drop during that period. The M.K.L. No. 2 was about 25 foot offset to a Mesaverde well. This well is in Section 5, 26 North, 7 West. It was completed in the Pictured Cliffs and since there was some difficulty with the Mesaverde well, this well was used to blow into the tubing to try and clean out the Mesaverde well and it blew continuously into the Mesaverde well, which was the M.K.L. No. 1, from May the 20th, 1952, until June the 6th, 1952, which was 17 days of continuous blowing, and during that time I kept track of the pressure on M.K.L. No. 2 and there was no decline in pressure.

The M.K.L. 2-8 in Section 7, 26 North, 7 West, also a Pictured Cliff well, was completed for an initial production after three hours of 850,000 cubic feet. This well was opened by accident, the well was tested and then a tool pusher didn't know the well had been tested and he went up and opened it. Nobody knew the well was opened and it remained open and blew continuously from September 2nd through October 8th, a total of 37 days, and during that period a check was maintained because of other activity on the M.K.L. No. 5-12, a direct east offset, and M.K.L. No. 411, a direct west offset. There was no decline in the shut-in pressure of either of the wells. Later when the error was discovered, the well was shut in and the pressures were checked and were the same.

Q Referring to what has been marked as R and G Exhibit No. 1, Mr. Barnes, what does that show?

A Well, these are just ownership and well plats of the Lindrith-Gavilan Area. Here is Lindrith in the middle and this is

Gavilan. This is in Township 24 North, Range 2 West, and this one takes in 25 North, Range 2 West. Before somebody asks, I did not prepare them. I purchased them from Mountain States Mapping Company; they are available to anybody that has twenty-five dollars. We will donate them to the Commission. Unfortunately, we don't have many copies to pass around, because in order to get them up to date and get them in time, and get them from the draftsmen, we could only get two prints this morning.

Q Have you examined the information on those maps?

A Yes, sir, I have.

Q Have you determined that information to be correct?

A It is correct insofar as all my records indicate. If there are any errors, I don't have anything to indicate any errors. The well locations appear to be correct and all the wells are plotted on here that have been drilled in these two townships with the location of the well shown, because it is plotted; the total depth of the well, the initial potential of the well is completed, and elevation and all the pertinent data on each well is in these little figures to the right of the well symbol. If you look at the map you will see the wells are rather scattered through that area, that they are on various spacing patterns, and that the wells are also according to the initial potential or the production that was reported by the operators, they are quite irregular; that they vary somewhat in size. That may be due to a number of things; first of all due to irregularity of the reservoir condition in the area, and that the wells tend to vary widely in their productive capacity over a short space; and secondly, to the method of testing. I don't know how far some

of the operators tested the wells. I would conclude from my own testing that some of them were tested with a pito tube and a pair of track shoes. They must have opened the well and dashed up and tested it in the first couple of minutes, because actually you can get any kind of a reading you want, any way from five million to a couple of thousand. It depends whether you test the well after one hour or three hours or fifteen minutes. I don't know if there was any effort on the part of operators to mislead anybody, but back in 1952 I don't think there was any regulation as to how the well should be tested. It was just up to the operator, and some may have used fifteen minutes or some may have used an hour, I don't know.

Q What do the exhibits reflect?

A They reflect the ownership in there; as you can see there is considerable fee land scattered through this area. They also reflect the fact that the wells are rather scattered. The area has been rather poorly drilled and poorly developed up to the present time. You will also notice that there are quite a few dry holes scattered in among the productive wells. Some of those were drilled deeper than the Pictured Cliffs, some were drilled to the Pictured Cliffs; in any event, under the completion practice that existed at the time, they were unable to complete them. I don't believe there is any possibility of anybody having deliberately walked off or left the well there, because the acreage situation was that many of the wells were drilled to hold acreage. If they could get a well there of any conceivable well, they certainly would have completed the well.

Q In regard to your testimony as to your tests in the Largo

Canyon Area, Mr. Barnes, in your opinion does that same condition prevail in the Gavilan Unit Area?

A Well, actually I don't think the reservoir conditions in the Lindrith-Gavilan Area are anywhere near as good as they are in the Largo Canyon Area where these particular wells were drilled. Some of these wells, one of them at any rate, was at one time, when it was completed, one of the largest Pictured Cliff wells ever drilled in the San Juan Basin up to that time. It was the M.K.L. No. 1-6 and completed for 7.6 million cubic feet per day, and in fact the gauge was so large that nobody would believe it, including myself, and El Paso Natural Gas came out and gauged it a couple of times to confirm the gauge; that brings up another point, namely, the spacing. At the time these wells in Largo Canyon were drilled, they were drilled on 160-acre spacing. The size of the wells is quite irregular and if the wells had been drilled on 320 acres, using -- it doesn't make any difference whether they were drilled in the northeast, southwest, or the north -- a good many good wells would have been passed up. The example of that is in Section 7 of 26 North, 7 West, if that Section had been drilled on, let's say, a northwest-southeast pattern, you would have obtained two wells, both of which were comparatively small. The one in the northwest corner made 450,000 cubic feet, the one in the southeast made 850,000. That would have been your reward for drilling in there on 320 acres. Up in the northeast quarter of the same Section is a well that made 5.7 million cubic feet. Down in the southwest quarter is one that made 460,000. Obviously on 320 acres you would have missed that big well. Of course, you can reverse it, you can turn it around the other way and show that

if you had established a 320-acre spacing pattern opposite to that, you would have missed some big wells that way. It is my opinion, based on my own experience in the Basin, that the development of the Pictured Cliffs sandstone, except for certain economic or acreage reasons, from the standpoint of reservoir conditions should be conducted on one well to 160 acres because the short range facies changes in the reservoir are such that you have a minimum of optimum sands and the maximum of minimum sand conditions. Therefore, if you drill on 320 acres what you do in effect, you reduce the mathematical possibility of encountering optimum sand conditions. Conversely, if you drill on 160, you increase the mathematical possibility. You are drilling a stratographic trap. Structure doesn't mean anything, it doesn't have any particular importance. You are throwing darts at a board, you are just probing holes in the dark, there is no way in the world you can predict the trends except in a general nature. The only way to find them is to drill holes in the ground. The more holes you drill up to a certain point, the better chances of developing these trends.

Q Would the drilling, in your opinion, of wells on 320-acre spacing patterns result in the failure to recover gas?

A Well, I don't know that it would, that is kind of a flat statement. I would change that and say this: that based on my own observation of the Pictured Cliff sandstone there aren't very many areas where one well to Pictured Cliffs would drain more than 160 acres. In fact, in a lot of areas I am not sure it would drain even 160. It depends on the reservoir conditions at a particular point.

Q In your opinion, will one well drain 320 acres in the Gavilan Unit Area?

A I seriously doubt it. I seriously doubt if one well would adequately drain 320 acres in that area.

Q On what do you base that conclusion?

A Well, I believe that while the Pictured Cliff sandstone is present in the area, I believe that the sand conditions are rather hard and tight, that over much of the area the sand contains a large proportion of silt and shale, and also that the sand contains a fairly good quantity of both calenitic and bentonitic clays and has a high connate water content and that the clays are pretty well saturated with water; and they just don't provide for very good permeability or good well drainage over a large area.

Q Mr. Barnes, do you know how many wells the R and G Drilling Company has drilled in this area?

A As I understand it, they have drilled a total of eight wells, five of those they have just surface casing set, the wells haven't been completed. Three wells, the R and G 101 and the R and G 102 and the R and G 103 have been drilled, to or through Pictured Cliff, and they have attempted to complete these wells.

Q Do you know with what results?

