Case No.

14

Application, Transcript,
Small Exhibits, Etc.

H E A R I N G

BEFORE THE OIL CONSERVATION
COMMISSION OF THE STATE
OF NEW MEXICO.

Held in the House of Representatives,
State Capitol, Santa Fe, New Mexico,
at two o'clock, P. M., December 6, 1939.

PRESENT:

Hon. John E. Miles, Governor, Chairman of Commission
Hon. Frank Worden, Commissioner of Public Lands, Secretary
Hon. A. Andreas, State Geologist, Member of Commission
Hon. Carl B. Livingston, Attorney for Commission

J. O. Seth	Stanolind Oil & Gas Co.	Santa Fe, New Mexico
D. D. Bodie	Cities Service Oil Co.	Hobbs, New Mexico
J. D. Atwood	Cities Service Oil Co.	Roswell, New Mexico
Lloyd L. Gray	Gulf Oil Corporation	Tulsa, Oklahoma
P. H. Bohart	Gulf Oil Corporation	Tulsa, Oklahoma
Russell G. Lowe	Gulf Oil Corporation	Tulsa, Oklahoma
R. S. Knaffen	Gulf Oil Corporation	Tulsa, Oklahoma
S. G. Sanderson	Gulf Oil Corporation	Tulsa, Oklahoma
A. D. Curtis	Barnsdall Oil Co.	Tulsa, Oklahoma
J. S. Noland	Barnsdall Oil Co.	Tulsa, Oklahoma
W.M. Fleetwood,Jr.	Barnsdall Oil Co.	Tulsa, Oklahoma
E. P. Keeler	Continental Oil Co.	Hobbs, New Mexico
R. S. Dewey	Humble Oil & Rfg. Co.	Midland, Texas
W. E. Hubbard	Humble Oil & Rfg. Co.	Houston, Texas
R. A. Koenig	Ohio Oil Co.	Hobbs, New Mexico
Glenn Bish	Ohio Oil Co.	Hobbs, New Mexico
H. L. Johnston	Continental Oil Co.	Hobbs, New Mexico
H. B. Hurley	Continental Oil Co.	Fort Worth, Texas
D. R. McKeithan	Phillips Petroleum Co.	Bartlesville, Oklahoma
A. E. Willig	The Texas Co.	Fort Worth, Texas
Ira Van Tuyl	Gulf Oil Corp.	Hobbs, New Mexico
Ross M. Stuntz,Jr.	Gulf Oil Corp.	Tulsa, Oklahoma
S. P. Hannifin	Magnolia Petroleum Co.	Roswell, New Mexico
Delmer R. Guinn	Cities Service Oil Co.	Hobbs, New Mexico
Allen B. Gibson	Cities Service Oil Co.	Hobbs, New Mexico
D. A. Powell	Drlg. & Exploration Co.	Hobbs, New Mexico
Jack H. Rankin	Repollo Oil Co.	Midland, Texas
N. B. Larsh	Repollo Oil Co.	Midland, Texas
H. J. Summy	Repollo Oil Co.	Midland, Texas
Frank Gray	Anderson-Prichard Oil Corp.	Hobbs, New Mexico
Weston Payne	Anderson-Prichard Oil Corp.	Oklahoma City, Okla.
H. J. Kemler	Shell Oil Co.	Midland, Texas
O. D. Crites	Shell Oil Co.	Houston, Texas
M. T. Smith	Shell Oil Co.	Midland, Texas
F. E. Heath	Sun Oil Co.	Dallas, Texas
Harvey Hardison	Standard Oil Co. of Texas	Houston, Texas
Francis C. Wilson	Wilson Oil Co.	Santa Fe, New Mexico
Weldon Brigance	Rowan Drilling Co.	Fort Worth, Texas
R. S. Christie	Amerada Petroleum Co.	Fort Worth, Texas
C. G. Campbell	Tex.-Pacific Coal & Oil	Midland, Texas
O. F. Hedrick	Tex.-Pacific Coal & Oil	Midland, Texas
G. W. Selinger	Skelly Oil & Getty Oil	Tulsa, Oklahoma
Colin C. Rae	Skelly Oil Co.	Tulsa, Oklahoma

PRESENT: (Continued)

M. Albertson	Shell Oil Co., Inc.	Houston, Texas
R. G. Schuehle	Shell Oil Co.	Midland, Texas
E. W. Childers	Tidewater Assoc. Oil Co.	Midland, Texas
Edgar Kraus	Atlantic Rfg. Co.	Carlsbad, New Mexico
Lig Biddick	Samedan Oil Corp.	Ardmore, Oklahoma
J. P. Cusack	J. P. Cusack, Inc.	Midland, Texas
A. M. McCorkle	Stanolind Oil & Gas Co.	Fort Worth, Texas
G. H. Card	Stanolind Oil & Gas Co.	Fort Worth, Texas
Howard P. Holmes	Two States Oil Co.	Dallas, Texas
Roy Yarbrough	Oil Conservation Comm.	Hobbs, New Mexico
Rex E. Rader	Stanolind Oil & Gas Co.	Hobbs, New Mexico
R. W. Tesch	Stanolind Oil & Gas Co.	Fort Worth, Texas
Guy H. Woodward	Stanolind Oil & Gas Co.	Tulsa, Oklahoma
G. S. Bays	Stanolind Oil & Gas Co.	Tulsa, Oklahoma

The hearing was opened by Governor Miles.

Thereupon, at the request of Mr. Worden, the Notice for Publication for the hearing was read by Mr. Livingston, as follows:

"NOTICE FOR PUBLICATION
STATE OF NEW MEXICO

OIL CONSERVATION COMMISSION

"Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 6th day of December, 1939, at two o'clock P. M., for the purpose of considering the following:

"Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

"Any person having any interest in the subject of the said hearing shall be entitled to be heard.

"Given under the seal of said Commission at Santa Fe, New Mexico, on October 31, 1939.

