

El Fidel Hotel
Albuquerque, New Mexico

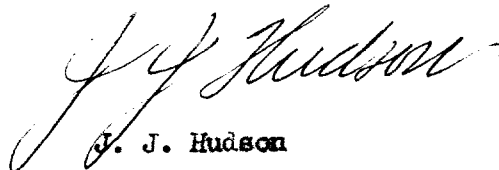
February 13, 1948

Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

The writer has made a study of the petition of Southern Union Production Company for a spacing order fixing the spacing of wells hereafter drilled in the Kutz-Canyon-Fulcher Basin gas fields, looking towards the best interest of the United States, the State of New Mexico and the development of potential areas involved. It is my opinion that this proposed program is sound. No doubt, there will be instances where exceptions are warranted, which would come under the wise discretion of the New Mexico Oil Conservation Commission.

Respectfully,



J. J. Hudson

JJH:fr

cc - Southern Union Production Company ✓
Burt Building
Dallas 1, Texas

EARL A. NICHOLS
Consulting Petroleum Engineer
2000 KIDWELL STREET
DALLAS, TEXAS
T3-1122

EC #4-126

February 5, 1948

Mr. Van Thompson
Southern Union Gas Co.
Burt Building
Dallas, Texas

Dear Mr. Thompson:

I have received the charts giving the results of the recommended field tests. These tests were performed on the Kutz Canyon - Fulcher Basin Field in order to attempt to establish a positive, mechanical answer as to whether pressure interference exists across 160 acre tracts in the above mentioned field. It was our belief that should such pressure interference exist between wells now drilled on approximately 160 acre spacing, one could accordingly feel that drainage across 160 acre tracts existed.

Seven wells whose approximate spacing are 160 acres per well were chosen. They were the SUP Walker #1, SUP Walker #2, SUP Mc Grath #1, SUP Mc Grath #2, SUP Mc Grath #3, SUP Kattler #1, and the SUP Hudson #2 wells. These wells were shut in at noon January 9, 1948 and remained shut in until 8:30 A.M. January 12, 1948. At this time all of the wells except the Walker #1 were put on production against a line pressure of 261 to 270 P.S.I. ga. At 9:00 A.M. on January 13th, the surrounding wells were taken off of the line and blown to the air, the Walker #1 still remaining shut in. A recording pressure chart on the well head of the Walker #1 well during this test reveals the attached tabulated and graphical results.

It is to be noticed that due to the normal cycle of atmospheric temperature change during a 24 hour period, the temperature effect on the recording instrument shows a distinctive 24 hour cycle change on the recorded pressures. To help clarify this effect, the pressures were plotted versus time of day and this graph is included. It will be noticed that, irregardless of these temperature effects, the overall curve of pressures for the second day lie considerably above the curve of the pressures for the first day of the shut in period. This is explained, of course, as being the normal build up of pressure due to the well being shut in. Likewise, the curves of pressure for the 3rd and 4th days lie respectively higher each day, showing this same build up. The surrounding wells were put on production, on the morning of the 4th day, but their effect on Walker #1 is not significantly felt until the 5th day. It will be noticed that the curve of pressures for the 5th day falls back below those of the 4th day, very definitely indicating pressure interference had reached the Walker #1 from the outlying wells.

In order to try to evaluate the magnitude of this pressure drop, an arithmetic average of the pressures the last 21 hours of the tests give a value of 1401.8 P.S.I. gauge. An arithmetic average of the pressures during the same hours of the preceding day gave 1403.6 P.S.I. gauge. This is a 1.8 pound drop. This may not seem like a large drop, but after considering all of the reservoir factors involved, this is felt to be as large a pressure drop as one might expect.

It is my feeling that these tests have conclusively shown pressure interference between wells now drilled on a 160 acre pattern. It is further my feeling that since pressure draw down can be experienced between such wells, drainage of reservoir material across 160 acre tracts exists under such conditions.

If there are any points discussed on which you would like further comment, please contact me.

Very truly yours,

Earl A. Nichols

Earl A. Nichols

EAN/1--

SHUT IN PRESSURES on WALKER # 1

<u>Time</u>	<u>1st day</u>	<u>2nd day</u>	<u>3rd day</u>	<u>4th day</u>	<u>5th day</u>
Noon	363	398	102	107	107
1 PM	381	398	103	107	107
2 "	381	101	105	108	102
3 "	387	103	106	108	102
4 "	389	101	101	108	102
5 "	387	398	102	107	103
6 "	383	395	101	106	101
7 "	383	391	100	101	103
8 "	382	393	100	101	103
9 "	381	392	398	103	103
10 "	382	391	396	103	102
11 "	381	391	391	102	102
12 Midnight	381	390	393	102	101
1 AM	381	388	393	102	100
2 "	381	386	392	101	100
3 "	382	386	393	101	100
4 "	382	381	393	101	100
5 "	383	381	391	100	100
6 "	383	381	391	100	399
7 "	381	381	391	100	399
8 "	388	390	101	102	399
9 "	392	397	103	103	
10 "	396	399	101	101	
11 "	398	102	106	107	

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 997
Roswell, New Mexico
February 10, 1948

EX 5-126

AIR MAIL

Mr. Willis L. Lea, Jr.
Southern Union Production Company
Burt Building
Dallas, Texas

Dear Mr. Lea:

Reference is made to your letter of January 26, enclosing for our information a copy of Southern Union Production Company's petition forwarded to the New Mexico Oil Conservation Commission requesting an order, after notice and hearing, fixing spacing requirements for wells hereafter drilled in the Kutz Canyon-Fulcher Basin gas fields, San Juan County, New Mexico. You requested our opinion concerning the proper spacing of wells in these fields.

The essential facts presented in your petition are substantiated by the records of this office, and, accordingly, this office concurs in your request for the establishment of a well spacing plan with a minimum of one well to 160 acres to promote orderly development without waste in the Kutz Canyon and Fulcher Basin gas fields.

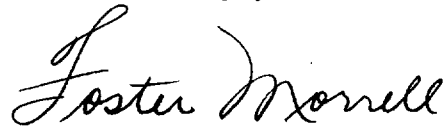
As most of the lands in these fields are public lands of the United States, it is the desire of this office to encourage uniform and economic development and greatest ultimate recovery of gas from these fields. This can be accomplished only so long as a reasonable profit can be secured from capital invested. Federal leases have been developed generally on a well spacing pattern of one well to 160 acres, except where necessary to protect properties from closer spacing by offset operators.

Only where the market demand and marketing facilities are unlimited for continued expansion with the completion of additional outlets or producing gas wells can necessary profit be obtained to continue development. These conditions are not present in the fields under consideration. Hence the drilling of unnecessary wells does not proportionately increase the ultimate volume of gas available for sale but instead tends to reduce the margin of profit of all wells in the fields and to discourage proper development of the fields.

Future development at a well density consistent with the majority of past development is essential to prevent injury to neighboring leases or properties and to protect equities involved.

There is no objection to your use of this letter in connection with your petition to the New Mexico Oil Conservation Commission. As this office is very interested in the subject, I expect to be present at the hearing in Santa Fe on February 17.

Very truly yours,

A handwritten signature in cursive script, reading "Foster Morrell". The signature is written in dark ink and is positioned above the printed name.

FOSTER MORRELL,
Supervisor, Oil and Gas Operations

RECEIVED
FEB 23 1948

ALBERT R. GREER
REGISTERED PETROLEUM ENGINEER
STATE OF NEW MEXICO

1020 North Shipp
Hobbs, New Mexico
February 21, 1948

The New Mexico Oil Conservation Commission

Santa Fe, New Mexico

Concerning: Brief submitted on the behalf of some
of the independent operators and small
land owners of San Juan County
in regard to:
Case Number 126, relative to the request
of the Southern Union Gas Company for a
spacing ruling for the Fulcher Basin-
Kutz Canyon Gas Fields, San Juan County.

Gentlemen:

I wish to submit herewith for your consideration in this matter
a few written statements summarizing this case and testimony pertaining
thereto, as I have analyzed it.

1. The general problem of optimum spacing in any field requires care-
ful study and a large amount of carefully gathered and compiled information.

2. Until approximately two weeks prior to this hearing all of the
necessary information has been available only to the Southern Union Gas Company.
At that time part of this necessary information had been compiled by them from
their files and made available to interested parties. Two weeks is not suffici-
ent time, however, to permit a study of this nature by an outside company or
individual. Moreover, the information assembled at that time was not adequate
to provide a definite solution.

3. A spacing ruling in an old field without regard to proration-- or
without a proration ruling-- would, in effect, be a direct contradiction to
the conception of correlative rights, as understood in the petroleum industry.

For, just as new 40-acre wells offsetting
old wells on 160 acres would unfairly drain the 160-acre
tract; so would new 160-acre units be drained by old wells
on 40-acre tracts.

4. The problem of increased wells without an unlimited market, and

*See index in
case file #126*

ALBERT R. GREER
REGISTERED PETROLEUM ENGINEER
STATE OF NEW MEXICO

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Brief of case 126

resulting smaller per well production rate as brought out by Mr. Foster Morrell of the USGS would, in my opinion, be more likely aggravated by 160-acre units than relieved; due to the increased number of forced offsets.

5. In regard to the evidence presented at the hearing, February 17, 1948 it was shown that old wells had a drainage influence over extended distances in some areas, and an interference test conducted on adjoining wells established communication between them: but the evidence presented did not show how much gas will be left unrecovered in the reservoir at abandonment for various well spacings; nor did the testimony describe the manner in which wells would be located on 160-acre units in order that wells could later be infilled on smaller tracts, if proven economically feasible.

To briefly clarify these points, I wish to point out:

(a) That, although drainage over extended distances has been proven and communication has been established between adjoining wells; the Kutz Canyon-Fulcher Basin Field is not unique in this respect. The same can be shown for most of the oil and gas fields now in existence.

(b) In view of this, a decision on a spacing ruling should be based—not from evidence of communication and some drainage alone—but also from a consideration of the value of the ultimately unrecoverable gas left in the reservoir for various well spacings; for which subject inadequate testimony was presented.

(c) A provision should be made, if a spacing of 160 acres per well is contemplated, to permit later infilled drilling on a closer spacing, if ever proven economically feasible. It should be recognized that the next smallest, practical spacing from 160-acre units is 80 acres per well; and this is possible only if the wells on the initial 160-acre tracts are spotted on 80-acre patterns. If a rigid center-spot location on 160 acres is required, the only uniform spacing on infilled drilling for each 160-acre tract would require 4 more wells, or an average of 32 acres per well.

From the testimony presented at the hearing, it can be seen that an increase in the price of gas, plus a decrease in the cost of drilling the wells

ALBERT R. GREER
REGISTERED PETROLEUM ENGINEER
STATE OF NEW MEXICO

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Brief of case 126

(both of which are normal trends*) would justify infilled drilling on 80-acre locations if it is found later that as much as approximately 25% more gas can be recovered on the closer spacing. This same information indicates that infilled drilling of 32 acres per well would probably never be economically feasible. Hence, 160-acre center-spot locations would make later infilled drilling on individual 160-acre tracts forever impossible.

Moreover, a study of the field indicates that a large number of the drilling units can be more effectively drained by locating the wells in the most permeable part of the unit; and this permeable part is not necessarily in the center of 160-acre tracts. For the same number of wells, the field can be more effectively drained by placing the wells in the most permeable parts of units rather than rigid center-spot locations.

It is therefore requested, that in the event the Commission decides to set a spacing ruling requiring 160-acres per well, that consideration be given to flexibility of locating each well on its unit: in order that maximum advantage may be realized from the continuously developed geological and engineering information; and in order that operators may have the opportunity to locate their wells on 80-acre patterns if they so choose, so that they would be in position in the future to infill wells if proven economically justifiable.

6. It is realized that some action may be necessary to protect the investment of operators who drilled wells on 160-acre tracts. It is possible, however that the entire situation could best be handled by an operators committee formed by active operators in the area. Regular meetings could be held and all additional information studied and discussed. In the event of failure of such a committee to bring reasonable agreement among the operators, resort could be had to legal action by the Oil Conservation Commission.

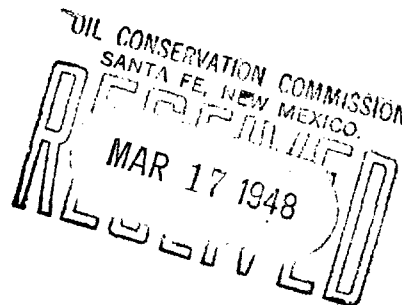
Yours very truly,

Albert R. Greer
Albert R. Greer

*The decrease in the cost of drilling would result from improved methods and competition in drilling as more activity centers in this area.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 997
Roswell, New Mexico
March 15, 1948



Mr. R. R. Spurrier
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Mr. Spurrier:

Reference is made to the petition of the Southern Union Production Company for an order fixing the spacing of wells in the Kutz Canyon and Fulcher Basin gas fields, San Juan County, New Mexico, on the basis of one well to a drilling unit of approximately 160 acres, testimony on which was taken under Case No. 126 at the hearing held in Santa Fe on February 17.

The Department of the Interior has approved five agreements communitizing Federal lands with fee lands in these two fields for drilling units of 160 acres. In approving these agreements the Department has stated

"The major portion of the gas production in the Fulcher Basin (or Kutz Canyon) field has been developed on an average spacing pattern of approximately 160 acres per well. Development on the basis of 160 acres per well is considered to be adequate for efficient exploitation of the gas reserves."

In the Approval-Certification-Determination executed by the Assistant Secretary for each of these agreements, which included separate or isolated 40 or 80 acre tracts of Federal land, is the following action:

"Determine that the portion of the Federal leasehold committed to the attached agreement cannot be independently developed and operated in conformity with the established well-spacing pattern for the (Kutz Canyon or Fulcher Basin) gas field and that consummation of the agreement will be in the public interest."