A It is my understanding that the wells have been thus far non-productive, that the wells were oil-sand fraced selectively, oil-sand fraced through perforations in the casing, and that they were not able to achieve commercial production in any of them.

Q Have you examined the logs on those three wells?

A Briefly I have.

Q Do you have those logs available, Mr. Barnes?

A I had them some place, I guess I left them down here -- here they are.

Q Do you have anything you want to add to your statements?

A No, I don't believe so.

Q Mr. Barnes, during your experience in the San Juan Basin, based upon the geological information, study of logs, and study of outcrops and other evidence available to you, do you have any evidence that one well will drain 320 in the Pictured Cliffs formation?

A To my knowledge there never has been any conclusive test that you can put your finger on and say that absolutely that would drain, Pictured Cliffs well would drain 320. I don't think there is any 100% conclusive test that one Pictured Cliff well will drain 160 acres. It may be that it is too early in the development and they haven't run enough tests, but certainly I don't know of any.

MR. KELLAHIN: That is all.

MR. PORTER: Are you through with the direct examination?

MR. KELLAHIN: Yes.

MR. PORTER: Suppose we take a recess until 1:15.

MR. KELLAHIN: We would like to offer in evidence Exhibits 1 and 2.

MR. PORTER: Is there objection to these Exhibits 1 and 2?

MR. BRATTON: Is that the maps on the board?

MR. KELLAHIN: Yes, sir.

MR. BRATTON: I would like to ask some questions before they are introduced.

MR. PORTER: All right.

MR. BRATTON: After the recess.

MR. PORTER: Yes, sir.

(Recess).

(R and G Drilling Company Exhibits
Nos. 3 through 7, inclusive,
marked for identification).

MR. PORTER: I believe that Mr. Kellahin concluded his direct examination of the witness. Are there other questions?

MR. BRATTON: I have a few questions.

MR. PORTER: Mr. Bratton.

CROSS EXAMINATION

By MR. BRATTON:

Q Mr. Barnes, in R and G Exhibits 1 and 2, is the information contained on those exhibits pertaining to initial potential tests subject to the same factors brought out there relative to Mr. Larson's information as to the wells drilled back in the early days?

A Yes, sir. Those, the well data on both of those exhibits was obtained from the data that was turned in to the State Oil Commission and the United States Geological Survey.

Q You cannot verify the tests made or the methods under which they were made?

A I don't know how the tests were run as they are listed on there. Those are the tests that are available for public record.

Q Mr. Barnes, you were testifying about some interference tests that were run in, I believe 27, 5, or 27,4?

A It was in 26 North, 7 West.

Q 26 - 7. That would be approximately 30 to 35 miles west of the proposed Gavilan Unit Area?

A That is right, it would.

Q Mr. Barnes, you were talking about a well in the Canyon Largo Unit. Had there been any wells drilled between that unit and the proposed Gavilan Unit Area with higher pressures and higher --

A (Interrupting) I wasn't referring to the Largo Canyon Unit. I was referring to what was known as the Largo Canyon-Pictured Cliff Pool. I don't believe the area I was referring to was in the area as unitized at all.

Q Are there any larger wells between that area and the area we are discussing here?

A Yes, sir, there are at this time.

Q Those wells run up to how large a well?

A Oh, this is hearsay, I didn't test it, but according to the records I understand as high as eleven and even thirteen million.

Q Would you say that the largest wells in the San Juan Basin in the Pictured Cliffs are along the western side, or are there larger wells going toward the east, towards the proposed Gavilan Unit Area?

A Actually, there are some pretty good sized wells scattered all the way through it. They don't seem to follow any particular size, you must realize that some of the later wells, very large wells were completed by improved methods. It is quite possible that some of the larger wells were sand fraced or water fraced, they might be as big, it's possible.

Q I believe you testified that R and G has drilled three wells since March of this year in the proposed Gavilan Unit Area?

A I don't know when they spudded in their first well, but they have drilled three wells, to or through the Pictured Cliff sandstone, through, I believe.

Q Do you know how many of the wells were spudded after the application was filed?

A No, I don't.

Q In your discussion of the drainage of 320 acres or 160 acres, did you give any consideration to the economic factors involved in the drilling of those wells?

A No, I didn't, and for this reason -- when you are talking about economics of drilling under present-day conditions, it is a case of what is one man's food may be another man's poison. Before the war when you talked about the economic situation, something was uneconomical, it applied to everything. Now you have a different tax situation, you have different ways of operating and different sizes of operation, so that one man may be able to operate under conditions that would be completely uneconomical for someone else.

Q Therefore, in your testimony you have given no consideration to the economics of drilling on 160 as opposed to 320 or some other size spacing?

A Well, I wouldn't say I haven't given any consideration to it. I have kept in mind the fact that so far most of the drilling in the Pictured Cliffs has been on 160, it apparently has been economical. There hasn't been any reason to believe otherwise.

MR. BRATTON: I believe that is all the questions I have.

MR. PORTER: Mr. Larson.

By MR. LARSON:

MR. LARSON: Robert Larson with San Juan Gas Corporation. I have a few questions.

Q I think that you testified that when you tested those wells

in that area, some of them started with potentials as high as five million the first few minutes and blow down to several hundred thousand in two hours or two and a half?

A That is correct.

Q You also testified that fracing over the Basin often-times increases production several times above what you would anticipate through shooting a well. If that is true, don't you think that fracture treatment of the wells in the Gavilan Area can increase the production by a considerable amount?

A It is entirely possible that it could; however, based on information that Mr. Russell will put forth here, it doesn't appear to work in all cases. Certainly they didn't have any success with it in the three R and G wells.

Q Could you say whether those three R and G wells that the situation was due to mechanical failures or whether it was due to the inability of the sand to produce?

A I don't know.

Q When you made those tests on the wells in the Gavilan Area, were they produced long enough to actually let them clean themselves up before you took your potentials?

A Those wells had all been pretty well cleaned out and during the testing they didn't make any water. Some of them on and off, ten or fifteen minutes would make a big slug of distillate, and after blowing that out would then go ahead. The gas is quite wet over there as far as heavy fracs and distillate go.

Q You said the wells in the Gavilan Area varied greatly on their initial potentials. Do they vary greatly on the pressures?

A No, they don't. The pressures are fairly uniform. However,

pressure isn't necessarily an indication of the ability of a well to produce. In fact, it may not mean anything.

Q You also testified that in your study of the Pictured Cliffs throughout the Basin that you have rapid shale-sand interfaces. You think this would be true in the Gavilan Area?

A Yes, I certainly do.

Q Then you think two or three wells could determine productivity of the Gavilan Area as a whole?

A No, I don't.

Q The dry holes that you spoke of in the Gavilan Area, you say they are definitely dry holes or do you think they could be completed as gas wells?

A Well, at the time they were drilled, efforts were made to complete them and under the completion practice that was in effect at that time, they were not able to complete the wells. Now whether that was the method involved or whether due to sand conditions, that is something that nobody knows right now.

Q I believe that the Green Briar well in the east half of Section 9 of 25 North, 2 West, was reported as temporarily abandoned. Do you know whether that is true or not?

A Which well is that?

Q It is the Green Briar-Stevenson, it is in the southeast quarter of 9, of 25 North and 2 West. I can't give you the number of the quarter section.

A You say it is Stevenson well?

Q Yes.

A I don't know what their reasons for temporarily abandoning that well are, it may have something to do with the fact that it

was an extremely small well, or it may have had something to do with the acreage or Federal or State regulations.

Q I think if you will check, you will find that well does have tubing in it with pressure gauges on it and will produce gas.

A It had tubing and pressure gauges and a head on it when I tested it in 1952. I haven't been back there since.