OIL CONSERVATION COMMISSION

By (Sgd.) FRANK WORDEN
Commissioner of Public Lands

By (Sgd.) A. ANDREAS
State Geologist"

(SEAL)

BY MR. WORDEN: You have heard the reading of the Notice and we are ready to proceed. Inasmuch as we have two matters here, it would perhaps be better to handle them as such. One is known as the Hobbs Order and the other as the Monument. It might avoid complications if we handle them separately:

JUDGE SETH: We think that is the procedure to follow. First Hobbs, I take it, then Monument? There is a question here as to which company or which side of the controversy should go on first. The Stanolind, which I represent, wants a change in the existing regulations. I don't know whether the other gentlemen want a change or want to keep them as they are, and it seems to me that would determine the order in which the cases should be presented.

MR. WORDEN: It is the impression of the Commission that the companies that are for a change will be heard. I think the other side should express as to whether they want a change or want the existing regulations. Now, as to whether the Gulf wants to keep the existing regulations or wants a change we do not know, and would like to have a statement from them.

JUDGE SETH: I think it should be limited to those who will give evidence.

COL. ATWOOD: Cities Service, which I represent, does not want a change but is opposed to some of the changes that might be made. For the purpose of the record, we would like for those who want a change to so state so we will have something to shoot at, then those who favor the change, whether it be one way or another, could offer their proof in support of the proposals. Those interested who want to take part in the presentation of the case have the right to cross-examine the witnesses on the different points and have the right to offer counter-proof against a particular change or against all changes or in favor of all changes.

JUDGE SETH: I take it you mean those who are going to offer proof and participate in the hearing?

COL. ATWOOD: Yes, I do think it would be helpful to the Commission in order to find out whether there is general dissatisfaction with the system or with just a few of the regulations. I believe the operators represented here should be permitted to express their views as to whether they want the status quo to remain or are in favor of a change.

JUDGE SETH: I believe that should come toward the end of the hearing.

GOVERNOR MILES: I would appreciate that information. I don't care if it comes at the end or the beginning of the hearing, but I would like to know what the general opinion is.

MR. LIVINGSTON: Gentlemen, permit me to make a remark. This is a judicial hearing. The Commission is sitting in its judicial capacity and not in its capacity as a board of executives and this matter is a matter to be heard upon testimony. I really don't feel that inasmuch as this is a judicial hearing the general feeling among those present should be controlling in the matter, in that the testimony is paramount.

GOVERNOR MILES: Doesn't the Commission have the right to call any witnesses to the stand it desires, Mr. Livingston?

MR. LIVINGSTON: Yes, sir.

MR. R. G. LOWE: This, it seems to me, is a legislative branch of the Commission's powers. They are going to prepare rules and regulations which in itself is legislative. Now, after those rules have been promulgated, if a controversy comes up as to whether they are proper rules, the Commission could hear the matter as a judicial matter. I suggest that either these changes should be made or should not be made. We feel that perhaps the present rules are not working equitably among all the operators and should ppobably be modified as to lease acreage and potential.

JUDGE SETH: Gentlemen, might I read an opening statement which more or less covers the early history of the Hobbs pools. I don't believe all you gentlemen are familiar with the history. There are a few corrections to be made and I will then submit it in typewritten form.

MR. WM. FLEETWOOD: Mr. Chairman, I would like to make a statement on behalf of Barnsdall Oil Company. Barnsdall has no production in the Hobbs field and probably their testimony will fall under that belonging to Monument. However, in order to be fair to everyone, we feel very much like Gulf does, and we want to participate in this Hobbs hearing because it will affect the Monument.

COL. ATWOOD: As stated a few minutes ago, Cities Service has no objection to the maintenance of the present system. If there is to be a change, then Cities Service would be in favor of the proposals of Gulf and Barnsdall rather than those of Stanolind.

JUDGE SETH: The following is the opening statement which covers the early history of the Hobbs pools.

"S T A T E M E N T
PRORATION SITUATION, HOBBS FIELD, NEW MEXICO

"Following the passage of an act allowing cooperative development of oil pools, by agreement among operators, by the Legislature of New Mexico, in 1929, the operators of the Hobbs Pool, on June 11, 1930, entered into an agreement to prorate the market outlet of that pool by allocating to each 40 acre unit its proportionate share based upon 25% acreage-75% potential factors, the potential factor being the average potential of all wells on each unit.

"The Midwest Refining Company (later acquired by the Stanolind Oil and Gas Company), supported at that time a 50% potential and 50% acreage plan, but finally agreed to a 25% acreage-75% potential plan similar to one which had been in effect in the Yates, Texas, Pool for about a year.

"During the first eight months of 1932, exhaustive efforts were made to bring about unitization of the Hobbs Field but agreement finally failed because the most favored plan, of 42.5% structural position-42.5% potential-15% acreage would redude the allowables of some companies. A later plan of 37.5% structural position-37.5% potential-25% acreage

also failed, for the same reason.

"Although the Hobbs Operators all accepted the 75% potential-25% acreage plan in June, 1930, by August, 1932, the majority were willing to accept 27.5 acreage-37.5 structural position-25% acreage. But on account of unanimous agreement being necessary for the adoption of any new plan, no change was made at that time.

"From the beginning of production, the Midwest Refining Company had maintained that potential should be given little consideration in any proration formula for a lime field such as Hobbs, and that structural position and pay thickness and acreage should far outweigh it. This policy has been maintained by the Stanolind Oil and Gas Company since taking over the Midwest properties.

"The fallacy of using potential in any proration plan, for any type of field, has become more and more apparent as production under proration has brought about more and more recognition of recoverable oil in place as a basis for equity.

"In March, 1933, acidation of the Hobbs Field was begun and continued up until October 1, 1934, at which time the operators agreed that potential tests of wells already completed and acidized after that date would not be recognized for use in the proration formula.

"On September 27, 1933, the proration agreement was modified, giving to wells making over 2% water an allowable based upon 40% acreage-60% potential. The modification of potentials by the use of bottom hole pressures was also introduced. This method of modifying potentials later proved to be erroneous and operated to cause great losses to Stanolind, as well as gains up to over 200,000 barrels to some companies. Stanolind vigorously opposed continuation of the 75%-25% method, but, due to the fact that Stanolind, as well as several other companies, had no pipe line facilities, they had no choice but to continue in the plan.