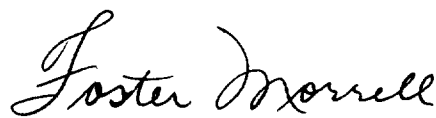
Your files should show the conditions under which 160 acres well spacing exceptions for drilling gas wells in these fields were granted by the Petroleum Administrator for War which included the following:

Each well be drilled on a drilling unit of not less than 160 surface acres; each well be drilled at least 1980 feet from all other wells; and each well be drilled at least 990 feet from any lease line, property line, or subdivision line which separates unconsolidated property interests.

Enclosed is a copy of a form letter dated March 1 from Fred Peasel and a copy of my instructions of March 10 regarding the spacing of gas wells on Federal leases adjoining lease Santa Fe 046563, issued to Peasel.

This information is being furnished with the hope that it would be helpful to the Commission to have further knowledge of the position taken by the Department of the Interior and by this office with respect to well spacing in the two gas fields as to Federal land. I would like to add that if at all feasible under existing State statutes, it would be most equitable to all parties concerned to include provision for allocation of gas in any order the Commission may issue establishing well spacing units in the Kutz Canyon and Fulcher Basin gas fields.

Very truly yours,

A handwritten signature in cursive script that reads "Foster Morrell".

FOSTER MORRELL,
Supervisor, Oil and Gas Operations.

Enclosures

FRED FEASEL

LAWYER

FOSTORIA 4, OHIO

March 1, 1948

U. S. Geological Survey
Box 187
Artesia, New Mexico

Re: Lease Santa Fe 046563
Fred Feasel, Lessee

Gentlemen:

The Oil Conservation Commission of New Mexico is now considering the advisability of adopting the policy of only one gas well, centrally located, to every 160 acres in the Kutz Canyon and Fulcher Basin Fields. If this policy is adopted, it should mean that no well would be located nearer than 1320 feet to the property line of any designated lease.

Anticipating that the above contemplated policy will shortly become a principle to be followed by the United States Geological Survey, I request that no one be authorized to drill on any Federal lands closer than 1320 feet from the property line of Santa Fe Lease Serial Number 046563, which is described as follows:

T. 27 N., R. 10 W., N.M.P.M., New Mexico

Sec. 2, Lots 3,4, $S\frac{1}{2}NW\frac{1}{4}$, $S\frac{1}{2}$, $S\frac{1}{2}NE\frac{1}{4}$;
Sec. 3, Lot 1;

T. 28 N., R. 10 W., N.M.P.M., New Mexico

Sec. 32, All;
Sec. 33, All;
Sec. 34, All.

NOTES

MORRELL

Very truly yours,

Fred Feasel

cc: U.S.G.S.
P.O. Box 997,
Roswell, New Mexico

U.S.G.S.
Federal Works Building
Washington 25, D. C.

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C
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TO : Mr. John A. Frost, Artesia Office
FROM : Foster Morrell, Roswell Office
SUBJECT : Lease Santa Fe 046563

March 10, 1948

Reference is made to several letters dated March 1 from Fred Feasel requesting that no one be authorized to drill on any adjoining Federal leases closer than 1320 feet from the property line of lease Santa Fe 046563. This request is based on the probability that the Oil Conservation Commission of New Mexico may adopt a well spacing pattern of one well to each 160 acres in the Kutz Canon and Fulcher Basin fields. Separate letters were submitted by Mr. Feasel covering each of the Federal oil and gas leases adjoining lease Santa Fe 046563.

Pursuant to Mr. Feasel's request, you are directed not to approve drilling on Federal leases adjoining lease 046463 closer than 990 feet from the outer boundaries of that lease. Mr. Feasel is mistaken in the principle that the well spacing pattern of 160 acres would require the gas well to be located exactly in the center of the drilling unit.

The spacing practice in these two fields for operating on Federal leases has been to limit development to one well to 160 acres. However, the wells are generally located 330 feet from the center of the 160 acre tract and not closer than 990 feet from the outer boundary of such well spacing unit. It is preferred, of course, that the drilling units be in the form of a square wherever practicable, which is the form of such units under the five communitization agreements previously approved by the Department.

A copy of this letter is being forwarded to Mr. Feasel for his information.

FOSTER MORRELL,
Supervisor, Oil and Gas Operations.

cc: Mr. Fred Feasel
Box 614
Albuquerque, New Mexico

cc: Washington Office

*Graham: These are my revisions -
skip the nomenclature*

NEW MEXICO OIL CONSERVATION COMMISSION

SANTA FE, NEW MEXICO

In the matter of the petition of the Southern Union Production Company for an order fixing the spacing of wells in the Kutz Canon-Fulcher Basin Gas fields of San Juan County (as they may be extended) on the basis of one well to a drilling unit of approximately 160 acres with suitable provisions for any related matters, including special approval of non-conforming well locations where necessary.

ORDER NO. _____

CASE NO. _____

WHEREAS, after due notice as required by law the Commission held a public hearing in Santa Fe on February 17, 1948, to consider the petition of Southern Union Production Company for the adoption of an order fixing the spacing of wells hereafter drilled in the Kutz Canon-Fulcher Basin gas fields, San Juan County, New Mexico, and related matters; and

WHEREAS, the Commission having considered the evidence adduced at such hearing, pertinent information otherwise available in the Commission's records, the statements made and viewpoints expressed by interested parties at or in connection with such hearing,

FINDS, from the evidence adduced:

A. That the Kutz Canon and Fulcher Basin gas fields ^{pool 13} are productive of natural gas from the Pictured Cliff sandstone formation, that such ^{pool} fields are contiguous and from all information available to date appear to be one continuous gas producing area or pool in the Pictured Cliff, with a total of over 75 producing gas wells at the present time;

B. That such pool has produced natural gas for more than 15 years, during which time the average of well-head pressures has declined to approximately 385 P.S.I. gauge from an initial field pressure of approximately 585 P.S.I. gauge, the difference indicating the substantial quantities of gas heretofore produced from the pool;

C. That by reason of rules of this Commission previously applicable to the pool, of the general practices of certain operators in the area and of policies of the U. S. Geological Survey (having jurisdiction over oil and gas practices

affecting the substantial federal acreage involved), a fairly uniform spacing of one well to 160 acres has heretofore prevailed in the pool;

2 D. That one well will, except in unusual instances, economically (and effectively) drain the recoverable gas in an orderly manner from at least 160 acres of the Pictured Cliff pool and, accordingly, that more dense spacing in the pool will, as a general rule, result in (waste or in unnecessary hazards conducive to waste) and unnecessarily increase the costs of development and production;

E. That, except in unusual instances, the volume of recoverable gas in the pool does not under existing conditions afford economic justification for the drilling of wells on units of less than 160 acres, more dense spacing being, therefore, likely to result in retardation of development, premature abandonment of wells and in other conditions wasteful or conducive to waste;

F. That for wells hereafter drilled a general spacing pattern of one centrally located well on a unit of 160 acres, substantially in the shape of a square, is required to protect the equities of those having interests in wells heretofore drilled on 160-acre tracts, for which general spacing pattern the pooling of properties should be encouraged when necessary;

G. That the gas productive area of the pool ^{may} ~~is likely~~ to be substantially more extensive, in one or more directions, than the presently developed portion thereof;

H. That the definition of the pool, contained herein, is reasonable and is necessary to the efficacy of this spacing order; and

I. That waste will result in the drilling of wells in the pool, as herein-after defined, unless special rules and regulations are adopted for the prevention thereof, and that the special rules and regulations provided below are necessary to prevent such waste and hazards conducive to waste, to protect present equities and to provide for the orderly development and operation of such pool, as it may be extended.

THEREFORE, IT IS ORDERED that, effective immediately, the following rules and regulations shall apply to wells hereafter authorized by the Commission to be drilled or completed or recompleted to the Pictured Cliff pool in the Kutz

0001
Canon-Pulcher Basin area, defined below, in addition to the Commission's applicable rules, regulations and orders heretofore or hereafter adopted to the extent not in conflict herewith:

Section 1. No well shall be drilled or completed or recompleted, and no Notice of Intention to Drill or drilling permit with respect to a well shall be granted or drilling location otherwise permitted to become effective, unless

(a) such well be located on a designated drilling unit of not less than one hundred sixty (160) acres of land, more or less, according to legal subdivisions of the United States Land Surveys, in which unit all the interests are consolidated by pooling agreement or otherwise and on which no other well is completed, or authorized for completion, in the pool;

as near as possible
(b) such drilling unit be ^{as near as possible} in the shape of a square except for normal variations in legal subdivisions of the United States Lands Surveys; and

(c) such well be located on its drilling unit at a distance from the outside unit boundaries of not less than seven hundred fifty feet

why not 990'? (750'); provided, if such proposed new well is to be an offset to any then producing gas well completed in the pool, or the drilling of which was authorized, prior to the effective date of this order, located on an adjoining unit in which the interests are not identical with those in the unit proposed to be drilled, such proposed well may be located and drilled offsetting the existing well and as close to the common unit boundary line as the well to be so offset.

Section 2. Any provision herein to the contrary notwithstanding, the Commission may, and in proper cases will, on petition or on its own motion, by order entered after notice and hearing to the extent required by law, grant exceptions and permit drilling locations to become effective, thereby authorizing the drilling or completion of wells in the pool not conform-

ing to the requirements of Section 1 above if the Commission shall find that the property sought to be drilled would be deprived of an opportunity to produce ^{his share of} gas from the pool in the absence of such exception, and shall also find one or more of the following conditions to exist:

- (a) that consolidation or pooling of the property sought to be drilled with necessary adjoining land, notwithstanding diligent efforts made in good faith, is impossible or impractical;
- (b) that the property sought to be drilled is located within a then developed portion of the pool and its non-conforming size or shape is due to the adjoining developed properties in the pool;
- (c) that because of the nature of the terrain, location of the proposed well at a lesser distance from one of the outer boundaries of its drilling unit should be permitted; or
- (d) that by reason of the location of the property sought to be drilled along the southwest or northeast flank of a developed portion of the area; it appears improbable that gas which can be produced in paying quantities will be encountered if the well conforms to Section 1, in which case the Commission may modify the requirements of Section 1 as to such well to the extent it deems necessary; provided, it shall be the general policy of the Commission in any such case to require the pooling of properties to consolidate interests in at least 160 acres if practical to do so, whether or not in the shape of a square, and to require that the well be located, if practical to do so, at least thirteen hundred twenty feet (1320') from each other well completed, or authorized for completion, in the pool;

or, irrespective of such findings, if the Commission shall find that by reason of all circumstances an exception is proper in the prevention of waste, hazards conducive to waste, or undue drainage between properties, or otherwise in the exercise by the Commission of its jurisdiction over the spacing of wells or its other powers conferred by law, express or implied.

The Commission reserves the right to impose any and all reasonable conditions upon the granting of any such exception, and to take all other proper actions in the exercise of its jurisdiction over the spacing of wells or its other powers conferred by law, express or implied.

IT IS FURTHER ORDERED that, in accordance with recommendations of the New Mexico Nomenclature Committee approved and adopted by this Commission, the Pictured Cliff gas producing pool in the Kutz Canon-Fulcher Basin area, to which this order applies, is defined to include initially the following described land in San Juan County, New Mexico:

Township 30 North, Range 12 West

Sections 28, 29, 30,
32, 33, 34: All
Sections 19 & 20 : $S\frac{1}{2}$
Section 31 : $N\frac{1}{2}$ & $SE\frac{1}{4}$
Section 35 : $S\frac{1}{2}$ & $NW\frac{1}{4}$
Section 36 : $S\frac{1}{2}$
Section 27 : $S\frac{1}{2}$ & $NW\frac{1}{4}$

Township 29 North, Range 12 West

Sections 1, 2, 3, 10,
11, 12, 13: All
Sections 4 & 24 : $N\frac{1}{2}$ & $SE\frac{1}{4}$
Section 14 : $N\frac{1}{2}$
Section 15 : $N\frac{1}{2}$

Township 29 North, Range 11 West

Sections 7, 18, 19,
20, 21, 28,
29, 33, 34: All
Section 6 : $SW\frac{1}{4}$
Sections 16 & 26 : $SW\frac{1}{4}$
Section 27 : $S\frac{1}{2}$ & $NW\frac{1}{4}$
Section 35 : $W\frac{1}{2}$ & $SE\frac{1}{4}$
Section 17 : $S\frac{1}{2}$
Sections 30 & 32 : $E\frac{1}{2}$ & $NW\frac{1}{4}$

Township 28 North, Range 11 West

Sections 11, 12, 13,
14, 24 : All
Sections 10 & 15 : $E\frac{1}{2}$
Section 22 : $NE\frac{1}{4}$
Section 23 : $N\frac{1}{2}$ & $SE\frac{1}{4}$
Section 25 : $N\frac{1}{2}$

Township 28 North, Range 10 West

Sections 7, 18, 19,
20, 29, 30,
32, 28, 33: All
Section 21 : $SW\frac{1}{4}$
Section 34 : $W\frac{1}{2}$

?

Not yet
approved

Township 27 North, Range 10 West

Section 4 : All

Section 3 : W $\frac{1}{2}$

~~and also to include, without the necessity of further action by the Committee or this Commission, all additional lands located within three-fourths (3/4) mile of any part of a drilling unit established hereunder which includes land in the pool as it is initially defined or as it may be extended by the application of this provision; provided, however, that such pool shall in no event be automatically extended so as to include any lands now or hereafter included by the Commission in some other producing area formally designated as an oil or gas pool or field in the Pictured Cliff; provided, further, by order of this Commission the pool may be redesignated from time to time so as to embrace other lands in the vicinity which are believed, on the basis of additional developments, to be capable of producing gas from the Kutz Canon-Fulcher Basin pool, whether or not such other lands shall have been at one time included in another designated field or pool producing from the Pictured Cliff.~~

Entered and adopted by the Oil Conservation Commission this _____ day of

_____, 1948.

Chairman

Commissioner

Commissioner

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

JOSEPH L. EGAN
PRESIDENT

SYMBOLS

DL = Day Letter
NL = Night Letter
LC = Deferred Cable
NLT = Cable Night Letter
Ship Radiogram

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RICHARD SPURRIER=

STATE CAPITOL SANTA FE NMEX=

JUST LEARNED OF SOUTHERN UNION HEARING SET FOR 17TH WOULD
LIKE TO PUT STATEMENT IN RECORD BEFORE ORDER IS ENTERED
PLEASE NOTIFY COMMISSION=

JOHN DEMPSEY.