Q You think that on figuring on your gas, which do you figure your most important, the open-flow potentials or the reserves that it will make?

A What was that again?

Q You think open-flow potentials or the total reserves of the well, which would you give greater credit to? Which do you think should be the one that you should look for most, high open-flow potentials or large reserves?

A If you have a large reserve and it can't get out of the ground, what good is it?

Q I am speaking of just reserves, recoverable reserves, well, put it that way.

A Well, it doesn't make any difference what the estimated or volumetric estimate of the recoverable reserve is if you can't get it to surface and into the pipeline. If the well won't put it into the line you have nothing.

Q What I am talking about is recoverable reserves, you can deliver to the pipeline.

A I think a deliverability test made at the well head is a better indication of the well's ability to produce and what percentage of the reserve will be produced.

Q In your testimony you said that by drilling on 160-acre

locations you could get the wells with high potentials on them, where you might overlook one with 320. Then by the same token, if we are looking for wells with high potential, don't you think we can drill on ten's and get it? The reason we don't drill on ten's is for economic purposes?

A There is minimum economic limit in these things. When the Basin was opened up the drilling was on 40 and some on 80 acre spacing. After development for a number of years and the fact they ran into offset problems and acreage problems and everything else, they had a hearing and I believe it was the Southern Union Gas Company that instituted the hearing back in 1947, I think, '47 or '48, and they asked for the 160-acre spacing which was based partly on reservoir conditions and partly on economic conditions. It has been in effect since then, and in the most part has been fairly successful. They seem to have found what apparently was a pretty good level of drilling economics and reservoir factors in the 160 acres.

Q That 160 is predominant over the western part of the Basin where your production varies from 1700 to 2200 feet?

A It was in effect in the entire San Juan Basin until fairly recently. These 320-acre spacing units and so on are a latter-day thing that has come about in most recent times, mostly in the Mesaverde.

Q Do you think, I think you said at one time that you thought this area may have low permeability due to the fact it has high connate water, which causes the shale particles in the sand to swell and reduce the permeability?

A No, I just said that was one of the factors that might cause

a low permeability, the fact that the cementing matrix appears to have considerable water in it and probably is already saturated has all the water it can hold and has swollen as far as it can swell. That, with other factors, acts as a block.

Q Doesn't the Pictured Cliffs have the connate water and calenite and bentonite in the lower part of the Basin?

A Yes, but there is a big variation from area to area, believe me.

Q That is what I am getting at. You think that water frac, then, where you have calenite and bentonite, water frac doesn't apparently cause the bentonite to swell?

A How could it if it is already fully saturated, has all the water it can take? The water won't hurt it at all, in fact it has been my contention for many years and in opposition to everyone else, that water would not hurt a Pictured Cliff or Mesaverde well. I think that is on record in some of the cases I have testified to here in the Oil Conservation Commission.

Q You said, I think, one other time, that there have been no tests to prove that one well will not drain 320 acres or that will prove that one well will drain 320 acres. Have there been any tests taken to prove it wouldn't drain 320 acres?

A Let me put it this way: There is no test to prove that it will drain 160 acres, so if you can't prove it will drain 160, it can't very well prove it will drain 320.

Q Then information is lacking at the present time?

A That is right. The indications are that it might drain 160, whether it will drain any more than that, I don't know.

Q We don't know at the present time?

A That is right.

MR. LARSON: That is all.

MR. PORTER: Any more questions? Mr. Kendrick.

By MR. KENDRICK:

Q Mr. Barnes, in your testimony about tests of some of the wells in the Gavilan Area, I believe that as a matter of terminology I understood you to say that some of the wells would draw five million feet in the first 15 minutes. Do you mean at the rate of five million feet?

A Yes, through a ten-inch nipple at the rate of around five million cubic feet within the first 15 minutes, that was going downhill at a very rapid rate.

MR. KENDRICK: That is all.

MR. PORTER: Any more questions?

MR. KELLAHIN: If there is no more cross examination, I have one question.

REDIRECT EXAMINATION

By MR. KELLAHIN:

Q You were questioned by both Mr. Bratton and Mr. Larson as to the problem of economics in the drilling of the wells. In considering the economics of drilling, would you have to consider the factors other than the cost of the actual drilling operation?

A Yes, certainly.

Q What would those factors be?

A You would have to figure the cost of your equipment, the cost of your drilling operation, that is whether that is obtaining the equipment to drill the well; if you were in the drilling business and had the equipment, it would cost you less than if you hired

somebody with a contract. There would be supervision and overhead, how many engineers or geologists you had in connection with the operation, how big an office staff you had, and then of course your tax situation, that is extremely important. If you are spending five-cent dollars, obviously you can afford to take a lot of chances.

Q In addition to that, the economics of drilling would be governed by your recoverable reserves and the drainage of the area involved, would it not?

A That is correct. The productivity of the wells and the ability of the wells to pay out, the length of time it took them to pay off the initial investment, and the amount of gas that you could figure on in a reservoir, and the percentage of that that was recoverable. That all enters into your economics.

Q Do you have any of that information in the Gavilan Area?

A I have made reserve estimates in there in the past, along that side of the Basin. I don't have any of the data with me and I am not prepared to testify on it at this time.

Q Do you have any information on the recoverable reserves?

A I couldn't tell you about the recoverable reserves over there, they haven't had any wells on production to give an idea whether they will put gas in the line or they won't.

Q That information is not available?

A No, it would be subject to personal opinion or pretty much of a guess.

MR. KELLAHIN: That is all.

MR. PORTER: Mr. Bratton.

MR. BRATTON: We have no further questions.

MR. PORTER: Do you have exhibits you wish to offer?

MR. KELLAHIN: We offer exhibits 1 and 2.

MR. PORTER: Any objection to the exhibits?

MR. BRATTON: No objection.

MR. PORTER: They will be received. The witness will be excused.

(Witness excused).

Do you have any more witnesses, Mr. Kellahin?

MR. KELLAHIN: Yes, sir. I have Mr. Russell. He has some brief testimony.

W I L L I A M C. R U S S E L L,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. KELLAHIN:

Q Would you state your name, please?

A William C. Russell.

Q Are you connected with the R and G Drilling Company?

A Yes, I am president.

Q Mr. Russell, does R and G hold any acreage or drilling rights to any acreage within the area under consideration in the Gavilan Unit?

A We have about 5,000 acres in 24, 25, and 26, 2, in 24 and 25, 2; the subject acreage. We have eight complete 160-acre locations in 25, 2 and in 24, 2 we have three complete 160-acre locations. We also have five partial locations in 24, 2 and eight partial locations in 25, 2.

Q By partial locations, do you mean less than --

A (Interrupting) I mean 40 or 80's.

Q Do you have any acreage immediately adjacent to the area involved in this hearing?

A Yes, we have two 160-acre locations in 25, 3, and also 40 acres over there and in 26, 2 we have nine 160-acre locations and five partial locations up there.

Q Mr. Russell, you have testified as to the number of 160-acre locations; in the event that the Commission saw fit to grant this application and the units were formed as requested by the applicant, how many drilling locations would you have on 320?

A We would have three, one of which we have already drilled and gotten a dry hole.

Q How do you hold this acreage, Mr. Russell?

A Well, we have 860 locations which we acquired from Gulf on a farm-out which requires us to drill four wells this year and four wells next year. On the rest of the acreage, most of which is fee on which we bought the leases, we have to drill half the locations this year and half next year.

Q If you fail to drill the locations what happens?

A We lose the lease on the undrilled portions of the lease.

Q That is within the area stated by you?

A Yes.

Q Have you drilled any wells over there in this area, Mr. Russell?