"On February 23, 1934, an N.I.R.A. Allocation Committee, representing Lea County operators, met at Artesia. The inequity of the use of potentials in a proration plan in New Mexico lime fields had become so apparent at that time that it was given no consideration, and allocation upon straight acreage was recommended. Representatives of Gulf and Stanolind met on April 17, 1934, and recommended straight acreage proration for Lea County, on a 40 acre unit basis, to the Allocation Committee, which adopted it, leaving the old Hobbs plan as the only one using potential. This plan was continued, as before mentioned, because unanimous agreement of the operators was necessary for change, and those operators having an advantage under potential refused to accept straight acreage, which became the rule in Lea County outside of Hobbs.

"In February, 1935, the New Mexico Legislature passed a conservation law forming a Conservation Committee, and establishing the proration of oil on the basis of recoverable oil in place as mandatory, except that proration

by agreement plans then in effect could be ratified by the Commission and continued, should the Commission so choose.

"When this law went into effect it was no longer necessary to reach a unanimous agreement of the operators in a pool for the acceptance by the Commission of a proration plan. At a hearing of the Hobbs operators, on December 11 and 12, 1936, evidence was submitted by Stanolind to support straight acreage allocation for the field. The hearing continued for two days. During the intermissions efforts were made by the operators to reach an agreement. Finally, at the end of the second day, a compromise was reached on 40% potential and 60% acreage factors; Stanolind agreed that it might not be advisable to make too abrupt a change in the acreage factor at that time.

"After this agreement was reached, all evidence previously offered was withdrawn, and new evidence was put on both by Stanolind and the Gulf to support the agreed plan.

"The Commission, on December 29, 1936, promulgated Case No. 6, Order No. 48, Proration Order for the Hobbs Field, Lea County, providing for proration upon the basis of 60% acreage and 40% average unit potential. The order also provided for the adjustment of potentials each six months by use of a bottom hole pressure factor adopted and agreed upon by the Hobbs operators previously.

"On May 11, 1939, the Commission issued notice for hearing for the purpose of revising, modifying and amending the existing proration plan of the Hobbs Field, designated as Order No. 48, of the Commission. At this hearing no evidence was offered, but a Committee of engineers was appointed to investigate the various conflicting claims of the operators. The hearing was continued until October 23rd, and was subsequently continued from time to time.

"The Committee of Engineers was unable to agree upon any change in the proration plan, for the obvious reason that no change could be made in an attempt to satisfy Stanolind's claims without lessening the allowable of most of the other companies.

"Stanolind is opposed to the present proration plan for the following reasons:

"Too much weight is given to potential, which has little or no relationship to the oil in place beneath the tract.

"Stanolind, early in the history of the pool, lost great quantities of oil by water movement which swept across the upper pays of its properties, moving oil toward the crest of the structure where it was produced by other operators. The reason Stanolind lost this oil to other operators was that the upper pay section on several of its leases on the southwest flank was much more permeable than other leases around the water edge of the field; as oil was withdrawn from up structure, the water finding easiest access through the more permeable pays of Stanolind's

leases, displaced oil therefrom rapidly. Stanolind set more packers than any other company in order that no waste would occur in the field, thus giving up its opportunity to produce this upper oil which finally moved on and was produced by other operators. If the loss of this oil for the sake of conservation cannot be compensated for to Stanolind, then the least that can be done is to allow Stanolind the same opportunity given operators in other Lea County pools, through the proper use of the acreage factor, to recover the remaining oil.

"Not only did Stanolind give up this upper oil through the setting of packers, but the packer wells were discriminated against in the erroneous method of correcting their potentials, through an adjusted bottom hole pressure factor, which cut the output from packer wells so that the allowable was reduced to a point where equity was no longer observed.

"Stanolind has further lost in its daily allowable over a period of years due to an inequitable use of the bottom hole pressure corredtion factor. The method of correcting potentials by this bottom hole pressure factor has resulted in a great many wells reaching a point of no potential, while at the same time able to produce many hundreds, and sometimes thousands of barrels of oil daily. On the other hand, many wells have gained increased potentials through the application of this bottom hole pressure corrective factor, although their bottom hole ressure steadily declined, a proposition impossible on the face of it. The Gulf Production Company has gained more than 200,000 barrels of oil due to the false correction in potential upward of a number of their wells, by use of this erroneous, inequitable, unengineering method of applying bottom hole pressure factor, while Stanolind, on the other hand, has lost.

"Practically all New Mexico fields are in a lime formation, cavernous in character. The caverns are irregular, with no particular uniformity in distribution. Frequently wells but one location apart will develop potentials varying from 10 to 1, or greater. Acidation has been found to increase the potential of the low potential wells in greater ratios than the high potential wells.

"The Hobbs field has been produced a number of years with an exceedingly high potential factor, i.e. 75%, in the proration formula. Gross inequities have occurred through these many years through the use of such a formula. Stanolind leases will never be able to recover the oil they lost during this period.

"It is the estimate of engineers that about half of Hobbs oil has been recovered. A large portion of this oil has been recovered under the basis of 25% acreage 75% potential, while a much smaller amount has been recovered under the 60% and 40% potential factors. If a straight acreage formula be put into operation during the remainder of the life of the field, it will have the same effect of a formula of 33.6% potential 66.4% acreage, over the whole life of the field, assuming that the field

be half produced now. Although this is apparently true, it will not be true actually, because the final 20% or 30% of production will be upon a pumping or stripping well basis, which will not be affected by any proration formula.

"For more than the past five years the State of New Mexico's allocation among the various fields has been upon a 40 acre unit basis. This oil has been allowed to Hobbs on a basis of the number of 40 acre units in Hobbs. However, when the amount of oil earned by Hobbs in this manner is allocated among the leases in the field, straight acreage is no longer recognized, 40% of the allowable being given to the tracts on the basis of erroneous potentials corrected by an erroneous method of applying bottom hole pressures, and further modified, particularly insofar as Stanolind's leases are concerned, by drastic penalizing of the allowable given packer wells, which, on account of being fortunately placed in a highly productive part of the field were not allowed to take advantage of their situation and recover the oil in place, simply because the formation was so permeable that it offered easiest access to the water drive responsible for the production of the oil from the reservoir."