Case

126

17.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

SYMBOLS

DL = Day Letter

NL = Night Letter

LC = Deferred Cable

NLT = Cable Night Letter

DM Ship Radiogram

JOSEPH L. EGAN
PRESIDENT

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

VA212 DL PD=FARMINGTON NMEX 16 300P

CHAIRMAN OIL CONSERVATION COMMISSION=

RESPECTFULLY REQUEST COMMISSION TO REFUSE SOUTHERN UNION GAS COMPANY'S REQUEST FOR 160 ACRE SPACING IN SAN JUAN COUNTY. CITIZENS OF THIS AREA FEEL THAT SUCH SPACING WOULD BE VERY DETRIMENTAL TO IMMEDIATE AND FUTURE OIL AND GAS DEVELOPMENT OF AREA, ALSO THAT NO VALID REASON EXISTS FOR 160 ACRE SPACING AT THIS TIME=

FARMINGTON CHAMBER OF COMMERCE.

160 160.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

(14)

JOSEPH L. EGAN
PRESIDENT

SYMBOLS

DL - Day Letter

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Ship Radiogram

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

VA51 PD=MONTICELLO UTAH 17 840A

VAN THOMPSON=

Case 126 3 FEB 17 AM 9 16

SOUTHERN UNION GAS CO LAFONDA HOTEL

THE PROPOSED 160 ACRES WELL SPACING ORDER IN THE PICTURED CLIFF FORMATION IN THE FULCHER BASIN AND KUTZ CANYON FIELD IN NORTHWEST NEW MEXICO APPEARS TO BE REASONABLE AND IS AGREEABLE WITH US=

WESTERN NATURAL GAS CO W K DAVIS.

160.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Southern Union Production Company
Burt Building
Dallas, Texas

April 6, 1948

Mr. R. R. Spurrier, Secretary
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Spurrier:

Having had an opportunity to review the stenographic transcript of our February 17 hearing, I wanted to call to your attention one or two minor discrepancies.

At page 3 in the center of the page Exhibit 4 should consist of "the chart and data accompanying Mr. Nichols' letter. . .". I notice that the letter is made a part of the transcript proper and to complete the record both the accompanying chart and data should be attached as Exhibit 4.

At page 10 the first sentence appearing below the appended core analysis information should be amended by deleting the word "to" so as to make the sentence read "From the data the average porosity is found to be 20%."

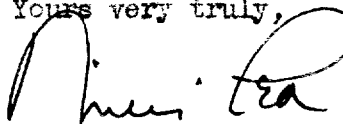
If you concur in these corrections, please advise me so that I may make them on my copy of the record. At the same time please call to my attention any other discrepancies which you observed.

Mr. Thompson has now returned to Dallas and we are trying to get together during the day with respect to revision of the suggested form of order. In any case, we will expedite our work and let you hear from us as promptly as possible.

I appreciate the very satisfactory conference we had in your office last week and trust that an appropriate order can be promptly entered.

With best regards and thanks, I am

Yours very truly,



Willis L. Lea, Jr.

WLL:fr
cc - Mr. George Graham ✓

NEW MEXICO OIL CONSERVATION COMMISSION

SANTA FE, NEW MEXICO

In the matter of the petition of the Southern Union Production Company for an order fixing the spacing of wells in the Kutz Canon and Fulcher Basin Gas fields of San Juan County (as they may be extended) on the basis of one well to a drilling unit of approximately 160 acres with suitable provisions for any related matters including special approval of unorthodox well locations where necessary.

ORDER NO. _____

WHEREAS, after due notice as required by law the Commission held a public hearing in Santa Fe on February 17, 1948, to consider the petition of Southern Union Production Company for the adoption of an order fixing the spacing of wells hereafter drilled in the Kutz Canon-Fulcher Basin gas fields, San Juan County, New Mexico, and related matters; and

WHEREAS, the Commission having considered the evidence adduced at such hearing, pertinent information otherwise available in the Commission's records, the statements made and viewpoints expressed by interested parties at or in connection with such hearing,

FINDS, from the evidence adduced:

1. That the Kutz Canon and Fulcher Basin gas fields are productive of natural gas from the Pictured Cliff sandstone formation encountered at depths ranging between 1700 and 2300 feet, approximately; that such fields are contiguous and from all information available to date appear to be one continuous gas producing area;
2. That such area has produced natural gas for more than 15 years, during which time the average of well head pressures has declined to approximately 385 P.S.I. gauge from an initial field pressure of approximately 585 P.S.I. gauge, the difference representing the substantial quantities of gas produced during such period;
3. That by reason of rules of this Commission previously applicable to the area, of the general practices of certain operators in the area and of policies of the U. S. Geological Survey (having jurisdiction over oil and gas practices affecting the substantial federal acreage involved,) a fairly uniform spacing pattern of one well to 160 acres has heretofore prevailed in the area;

4. That one well will, except in unusual instances, economically and effectively drain the recoverable gas in an orderly manner from at least 160 acres of the Pictured Cliff and, accordingly that more dense spacing will, as a general rule, result in waste or in unnecessary hazards conducive to waste and unnecessarily increase the costs of development and production;

5. That, except in unusual instances, the volume of recoverable gas in the Pictured Cliff reservoir does not under existing conditions afford economic justification for the drilling of wells on units of less than 160 acres, more dense spacing being, therefore, likely to result in retardation of development, premature abandonment of wells and in other conditions wasteful or conducive to waste;

6. That for wells hereafter drilled a general spacing pattern of one centrally located well on a unit of 160 acres, substantially in the shape of a square, is required to protect the equities of those having interests in wells heretofore drilled on 160 acre tracts, for which purpose the pooling of properties should be encouraged when necessary; and

7. That waste will result in the drilling of wells in the Kutz Canon-Fulcher Basin area, as hereinafter defined, unless special rules and regulations are adopted for the prevention thereof, and that the special rules and regulations provided below are necessary to prevent such waste, to protect present equities and to provide for the orderly development and operation of such area;

THEREFORE, IT IS ORDERED that, effective immediately, the following rules and regulations shall apply to wells hereafter drilled or completed or recompleted to the Pictured Cliff in the Kutz Canon-Fulcher Basin area, defined below, in addition to the Commission's rules, regulations and orders heretofore or hereafter adopted to the extent not in conflict herewith:

1. No well shall be drilled or completed or recompleted, and no drilling permit shall be granted or drilling location otherwise permitted to become effective, unless

(a) such well be located on a drilling unit of one hundred sixty (160) acres of land, more or less, according to official government survey, in which all the interests are consolidated by pooling agreement or otherwise and on which no other Picture Cliff well is located or drilling;

- (b) such well be located at the center of its drilling unit or at a distance from the center not greater than one-eighth (1/8) the width of such unit at its narrowest part; and
- (c) such drilling unit be in the shape of a square except for normal variations in land divisions of the government survey.

2. Any provision to the contrary notwithstanding, the Commission may in proper cases by order entered after notice and hearing, as required by law, grant exceptions and permit drilling locations to become effective, thereby authorizing the drilling or completion of wells to the Pictured Cliff not conforming to the requirements of Section 1 if the Commission shall find that the property sought to be drilled would be deprived of an opportunity to produce gas in the absence of such exception, and shall also find one or more of the following conditions to exist.

- (a) that consolidation of properties through pooling of interests in additional land notwithstanding diligent efforts made in good faith; is impossible or impractical,
- (b) that the property sought to be drilled is located within a developed portion of the area and its unorthodox size or shape is due to the adjacent developed properties;
- (c) that because of the nature of the terrain, location of the proposed well at a greater distance from the center of its drilling unit should be permitted; or
- (d) that by reason of the location of the property sought to be drilled along the southwest or northeast flank of a developed portion of the area; it appears impossible that gas which can be produced in paying quantities will be encountered if the well conforms to Section 1, in which case the Commission may modify the requirements of Section 1 to the extent it deems necessary; provided, it shall be the general policy of the Commission in any such case to require the pooling of properties to consolidate interests in 160 acres if practical to do so, whether or not in the shape of a square, and to require that the well be located at least thirteen hundred twenty (1320) feet from the nearest well producing from the Pictured Cliff if practical to do so.

The Commission reserves the right to impare reasonable conditions upon the granting of any such exception.

IT IS FURTHER ORDERED, that the Kutz Canon- Fulcher Basin area which is subject to this order, herein sometimes termed the "area", shall be those lands in T.30N, R 12W, T 29N, R. 12W, T 29N, R. 11W, T 28N, R 11W, and T 28N, R. 10W, N.M.P.M., which are commonly known as the Kutz Canon or Fulcher Basin gas field, or as both such fields, and also all land located within one (1) mile of any well in such fields which is capable of producing natural gas from the Pictured Cliff, including wells hereafter drilled which extend the gas productive area of such fields; provided that the term "area" shall not include any lands now or hereafter included by the Commission in some other field or fields.

Entered and adopted by the Oil Conservation Commission this _____ day of _____, 1948.

CHAIRMAN

COMMISSIONER

COMMISSIONER

San Juan County, New Mexico.
February, 1948.

TO.

The New Mexico Oil and Gas Conservation Commission.
Santa Fe, New Mexico.

Gentlemen:-

The undersigned owners of fee lands situated in San Juan County, respectfully submit their opposition to the granting of the petition of the SOUTHERN UNION PRODUCTION COMPANY, now pending before the Commission, such petition being entitled.

"In the matter of the petition for an order fixing the spacing of wells hereinafter drilled in the Kutz Canyon and Fulcher Basin Fields in San Juan County, AS THEY MAY BE EXTENDED and related matters. "

- (1) We deem the granting of the petition will result in a disadvantage to operators as a whole, and to the State of New Mexico, and to the fee land owners.
- (2) In particular we oppose any rule or regulation whereunder the present Kutz Canyon and Fulcher Basin Fields may be extended
- (3) A Major part of the lands in the County (including State lands) are undeveloped, both as to oil and gas.
- (4) Numerous oil and gas leases have been secured by Major and Independent operators embracing units less than 160 acres.
- (5) The State of New Mexico has issued many oil and gas leases, on state and institutional lands and many of such leases are in smaller units than 160 acres, many being for 40 acres, 80 acres, and 120 acres. The Commissioner of Public Lands (and the state) will be in the position of having issued oil and gas leases, accepting money therefore and then not allowing development of such leased lands. (If a 160 acre unit be adopted.)
- (6) The petitioner (The Southern Union Production Company) who have heretofore developed certain of the lands now within the area of the Kutz Canyon and Fulcher Basin Fields, dispose of natural gas to the Southern Union Gas Company, its associate, under some arrangement unknown to the protestants. The Southern Union Gas Company is the only purchaser of gas produced in these two fields, and therefore the two corporations have a MONOPOLY as pertains to the present disposition and transportation of gas, and have been able to (and do) dictate and fix the price of gas produced by independent operators, and it now appears that said two corporations have succeeded in getting the gas situation in said two fields in a condition to meet its desires, and now wish an order from the Commission, which would prevent independent operators from drilling, as to units of less than 160 acres.
- (7) The limits of the present Kutz Canyon and Fulcher Basin Fields should be definitely determined. Gas has been discovered in other parts of the County, to-wit: Several wells near Blanco, wells at Bloomfield, at Aztec, and near the state line to the north. It should be made certain that neither the petitioner, or any one else, might successfully claim that the Kutz Canyon and Fulcher Basin Fields be EXTENDED to embrace other parts of the County.
- (8) No rule or regulation should be adopted that would interfere or restrict or retard the development of lands within the County as to exploration, production or development of either oil or gas in any part of the County, inasmuch as there are several sands and formations, above and below the picture cliff formation (from which the petitioner obtains gas)

Wherefore petitioners, as protestants, pray that said petition be denied.

Respectfully submitted.

Name of land owner.

Name of land owner.

Joe Spence
M. L. Francisco
L. D. Nolan
Marcelline D. Williams

J. P. Hargis
Linn Blancey
Carl C. Dool
Frank Wood
A. F. Scott

Ad. McEarty
W. G. Stallings
Reid Popfinger
Best Place
Alton Anthony
G. L. Finch
Victor Motte Sr.
Raymond Lewis
Milton Thomas
E. R. Thomas
Mrs. John Thomas
C. M. Crawford
Jane Crawford
Crawford
Minnie Dotie Crawford
J. D. Rosemore
Mrs. J. D. Rosemore
Maudie Bailey
Burrill H. Crawford
Lynna Crawford
H. Crawford
Israel Crawford
E. R. Caldwell
Nora Caldwell
Lois E. Noak
W. H. Stark
Eula Stark
Alma Stark
Gladys Stark
J. M. Noak
Leo Warren
Annie Stallings
Helen Warren
H. L. Stallings
J. L. Stallings
Bernie C. King
Rosa C. King

C. R. Quinn
Mrs. C. R. Quinn
Haward Goodman
R. R. Horal
Geo. R. Horal
Winniford House
Blair Patterson
Doris Webb
Lawrence
J. A. Johnson
Pete George
Geo. Blake
James W. Henry
Mrs. John Graham
Lang Wood
Mrs. Lang Wood
John Graham
Edward L. Larson
Paul H. Boone
Edmund
G. H. Wright
Oscar Parker
Gabrie Barber
J. B. Smith
Henry M. Smith
Charles D. Smith
Maurine Smith
Mrs. Ed. Loar
E. L. Loar
R. L. Harper
William E. James
W. B. Loar
Mrs. Betty Nell Loar
Robert L. Loar
Thos. F. Terby
L. B. Dean
Fred Hinkins

San Juan County, New Mexico.
February, 1948.