A Yes, we have drilled three.

Q I hand you exhibits marked 3 through 7, inclusive, and ask you to state what those are.

A Exhibit 3 is a Slumber-J electric log of the R and G 101;

Exhibit 4 is an electric log of the 102; Exhibit 5 is an electric log of 103; Exhibit 6 is a micro-log of 103; Exhibit 7 is a micro-log of 102.

Q Have those logs been made available to the San Juan Gas Corporation?

A I instructed Schlumberger to distribute copies to San Juan Natural Gas.

Q Have you ever received any logs on wells drilled by them in this area?

A No, I understand they were drilling dry holes down there.

Q Mr. Russell, were you present at the drilling and completion of these wells?

A Yes, I was.

Q Personally?

A Yes.

Q Did you notice any unusual conditions in the drilling of these wells?

A Well, we drilled twenty-three pictured Cliff Wells in the Basin last year and in those wells we always, when we encountered the Pictured Cliff sand formation there was a drilling break and they drilled fairly easily through the sand, but down here in this area we have found that the sand is very hard and with the drilling time running up to 20 minutes per foot, that is carrying about 35,000 pounds of weight on a new bit -- it didn't all drill 20 minutes to the foot, but would run anywhere from 7 minutes to 20 minutes, usually around 14, 15, minutes.

Q What does that indicate to you?

A That is a very hard formation, very tight.

Q Mr. Russell, what was done toward completion of these three wells?

A Well, in each instance we drilled completely through the Pictured Cliff formation, logged it and set pipe all the way through. We perforated the pipe and sand fraced. As yet we haven't seen any gas.

Q Could you describe what operations were actually carried on on those wells?

A All right. We perforated in the 101, which we were not able to get a micro-log on, we couldn't get the log down. We had to get the electric log through the drill pipe sections at a time. We picked out the likely looking zones there and perforated some 25 feet with well-x torpedo jets three to the foot and in-fraced and the formation, we thought the formation was fracing it, but broke down at about 2500 pounds. However, we set a plug after fracing the lower section and perforated the upper section, and then we discovered that we hadn't broken the formation at all. We had broken our cement job, we got all our sand and oil back and we squeezed that well three times until we were convinced we did have a cement job, and went back and perforated again and fraced and apparently everything went off as it showed, but there was not a show of gas after swabbing for four days.

Q What is the situation on your 102 well?

A It is just about the same as the 101, except we had a cement job, we didn't have to squeeze.

Q What was the situation on the 103?

A Just about the same. The 102 we perforated with bullets. It was our best looking log and we perforated the dry pipe with

and tested, and there was no water, no mud returned, so apparently we had a good cement job, so we loaded the hole with water and started swabbing, trying to swap up some gas. We never swabbed up enough to burn. Then we got well-X's formation fracturing tool, the so-called bore gun and we put four charges of that into the formation and fraced, and as yet we are still working on that well, we haven't any gas.

Q Mr. Russel, how long have you been engaged in the business over there in the Gavilan Unit Area?

A Actually drilling about six weeks, I suppose.

Q How long have you been getting your leases and getting ready to operate?

A Oh, I guess back about a year.

Q Did you take your leases in reliance upon the State-wide 160-acre rule?

A Yes, I did.

Q What would be the effect of the granting of this application on you?

A Well, I certainly would be out of business in the Gavilan Area, anyway.

Q You feel that you would lose the leases?

A Yes, we would have to drop the leases and quit.

Q In your opinion, will one well drain 320 acres in this area?

A Well, you can't drain one acre yet. I don't think so.

Q Do you feel that the granting of this application would protect your correlative rights?

A I am afraid it wouldn't.

MR. KELLAHIN: That is all. At this time we offer Exhibits 3 through 7.

MR. PORTER: Exhibits 3 through 7, inclusive. Are there objections to the admission of the exhibits?

MR. BRATTON: We have no objection.

MR. KELLAHIN: I have one other question.

Q Mr. Russell, there has been some discussion here of economics; what would be the effect of the 160-acre unit as against a 320-acre unit be on you in that respect?

A Well, our situation is such that we don't like to pay a lot for leases because that is cash out of pocket, whereas these wells run about 80% intangible drilling cost, on which there is a great tax advantage. We have been paying \$25.00 an acre down there for leases, \$12.50 cash and \$12.50 out of 50% of the production, which amounts to \$2,000.00 cash outlay per 160-acre location. I don't feel that we would pay \$4,000.00 for one drilling location. I think that is just about as far as we would go, \$2,000.00 cash outlay for one drilling location.

Q Who does your drilling?

A We do our own.

Q You own your own rigs?

A Yes.

Q How many rigs do you have?

A We have two.

Q Any other equipment?

A Yes, we have three trucks and that is about it.

Q What are you doing with this equipment, pending the decision in this case?

A Well, we have it all staked and the employees waiting around down there.

MR. KELLAHIN: That is all.

MR. PORTER: Mr. Bratton.

CROSS EXAMINATION

By MR. BRATTON:

Q Mr. Russell, have you considered the possibility of communicating these 160-acre locations to which you testified?

A Well, no one has really approached me from that angle, but it had occurred to me that something like that might be worked out. However, our situation is such that we won't drill the lease on which the working interest amounts to less than 75% of the total. It is my understanding that some of the San Juan Gas acreage is burdened with more than a 12 $\frac{1}{2}$ % override, maybe that is wrong, I don't know. There is no way of knowing.

Q You have made no efforts or taken no steps toward communication of the area?

A Well, no overtures have been made to me along that line.

Q You mentioned your contracts to drill four wells this year and four wells next year. What do you mean, when does that yearly period start? I believe that was your Gulf contract.

A Yes, that is the Gulf contract. It started April 9.

Q On your other contracts you stated substantially the same thing, one-half this year and one-half next year?

A That is right, yes.

Q When do those begin?

A They begin -- of course, there are probably seven of those leases covering acreage that we have acquired so far and they

commenced around the 1st of March and run down until the present time. As a matter of fact, we have one lease in escrow over at the Albuquerque National Bank covering two 160-acre locations, on which today is the last day that we have to either pay for those leases or drop them.

Q Are those within the Gavilan Unit Area, proposed Gavilan Unit Area?

A No, they are in 26, 2; however, if a temporary order issues for 320-acre spacing in 24, 2 and 25, 2 we are going to drop everything we have in 26, 2 and everything we have in 25, 3 and everything in the area, because we have no assurance that if we go and drill on 160 somebody won't come in next month and ask for 320 spacing up there. We are not going to run that risk again.

Q Do your contracts have provisions in them that they are subject to applicable laws and rules and regulations?

A As I recall only the Gulf farm-out contract does.

Q You don't recall whether the others do or not?

A I don't recall about the others, no.

Q When did you commence the three wells which you have drilled in this area?

A I don't recall the exact date, however --

Q (Interrupting) Let me ask you this way; were they after this application was made and brought to your attention?

A No, we had all those locations staked before I knew about this application.

Q But you did know about the proposed Gavilan Unit Area and the steps which had been taken toward its formation?

A Nobody told me, I suppose it was three weeks ago I saw a

notice in the New Mexican, a legal advertisement, and about two weeks ago I got notice from the Commission.

Q No, I am talking about the proposed unit area, the Gavilan Unit Area, not this hearing.

A Oh, Mr. Morrell, as a matter of fact, Mr. Phillips called me two months ago. I was here at the hearings two months ago when he called and told me what he was proposing to do in this area.

Q That was prior to the commencing of any of the wells?

A Prior to commencing the wells, yes.

Q What is your total acreage within the proposed Gavilan Unit Area?