Stanolind's position is this. What we want is an opportunity during the remaining life of the field to have the same opportunity that every producer in every other pool in Lea County has - to have an allocation or production based on straight acreage. The Monument is 80% acreage and 20% bottom hole pressure differential.

Thereupon, the various witnesses were called and duly sworn by Mr. Worden.

Mr. G. H. Card testified as follows:

JUDGE SETH: Please state your name.

A. G. H. Card.

Q. What is your profession?

A. I am Division Engineer for the Stanolind Oil and Gas Company in Fort Worth. Petroleum Engineer.

Q. Will you please state your training.

A. I graduated from Stanford University in 1924 with a degree in engineering and economics and got a graduate petroleum engineering degree in 1932 from Stanford. I worked in the Hendrick Field in West Texas in 1932 for about a year and then went to East Texas for a year and then to Fort Worth as Petroleum Engineer where I did considerable petroleum engineering work on the West Texas and New Mexico fields. I was in our Tulsa office as a petroleum engineer for two years and also did a great deal of petroleum engineering work on West Texas and New Mexico Fields, and since March, 1937, I have been Division Engineer in Fort Worth, in charge of engineering work in West Texas and New Mexico.

Q. How many years has your work included the Lea County Field in New Mexico, including Hobbs?

A. For about five years.

Q. Are you familiar with conditions in the Lea County Pools?

A. Yes, sir.

Q. What is the general nature of the Hobbs pools? By that I mean from what kind of formation is the oil produced?

A. The oil in the Hobbs field is produced from Dolomitic limestone formation.

Q. And what is the formation in the Monument Field?

A. Same type.

Q. And the Eunice Field?

A. Same type.

Q. And is that generally true, with some minor exceptions, in all the pools in Lea County?

A. It is true with the exception of the sand fields east of the lime fields.

Q. Do you know how the allowable for the whole state after it has been determined by the Commission is allocated to the various pools?

A. It is allocated among the pools on the basis of 40-acre units.

Q. And is that true of all Lea County pools?

A. That's true.

Q. And does that have the same effect as an allocation on an acreage basis?

A. Same as a straight acreage basis.

Q. How is the production in the Eunice Field allocated among the various wells?

A. On a straight acreage basis. Each forty-acre unit getting the same allowable.

Q. Monument?

A. 80% acreage and 20% bottom hole pressure.

Q. Hobbs?

A. Allocated on 60% acreage and 40% potential. That is, 40% average unit potential with potential adjusted every six months with bottom hole pressure.

Q. In your opinion, is there such difference between the three pools as justifies any difference in the allocation of the allowable to the wells in each one?

A. No difference.

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Q. Now, the New Mexico laws require this Commission to give each operator in the pool a fair share of the recoverable oil to the extent that it may be recovered without waste. Now, in determining this matter of fair share of recoverable oil, what factors are used in determining such matters, Mr. Card?

A. The factors used are acreage, pay thickness, porosity and percent of recovery.

Q. What does porosity mean?

A. Means the void space in the reservoir where the oil --

Q. Porosity is the measure of volume of oil that any particular underground reservoir will contain? Measure of quantity of oil?

A. Yes.

Q. What is permeability?

A. Permeability is the fluid conductivity factor of the reservoir. It is the measure of the flowing capacity - the ease with which the fluid can flow out through the reservoir.

Q. Permeability is the facility with which oil will flow through the ground?

A. That's true.

Q. Now, these factors you spoke of - acreage, pay thickness, porosity and percentage recovery, are they subject to quantitative determination?

A. Acreage is subject to quantitative determination. Pay thickness is subject to quantitative determination in a rough way. Porosity in limestone fields such as Hobbs is not subject to quantitative determination, because it has been impossible in the Hobbs field to obtain any cores through the porous producing section of the reservoir. Therefore it has been impossible to determine the porosity in many wells.

Q. Why has it been impossible to obtain satisfactory cores?

A. Because of the cavernous condition or nature of the reservoir.

Q. Is there a variation among the various wells in Hobbs in this matter of cavernous condition of porosity?

A. In each individual well and contiguous and adjacent wells - very wide variance.

Q. Can any fair average per cent of porosity be estimated in the Hobbs field in your judgment?

A. No, it cannot be estimated.

Q. And can this factor of porosity be used in determining the oil in place at Hobbs with any degree of accuracy?

A. No, not at all.

Q. Returning to the other factor you mention - percent of recovery. What factors enter into that?

A. The factors of permeability, method of production which includes conservation of energy in the reservoir and also the type of expelling force in the reservoir.

Q. By "expelling force" you mean water drive or gas drive, or whatever is present in a particular pool?

A. That's true.

Q. Mr. Card, what per cent of the oil in the Hobbs pool has been produced up to the present date, in your opinion?

A. About fifty per cent.

Q. Has there been any gas cap developed?

A. Yes, there has been a tremendous gas cap developed throughout the top of the structure.

Q. And is there a water drive?

A. Yes.

Q. And what effect has that had on the oil now left in place? By that I mean has it had any tendency to even up the oil remaining in place, in your opinion?

A. Yes, due to this development of the gas cap throughout the top of the structure it has leveled off so that at present the oil saturated section is more or less uniform.

Q. The gas cap and the water drive have more or less made the remaining oil and gas in place uniform throughout the field - sort of pancaked it and flattened it out?

A. That's true.

Q. For that reason would an acreage basis probably more fairly represent the recoverable oil than it would perhaps in the beginning of the production?

A. At the present time, yes.

Q. As to what is left there?

A. Yes.

Q. Mr. Card, going back to the various factors we have been discussing, is there any relationship in your judgment between porosity, that is, the volume of oil in a given area, and permeability?

A. The only relationship is quantitative. A given rock is permeable by virtue of its porosity. Obviously, a rock with no porosity could have no permeability, or a rock with a high porosity could be either slightly permeable, medium permeable, or highly permeable.