TO.

The New Mexico Oil and Gas Conservation Commission.
Santa Fe, New Mexico.

Gentlemen:-

The undersigned owners of fee lands situated in San Juan County, respectfully submit their opposition to the granting of the petition of the SOUTHERN UNION PRODUCTION COMPANY, now pending before the Commission, such petition being entitled.

"In the matter of the petition for an order fixing the " spacing of wells hereinafter drilled in the Kutz canyon and Fulcher Basin Fields in San Juan County, AS THEY MAY BE EXTENDED and related matters. "

- (1) We deem the granting of the petition will result in a disadvantage to operators as a whole, and to the State of New Mexico, and to the fee land owners.
- (2) In particular we oppose any rule or regulation whereunder the present Kutz Canyon and Fulcher Basin Fields may be extended
- (3) A Major part of the lands in the County (including State lands) are undeveloped, both as to oil and gas.
- (4) Numerous oil and gas leases have been secured by Major and Independent operators embracing units less than 160 acres.
- (5) The State of New Mexico has issued many oil and gas leases, on state and institutional lands and many of such leases are in smaller units than 160 acres, many being for 40 acres, 80 acres, and 120 acres. The Commissioner of Public Lands (and the state) will be in the position of having issued oil and gas leases, accepting money therefore and then not allowing development of such leased lands. (If a 160 acre unit be adopted.)
- (6) The petitioner (The Southern Union Production Company) who have heretofore developed certain of the lands now within the area of the Kutz canyon and Fulcher Basin Fields, dispose of natural gas to the Southern Union Gas Company, its associate, under some arrangement unknown to the protestants. The Southern Union Gas Company is the only purchaser of gas produced in these two fields, and therefore the two corporations have a MONOPOLY as pertains to the present disposition and transportation of gas, and have been able to (and do) dictate and fix the price of gas produced by independent operators, and it now appears that said two corporations have succeeded in getting the gas situation in said two fields in a condition to meet its desires, and now wish an order from the Commission, which would prevent independent operators from drilling, as to units of less than 160 acres.
- (7) The limits of the present Kutz Canyon and Fulcher Basin Fields should be definitely determined. Gas has been discovered in other parts of the County, to-wit: Several wells near Hlanco, wells at Bloomfield, at Aztec, and near the state line to the north. It should be made certain that neither the petitioner, or any one else, might successfully claim that the Kutz Canyon and Fulcher Basin Fields be EXTENDED to embrace other parts of the County.
- (8) No rule or regulation should be adopted that would interfere or restrict or retard the development of lands within the County as to exploration, production or development of either oil or gas in any part of the County, inasmuch as there are several sands and formations, above and below the picture cliff formation (from which the petitioner obtains gas)

Wherefore petitioners, as protestants, pray that said petition be denied.

Respectfully submitted.

Name of land owner.

George A. Hood
Floyd H. West
R. W. Cunningham
Lyde H. Willard
G. D. Brown

Name of land owner.

Walter E. Barnes
G. V. Atkinson
L. E. Allen
J. H. Luther
Leonard Townsend

R. F. Liker
B. W. Shelly
L. A. McCoy
H. A. Miller
A. J. Cynova
E. M. Collins
M. Andrew Cynova
Beverly Hardesty
M. L. Williams
J. D. Hickman
L. B. Franklin
Fred Lombard
T. J. McEarty
Robert Schmidt
William Quinn
Jane Quinn
Robert Quinn
Earl Stetson
Florence Goodard
John Carazza
J. B. Ellis
W. E. Hutchison
M. W. Knudson
K. C. Gress
Ella Walling
C. L. Hutton
O. F. Tucker
Chiepper
F. O. Brothers
M. Hemera ^{in the absence of} son Paul L.
R. D. Cutler
V. R. H. Cresson
John W. Hutton
Benito & B. acc

San Juan County, New Mexico.
February, 1948.

TO,
The New Mexico Oil and Gas Conservation
Commission.
Santa Fe, New Mexico.
Gentlemen;

The undersigned owners of fee lands situated in San Juan County, respectfully submit their opposition to the granting of the petition of Southern Union Production Company, now pending before the Commission, such petition being entitled;

"In the matter of the petition for an Order fixing the spacing of wells hereinafter drilled in the Kutz Canyon and Fulcher Basin Fields in San Juan County, AS THEY MAY BE EXTENDED and related matters."

Our opposition includes the following.

1. We deem the granting of the petition will result in a disadvantage to operators as a whole, and to the State of New Mexico, and to the fee land owners.
2. In particular we oppose any rule or regulation whereunder the present Kutz Canyon and Fulcher Basin fields may be EXTENDED.
3. A major part of the lands in the county (including State lands) are undeveloped, both as to oil and gas.
4. Numerous oil and gas leases have been secured by Major and Independent operators embracing units less than 160 acres.
5. The State of New Mexico has issued many oil and gas leases, on state and institutional lands and many of such leases are in smaller units than 160 acres, many being for 40 acres, 80 acres and 120 acres.
The Commissioner of Public lands (and the State) will be in a position of having issued oil and gas leases, accepting money therefor, and then not allowing development of such leased lands. (if a 160 unit be adopted).
6. The petitioner, who have heretofore developed certain of the lands now within the area of the Kutz Canyon and Fulcher Basin fields, disposed of natural gas to the Southern Union Gas Company, its associate, under some arrangement unknown to protestants.
The Southern Union Gas Company is the only purchaser of gas produced in these two fields, and therefore the two corporations have a MONOPOLY as pertains to the present disposition and transportation of gas, and have been able to (and do) dictate and fix the price of gas produced by independent operators, and it now appears that said two corporations have succeeded in getting the gas situation in said two fields in a condition to meet its desires, and now wish an order from the Commission, which would prevent independent operators from drilling, as to units of less than 160 acres.
7. The limits of the present Kutz Canyon and Fulcher Basin fields should be definitely determined.
Gas has been discovered in other parts of the county, to-wit, several wells near Blanco, wells at Bloomfield, at Aztec, and near the State line to the north.
It should be made certain that neither the petitioner, or any one else, might successfully claim that the Kutz Canyon and Fulcher Basin fields be EXTENDED to embrace other parts of the county.

8. No rule or regulation should be adopted that would interfere or restrict or retard the development of lands within the county as to exploration, production or development of either Oil or Gas in any part of the county, inasmuch as there are several sands and formations above and below the Picture Cliff formation (from which petitioner obtains gas).

Wherefore petitioners, as protestants, pray that said petition be denied.

Respectfully submitted.

Name of land owner.

C. A. Ransom
 R. C. Montgomery
 Chas. W. Maddox
 A. B. McCoy
 H. Blum
 R. E. Sheppard
 L. M. Jagers
 E. R. Boettcher
 J. W. Fisher
 J. L. McWilliams
 L. L. Wade
 L. E. Sipe
 Thos. A. King
 Joseph S. Hartman
 J. C. McKinney
 J. M. Martin
 Wade W. Townsend
 Arthur Lawton
 Wesley Oliver
 Fred. J. Utton
 Robert H. Lewis
 A. H. Will
 Lorraine L. Smith
 Walter Hoyle.

Name of land owner.

W. H. Cantrell
 Geo. F. Brinkman
 C. H. Dyer
 Glen Swire
 C. W. Magee
 Roy L. Sullivan
 H. E. Thomas
 J. A. Brown
 L. L. Stallings
 Bruce W. Hake
 Robert C. Brown
 Frank J. Atkins
 Carl Sexton
 J. C. Townsend
 J. A. Brown
 G. L. Turner
 James Scott
 Bruce Walter
 J. L. Lewis

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 997
Roswell, New Mexico
April 29, 1948

Case 126

Mr. R. R. Spurrier
Director, New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Dear Dick:

As a result of your comment during our brief visit in the Survey office in Artesia on April 21, regarding the relatively wide distribution that might be given part of the material included in the report entitled "Allocation of Gas Withdrawals Among Wells in the Fulcher Basin Pool", I reviewed the original draft of the paper and found that a few minor changes and revisions would be desirable.

I am enclosing a copy of the report on which the desired changes have been indicated by penciled notation (pages 3, 5, 6 and 7, and figure 1) with a request that the material reproduced for distribution be conformed accordingly.

Submission of the edited copy transmitted herewith does not change or modify in any way restrictions that may have been expressed by the Supervisor regarding the use or distribution of the material contained in the draft of the report handed to you at his direction when you visited this office several weeks ago.

Please call on me if I can assist you in any way.

With sincerest regards.

Very truly yours,

M. A. Schellhardt

M. A. SCHELLHARDT,
Gas Engineer.

OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

IN THE MATTER OF PETITION FOR AN
ORDER FIXING THE SPACING OF WELLS
HEREAFTER DRILLED IN THE KUTZ
CANYON AND FULCHER BASIN GAS FIELDS
OF SAN JUAN COUNTY, AS THEY MAY BE
EXTENDED, AND RELATED MATTERS.

NO. _____

SOUTHERN UNION PRODUCTION COMPANY,
Petitioner

To the Commission and its
Honorable Members:

This is a Petition for an order of the Commission fixing by appropriate rules and regulations the spacing requirements applicable to wells hereafter drilled in the Kutz Canyon gas field and in the Fulcher Basin gas field, San Juan County, and related matters. Your Petitioner, Southern Union Production Company, a corporation authorized to transact business in New Mexico, maintains an office in Santa Fe at the corner of Marcy and Otero Streets and an office in Farmington.

Petitioner would show the Commission as follows:

1.

The Kutz Canyon and Fulcher Basin fields are productive of natural gas in commercial quantities from the Pictured Cliff sandstone formation encountered at depths ranging between 1700 and 2300 feet, approximately. The fields are in close proximity, may be contiguous and may, in fact, be essentially one gas producing area. The term "general area" will be used herein to refer to these fields, as they may be extended from time to time. The lands now known or reasonably regarded as proved to be productive of natural gas in commercial quantities from the Pictured Cliff are those described in Exhibit A annexed.

2.

According to Petitioner's information, there are now a total of approximately 76 wells in the general area which are productive of natural gas from the Pictured Cliff. Except for those very recently completed and in the process of being connected, each such well is connected with and producing into the natural gas transportation system of Southern Union Gas Company extending from gas areas in San Juan County, New Mexico, to existing markets in Santa Fe,

ILLEGIBLE

Albuquerque and elsewhere.

3.

Petitioner has been actively engaged for many years in operating its own wells and certain others in the general area. It has accumulated statistics and other information bearing upon the permeability, porosity and producing characteristics of the Pictured Cliff, and from such information believes that a well completed in the Pictured Cliff will in an orderly manner drain gas from not less than 160 acres of that formation; hence, that more dense drilling is unnecessary and uneconomic.

Although there are exceptions, previous drilling in this area has generally conformed to 160-acre spacing, with wells located substantially in the center of a unit. To some extent this spacing pattern is a result of the fact that during World War II the Commission's spacing rule applicable to gas areas provided generally for one well to each 160 acres. To some extent it is due to the current policies of the United States Geological Survey in its exercise of jurisdiction over oil and gas practices affecting the substantial federal acreage in the area. To some extent, moreover, it is a result of Petitioner's own convictions, based on the data accumulated from its own and other wells, and the convictions of certain other operators.

Knowledge of the general area and its characteristics has, of course, increased with extensions of the proven acreage and other developments, particularly in recent years. Much of this pertinent information has not yet been submitted to the Commission in appropriate form.

4.

The present spacing rule applicable in the general area appears to be contained in Section 1 of Order 637 effective March 1, 1946 (the Statewide Order), which provides in part:

Unit of production shall consist of 40 or less an acreage with the largest number of wells in any unit which is at least one producing well.

"1. (a) 1. . . . No well shall be drilled closer to any unit boundary line than 330 feet or less than 660 feet from any other well except upon petition, notice and hearing as provided by law, provided such unworthodox well location will create neither waste nor hazards conducive to waste."

The present spacing provision, therefore, would permit the location, on 40-acre tracts, of proposed wells within 330 feet of any established drilling unit, including those 160-acre units now existing in the general area which are

producing gas from one centrally located well. It is apparent that under present spacing rules the recent marked activity and competition for the limited attractive acreage available will result in 130 foot offset wells in a gas area and, consequently, in competitive offset drilling of unnecessary wells -- on units already established in addition to those to be established in the future. In this connection it is believed significant that Section 12, Chapter 72, Laws of 1925 (Section 69-213, New Mexico Statutes Annotated, '41 Edition), while it is applicable to oil or oil and gas wells, provides in part as follows:

"The drilling of unnecessary wells creates fire and other hazards conducive to waste, and unnecessarily increases the production cost of oil and gas to the operator, and thus also unnecessarily increases the cost of the products to the ultimate consumer."

It is also significant that by Section 10 of the same enactment (Section 69-211, '41 Edition), the Commission is expressly authorized to make rules, regulations and orders fixing the spacing of wells. Moreover, the Commission possesses, and in several instances has exercised, authority to promulgate special rules and regulations applicable to a particular area of production.

5.

By proper rule, regulation or order of special application to the Kutz Canyon-Fulcher Basin general area, as it may be from time to time extended, the Commission should inaugurate and enforce a spacing program which will economically and effectively permit, without unnecessary drilling costs or operating expenses, the recovery of natural gas reasonably producible from that area. Petitioner is prepared to submit evidence pertinent to a proper spacing program. From the information available to it petitioner believes that, except in unusual instances, a uniform spacing unit of not less than 100 acres should be provided with respect to wells hereafter drilled in the general area,

Attention is directed to the increasingly common practice of pooling leaseholds for exploration and development, particularly where small tracts in gas areas are involved, and to the expeditious method now provided by applicable statutes and regulations for communitizing federal oil or gas acreage with other lands. Moreover, the Commissioner of Public Lands is authorized in proper cases to approve and consent to unitization programs involving State of New Mexico leases.