A I can figure it for you right quick. It is 2,960 acres.

Q That is a little less than 10% of the proposed Gavilan Unit Area, isn't it? It is 30,000 acres so it would be a little less than 10%?

A Well, that is practically 100% of the acreage we have on which we can drill.

Q How many 320-acre locations do you have undrilled within the proposed unit area?

A We have two.

Q You say if this order or a temporary order were issued, you would drop your acreage north of here and west of here?

A We'd get out of the area altogether, yes.

Q You know there has been an order entered in the Tapicito Area for temporary 320-acre spacing?

A I am not familiar with that at all, didn't know that.

MR. BRATTON: I don't have any other questions.

MR. PORTER: Mr. Mankin.

By MR. MANKIN:

Q Mr. Russell, you indicated you had some acreage west and northwest, I believe, in about 26, 3, did you not?

A We have some acreage in 26, 2 and 25, 3.

Q Isn't this some of the acreage that you speak of within the Tapico Area, or are you aware of the Tapicito Area?

A I don't know the exact outline of the Tapicito Area, however --

Q (Interrupting) I believe Mr. Morrell's Exhibit here indicates that this area here on his Exhibit No. 4 is Tapicito Area.

A No, we have one location in the southeast quarter of Section 35, which is 160-acre farmout from Magnolia, so apparently they favor 160-acre location down there.

Q What Section was that?

A Section 35, which would be outside that.

Q Is that in 26?

A That is 25, 3.

Q 25, 3.

A Yes. We have one location, this Section 1, 25, 3 which is also outside that unit.

Q That is actually just adjoining the first one we mentioned, adjoining the Lindrita Area?

A Yes.

Q I will ask you, in regard to your three completions, your 101, 102, 103, or attempted completions, what size of sand-oil frac treatment did you perform on each of those?

A We have a five hundred barrel tank which we used, and in addition to that, we loaded the hole, which makes it a treatment of

about 25,000 gallons.

Q Is that for each of those three attempted completions?

A Yes, we used oil on the first two and water on the third one.

Q The first two that you used oil, was that a sand treatment as well?

A Yes.

Q About a pound or so of sand, would you say?

A A pound, yes, it averaged out about a pound per gallon.

Q On the water frac or the third one, is that the last one, the 103?

A The last one was the 102.

Q The one that used the water?

A That is the one we used the water on, yes.

Q What were the amounts used there?

A We used the same amount of water, 25,000 gallons, and we only used 14,000 pounds of sand. We used a coarse sand, 10-20, I didn't want to get too much in there, afraid it may sand off.

Q Did you ever break the formation down on any of the three treatments?

A I don't know. The treating pressures indicated that we had broken the formation. I think that we broke a formation somewhere but as far as breaking the hard Pictured Cliffs formation, I have doubts of it.

Q None of the three have you been able to get any sizeable quantities of gas?

A No, we have never gotten any gas at all. We could swab up after a frac we could swab up a little gas on top of the swab,

there would be enough to light but not enough to burn steadily, just while pulling the swab it would burn.

MR. PORTER: Anyone else?

MR. LARSON: Robert Larson. I would like to ask a question.

MR. PORTER: Mr. Larson.

By MR. LARSON:

Q Did you state previously that you were not interested in half-locations?

A No, we are not interested in half-locations.

Q Then do you mean by that you'll drop all your acreage in the Gavilan Unit that you do not have 160 acres on?

A We'll keep what we have on 160 acres and we have paid for, we will keep it until it expires. We will lose it naturally. We have some other leases there on which we haven't paid for and we certainly don't intend to pay for, if there is 320-acre spacing, because --

Q (Interrupting) You have quite a bit of your total acreage in 80 and 40, don't you have a fair amount in 80 and 40?

A Yes.

Q And you have no intentions of drilling those or joining us into any of those even on 160's?

A No, we wouldn't join with anyone in drilling a well. We would try to piece out those locations where we have 80, we would try to acquire the other 80 in some manner, farm-out, or buy it, and go ahead and drill it ourselves. We are not geared to a partnership drilling program.

Q The dry hole, have you plugged that well?

A No, we haven't plugged any of the wells.

Q Then it is not a dry hole in your opinion?

A Serious --

Q Well, I mean --

A I tell you --

Q Don't you plug dry holes?

A Well, I haven't plugged these yet.

Q Do you think that they are dry due to mechanical failure or due to failure of the formation to produce?

A Well, I certainly don't know. I suspect that it is failure of the formation to produce.

Q Well, your three locations you have drilled, one of them in your major acreage block, one of them, the wells in 2 and 3 are in the southeast portion of that, and the well in 28 is in the northwest portion of your acreage block, is it not?

A The one in 28 is on the southwest quarter, the one in 2 is southwest, the one in 3 is in the southeast quarter.

Q The predominance of your acreage in the Gavilan Unit lies between the well in 28 and the well in 2, does it not?

A No, I wouldn't say so.

Q Well, you think that then if these wells are dry, due to the fact that the formation is tight enough in that particular area of the Gavilan Area, that it wouldn't produce; do you think you would make more gas than that if you drilled two of these types of wells to 320? Do you think that would improve your recoveries out of it?

A I am afraid I don't follow you.

Q You say you think the sand in the immediate area through here is too tight to produce. You think that we could produce it

if we drilled it on 160, then?

A I don't know.

Q If a well is a dry hole it is a dry hole whether on five acres --

A (Interrupting) Whether on five or a thousand acres.

Q That is right.

A Yes.

Q You said you drilled 23 wells last year. How many were productive?

A 22.

Q When you could run your log on your first well, that was the one you couldn't get it down, is that correct?

A I got the electric log down, I couldn't get the micro-log down; there is quite a bit of difference in the size of the logs.

Q The first hole did have a bad cement job?

A It did, yes.

MR. LARSON: That is all.

MR. PORTER: Does anyone else have a question? The witness may be excused.

(Witness excused).

Are there other witnesses in the case?

MR. KELLAHIN: We have no further witnesses.

MR. PORTER: Anyone have a statement they wish to make in connection with this case?

MR. ANDERSON: Sir, I would like to make a statement.

MR. PORTER: Mr. Anderson.

MR. ANDERSON: John Anderson, Oil and Gas Supervisor, United States Geological Survey, Roswell. First I would like to

add a correction to a statement that was made yesterday by the representative of the El Paso Natural Gas Company, who said that El Paso was unit operator of the Lindrith Unit and was in favor of 320-acre spacing in the Gavilan, in the proposed Gavilan unit, which adjoins, for the reason that El Paso was going to develop Lindrith on 320 acres. In the first place, Magnolia is the unit operator of Lindrith. In the second place, we have not yet received a plan of development for the year 1956. When we do receive it from whoever submits it, when that plan is approved by this Commission and the Commissioners and the Geological Survey, that will set up the spacing for the wells, not simply a gratuitous statement made here or any place else.

Another thing, in the testimony this morning, San Juan Gas Corporation, quite a bit of material was brought out about the block-type units in the San Juan Basin, a number of them are shown on Exhibit No. 4. Now I think for the benefit of all of us, we ought to take a good look at those block-type units and see just what they do. I have here the unit agreement for the Canyon Largo, which to my knowledge was the first block-type unit that was ever proposed in the San Juan Basin. However, it is not the first one that was approved, in fact it was rather late in the game when it was approved. Looking at the unit agreement to see where we first find any mention of the 320-acre drilling block, comes in Section 11, participation after discovery. This is what it says: "The unit area is hereby divided into drilling blocks containing 320 acres each, more or less, which drilling block shall constitute one-half section by Government survey, the sections being divided by line running north and south in such manner that each drilling

block shall either be the east half or the west half of a given section." Then they go along further: "Upon the completion of the well capable of producing unitized substance or as soon thereafter as required by the supervisor or the Commissioner, the unit operator shall determine whether said well is capable of producing such substance in paying quantities." Then after that is done we go on: "All of the land in said drilling block shall constitute a participating area effective upon the date of first production." Nowhere in this unit agreement is there any statement that says one well or two wells or six wells or any number of wells shall or can be drilled on that drilling block. That drilling block probably is a misnomer. Actually it is a participating block. As far as the Canyon Largo unit agreement is concerned, the obligation well was a Dakota well. This as well as other 320-acre drilling block units was drawn up primarily with the idea of Mesaverde production in mind. That also was brought out this morning.