Q. Would it be possible for a rock to have numerous openings or cavities in it and have high porosity, yet if those openings or cavities were not connected, it would have no permeability whatever?

A. That's true.

Q. What bearing, if any, does permeability or the degree of permeability have on the amount of oil in place under a given area?

A. It has no bearing at all on the oil in place. It is merely the measure of the ease with which the fluid flows out from the reservoir.

Q. In other words, permeability means merely the movement and not the quantity of oil in the ground?

A. That's true.

Q. Is it possible to set a definite percentage of recovery in the Hobbs field?

A. No, I would say not. Due to the variation in the elements affecting this factor.

Q. Is potential a factor that can be used in calculating oil in place?

A. No, sir, it cannot.

Q. What does potential really measure?

A. Potential is a measure of the permeability, the pay thickness and the bottom hole pressure in a particular well.

Q. What has been the relation between ultimate recovery and potential in prorated and unprorated fields within your knowledge?

A. The relationship of these two factors in a prorated field has given ultimate recoveries to prorated leases entirely different than they would have received if the field had been operated under wide open conditions or under the law of capture.

Q. Do you know of any example of this in the limestone fields?

A. Yes, the Hendrick Field in Texas.

Q. That field is immediately south of the state line in Texas?

A. Immediately south of the state line, in Texas, on the same trend of the lime fields in New Mexico.

Q. On the same trend as Hobbs and Monument and Eunice Fields?

A. Yes.

Q. And it is a lime field?

A. It is producing from a limestone horizon.

Q. What has been the relationship in that field between potentials and ultimate recovery and the type of flow?

A. In the Hendrick field there has been practically no restriction of production and ever since development the field has been produced under wide open conditions. There has been found no relationship between the potential of the wells and their ultimate recovery.

Q. Has that field produced the greater part of its oil?

A. It is in its last stages of production at this time.

Q. Have you made up an exhibit indicating the relationship between initial production and ultimate recovery in the Hendrick field?

A. Yes, sir.

Q. Will you produce it, please?

(Exhibit "A" introduced into evidence.)

Q. Please explain what the scale on the left hand side of the figure means?

A. This scale shows the mean initial potential of the lease in barrels per day and the bottom scale is the mean or average recovery per acre in thousands of barrels per day for the lease.

Q. Will you take some of the wells and show whether the ultimate recovery agreed or was in conformity with the original potential?

A. For example, here are leases 28 and 26 with practically the same average initial potential of 2200 barrels per day and the recovery up to September 1, 1939, per acre widely varies. It is about ten or eleven thousand barrels per acre on lease 28 and about twenty-five or twenty-six thousand barrels on lease 26. You can take other numerous examples throughout this diagram and see how widely the average initial potentials of the various leases vary with their average recovery per acre. There are four or five other leases having an average initial potential of twice the average initial potential of lease 26 and their average recovery per acre is less than half that of lease 26.

Q. You gather from that, that was a lime field? And could you state that there is no relation between potential and ultimate recovery in that field?

A. In the Hendrick Field, very little or no relation between initial potential and recovery.

Q. If that field had been prorated under restricted outlet on potential, what would have been the effect on the wells?

A. The water would have controlled. The wells up structure would have drained the oil from the wells down structure where the water drive was coming from. There would have been regional drainage instead of local drainage, which was the case in the Hendricks field, produced in wide-open conditions.

Q. What do you mean by local drainage?

A. When a field is produced wide open, each well drains its local drainage area. The high potential wells go to water first after the oil is partially exhausted.

Q. That going to water - is that conducive to waste of oil?

A. Yes. It has been considered waste of oil due to operating under wide-open conditions leaving large quantities of oil underground.

Q. In the Hobbs field under the various proration formulas, what kind of drainage has that resulted in?

A. The Hobbs field has been producing under conditions of regional drainage.

Q. What do you mean by regional drainage?

A. Due to the restricted outlet under proration, the field produces much less than at its greatest capacity. The wells with high potentials produce large volumes of oil and drain oil from neighboring wells. Wells on the upper parts of the structure produce oil and have that oil replaced from edge wells which are subjected to a water drive such as on the Southwest flank of the structure.

Q. Have you some maps showing this manner of regional drainage?

A. Yes, sir.

Q. Are these maps of the Hobbs pool?

A. Yes, sir.

(Maps marked Exhibits "B", "C" and "D" introduced into evidence.)

Q. And do they represent conditions in the Hobbs field?

A. Yes, sir.

Q. Now, as to Exhibit "B". State what that is.

A. This is an idealized cross section.

Q. Can you show on the map next to it where the cross section is?

A. Right here. Along the north line of wells just south of the section line between townships 18 and 19 South.

Q. Explain what that exhibit shows?

A. Exhibit "B" shows the blanket encroachment of water across the upper zone. I might explain that the top line is the top of the white lime; the second line represents the impervious zone which represents the division between the first pay and the second pay, and the third line represents the sandy break between the second pay and the third pay.

Q. There are three zones that are pays?

A. Yes, sir.

Q. Are they separate and distinct?

A. Yes, sir. The water reached each one of the wells as shown by the vertical lines on the dates shown on the exhibit by those wells.

Q. Can you give some of the dates without much trouble?

A. Landreth State C-1, 1-22-31; Stanolind McKinley 6, 10-8-32; Sun McKinley 1, 2-27-33; Sun McKinley 3, 3-14-32; Stanolind State 8, 11-22-32; Stanolind Byers 8, 1-10-36.

Q. That shows the water encroachment in the upper pay?

A. The rapid advance of the water across the southwest flank of the field.

Q. Now, take the next pay.

A. This is the second pay. The water encroachment is not near as rapid because this pay is not near as permeable. The water encroachment in the upper pay has been much more rapid because of higher permeability. This rapid water encroachment illustrates what we were talking about a little while ago. This water encroached across this section of the field at a very rapid rate, displacing oil from the upper pay, pushing the oil on up structure and replacing the oil produced by the up structure wells.