WHEREFORE, Petitioner requests that the Commission, after notice and hearing as required by law and applicable regulations, enter its proper order or orders fixing the spacing of wells hereafter drilled in the Kutz Canyon-Fulcher Basin general area of production, as it may be from time to time extended, on the basis of one well at approximately the center of a 160-acre drilling unit in substantially the shape of a square, with suitable provisions for any related matters, including special approval, after notice and hearing, of unorthodox well locations necessitated by the size or shape of available units or by the nature of the terrain; and, pending final action on such request, that the Commission, its agents and employees refrain as a matter of policy from approving or permitting to become effective any Notice of Intention to Drill now or hereafter on file with respect to a well in the general area which does not provide for the location of such well at or within a reasonable distance of the center of its drilling unit consisting of 160 acres, more or less, in substantially the shape of a square.

Petitioner hereby offers to supply such information concerning the subject matter of this application as is available to it.

Respectfully submitted,

SOUTHERN UNION PRODUCTION COMPANY

By J. C. Reed
Vice President

ATTEST:

Assistant Secretary
Assistant Secretary

VERIFICATION

STATE OF TEXAS)
)
COUNTY OF DALLAS)

Before me, a Notary Public in and for Dallas County, Texas, personally appeared J. C. REED, Vice President of SOUTHERN UNION PRODUCTION COMPANY, a corporation, well known to me to be such person and officer, and he upon oath

duly administered stated that he had read the foregoing petition and that the facts therein set forth are true and correct to the best of his information and belief, and that he had executed such petition on behalf of said corporation as its free and voluntary act and deed, pursuant to due authorization.

J C Reid

Sworn to and subscribed before me this 24th day of January, 1946, to certify which witness my hand and seal of office.

W. C. [illegible]
Notary Public in and for
Dallas County, Texas

My Commission Expires:

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EXHIBIT A

Description of lands known or reasonably regarded as proved to be
productive of natural gas in commercial quantities from the Pictured
Cliff.

Township 30 North, Range 12 West

Sections 26, 29, 30,
32, 33, 34: All

Township 29 North, Range 12 West

Sections 1, 2, 3, 11, 12, 13: All
Section 14: $\frac{1}{2}$

Township 29 North, Range 11 West

Sections 16, 19, 20,
26, 29, 33, 34: All
Section 7: $\frac{1}{2}$
Section 21: $\frac{1}{2}$

Township 28 North, Range 11 West

Sections 11, 13, 14, 24: All

Township 28 North, Range 10 West

Section 19, 29: All
Section 18: $\frac{1}{2}$
Section 20: $\frac{1}{2}$
Section 30: $\frac{1}{2}$
Section 32: $\frac{1}{2}$

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May 31, 1946

ALLOCATION OF GAS WITHDRAWALS AMONG THE WELLS IN THE FULCHER BASIN POOL

By M. A. Schellhardt

INTRODUCTION

The Fulcher Basin pool is situated in San Juan County, New Mexico. The developed area, at present, includes land in the public and patented categories in T. 30 N., R. 27 W.; T. 29 N., R. 12 W.; and T. 29 N., R. 11 W. Records for April 1946 show that there were 26 productive wells in the pool; 15 of which were on public land and 11 were located on patented land.

The New Mexico conservation statutes pertaining to oil and gas development and recovery operations include no stipulations regarding ratable taking of gas from gas pools. Gas wells, however, are not excepted by the statute authorizing the Conservation Commission to "fix the spacing of wells". Statutory provisions regarding the ratable taking of gas apply only to gas withdrawals from prorated oil pools. The State conservation laws also empower the Commission to require that wells be operated in such manner as to prevent injury to neighboring leases or properties, and to prevent underground and surface waste of oil and gas. Operation of the only pipe line serving the Fulcher Basin pool, however, is subject to the regulations concerning rights-of-way for pipe lines (GLO circular No. 1386, page 16) approved by the Secretary of the Interior May 7, 1936. An excerpt from those regulations follows. "In approving such right-of-way grant it shall be specifically stated that such pipe line shall be constructed, operated, and maintained as a common carrier and that the grantee shall accept, convey, transport, or purchase without discrimination oil or natural gas produced from Government lands in the vicinity of the pipe line in such proportionate amounts as the Secretary of the Interior may, after a full hearing with due notice thereof to interested parties and a proper finding of facts determine to be reasonable, and in addition that the use of such pipe line for the transportation of oil or gas shall be limited to oil and gas produced in conformity with State and Federal laws including laws prohibiting waste."

The only regulatory requirement applicable to the proration of deliveries from the wells in the Fulcher Basin pool is the stipulation in the Federal regulations concerning pipe line rights-of-way that natural gas produced from Government lands be transported or purchased

in such proportional amounts as shall be determined reasonable by the Secretary of the Interior. Under the existing circumstances measures developed voluntarily and applied for allocating gas withdrawals from the groups of wells in the respective land categories among the wells in the respective groups may be conformed to principles desired.

Conventional gas proration practices applied throughout the early stages of the development of the natural gas industry in the many states were predicated upon the "law of capture", the principle adhered to by the courts in rendering decisions regarding the ownership of accumulations of oil and gas existing in or recovered from natural reservoirs. Proration methods that conformed to the law-of-capture principle of recovery operations required consideration of only one factor, availability, which generally was expressed in terms of open flow delivery capacity or "potential".

The trend of statutes enacted by state legislative bodies in recent years, however, shows an increasing tendency to regard migratory minerals in place as property susceptible to the precepts of ownership rights accorded to owners of land. The effect of the operation of the revised legal concept regarding property rights and the ownership of oil is evidenced by two commonly occurring examples, namely, (1) participation of the owners of small areas, that often could not be developed individually for economic reasons, in the revenues derived from wells drilled on blocks formed by the pooling of small tracts to conform to established spacing regulations, and (2) compensatory payments made by holders of leasehold rights to royalty interests on undrilled tracts offset by productive units. The changed concept regarding property rights and the ownership of oil now held by a large element of the oil industry was expressed by a statement issued by the Board of Directors of the A.P.I. in 1931, an excerpt from which is quoted as follows, " * * * * * that it indorses, and believes the petroleum industry indorses, the principle that each owner of the surface is entitled only to his equitable and ratable share of the recoverable oil and gas energy in the common pool in the proportion which the recoverable reserves underlying his land bear to the recoverable reserves in the pool".

The revised concept regarding property rights and the ownership of oil in place was fostered by the restrictions imposed upon rates of oil withdrawal and well spacing by regulatory agencies in several states to correct the condition of over supply that followed extensive development of the East Texas field. Although the bases used during the early era of oil proration for determining allowables for oil wells in many areas involved the precepts of the law of capture, the trend of allocation practices applied to oil recovery throughout

the intervening period shows increasing consideration for the fundamental principle of property rights and ownership described by the statement quoted in the preceding paragraph. Orders of the State Conservation Commission of New Mexico pertaining to oil prorate pool allowables equally among the wells or oil productive units therein. The delivery capacity factor is considered only if wells are incapable of producing oil at the maximum rate allocated to the respective productive units. Wells not capable of producing maximum allowables are classified as marginal and their allowables^{ies} are determined directly by productive capacity.

Progress toward conformation of gas ^{allocation} ~~allocation~~ practices to the more recently developed concept regarding the ownership of migratory minerals, which would insure the diverse interests reasonable opportunities to recover (not market) their equitable share of the recoverable gas in a common reservoir, lagged behind the advance made by oil allocation methods toward that objective. Regulatory measures established maximum allowable delivery rates for natural gas wells in several states many years before the application of regulatory measures to oil recovery rates became general. The precedents established by early regulatory practices have materially retarded the development and application of equitable allocation measures to natural gas recovery operations.

GENERAL CONSIDERATIONS

The availability of gas from gas wells, usually expressed as open flow delivery rate, served as a conventional standard for prescribing conservational measures and for prorating market demand among groups of wells throughout the history of gas recovery operations in many fields. Proration measures predicated upon the delivery capacity factor were beneficial to the development of orderly marketing programs in many fields. A knowledge of the delivery capacities of individual wells and of conditions that influence the producing characteristics of individual wells and of pools as a whole is essential to gas transmission and marketing economy. Delivery capacities of gas wells however do not provide a reliable index to the volume of gas in a reservoir or to the volume of gas underlying acreage accredited to individual wells by prevailing well spacing programs. Consequently, the delivery capacity factor is not essential to allocation formulas predicated upon the principle that the owners of productive units developed in conformance to authorized spacing regulations should have a reasonable opportunity to produce the recoverable gas embraced by the respective units.

Conservation measures likewise based upon delivery capacity were beneficial to ultimate recoveries from many gas reservoirs. Application of conventional proration and conservation measures based on

delivery capacity has not been feasible physically or economically, however, throughout the operative lives of many shallow gas wells. Difficulties that beset evaluating delivery capacities of the deep, high-pressure gas wells that represent an increasing element of over-all source of supply were discussed in Bureau of Mines R.I. 3767. ^{1/} Moreover, operation of deep gas wells will be considerably more difficult than shallow wells as reservoir pressures decline and the inadequacy of conventional delivery restrictions, as a conservation measure, will be manifest at considerably higher pressures. Inasmuch as the beneficial effect of restricted delivery rates on ultimate recoveries from gas wells probably is a direct result of the corresponding limitation effected thereby on pressure differentials in the reservoir, it is logical to conclude that pressure could be used advantageously for prescribing conservative operating practices.

Conventional proration measures reduced delivery rates from gas wells progressively as open flow delivery rates declined. The decreased pressure differentials that prevailed in the reservoirs about the wells under the decreased rates of gas withdrawal probably were beneficial to efficiency of well operation and to ultimate recoveries in reservoirs subject to active water encroachment. Conditions observed in some pools in which there was no evidence of water encroachment, however, indicated that well performance was improved materially by maintenance of relatively high rates of withdrawal during the latter stages of their operative lives.

RELATIONSHIPS BETWEEN PRESSURES AND GAS DELIVERY RATES FOR GAS WELLS

Generalized relationships between back pressures at the face of the producing sand, expressed as percentages of the closed-in pressures, and rates of gas delivery, expressed as percentages of the absolute open-flow deliveries, for gas wells are shown by the graphs on figure 1.

^{1/} Schellhardt, M. A., Application of the Back-Pressure Method for Determining Absolute Open Flows of Large Gas Wells: Bureau of Mines Rept. of Investigations 3767, 1944, 13 pp.

An empirical equation expressing a fundamental relationship between rate of flow of gas through reservoirs into wells and well pressures^{2/} follows:

$$Q = C (P_f^2 - P_s^2)^n$$

where

- Q = rate of flow of gas in cubic feet per 24 hours,
- C = a coefficient,
- P_f = shut-in formation pressure, pounds per square inch absolute,
- P_s = back pressure at the sand face in the well bore in pounds per square inch absolute,
- n = an exponent corresponding to the slope of the straight-line relationship between Q and $(P_f^2 - P_s^2)$ plotted on logarithmic paper.

Limits of the range of values for the exponent, n, of the equation were discussed in Bureau of Mines Monograph 72^{3/} and in Bureau of Mines R.I. 3767.^{4/} Graphs A to G, figure 1, represent generalized relationships between pressures at the face of the sand and rates of gas delivery corresponding to values ranging from 1.2 to 0.6 for the slopes of the relationships determined by plotting rate of gas delivery, Q, against corresponding values of the pressure factor, $(P_f^2 - P_s^2)$, on logarithmic paper.

The graphs on figure 1 indicate that if values of the slopes of the relationships between Q and $(P_f^2 - P_s^2)$, or values of n of the equation for flow, $Q = C(P_f^2 - P_s^2)^n$, determined by back-pressure data range from 1.2 to 0.6, back pressures at the face of the sand corresponding to deliveries equivalent to 25 per cent of the absolute open flows of the wells range from ~~about~~ 83 to 95 per cent of the closed-in pressure. The graphs on figure 1 show also that if values of n range from 1.2 to 0.6, rates of gas delivery at back pressures equivalent to 90 per cent of the closed-in pressures range from ~~about~~ 13 to 37 per cent of the absolute open-flow deliveries of the wells. Hence, the absolute open-flow delivery of a well provides only an approximate index to rates of gas delivery that may be produced at elevated back

2/ Pierce, H. R. and Rawlins, E. L., The Study of a Fundamental Basis for Controlling and Gaging Natural-Gas Wells. Part 2: Bureau of Mines Rept. of Investigations 2930, 1929, 21 pp.

3/ Rawlins, E. L., and Schellhardt, M. A., Back-Pressure Data on Natural-Gas Wells and Their Application to Production Practices: Bureau of Mines Monograph 7, 1936, pp. 33 and 34.

4/ Footnote 1.