Section 10: "Within six months after the completion of a well capable of producing unitized substance in paying quantity, unit operator shall submit to the supervisor and to the Commissioner and the Commission an acceptable plan of development." Then we go on and say the plan of development shall be as complete and adequate as the supervisor or the Commissioner and the Commission may determine to be necessary for the timely development and proper conservation of the resources of the unitized area and shall have a specified number and location of any wells to be drilled and the proposed order and time for such drilling and to the extent specified by the operating practices regarding the necessity and advisability

to the proper conservation of the natural resources."

Now nowhere in Canyon Largo is there any obligation to drill one or two wells or any number of wells on these drilling blocks. Whenever the plan of development is submitted for the approval of the supervisor and the Commission and the Commissioner, at that time the number of wells that are going to be drilled on each one of these drilling blocks is going to be considered. Certainly the unit operator nor the approving officials of the State and the Government are going to approve the drilling of wells that would be contrary to any specific or general orders of the Oil and Gas Commission. At the same time, in Canyon Largo I can see nothing in the unit agreement that sets up 320-acre spacing for Pictured Cliffs or for Mesaverde or for Dakota. It just simply says if a well is drilled on 320 acres, that 320 acres is in a participating area if the well is commercial. That is all this 320-acre drilling block says in this one unit.

I have another one here just taken at random, San Juan 27-4 which is fairly close to the proposed Gavilan Unit Area. Their 320-acre drilling blocks are set up in essentially the same language as is used in Canyon Largo. Nothing is said about the spacing of wells or how many wells to be drilled on each one of them. All it says is upon the completion of a well on one of those blocks, the 320 acres is a participating area, and other blocks can be added to that participating area when a well is drilled on it. There is no part of the unit agreement that says you can't drill two wells on it. Of course, in the unit operating agreements, provision is made for taking care of the expense of drilling, and in these block-type units, if two wells were drilled on a 320-acre

drilling block, it would be necessary to make some adjustment in the cost, inasmuch as the usual operating agreement simply contemplates only the drilling of one well. However, the unit agreement does not require that Pictured Cliffs be drilled on 320-acre spacing.

Now as to the proposed Gavilan Unit, Mr. Morrell has outlined essentially the procedure that has been followed and the results up to the present time. He has filed on behalf of San Juan Gas Corporation with our office in Roswell the required three copies of the proposed unit plan, the proper exhibits, and under our procedure we will forward that to our Washington office with our recommendations. In discussions with Mr. Morrell and Mr. Phillips, we have told both of them that the Roswell office does not favor a unit agreement with 320-acre drilling blocks for the Gavilan Area, particularly one of the type that has been submitted, which sets up for the drilling of one well in each one of the 320 acres. It does make provision, however, that additional wells can be drilled at the election of the operator. However, it is our opinion that setting up a unit agreement of that type certainly sets 320-acre spacing for Pictured Cliffs which we ourselves do not believe is proper for this area at this time, inasmuch as no one knows anything about the permeability and the ability of any well to drain any area, whether it be 160 or 320 or 5 acres. In fact, as some of the testimony has shown, there is serious question as to whether there is a present well in the proposed unit area that would produce gas in commercial quantities that is sufficient to pay for well costs or even deliver against the usual pipeline pressure of anywhere from 250 to 400 pounds.

Now I have just one other matter. San Juan Gas Corporation has told us that they have certain commitments from the United States Geological Survey in Washington. The information that I have is entirely to the contrary. With your permission I would like to read certain portions of a memorandum dated April 20, 1956, from H. D. Barton, who is the chief of the Oil and Gas Leasing Branch and my immediate superior, regarding the proposed Gavilan Unit, Rio Arriba County, New Mexico. "On March 8, Mr. Morrell and E. Alex Phillips discussed the case here in a little more detail, but no commitments were made or waiver of procedure indicated.....

Actually, no commitments whatever were made but willingness to permit the filing of proposals discussed was indicated in order that the merits of such proposals could be decided upon the basis of supporting presentations which certainly should include the proponents, yours, the State's, and any other pertinent."

As for the block-type unit versus the standard form, the extent of our commitment was that the block-type unit appeared to better suit certain units under favorable conditions, as for the 320-acre, we indicated surprise that 320 acres may be used for the shallow Pictured Cliffs formation. If the unit, that field condition, warranted even upon a temporary basis, we would consider the facts when presented, however, on the whole, much justification would be expected. Accordingly, the discussion of 320 block-type units carried no commitment as to acceptable spacing other than to review a proposal when submitted. We will consider the Gavilan in the same way as any other when submitted in the regular manner.

That is the close of my statement.

MR. PORTER: Does anyone else have a statement?

MR. MORRELL: Foster Morrell. I would like to clear for the record and for the benefit of the Commission that we have no axe to grind in this entire case. We have tried to keep above-board from the beginning and keep all our material on top of the table; so that the Commission may be fully aware of the significance of the remarks made by Mr. Anderson, we first approached him as to a unit agreement. He expressed the opinions and in his opinion he doubted that one well would drain 320 and was therefore not personally in favor of the 320-acre drilling block. He was in favor of what we know and use, a Federal land as a standard form of agreement. Under the standard form of agreement, the plan of development shall set forth the spacing as Mr. Anderson has so stated, subject to approval of the supervisor, the Commission, and the Commissioner. He has indicated to me that he would have no objection to drilling under a standard form of agreement on an exploratory basis on wells, call them diagonal 160 or 320 with no committment as to eventual spacing of the wells. That is also indicated by Mr. Anderson's action in a letter that is filed with the Commission in the Tapicito case, where he has approved for the one-year period of the temporary order for Tapicito the drilling of wells on 160 acres, retaining the right at any time they saw fit to require wells to a density of 160 acres if justified. I am referring here to a letter dated January 18, 1956, to Humble Oil and Refining Company, referring to the Tapicito Area. We have an honest difference of opinion which makes a good horse race or lawsuit. We are in the position that with only 66% of the proposed Gavilan Unit Area being Federal land, the governmental representatives cannot control the action on the remainder. Therefore, in

view of the actions taken by the Commission heretofore, particularly in the Gallegos Canyon case, where part of a pool was on one spacing and the remainder of the pool was on a different spacing, the spacing had to be taken to the smallest development, in that case, 160 acres.