Q. Now, take the next exhibit - Exhibit "C" - and explain what that is.

A. These two Exhibits "C" and "D" here are practically the same. The various lines show the water encroachment by years. Each color on Exhibit "C" shows the water encroachment for that year and the last color shows the water encroachment to 10/1/39. You can see how fast the water moved across Stanolind properties from 1931 to 1933.

Q. Now the other one - Exhibit "D" - will you please explain that?

A. It is the same. A water encroachment map, only colored differently, and the red circles are wells in which packers are set to control the water production. These water packers have been set here in the impervious zone between the first and second pays and in the sandy break between the second and third pays.

Q. The water packers are set between the pays, is that correct?

A. Yes, sir.

Q. And what is the purpose of them?

A. To shut off the water production from the upper zone in that well and also to conserve the reservoir energy of the field.

Q. If the packer were placed at the bottom of that first pay, would it have the effect of stopping production in that well from the pay above where the packer is set?

A. Yes, and there would be no more oil or water produced from that particular pay provided the perforations in the tubing were below the packer.

Q. How did the setting of these water packers affect the production of oil from these wells?

A. When the packers were set below these zones, these particular wells lost all chance of recovering any more oil from the particular section below which the packers were set,

and this oil moved on up structure ahead of the water drive.

Q. That water coming in. Is that an illustration of what is known as water drive?

A. Yes, sir.

Q. Is that water coming in under pressure?

A. Yes, sir.

Q. High pressure?

A. Yes, sir.

Q. From the southwest flank of the field?

A. Yes.

Q. And after it comes in, what happens to the oil up there, if anything?

A. As water comes in, the oil surrounding the low structure wells is forced up structure, replacing the oil that is produced up structure.

Q. And the water coming in pushed the oil that was left there ahead of it, was that true?

A. Yes.

Q. Could those wells where those packers have been set still have been produced without packers?

A. Yes, they could have been produced without packers, but it would have been necessary to handle large quantities of water from these wells and this would have been injurious to the reservoir energy of the field, as it would have lowered the reservoir pressure because the maintenance of reservoir pressure is dependent on the water.

Q. And production from that zone after water came in would have resulted in many times as much total fluid production if packers had not been set?

A. Yes, many times.

Q. Would that have had a bad effect on the wells on up structure?

A. It would have reduced the pressure on the wells on the up structure. Many of these wells up here would be pumping today if packers had not been set in our wells, but they would not have as much oil as they have with the packers.

Q. Where is most of the water in the field being produced now?

A. Most of the water in the field today is being produced north of this section line between sections 24 and 25 and the east tier of sections. As a matter of fact, the report of the proration office showing water production for August, 1939, shows that 7186 barrels of water per day is being produced or 77% of the total water production of the field.

Q. How much in the yellow part of the map?

A. South of this black line here (indicating), in August there were 1329 barrels of water being produced, or 14.3% of the total water produced in the field.

Q. Have packers been set in the north end of the field? Other than you show there by red circles?

A. The red circles are the packer wells, and in addition two or three other wells have been plugged back to control water.

Q. What has been the effect of not setting packers in the north end?

A. You can see from the figures I have just given the water production up here is much greater than down here where packers have been set to control water.

Q. They are producing in many instances much more water than oil?

A. Yes, sir.

Q. What effect does that have on the conservation of oil and ultimate recovery?

A. It has a very injurious effect.

Q. Why weren't more packers set in the north end of the field?

A. It would appear that due to the proration formula that has been in effect, that is, the correction of potentials by bottom hole pressure, and the assigning of the field average pressure to packer wells, these wells would be assigned lower pressures after packers were set than they had before or would have if packers were not set, and therefore their potentials and allowable would be reduced.

Q. That part of the allowable based on potential would be reduced?

A. Yes.

Q. Do those maps, particularly Exhibits "B" and "C", show what you mean by regional drainage rather than local drainage?

A. Yes, sir.

Q. If there had been local drainage, would there have been water encroachment around each well rather than blanket encroachment?

A. Yes, sir.

Q. Do you know how many water packers have been set in the field there?

A. There have been 34 water packers set in the field.

Q. How many has Stanolind set?

A. Of these, Stanolind has 13. This is a far greater percentage than we have acreage in the field, as we have about 22% of the acreage.

Q. You talked about these maps showing the regional drainage. Is there some local drainage in the Hobbs pool?

A. Yes, I believe there are certain portions of the field operating under local drainage.

Q. What portions of the field are there?

A. I would say the extreme southeast section of the field in the low permeable area.

Q. Why is that section being operated under local drainage?

A. Because of the low permeability of that area. There is no drainage either to or from that area.

Q. The low permeability means the difficulty of the fluid to flow through the reservoir?

A. Yes, sir.

Q. Could Stanolind have produced from that upper pay after water came in for a considerable time, in your opinion?

A. Yes, sir, they could.

Q. Have you any reference to any literature on petroleum engineering which contains any reference to the relationship between potential and other factors used in calculating oil in place?

A. Yes, sir, I have one here. It is contained in the proceedings of the Third Pennsylvania Mineral Convention, Petroleum and Natural Gas Section, Bulletin No. 12 of the Pennsylvania State College, in a paper written by G. H. Fancher, J. A. Lewis and K. B. Barnes.

Q. Will you state who these men are?

Q. Mr. Fancher is one of the Petroleum Professors at the University of Texas. Mr. Lewis is operating a core laboratory which analyses cores in Dallas, Texas, and Mr. Barnes works for the Gulf Production Company.

Q. And what is the title?

A. "Some Physical Characteristics of Oil Sands."

Q. Will you read some of that?

A. On page 78 of this bulletin appears the following sentence:

> "A map purporting to show profiles of constant porosity was prepared by Rounds (139) for the Hobbs pool in New Mexico. The lines were established by connecting wells of approximately equal initial production. It would seem that such lines are lines of constant permeability rather than constant porosity and serves to illustrate the unfortunate confusion prevalent concerning the two properties."

Q. They speak of "lines of constant porosity." Does that mean lines of oil in place?

A. Porosity is a measure of oil in place.

Q. That would mean lines of equal porosity?

A. Lines drawn through equal porosity. However, the authors stated that these lines were really lines of constant permeability rather than lines of constant porosity.