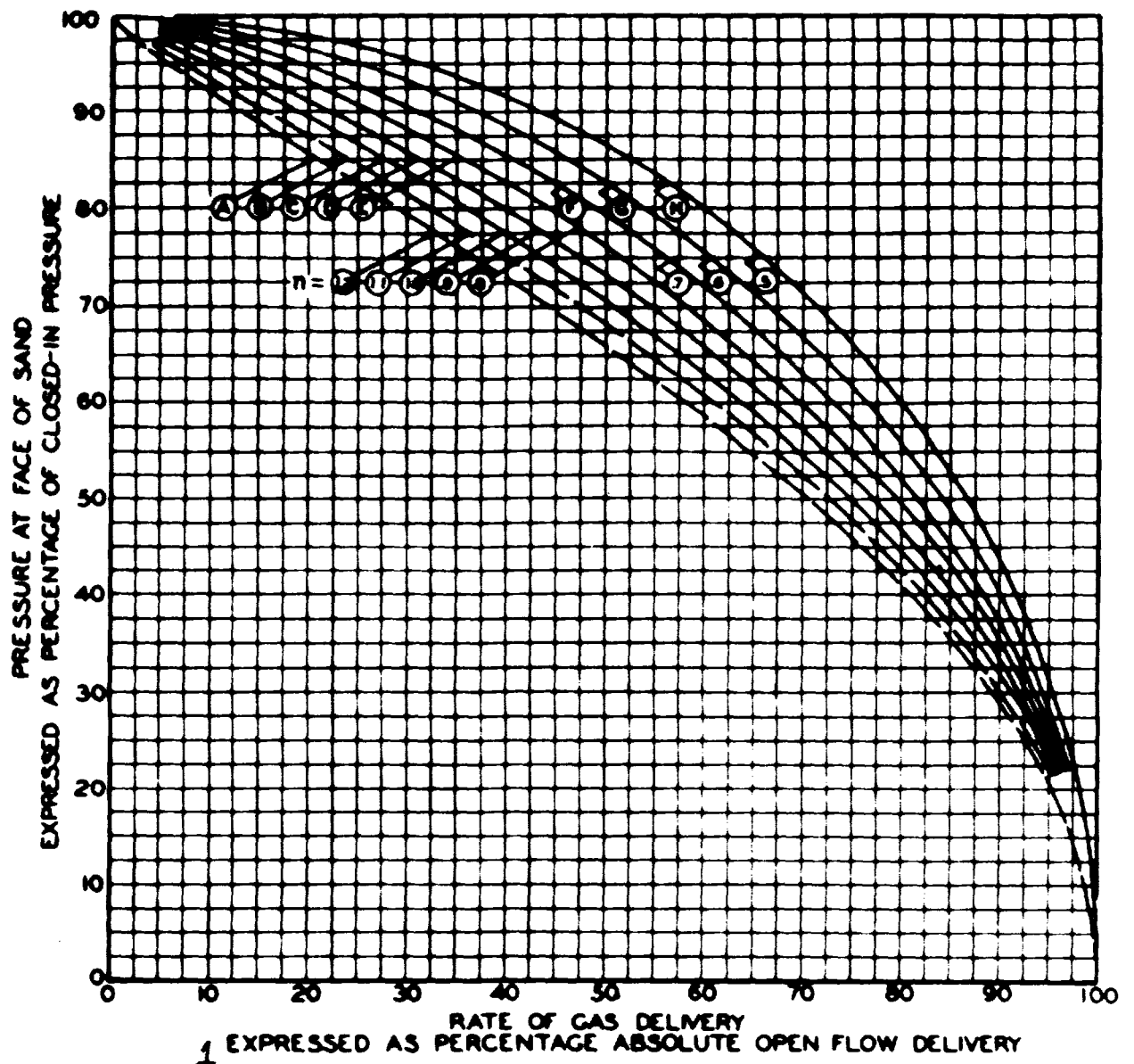


FIGURE X-GENERALIZED RELATIONSHIPS BETWEEN PRESSURE AT FACE OF SAND AND RATE OF GAS DELIVERY FOR GAS WELLS.

July 26, 1946

APPENDIX

to report entitled

ALLOCATION OF GAS WITHDRAWALS AMONG WELLS IN THE FULCHER BASIN POOL

The most recent closed-in pressure data available for the wells in the Fulcher Basin pool were gauged in April 1946. Production reports show that the volume of gas withdrawn from the pool in April was 166,084,000 cubic feet, which represents an average withdrawal rate of 5,535,000 cubic feet per 24 hours. The average daily withdrawal rate for April 1946, closely approximated the average daily rate of withdrawal for 1945, which was 5,452,000 cubic feet.

Comparison between actual withdrawals for April 1946 and corresponding well allowables determined by the pressure-reserve criterion is shown by the data in table 1. Comparison between allowables determined by the open flow standard and allowables determined by the pressure-reserve criterion is shown by the data in table 2. Information regarding the reserves underlying the various developed tracts in the pool was not available and the acreage allocated to the respective wells by Foster Morrell, Supervisor of Oil and Gas Operations, was used instead of reserves for computing allowables by the pressure-reserve criterion. Although reservoir pressure data are essential to accurate evaluation of reserves and the solution of many gas recovery problems, the relationship between the allowables computed by the pressure-reserve criterion is not influenced materially by the substitution of wellhead pressures for the values of the corresponding pressures at the productive zone. Wellhead pressure data were used for computing the pressure-reserve criterion allowables shown in tables 1 and 2. The open flow delivery data shown in table 2 represent the initial delivery capacities of the wells, and the corresponding allowables (table 2) were based on the initial open flow delivery data.

Withdrawal data shown in table 1 represent the maximum delivery rates obtainable under the pressures prevailing in the gathering system in April 1946. Consequently, any adjustment of delivery rates that might be required to conform withdrawals to a different system of proration would require either that pool withdrawal rates be reduced or that the gathering system pressures be decreased.

M. A. SCHELLHARDT
Gas Engineer

Table 1. Data on wells in Fulcher Basin pool showing comparison between actual withdrawals in April 1946, and allowables determined by the pressure-reserve criterion.

Operator	Well	Lease serial No. (GLO)	Actual withdrawals Mcf	Allowables by Pressure- Reserve Criterion	Closed-in press. (P), psi.	Closed-in press. (P), squared (thousands)	Allocated pressure (Rw)	P ² X Rw, (thousands)	P ² X Σ P ² X
N. D. Exploration Company	Carroll No. 1	S.F. 065557	4,487	6,342	411	168.9	160	27,024	.03818
N. D. Exploration Company	Carroll No. 2	S.F. 065557	6,216	6,716	423	178.9	160	28,624	.04044
N. D. Exploration Company	Carroll No. 5	S.F. 065557	9,292	1,025	378	142.9	120	17,148	.02423
N. D. Exploration Company	Carroll No. 6	S.F. 065557	5,453	4,866	360	129.6	160	20,736	.02930
N. D. Exploration Company	Carroll No. 8	S.F. 065557	4,071	4,866	360	129.6	160	20,736	.02930
Southern Union Prod. Company	Carroll No. 3	S.F. 076465	(15,380)	(2,325)	(389)	150.5	(80)	(12,040)	(.01701)
Southern Union Prod. Company	Carroll No. 4	S.F. 076465	()	()	(386)	()	()	()	()
Southern Union Prod. Company	Carroll No. 7	S.F. 076465	5,546	6,752	424	179.8	160	28,768	.04065
Southern Union Prod. Company	Well No. 1	S.F. 075587	1,747	7,007	432	186.6	160	29,856	.04219
Southern Union Prod. Company	Well No. 2	S.F. 075587	10,903	4,599	390	152.1	160	19,600	.02769
Southern Union Prod. Company	Cossens No. 1	S.F. 077056	6,839	7,075	434	188.4	160	30,144	.04259
Southern Union Prod. Company	Cossens No. 2	S.F. 077056	7,595	7,705	453	205.2	160	32,832	.04639
Southern Union Prod. Company	Hudson No. 1	S.F. 077922	4,098	9,274	407	167.0	160	39,520	.05584
Southern Union Prod. Company	Cooper No. 1	S.F. 077317	3,936	7,671	452	204.3	160	32,688	.04619
Summitt Oil Company	Summitt No. 3-B	S.F. 047019(b)	6,811	5,677	449	201.6	120	24,192	.03418
Southern Union Prod. Company	Cossens No. 3	S.F. 075695	0		476	226.6	80		
			92,374	85,400				363,908	.51418
Southern Union Prod. Company	Hart No. 1	Patented	4,010	5,503	442	195.4	120	23,448	.03313
Southern Union Prod. Company	McDaniel No. 1	Patented	7,793	7,680	452	204.3	160	32,688	.04618
Southern Union Prod. Company	Walker No. 1	Patented	7,268	7,269	440	193.6	160	30,976	.04377
Southern Union Prod. Company	Walker No. 2	Patented	1,460	5,713	390	152.1	160	24,336	.03439
Southern Union Prod. Company	McGrath No. 1	Patented	4,661	7,336	442	195.4	160	31,264	.04417
Southern Union Prod. Company	McGrath No. 2	Patented	16,276	7,807	456	207.9	160	33,264	.04700
Southern Union Prod. Company	McGrath No. 3	Patented	4,638	7,738	454	206.1	160	32,976	.04659
Southern Union Prod. Company	Kattler No. 1	Patented	4,411	6,942	430	184.9	160	29,584	.04180
Southern Union Prod. Company	Allen No. 1	Patented	1,260	9,090	492	242.1	160	38,736	.05473
Maddox-Hargis	Hargis No. 1	Patented	10,513	9,235	496	246.0	160	39,360	.05561
Carroll et al	Carroll No. 1	Patented	11,400	6,381	476	226.6	120	27,192	.03842
			73,710	80,684				343,824	.48579
			166,084	166,084				707,732	

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TABLE 2. Data on wells in Fulcher Basin pool showing comparison of allowables determined by the pressure-reserve criterion for April 1946, with those determined by the open flow standard

Operator	Well name and number	Lease serial number (GLO)
E. D. Exlor. Co	Carroll 1	S.F. 065557
E. D. Exlor. Co	Carroll 2	S.F. 065557
E. D. Exlor. Co	Carroll 5	S.F. 065557
E. D. Exlor. Co	Carroll 6	S.F. 065557
E. D. Exlor. Co	Carroll 8	S.F. 065557
Southern Union Prod. Co.	Carroll 3	S.F. 076465
" " " "	Carroll 4	S.F. 076465
" " " "	Carroll 7	S.F. 076465
" " " "	Reid 1	S.F. 075587
" " " "	Reid 2	S.F. 075587
" " " "	Cozzens 1	S.F. 077056
" " " "	Cozzens 2	S.F. 077056
" " " "	Hudson 1	S.F. 077922
" " " "	Cooper 1	S.F. 077317
Summitt Oil Company	Summitt 1	S.F. 047019(b)
Southern Union Prod. Co.	Leah 1	Patented
" " " "	Waller 1	"
" " " "	Walker 1	"
" " " "	Walker 2	"
" " " "	McCrath 1	"
" " " "	McCrath 2	"
" " " "	McCrath 3	"
" " " "	Kattler 1	"
" " " "	Allen 1	"
Madden-Hargis	Hargis 1	"
Carroll-Cornell	Carroll-Cornell 1	"

Closed-in wellhead press., psig.	Open flow, M cu. ft. per 24 hrs.	Allowables, M cu. ft. Pressure-reserve criterion	Open flow standard
411	1,100	6,342	5,656
423	1,300	6,716	6,685
378	2,500	4,025	12,856
360	910	4,866	4,679
360	917	4,866	4,716
389	1,290	(2,825	6,624
386	2,300		11,828
424	750	6,752	3,857
432	550	7,007	2,828
350	4,100	4,599	21,084
434	1,000	7,075	5,142
453	802	7,705	4,124
497	686	9,274	3,527
452	1,140	7,671	5,862
449	850	5,677	4,371
		85,400	103,849
442	857	5,503	4,408
452	1,000	7,670	5,143
440	1,300	7,269	6,685
390	517	5,713	2,659
442	768	7,336	3,949
456	2,110	7,807	10,851
454	510	7,738	2,622
430	2,500	6,942	12,856
492	230	9,090	1,184
496	910	9,235	4,679
476	1,400	6,381	7,199
		80,684	82,235
		166,084	166,084

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(relative differentials)

differ widely

pressures and the difference between closed-in pressures and back pressures at the face of the sand that may prevail in wells operated at rates of withdrawal equivalent to the same percentage of their absolute open flows ~~varies~~ ^{differs} materially. The data presented show that well pressure might be used effectively for prescribing limiting operating conditions for gas wells. Application of conservation measures predicated upon well pressure instead of delivery rate would prove advantageous and the need for evaluation of open flow delivery rates, for that purpose, would be eliminated.

A PRESSURE-RESERVE CRITERION FOR DETERMINING ALLOWABLES FOR GAS WELLS

Responsibility for disposing of gas available from individual wells in many fields for purposes approved by regulatory authorities rests upon the operator. Consequently, an allocation or proration system need only distribute overall withdrawals authorized by regulatory authorities or required to supply existing market demand among connected wells and establish allowables on a common equitable basis for any additional wells that pool development might include.

Reserves and reservoir pressures are factors most essential to the development of a system for allocating gas withdrawals from a pool among the wells therein. The reservoir stratum in some gas pools is very permeable and a wide variation of rates of withdrawal from different areas creates only moderate regional pressure differentials which equalize quickly when the wells are closed in. The pressure factor is relatively unimportant to an allocation formula for application to pools of that type inasmuch as rapid migration of gas tends to maintain uniform reservoir pressures, thereby accenting the importance of the reserve factor. Permeabilities of the productive strata in most gas pools, however, are not favorable to rapid equalization of pressure and often wide differences are created in the pressures prevailing in different areas of the pool by the conforming withdrawals to open flow or to some measure of delivery capacity. The pressure factor is highly important to the equitable allocation of withdrawals among wells in pools characterized by non-uniform permeability; particularly if well spacing patterns are uniform and reserves are expressed in terms of area or acreage.

A generalized formula incorporating factors essential to equitable allocation of withdrawals among the wells in a pool follows:

$$a = A \left(\frac{P_f^2 \times R_w}{\sum (P_f^2 \times R_w)} \right)$$

where

a = maximum allowable rate of gas withdrawal from a well,
M cubic feet per 24 hours,

P_f = closed-in pressure at the productive zone in the well,
pounds per square inch absolute,

R_w = gas reserve under the acreage allotted to the well, consistent units,

A = volume of gas to be supplied from the common reservoir during a specified period, expressed as M cubic feet per 24 hours,

$\sum (P_f^2 \times R_w)$ = sum of the products of $P_f^2 \times R_w$ for all of the wells in a pool.