I re-emphasize to the Commission that I think it is time that the Commission should take cognizance of its action taken in 1948 for a uniform 160 acres for the San Juan Basin. Several thousands of wells have been drilled since then. We know more about potential possibilities of the Pictured Cliffs, we do have a potentially increased market and where such wells are completed that have deliverabilities, that economic recovery can be made on 320 acres. We do not want to be in a position of having to drill unnecessary wells that are not economical. I haven't prepared this as an exhibit, but I would like to show to the Commission the wells in Rio Arriba County that are already drilled or being drilled on a 320-acre basis with or without approval of the Commission. Now there is a sufficient number of wells that if we did get into a position, which I have recommended heretofore, of having 320 acre spacing units, which could result in proration units, that those wells could take advantage of what is double the present allowable. We can operate under a standard form of unit agreement such as Mr. Anderson recommends; however, there are other economic factors involved. The participating area under a standard form of unit agreement has to be based on geologic inference; we get into the discussions, what is in the area should be in the participating area or should not. I have already stated in my previous testimony the difficulties that have occurred in Huerfano which was the

subject of a hearing before the Commission. Again, on the standard form of agreement, all as the participating areas enlarged, as Mr. Anderson brings up the operating agreement, there has to be retroactive adjustments on the cost of wells. It is a very complicated procedure, particularly if the adjustment goes over a tax period and you have already paid the taxes. Whereas, under the block-type of unit, the economics from the working interest owners are so much simplified because the operating, the working interest owners of that particular drilling block in 320, if it is a standard form, pay the cost of that well, that drilling block becomes a part of the participating area; the operators in adjoining drilling blocks pay for the cost of that well. That eliminates the question and the discussion that comes about so often between working interest owners, that your well cost more than mine. This way you essentially pay for your own well. There is no retroactive adjustment in cost.

I think it is very clear and very easy to see that there is a very great simplification. It is true as Mr. Anderson says that the drilling block doesn't set the spacing unit, but is essentially the same as I mentioned before, that a 40-acre allowable or 80-acre, say in the Crossroads in Lea County, is granted to a pro-ration unit; you can drill as many as you want but you still get that one allowable. Now on a drilling block, if you get one well on 320 and you put your entire 320 into participation, the royalty owners are protected and the working interest can determine whether it is economically feasible to drill the second well.

I merely wanted to clear that statement, although it may seem to be a difference of opinion, we have only the basic principle

of which type of agreement would be most satisfactory. I would like to also state that I believe my testimony will show and the exhibits will show that I did not claim there were any commitments made by the Washington office. It is quite difficult in drawing a unit agreement and time-consuming and costly to the other parties; if we had the possibility of two types of agreement, we got Mr. Anderson's opinion, we expressed that and delivered it to Washington. The gentlemen we spoke to there, they saw no reason why we shouldn't submit it for consideration. The exhibit that I have filed says they were informal understandings subject to filing for approval, so there was no specific commitment. We were asking for suggestions and received them.

MR. KELLAHIN: May it please the Commission, I will try to be as brief as possible, but we are confronted with a decision here that is of great importance to my clients. In the first place, I think we are all in agreement that the action taken by this Commission is going to govern the development of this pool in the future, and I would like to call the Commission's attention to Section 65-314 of the New Mexico Statutes in regard to the allocation of production, pooling and spacing. The witness for the applicant has testified and I find myself in agreement with him, that the spacing order entered by this Commission will doubtless become the proration order of the future, and on that basis I feel that the Commission should take into consideration the requirements for the allocation of production at this time. Further than that, the statute itself covers spacing as well as allocation of production and therefore applies to the setting of a spacing pattern. In that connection, the rules require that this Commission consider the

area that can be efficiently and economically drained and developed by one well. In so doing, the Commission must consider the economic loss caused by the unnecessary drilling of unnecessary wells, the protection of correlative rights including those of royalty owners, the prevention of waste, the prevention and augmentation of risks from the drilling of excessive numbers of wells and the prevention of reduced recovery from too few wells.

To me this seems to be a strange case. It has been presented, we have been listening to testimony lasting throughout this day, and yet there is not one shred of evidence in the record, not just to show that one well will drain 320 acres in the Gavilan Unit Area, there is no evidence in this record or testimony in the record that one well will drain 320 acres anywhere in the Pictured Cliffs formation. The witnesses all testified that such information is not available. There is no interference tests shown, although we have several thousand wells drilled in the Pictured Cliffs. Certainly if one well will drain 320 acres at this late date somebody could come forth with some evidence to show that one well will drain 320 acres.

We are dealing with a situation which has arisen and affects my clients in particular, where in reliance upon a State-wide rule they have gone in and purchased 160-acre units for the purpose of drilling. They are not big operators, they want to scatter their risks as far as possible. They want to get into the oil business as rapidly and economically as they can. They had a right to rely on the order of the Commission which set the drilling units in New Mexico on gas in the northwestern portion on 160 acres. Now they are faced with the proposition that as soon as they buy

160-acre drilling locations and leases, someone comes along and applies for an order which can prevent them from drilling those units. The only remedy down the road undoubtedly would be, and I personally would certainly hate to see this, a legislative enactment setting the size of the unit. It was done done in other States and would be precisely for the reason done here. The operators have a right to rely on the orders of the Commission after they have risked their money and ventured their capital in order to get into the oil business.

Insofar as the effect of these other units which have heretofore been approved, in the first place I think that Mr. Anderson has effectively answered the question as far as the size of units involved in those unit agreements is concerned. However, I would like to point out that it is the position of the applicant that they have effectively, by securing approval of these unit agreements, they have effectively set up a 320-acre spacing. If that is true, I don't know what they are before the Commission for, they have a unit, aside from approval of their unit agreement, with which we have no quarrel. If they want a unit agreement we have no objection to that, certainly. According to their position, approval of that unit agreement will give them 320-acre spacing within this unit. The only reason they want a rule affecting the entire area on 320-acre spacing is to keep Mr. Russell from drilling wells. That is exactly what the witness said. He said, "We don't want him drilling wells that we will have to offset." Certainly he has got as much right to drill up there as the San Juan Gas Corporation has. He has run the same risks and he has gone somewhat further already than the applicant has, in that he has attempted to complete the

wells up there, and he has staked, in addition to that, five other locations and set the surface string on it. There are eight wells under way in that area as against a proposed development program of ten wells for some 30,000 acres, which this applicant is proposing to develop. We are already well on the way on some 2,000 acres with eight wells. Now those people who own the mineral interests are entitled to development, and I, as you know, am representing some of them in this hearing, too. If their correlative rights are to be protected, then certainly the man who is willing to drill on 160 acres, and has found it in other areas economical to do so, is entitled to the opportunity to do so in this area.

I would like to very briefly go over the testimony that has been offered here. All the way through, they want this order in order to determine what the reserves are, they don't know. They want the order to protect them from having to drill offset wells. In effect, they say they want the order for economic reasons, and yet they have produced no economic reasons. They have no economic information. There is just no basis in this record upon which this Commission can grant 320 acres. Economically, it may not be feasible to drill on 160 acres, that I don't know. Certainly with three dry holes I am sure Mr. Russell would agree that the three dry holes were not even on it, but if you are going to change the state-wide rule, then the burden is upon the applicant to show the reason for changing that rule. The only, the most remote evidence that they offered here which would support anything was the question of economics; in other words, they don't want to drill on 160 because it is cheaper to drill on 320. If you are going to consider economics, then you have to consider many, many

factors besides the initial cost of the well, and that is the only testimony offered by the applicant in this case. The testimony was that it cost \$35,000.00 to drill a well. They have no record on production; they had some testimony in here in regard to some potentials based on a pressure test, and as Mr. Barnes testified, that pressure test on a shut-in well is practically meaningless when you don't let it blow down for at least three hours or more. Their own testimony is that they opened the valve for some five minutes. That gives no potential on a well. There is no core data available. There is only the roughest sort of estimates in regard to porosity and permeability. There was an attempt to give some reserve figures, but there was no evidence offered to support the reserve figures. They are just a guess at the very best, so on that basis I don't see how the Commission can seriously entertain this application for 320-acre units.

MR. PORTER: Mr. Bratton.

MR. BRATTON: Gentlemen, I will not take long of your time as you have been extremely patient already. This has gone on for an extended length of time.