Q. And was there considerable acidation of wells at Hobbs?

A. Yes, sir.

Q. Did that begin in March, 1933, and continue up to about October, 1934?

A. Yes, sir.

Q. Now, by acidation means that acid was pumped down these wells?

A. Yes, sir.

Q. And the idea is it eats up the lime?

A. Eats up the limestone formation in the producing section around the well.

Q. The idea is to make the oil come to the well more readily?

A. Increases the permeability.

Q. Does it reach very far back? The effects of it?

A. It depends on how much acid you put in and the condition of the reservoir when you put it in.

Q. And it doesn't cover large areas, like a forty-acre tract?

A. No.

Q. Was that acid campaign pretty general with Hobbs?

A. Yes, there was a large number of wells acidized.

Q. As a result of this campaign, do you know how much the potentials were increased on the acidized wells?

A. They were increased approximately from one million barrels per day to 1,900,000 barrels per day.

Q. Almost double?

A. Yes.

Q. As a result of this increase in potential, due to acidation, did the Hobbs Engineering Committee increase their estimate of ultimate recovery from the field?

A. No estimate was made whatever.

Q. Could acidation in any manner increase the total of recoverable oil in place under any particular tract of land?

A. No, in my opinion it would not increase the oil in place, but it may slightly increase the recovery factor.

Q. It might make it more easy to recover the oil?

A. Yes, sir.

Q. But wouldn't increase the oil under the land?

A. No.

Q. You testified, Mr. Card, as to the rapid water encroachment across the southwest flank of the Hobbs pool and across the Stanolind leases in that area. Have you made a calculation of the amount of oil that Stanolind lost due to this rapid water encroachment?

A. Yes, sir.

Q. Will you please explain how these figures were calculated and state your figures as to the total loss of Stanolind in that area?

A. The manner in which the calculations were made I will read from this page here. "The following data and assumptions were made in calculating the effects of water flooding on Stanolind wells in the Hobbs field, Lea County, New Mexico, to August 1, 1939:

1. Wells Considered - Only those wells which now contain water packers, or those producing an appreciable amount of water, were used. Where the migration due to water flooding appeared to be to other Stanolind properties, the well flooded was not considered.

2. Original Recoverable Oil in Place - The original oil in place was calculated on the ratio of the pay thickness of the unit to the total feet of pay in the field, and an ultimate recovery of 175 million barrels for the total field. (Pay thickness in the above means the interval from the average top of the white lime for each unit to the -600 datum, below sea level.) The original oil in place was also corrected for the time the well was drilled by assuming that its unit had been depleted that percent which the production of the field at that time bears to the estimated ultimate field recovery.

3. Fluid Zones, Original Recoverable Oil in Place and Division of Production - It was also assumed that the original recoverable oil in place and the production from the flooded zones was in the ratio of the thickness of the flooded zones to the total pay thickness of the unit until either a packer was set or until the present if no packer was set.

4. Rate of Encroachment and Percent of Zone Flooded - The rate of encroachment is assumed to have been uniform from the time water first appeared in the well up until the time it was packed off, or up until the present if no packer was set, in which case the water producing zone is considered to be flooded the percent shown on the latest 24-hour individual well production tests. The zones encroached were taken from the latest revision of water encroachment maps for each zone.

5. Other Date - Byers NE/4 No. 33 - Only Zone 1 drilled. New Mexico's State Conservation Law became effective June 1, 1935."

According to these calculations, Stanolind has lost in this area, the southwest flank of the field, up to August 1, 1939, from the time of the development of the leases, 1,550,000 barrels and from June 1, 1935, up to August 1, 1939, which first date was the date the conservation law went into effect, Stanolind leases have lost 518,000 barrels.

Q. That is the result of your calculations made in the manner you have testified?
A. Yes, sir.

Q. And you believe it was a fair method of making the calculations?

A. Yes, sir.

Q. If you had based your calculations merely on acreage, would it have been more or less?

A. The loss would probably have been more.

Q. And, of course, it is a matter of judicial knowledge that the present proration plan for Hobbs is 60% acreage and 40% potential?

A. Yes, sir.

Q. And there is a provision made for adjustment of potential by bottom hole pressure?

A. Yes, sir.

Q. Will you please state that formula? How it operates?

A. The bottom hole pressure correction formula is the new well potential equals the old well potential times a fraction whose numerator is the new well pressure minus two-thirds the present field average pressure and the denominator is the previous field average pressure minus two-thirds of the present field average pressure.

Q. How often are these adjustments made under the present formula?

A. Every six months.

Q. Under this formula might a well increase in potential even though its pressure declines?

A. Yes, the way this bottom hole pressure formula works, as long as the well's pressure during any particular survey is above the field average pressure, no matter if the pressure on that well increased or decreased from the previous survey, the potential on the well will be increased; and, on the other hand, if a well's pressure is below the field average, whether or not its pressure has increased or decreased, its potential will be declined. For example, if a well had a pressure of 925 pounds and increased from one survey to the next to 950 pounds, its potential would be declined because its pressure is below the field average, which is now about 1180 pounds.

Q. And those that remain above the average of the field will get increases in potential, although there may have been a material drop in pressure?

A. Yes.

Q. How are packer wells handled?

A. Packer wells are assigned the field average pressure. It was thought at the time the pressure adjustment formula was put in that the packer wells should not be discriminated against because the packers were set to conserve the energy of the field and it was decided to assign to these wells the field average pressure. Also non-packer wells on which pressures are not taken are assigned the pressure of the closest well or the average pressure of the closest wells.

Q. And how long has this method of adjustment of potential by bottom hole pressure been used?

A. Since November, 1933.

Q. Up to January 1, 1937, it has operated on 75% of the allowable?

A. Yes, sir.

Q. And since January 1, 1937, it has operated on 40% of the allowable?

A. Yes.

A. Yes.

Q. What has been the result of the application of this formula, bottom hole pressure business, to potential?

A. As a result of this formula, there are fifteen wells in the field which have been reduced to zero potential. Stanolind has eight of these wells.