The square of the value of reservoir pressure is used in the formula because ~~the significance of~~ the dynamic property of the pressure factor is more important to the allocation formula than static properties of pressure; irrespective of whether the reserve factor is expressed in terms of gas volume or land area. Under normal conditions the rate of flow of gas through reservoir strata, either into wells or from one area to another, is a function of the difference between the values of the squares of the prevailing terminal pressures. The absolute open flow delivery rate of a gas well is a function of the square of the effective reservoir pressure. Values of reservoir pressures determined for different wells in a gas pool by tests of brief duration often differ widely. Percentage recovery of gas in place usually will be lower for productive units characterized by higher pressures than for units having lower reservoir pressures. Although the relative values of the pressures do not always provide a reliable standard for evaluating the proportion of the recoverable gas remaining in or produced from the various productive units, existence of pressure differential in a gas reservoir is a positive indication of fluid migration either within the respective units or across unit boundaries.

The wide variety of factors influencing gas recovery operations in different gas pools might require that a general formula for determining allowables for gas wells be modified or supplemented for effective application under the prevailing local conditions. As an example, available information regarding reserves underlying individual units in many pools is meager and it is common practice for proration purposes to express reserves in terms of area. In pools developed by uniform well spacing programs, substitution of acreage for recoverable gas volume will induce a condition similar to that prevailing in oil pools prorated on a straight "per unit" basis in that some wells on units characterized by relatively small reserves^{5/} will not deliver the volumes of gas allocated to them. The complication might be eliminated, however, by application of a marginal

^{5/} The permeability of the gas bearing stratum varies widely throughout the areal extent of many gas pools and the proportion of the gas in place in many productive units that can be recovered at commercial rates of withdrawal from wells drilled thereon is a function of permeability. In many gas pools where withdrawals from individual wells were determined by their delivery capacities, areas characterized by relatively small reserves ~~per acre~~ initially and by ^{above} average reservoir permeabilities usually are characterized by reservoir pressures lower than those prevailing either in areas having larger reserves and average permeabilities or in areas having relatively small reserves and low permeabilities.

In applying the pressure-reserve criterion to allocate withdrawals among wells in pools developed by uniform spacing programs, substitution of acreage for reserves will increase the proportion of the pool allowable allocated to productive units characterized by relatively small reserves. Inasmuch as areas having relatively small reserves usually are characterized by relatively low reservoir pressures, the pressure factor will materially reduce the inequity introduced by substituting acreage for reserves where those conditions prevail. Allowables determined for productive units in areas characterized by relatively small reserves and low permeabilities however will be too high and a marginal factor should be applied to conform excessive allowables, resulting from the substitution of acreage for reserves, to producible withdrawal rates; thereby permitting the distribution of the excess volume that otherwise would have been allocated to the weak wells among the other wells in the pool either during contemporary or subsequent allocation periods.

factor to adjust allocated deliveries for weak wells to conform to local conditions. Conditions prevailing in some fields might require that the application of the described allocation formula be supplemented by a conservation measure prescribing a minimum operating pressure for the wells in a pool. In semi-depleted pools where deliveries have been prorated on an open flow basis, wells characterized by large open flows often are characterized by closed-in pressures considerably lower than wells of smaller delivery capacities. Conditions similar to those described should be considered in determining pool allowables.

The problem of determining allowables for pools is related closely to that of determining allowables for wells. Experience indicates that factors essential to efficient and economic recovery operation of a gas pool should be given adequate consideration in the process of determining pool allowables; thereby facilitating application of regulations for determining allowables for individual wells as an independent process requiring only consideration and evaluation of the factors directly involved.

Application to Fulcher Basin Pool

Productive wells in the Fulcher Basin pool are completed in the Pictured Cliff sandstone member of the ~~Cretaceous system~~. The data recorded on the logs of wells located on public land indicate that the top of the "pay" in the various wells ranges in depth from 1,665 to 1,978 feet below derrick floor datum, and in elevation from 3,844 to 3,907 feet above sea level. The intervals included by the gas-bearing strata range from 10 feet in a well productive from a single permeable zone to 105 feet in a well productive from three permeable zones. The writer is not familiar with the stratigraphy of the reservoir, particularly with regard to the identity of and relationship between the respective pay strata in the different wells, nor the relationship between the gas-bearing strata and the water-bearing strata penetrated a short interval above the gas-bearing strata in some wells. It is the opinion of those familiar with sub-surface conditions in the field, however, that there is no communication between the water-bearing and gas-bearing reservoir systems and that the gas productive strata of the Pictured Cliff sandstone are not water-bearing within the limits of the field.

The completed wells in the Fulcher Basin pool are equipped with only one string of casing which is landed and cemented at points ranging from a short interval below to a short distance above the tops of the upper strata productive in the different wells.

Data available for a group of 14 wells show that initial closed-in wellhead pressures ranged from 485 to 592 pounds per square inch and initial open flow rates of gas delivery ranged from 437,000 to 4,000,000 cubic feet per 24 hours. Data obtained in April 1946 indicated that closed-in pressures for 26 wells ranged from 350 to 497 pounds per square inch. Corresponding open flow delivery rates for the wells ranged from 230,000 to 4,100,000 cubic feet per 24 hours.

The locations of the 26 wells in the field do not conform to a uniform spacing pattern. The intensity of the pool development, however, roughly represents a ratio of one well per 160 acres.

The described factors and conditions indicate that the general characteristics of the pool are similar to those of many shallow gas fields. Apparent freedom of the gas-bearing strata from water (other than interstitial) probably is one of the most distinctive characteristics of the pool. Existing physical conditions are not unfavorable to obtaining the data required for allocating gas withdrawals from the pool among the wells either on a basis of delivery capacity or by the described pressure-reserve criterion. The delivery capacities of the wells are relatively low and they could be "blown down" to permit measurement of gas deliveries produced at relatively low back pressures. The presence of water-bearing strata behind the gas string of casing, however, probably would make inadvisable the creation differentials between exterior and interior casing pressures that exist under open flow conditions. Consequently, if the delivery capacity is used for prorating withdrawals, the method used for evaluating deliveries corresponding to the chosen standard should not require that the wells be operated at pressures materially less than those that prevail under routine operations.

Conditions in the Fulcher Basin pool are favorable to the application of the pressure-reserve criterion for allocating gas withdrawals among wells. The wells probably are relatively free from liquids and periodic gaging of closed-in wellhead pressures would be the only field tests necessary to obtain the required data. Although available data is inadequate for evaluating gas reserves under individual productive units, the reserve factor might be expressed in terms of acres. A problem introduced by the existing non-uniform pattern of the well locations probably could be solved to the satisfaction of the various owners of leasehold and royalty interests by adjusting the acreage assigned to the respective productive units to eliminate inequities that otherwise will exist.

Application of the pressure-reserve criterion for allocating gas withdrawals from the Fulcher Basin pool among the wells therein will

tend to insure that the various operators will have a reasonable opportunity to produce from their productive leaseholds a fair share of the total gas withdrawals. An application of the pressure-reserve criterion will prove advantageous also in that the required field work will be much less extensive than that required to obtain data essential to the application of a system of allocation based upon a gas delivery factor.

Comparison of allowables evaluated by the pressure-reserve criterion with those determined by the open flow standard, for wells in the Fulcher Basin pool, will be included in an appendix to this report.

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

JOSEPH L. EGAN
PRESIDENT

1220

SYMBOLS

DL = Day Letter

NL = Night Letter

LC = Deferred Cable

NLT = Cable Night Letter

Ship Radiogram

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

VA179 NL PD=DALLAS TEX 24

GEORGE GRAHAM, ATTORNEY OR R R SPURRIER, SECRETARY

OIL CONSERVATION COMMISSION SF=

APPLICATION FOR SPACING ORDER KUTZ CANYON-FULCHER BASIN
FIELDS OF SAN JUAN COUNTY AIR MAILED TODAY WITH PARAGRAPH
SUGGESTED FOR INCLUSION IN NOTICE AS FOLLOWS: IN THE MATTER
OF THE PETITION OF SOUTHERN UNION PRODUCTION COMPANY FOR AN
ORDER FIXING THE SPACING OF WELLS IN THE KUTZ CANYON AND
FULCHER BASIN GAS FIELDS OF SAN JUAN COUNTY (AS THEY MAY BE
EXTENDED) ON THE BASIS OF ONE WELL TO A DRILLING UNIT OF
APPROXIMATELY 160 ACRES WITH SUITABLE PROVISIONS FOR ANY
RELATED MATTERS INCLUDING SPECIAL APPROVAL OF UNORTHODOX
WELL LOCATIONS WHERE NECESSARY=

SOUTHERN UNION PRODUCTION CO WILLIS L LEA JR.

160

DOMESTIC SERVICE	
Check the class of service desired; otherwise this message will be sent as a full rate telegram	
FULL RATE TELEGRAM	SERIAL
DAY LETTER	NIGHT LETTER <input checked="" type="checkbox"/>

WESTERN UNION

1206

INTERNATIONAL SERVICE	
Check the class of service desired; otherwise this message will be sent at the full rate	
FULL RATE	DEFERRED
CODE	NIGHT LETTER

JOSEPH L. EGAN, PRESIDENT

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
			SOUTHERN UNION PRODUCTION COMPANY	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

DALLAS TEXAS

JANUARY 24, 1948

MR. GEORGE GRAHAM, ATTORNEY OF
MR. R. R. SPURRIER, SECRETARY
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

APPLICATION FOR SPACING ORDER KUTZ CANYON-FULCHER BASIN FIELDS OF SAN JUAN

COUNTY AIR MAILED TODAY WITH PARAGRAPH SUGGESTED FOR INCLUSION IN NOTICE AS FOLLOWS:
IN THE MATTER OF THE PETITION OF SOUTHERN UNION PRODUCTION COMPANY FOR AN ORDER
FIXING THE SPACING OF WELLS IN THE KUTZ CANYON AND FULCHER BASIN GAS FIELDS OF SAN
JUAN COUNTY (AS THEY MAY BE EXTENDED) ON THE BASIS OF ONE WELL TO A DRILLING UNIT OF
APPROXIMATELY 160 ACRES WITH SUITABLE PROVISIONS FOR ANY RELATED MATTERS INCLUDING
SPECIAL APPROVAL OF UNORTHODOX WELL LOCATIONS WHERE NECESSARY.

SOUTHERN UNION PRODUCTION COMPANY

By Willis L. Lea, Jr.

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SERVICE**

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request, refund full amount
paid for copies not previously
mailed. Prices subject to
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ALL MESSAGES TAKEN BY THIS COMPANY ARE SUBJECT TO THE FOLLOWING TERMS:

To guard against mistakes or delays, the sender of a message should order it repeated, that is, telegraphed back to the originating office for comparison. For this, one-half the unrepeatable message rate is charged in addition. Unless otherwise indicated on its face, this is an unrepeatable message and paid for as such, in consideration whereof it is agreed between the sender of the message and this Company as follows:

1. The Company shall not be liable for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the unrepeatable-message rate beyond the sum of five hundred dollars; nor for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the repeated-message rate beyond the sum of five thousand dollars, unless specially valued; nor in any case for delays arising from unavoidable interruption in the working of its lines.
2. In any event the Company shall not be liable for damages for mistakes or delays in the transmission or delivery, or for the non-delivery, of any message, whether caused by the negligence of its servants or otherwise, beyond the actual loss, not exceeding in any event the sum of five thousand dollars, at which amount the sender of each message represents that the message is valued, unless a greater value is stated in writing by the sender thereof at the time the message is tendered for transmission, and unless the repeated-message rate is paid or agreed to be paid, and an additional charge equal to one-tenth of one per cent of the amount by which such valuation shall exceed five thousand dollars.
3. The Company is hereby made the agent of the sender, without liability, to forward this message over the lines of any other company when necessary to reach its destination.
4. Except as otherwise indicated in connection with the listing of individual places in the filed tariffs of the Company, the amount paid for the transmission of a domestic telegram or an incoming cable or radio message covers its delivery within the following limits: in cities or towns of 5,000 or more inhabitants where the Company has an office which, as shown by the filed tariffs of the Company, is not operated through the agency of a railroad company, within two miles of any open main or branch office of the Company; in cities or towns of 5,000 or more inhabitants where, as shown by the filed tariffs of the Company, the telegraph service is performed through the agency of a railroad company, within one mile of the telegraph office; in cities or towns of less than 5,000 inhabitants in which an office of the Company is located, within one-half mile of the telegraph office. Beyond the limits above specified the Company does not undertake to make delivery, but will endeavor to arrange for delivery as the agent of the sender, with the understanding that the sender authorizes the collection of any additional charge from the addressee and agrees to pay such additional charge if it is not collected from the addressee. There will be no additional charge for deliveries made by telephone within the corporate limits of any city or town in which an office of the Company is located.
5. No responsibility attaches to this Company concerning messages until the same are accepted at one of its transmitting offices; and if a message is sent to such office by one of the Company's messengers, he acts for that purpose as the agent of the sender.
6. The Company will not be liable for damages or statutory penalties in the case of any message except an intrastate message in Texas where the claim is not presented in writing to the Company within sixty days after the message is filed with the Company for transmission, and in the case of an intrastate message in Texas the Company will not be liable for damages or statutory penalties where the claim is not presented in writing to the Company within ninety-five days after the cause of action, if any, shall have accrued; provided, however, that neither of these conditions shall apply to claims for damages or overcharges within the purview of Section 415 of the Communications Act of 1934.
7. It is agreed that in any action by the Company to recover the tolls for any message or messages the prompt and correct transmission and delivery thereof shall be presumed, subject to rebuttal by competent evidence.
8. Special terms governing the transmission of messages according to their classes, as enumerated below, shall apply to messages in each of such respective classes in addition to all the foregoing terms.
9. No employee of the Company is authorized to vary the foregoing.