I would like to make a few remarks pertaining to the case as presented and our theory of it. I would like to start by commenting on Mr. Anderson's statement and I will say I take a second seat to no one in my respect and admiration for Mr. Anderson, but in this case I can't help believing he is shooting his arrow at the wrong tree at the wrong time. If he is basically opposed to a permanent 320-acre spacing in this area, that is fine, we are not asking for that. We are asking for a temporary order in order that we can put forward an extensive development

program throughout this entire area.

As Mr. Kellahin pointed out, we are concerned about the problem of offset wells in the immediate future. We are not talking in terms of ten wells. I believe Mr. Barnes has said that the San Juan's program contemplates as high as twenty or more wells within the next year, and we would like to run those wells throughout the length of the area, rather than having to concentrate them in one little narrow strip offsetting Mr. Russell's acreage. In other words, we want our correlative rights protected, too. So often the correlative rights theory is thought of as protecting the interest of the man who has the lease interest. I will point out that we do have 79% of the acreage in the area, compared to Mr. Russell's 10%. We seek an order protecting our correlative rights, too.

As has been pointed out, the area is lightly explored. It is not fully tested yet. We have put on our case as fully and fairly as we could and we have not claimed that the evidence at this time conclusively proves what one well will drill. We ask merely the time to go throughout the entire area and come back to this Commission with some evidence. We ask only the same type of order that was entered in the Tapicito Area immediately to the west of here. Mr. Kellahin participated in and argued very eloquently in the Gallegos Canyon Unit Area. We do not want to faze his arguments which he presented at a later date in this case. At that time the area had been allowed to become developed partially on 160, partially on 320's, and when the Commission finally determined the matter, one consideration stated in their order was the fact that there were interests in the area that would be

severely damaged by an order granting permanently 320 acres. That is exactly the same type of situation that could arise in this area. It has not arisen to any extent yet. There are not extensive vested interests that would be damaged in this area by a permanent order, and there certainly is no interest that would be damaged by a temporary order, other than Mr. Russell's statements as to his contractual obligations. First of all, as to those we would like to point out that any contract made certainly must be made in view of the rules and regulations of the Conservation Commission, and any contract must be conformable thereto. That was in the contemplation of Mr. Russell and certainly the parties he was contracting with. We don't desire to damage Mr. Russell, we don't want him to damage us.

We have talked in terms of one year as a length of time within which we could come back with more information upon which the Commission could better analyze the situation at that time. We would suggest that possibly the Commission might consider a lesser period of time, some time during which we would have the opportunity to go ahead and develop the area to a lesser extent than we could in one year, but we could still gain considerable additional information to bring back to the Commission, and yet the length of time would not be such that it would overlap Mr. Russell's contractual obligations.

We also wish to point out, as has been discussed in the testimony here, that there are alternatives, communitization, to which Mr. Russell seems not amenable but which he certainly has not flatly refused to consider. We would like to suggest seriously to the Commission that we believe that the interests which have

been set forth here as in favor of a temporary order for some reasonable length of time granting 320-acre spacing in this area greatly outweigh any objections which have been presented here to such an order.

We thank you for your attention and your courtesy.

MR. ANDERSON: I would like to add to my remarks that the Roswell office of the Geological Survey is opposed to the issuance of the order requested by the applicant.

MR. PORTER: Mr. Gurley.

MR. GURLEY: We have received several telegrams from interested parties in this case. I would like to read them into the record.

MR. PORTER: Go ahead.

MR. GURLEY: "New Mexico Oil Commission, Santa Fe, New Mexico: As one of the larger lease holders in area, we are in accord with San Juan Gas Corporation's request for temporary spacing of 320 acres in proposed Gavilan Unit Case No. 1066. A. G. Hill."

"New Mexico Oil Commission, Santa Fe, New Mexico: As owners of leasehold in the subject area we urge approval of temporary 320 acres spacing on Case Number 1066 Gavilan Unit 25 North Two West Rio Arriba County New Mexico for San Juan Gas Corp. C. L. McMahon, Inc."

"New Mexico Oil and Gas Conservation Commission, State Capitol, Santa Fe, New Mexico: In regard to Case No. 1066, application of San Juan Gas Corporation for an order temporarily establishing 320 acre drilling units for certain land in Townships 24 and 25 North, Range 2 West, Rio Arriba County, New Mexico. This

is to advise that Humble Oil and Refining Company is in full accord with San Juan Gas Corporation request. Humble Oil and Refining Co., by R. W. Bybee."

"New Mexico Oil Commission, Santa Fe, New Mexico: Re Hearing 1066 we as lease owners in the area are in sympathy with San Juan Gas Corporations request for 320 acre temporary spacing in the proposed Gavilan Unit. Gilcrease Oil Co."

"New Mexico Oil Commission, Santa Fe, New Mexico: Re Hearing 1066, I as mineral owner in the area are in sympathy with San Juan Gas Corporations request for 320 acre temporary spacing in the proposed Gavilan Unit. E. L. Ames."

"New Mexico Oil and Gas Commission, Santa Fe, New Mexico: In my opinion the application of San Juan Gas Corporation for temporary 320 acre spacing in the Lindrith Gavilan Area is justified. James H. Gardner."

MR. BRATTON: We have a letter which is not addressed to the Commission, but it is on the same subject as this from Skelly which we would like to introduce in the record. Do you care for me to read it?

MR. KELLAHIN: It is introduced in the same way as the telegrams.

MR. GURLEY: "Mr. Foster Morrell, Nickson Hotel Building, Roswell, New Mexico. Re: Proposed Gavilan Unit, Rio Arriba County, New Mexico.

Dear Sir:

Your letter of May 2, addressed to Mr. Cashman, has been referred to the writer for reply. You advise that Case 1066 has been set for hearing 9:00 A.M. on May 16 in Santa Fe, which

hearing is to cover the subject matter of 320-acre drilling and spacing units.

This is to advise that Skelly has no objections to the issuance of an order temporarily establishing 320-acre drilling units for the Pictured Cliffs formation.

Yours very truly,

/s/ George W. Selinger

MR. MORRELL: Could we have the record show that Mr. Selinger was not able to stay for the remainder of the meeting and authorized me to file that for him?

MR. WALKER: The record will so show.

MR. PORTER: Are there other statements in this case? We will take a few minutes recess.

(Recess).

MR. PORTER: The meeting will come to order. We have decided that due to the large volumes of testimony which have been received in this case and the fact that it is very controversial, that we feel that we should discuss it with the Chairman of the Commission before rendering any decision. We have tried to contact the Governor, but have been unable to do so. It is, therefore, our decision to take the case under advisement. We will render a decision as soon as possible.

MR. KELLAHIN: I assume that the Commission does understand Mr. Russell's position and the need for an immediate order. He has his workmen standing out there and his rigs standing by.

MR. PORTER: That decision will be made as soon as we can.

MR. KELLAHIN: I don't want to be in a position to pressure the Commission.

MR. WALKER: That was taken into consideration. I am quite sure the Governor is out of town, we know he is out of town, and we expect him back and his decision will be taken up and expedited as soon as possible.

MR. KELLAHIN: We appreciate all the consideration that has been given us here.

MR. BRATTON: We concur in the speedy decision. It is a matter of importance to us, too.

* * * * *

STATE OF NEW MEXICO)
 : SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify the foregoing and attached transcript of proceedings before the Oil Conservation Commission for the State of New Mexico was reported by me in steno-type and reduced to typewritten transcript by me and/or under my personal supervision, and that same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my hand and seal this 26th day of May, 1956.


Notary Public - Court Reporter

My commission expires:

June 19, 1959.