10-42

CLASSES OF SERVICE

DOMESTIC SERVICES

FULL RATE TELEGRAMS

A full rate expedited service.

DAY LETTERS

A deferred service at lower than the full rate

SERIALS

Messages sent in sections during the same day.

NIGHT LETTERS

Accepted up to 2 A.M. for delivery not earlier than the following morning at rates substantially lower than the full rate telegram or day letter rates.

CABLE SERVICES

FULL RATE CABLES

The standard fast service at full rates. May be written in any language that can be expressed in Roman letters or in cipher.

CODE (CDE)

A fast message service consisting of words formed without condition or restriction, counted at 5 characters per word. Minimum charge of 5 words applies.

DEFERREDS (LC)

Plain language messages, subject to being deferred in favor of full rate and CDE messages.

NIGHT LETTERS (NLT)

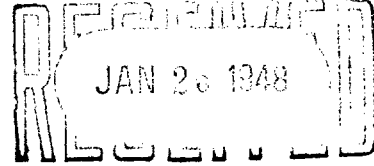
Overnight plain-language messages. Minimum charge of 25 words applies.

SOUTHERN UNION PRODUCTION COMPANY
BURT BUILDING
DALLAS, TEXAS

AIR MAIL

January 24, 1948

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO.



Mr. George Graham, Attorney or
Mr. R. R. Spurrier, Secretary
Oil Conservation Commission
Santa Fe, New Mexico

Dear Sir:

As we discussed the other day on the telephone, there is enclosed the petition of Southern Union Production Company for the Commission's order fixing spacing rules of special application to the Kutz Canyon-Fulcher Basin gas fields, San Juan County, as they may be hereafter extended. Also enclosed is a form suggesting the pertinent statement concerning this petition which might be included in your proposed notice of hearing, and a confirmation copy of our telegram dispatched today.

Please let us hear from you should there be any particular incidental subject on which you would like us to be prepared at the February 17 hearing. It is expected that Mr. Van Thompson, our engineer, and I will attend with Mr. J. R. Cole. Because of the interest which has been indicated in this subject by other operators, it is not unlikely that several of them will be in attendance, possibly for the purpose of introducing evidence.

Please arrange for us to receive in due course a copy of each publisher's affidavit with respect to the pertinent notice of hearing.

With thanks, we are

Yours very truly,

Willis L. Lea, Jr.
General Attorney

WLL:FG
Encls.

cc: Mr. J. R. Cole, Santa Fe
Mr. Van Thompson, Dallas

OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

IN THE MATTER OF PETITION FOR AN
ORDER FIXING THE SPACING OF WELLS
HEREAFTER DRILLED IN THE KUTZ
CANYON AND FULCHER BASIN GAS FIELDS
OF SAN JUAN COUNTY, AS THEY MAY BE
EXTENDED, AND RELATED MATTERS.

SOUTHERN UNION PRODUCTION COMPANY,

Petitioner

NO. _____

To the Commission and its
Honorable Members:

This is a Petition for an order of the Commission fixing by appropriate rules and regulations the spacing requirements applicable to wells hereafter drilled in the Kutz Canyon gas field and in the Fulcher Basin gas field, San Juan County, and related matters. Your Petitioner, Southern Union Production Company, a corporation authorized to transact business in New Mexico, maintains an office in Santa Fe at the corner of Marcy and Otero Streets and an office in Farmington.

Petitioner would show the Commission as follows:

1.

The Kutz Canyon and Fulcher Basin fields are productive of natural gas in commercial quantities from the Pictured Cliff sandstone formation encountered at depths ranging between 1700 and 2300 feet, approximately. The fields are in close proximity, may be contiguous and may, in fact, be essentially one gas producing area. The term "general area" will be used herein to refer to these fields, as they may be extended from time to time. The lands now known or reasonably regarded as proved to be productive of natural gas in commercial quantities from the Pictured Cliff are those described in Exhibit A annexed.

2.

According to Petitioner's information, there are now a total of approximately 76 wells in the general area which are productive of natural gas from the Pictured Cliff. Except for those very recently completed and in the process of being connected, each such well is connected with and producing into the natural gas transportation system of Southern Union Gas Company extending from gas areas in San Juan County, New Mexico, to existing markets in Santa Fe,

Albuquerque and elsewhere.

3.

Petitioner has been actively engaged for many years in operating its own wells and certain others in the general area. It has accumulated statistics and other information bearing upon the permeability, porosity and producing characteristics of the Pictured Cliff, and from such information believes that a well completed in the Pictured Cliff will in an orderly manner drain gas from not less than 160 acres of that formation; hence, that more dense drilling is unnecessary and uneconomic.

Although there are exceptions, previous drilling in this area has generally conformed to 160-acre spacing, with wells located substantially in the center of a unit. To some extent this spacing pattern is a result of the fact that during World War II the Commission's spacing rule applicable to gas areas provided generally for one well to each 160 acres. To some extent it is due to the current policies of the United States Geological Survey in its exercise of jurisdiction over oil and gas practices affecting the substantial federal acreage in the area. To some extent, moreover, it is a result of Petitioner's own convictions, based on the data accumulated from its own and other wells, and the convictions of certain other operators.

Knowledge of the general area and its characteristics has, of course, increased with extensions of the proven acreage and other developments, particularly in recent years. Much of this pertinent information has not yet been submitted to the Commission in appropriate form.

4.

The present spacing rule applicable in the general area appears to be contained in Section 1 of Order 637 effective March 1, 1946 (the Statewide Order), which provides in part:

"1. (a) 1. . . . No well shall be drilled closer to any unit boundary line than 330 feet or less than 660 feet from any other well except upon petition, notice and hearing as provided by law, provided such unorthodox well location will create neither waste nor hazards conducive to waste."

The present spacing provision, therefore, would permit the location, on 40-acre tracts, of proposed wells within 330 feet of any established drilling unit, including those 160-acre units now existing in the general area which are

producing gas from one centrally located well. It is apparent that under present spacing rules the recent marked activity and competition for the limited attractive acreage available will result in 330 foot offset wells in a gas area and, consequently, in competitive offset drilling of unnecessary wells -- on units already established in addition to those to be established in the future. In this connection it is believed significant that Section 12, Chapter 72, Laws of 1935 (Section 69-213, New Mexico Statutes Annotated, '41 Edition), while it is applicable to oil or oil and gas wells, provides in part as follows:

"The drilling of unnecessary wells creates fire and other hazards conducive to waste, and unnecessarily increases the production cost of oil and gas to the operator, and thus also unnecessarily increases the cost of the products to the ultimate consumer."

It is also significant that by Section 10 of the same enactment (Section 69-211, '41 Edition), the Commission is expressly authorized to make rules, regulations and orders fixing the spacing of wells. Moreover, the Commission possesses, and in several instances has exercised, authority to promulgate special rules and regulations applicable to a particular area of production.

5.

By proper rule, regulation or order of special application to the Kutz Canyon-Fulcher Basin general area, as it may be from time to time extended, the Commission should inaugurate and enforce a spacing program which will economically and effectively permit, without unnecessary drilling costs or operating expenses, the recovery of natural gas reasonably producible from that area. Petitioner is prepared to submit evidence pertinent to a proper spacing program. From the information available to it Petitioner believes that, except in unusual instances, a uniform spacing unit of not less than 160 acres should be provided with respect to wells hereafter drilled in the general area,

Attention is directed to the increasingly common practice of pooling leaseholds for exploration and development, particularly where small tracts in gas areas are involved, and to the expeditious method now provided by applicable statutes and regulations for communitizing federal oil or gas acreage with other lands. Moreover, the Commissioner of Public Lands is authorized in proper cases to approve and consent to unitization programs involving State of New Mexico leases.

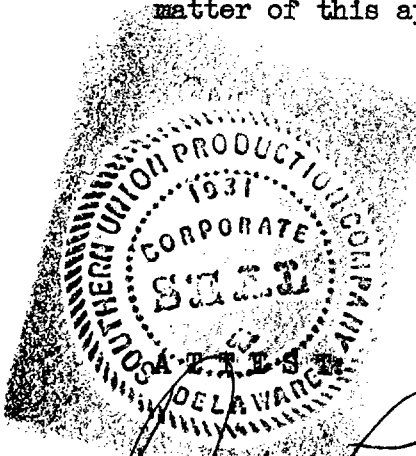
WHEREFORE, Petitioner requests that the Commission, after notice and hearing as required by law and applicable regulations, enter its proper order or orders fixing the spacing of wells hereafter drilled in the Kutz Canyon-Fulcher Basin general area of production, as it may be from time to time extended, on the basis of one well at approximately the center of a 160-acre drilling unit in substantially the shape of a square, with suitable provisions for any related matters, including special approval, after notice and hearing, of unorthodox well locations necessitated by the size or shape of available units or by the nature of the terrain; and, pending final action on such request, that the Commission, its agents and employees refrain as a matter of policy from approving or permitting to become effective any Notice of Intention to Drill now or hereafter on file with respect to a well in the general area which does not provide for the location of such well at or within a reasonable distance of the center of its drilling unit consisting of 160 acres, more or less, in substantially the shape of a square.

Petitioner hereby offers to supply such information concerning the subject matter of this application as is available to it.

Respectfully submitted,

SOUTHERN UNION PRODUCTION COMPANY

By J. C. Reid
Vice President


[Signature]
Assistant Secretary

VERIFICATION

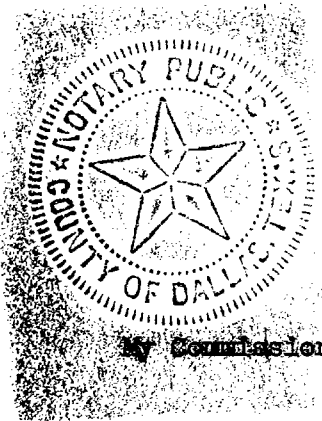
STATE OF TEXAS)
)
COUNTY OF DALLAS)

Before me, a Notary Public in and for Dallas County, Texas, personally appeared J. C. REID, Vice President of SOUTHERN UNION PRODUCTION COMPANY, a corporation, well known to me to be such person and officer, and he upon oath

duly administered stated that he had read the foregoing petition and that the facts therein set forth are true and correct to the best of his information and belief, and that he had executed such petition on behalf of said corporation as its free and voluntary act and deed, pursuant to due authorization.

J C Reid

Sworn to and subscribed before me this 24th day of January, 1948, to certify which witness my hand and seal of office.



My Commission Expires:

Jaye Griffin
Notary Public in and for
Dallas County, Texas

JAYE GRIFFIN
Notary Public, Dallas County, Texas
My commission expires June 1, 1949.

EXHIBIT A

Description of lands known or reasonably regarded as proved to be productive of natural gas in commercial quantities from the Pictured Cliff.

Township 30 North, Range 12 West

Sections 28, 29, 30,
32, 33, 34: All

Township 29 North, Range 12 West

Sections 1, 2, 3, 11, 12, 13: All
Section 10: $E\frac{1}{2}$

Township 29 North, Range 11 West

Sections 18, 19, 20,
28, 29, 33, 34: All
Section 7: $W\frac{1}{2}$
Section 21: $W\frac{1}{2}$

Township 28 North, Range 11 West

Sections 11, 13, 14, 24: All

Township 28 North, Range 10 West

Section 19, 29: All
Section 18: $W\frac{1}{2}$
Section 20: $W\frac{1}{2}$
Section 30: $E\frac{1}{2}$
Section 32: $E\frac{1}{2}$

AIR MAIL

January 24, 1943

Mr. George Graham, Attorney or
Mr. R. R. Spurrier, Secretary
Oil Conservation Commission
Santa Fe, New Mexico

Dear Sir:

As we discussed the other day on the telephone, there is enclosed the petition of Southern Union Production Company for the Commission's order fixing spacing rules of special application to the Kutz Canyon-Fulcher Basin gas fields, San Juan County, as they may be hereafter extended. Also enclosed is a form suggesting the pertinent statement concerning this petition which might be included in your proposed notice of hearing and a confirmation copy of our telegram dispatched today.

Please let us hear from you should there be any particular incidental subject on which you would like us to be prepared at the February 17 hearing. It is expected that Mr. Van Thompson, our engineer, and I will attend with Mr. J. R. Cole. Because of the interest which has been indicated in this subject by other operators, it is not unlikely that several of them will be in attendance, possibly for the purpose of introducing evidence.

Please arrange for us to receive in due course a copy of each publisher's affidavit with respect to the pertinent notice of hearing.

With thanks, we are

Yours very truly,



Willis L. Lea, Jr.
General Attorney

WLL:FG
Encls.

cc: Mr. J. R. Cole, Santa Fe
Mr. Van Thompson, Dallas

NOTICE FOR PUBLICATION

STATE OF NEW MEXICO

OIL CONSERVATION COMMISSION

The State of New Mexico, by its Oil Conservation Commission, hereby gives notice, pursuant to law, of the following public hearings to be held February 17, 1948, beginning at 10:00 o'clock A.M. on that day, in the City of Santa Fe, New Mexico:

Case No. _____

In the matter of the petition of Southern Union Production Company for an order fixing the spacing of wells in the Kutz Canyon and Fulcher Basin gas fields of San Juan County (as they may be extended) on the basis of one well to a drilling unit of approximately 160 acres with suitable provisions for any related matters including special approval of unorthodox well locations where necessary.

Given under the seal of the Oil Conservation Commission of New Mexico, at Santa Fe, New Mexico, on January _____, 1948.

THE STATE OF NEW MEXICO acting by
and through its Oil Conservation
Commission

By: R. R. Spurrier,
Secretary

(SEAL)

CASE No.

126

Large Exhibits
OCD