Q. These fifteen wells that were reduced to zero potential, if the top allowable is 60 barrels, the utmost that they could allow to be produced would be sixty per cent?

A. That would be 36 barrels.

Q. What do individual well tests and over and short statements show regarding the Stanolind wells that have zero potentials?

A. Individual well tests show that the Stanolind wells which now have zero potential are capable of making their allowable greatly in excess of their allowable, and also over and short statements show that they are capable of making their allowable.

Q. Yet under the present formula they do not get any more than the 60% allowed them for acreage?

A. Yes.

Q. Have any wells had large increases in adjusted potential as a result of using this bottom hole pressure formula?

A. Yes, there are many wells which have had large increases in potential due to bottom hole pressure correction. There are about five wells in the field now which have rated potentials

in excess of 26,000 barrels per day. I mention 26,000, as that is the highest potential after acid recorded in the field.

Q. Have these five wells had an increase in their adjusted potential since the present proration went into effect January 1, 1937?

A. Yes, they have had large increases in potential. This increase has ranged from 4500 to 7800 barrels per day in potential.

Q. And they have had the advantage of this increase for nearly three years on 40% of their allowable?

A. Yes, sir.

Q. Has anything happened that could have increased the oil in place under those leases?

A. Absolutely nothing that I know of.

Q. Do you believe this method of adjusting potentials by bottom hole pressure has been equitable?

A. I certainly do not. The erroneous potentials which it has created is alone sufficient to condemn it.

Q. There are fifteen wells, I believe you said, that do not get 40% of the allocation based on potential at all, is that true?

A. That's true.

Q. By assigning the field average pressure to packer wells instead of declining their potentials by the field average decline in potential in other wells, have Stanolind packer wells been penalized?

A. Yes.

Q. How much greater would the present potential now be if they had been declined according to the field average decline instead of by assigning the field average pressure?

A. The potential of Stanolind packer wells would now be 57,260 barrels greater than it is at the present time.

Q. In other words, Stanolind has suffered a considerable loss in allowable by setting packers due to adjustment of potential on packer wells, and has also given up large quantities of oil to up structure leases?

A. Yes, sir.

Q. Which company at Hobbs has benefited the most due to bottom hole pressure adjustment?

A. The Gulf.

Q. How much has their allowable been increased by bottom hole pressure over and above what their allowables would have been if the potential had not been adjusted?

A. Up to September 1, 1939, about 198,000 barrels, and at the present time it would no doubt be in excess of 200,000 barrels.

Q. That is the increase in potentials of the Gulf wells?

A. That is increase in allowable.

Q. In allowable?

A. Yes.

Q. Has that been in real oil produced during the period?

A. Yes.

Q. They have been given that many barrels by reason of this bottom hole pressure formula?

A. Yes, bottom hole pressure formula.

Q. Have you a diagram showing the relationship or lack of relationship between bottom hole pressure and potential?

A. Yes, sir.

Thereupon, Judge Seth suggested that the hearing be recessed, which suggestion was adopted, and the hearing stood in recess until 9:00 A. M. the following morning, December 7.

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I, Irene Kershner, hereby certify that the above and foregoing twenty-three and a fraction pages of typewritten matter constitute a true, correct and complete transcript of the shorthand notes taken by me at the hearing before the Oil Conservation Commission held in the House of Representatives, State Capitol, Santa Fe, New Mexico, on Wednesday, December 6, 1939.

I N D E X

Witness	Direct	Cross	Re-Direct	Re-Cross
Dewey, R.S.	1-Hubbard 12- "	7-Seth 8-Bodie 9-Woodward 11-Bohart 12-Atwood 12-Rae 14-Atwood		
Card, Geo.H.	17-Seth	28-Bohart 34-Knappen 47-Sanderson	52-Seth	55-Woodward 57-Atwood 58-Rae 59-Woodward 60-Knappen 62-Gray
Tesch, Robt.W.	63-Seth	69-Christie 69-70-Knappen 73-Muscat 77-Knappen		
Petitioner Rests - page 78				
Gray, L.L.	78-Lowe	90-Seth 92-Hubbard		
Knappen, R.S.	94-Lowe 137-Bohart 140-Sanderson 142-Lowe 145-Bohart	147-Rankin 158-Rae 163-Livingston 164-Dewey 165-Woodward 166-Kraus 167-Rankin 172-Woodward 203-Fleetwood 204-Rankin 205-Woodward 207-Hubbard 208-Harms 216-Rae	218-Lowe	

CASE No. 14

To consider revising the Hobbs Proration Order, and the Monument Proration Order.

MORNING SESSION, DECEMBER 7, 1939

Pursuant to recess, the hearing in Case No. 14 was resumed at 9:00 o'clock, A. M. on December 7, 1939, all members of the Commission being present, the Honorable John E. Miles presiding, whereupon the following proceedings were had, to-wit:

BY MR. HUBBARD: Mr. Chairman: I am W. E. Hubbard, of the Humble Oil Company. I do not know whether our appearance has been entered here, but at this time we desire to enter such appearance.

I would also like to say that we have no specific formula to offer for whatever may be worked out. However, Mr. R. S. Dewey, who since the inception of the Hobbs oil field, has been in charge of our engineering force in New Mexico, has prepared some data, of an economic nature, which is rather germane to this whole matter. I have asked the plaintiffs if it would suit them if we would inject this data at this time, and they have agreed. I would like to ask Mr. Dewey to give this matter in his own manner.

R. S. DEWEY,

being first duly sworn to tell the truth, the whole truth and nothing but the truth, was examined by Mr. Hubbard, and testified as follows:

DIRECT EXAMINATION

BY MR. HUBBARD: We have a number of exhibits here --

BY MR. WORDEN: For the sake of the record, I think Mr. Dewey should be qualified -- I take it he is offering this data as an expert.

Q Your name is R. S. Dewey?

A Yes.

Q You are an employee of the Humble Oil Company?

A Yes, sir.

BY MR. SETH: We admit his qualifications.

Q Exhibit No. 1 is presented to show the distribution of the higher

gas-oil ratic of wells, as represented in the exhibit, in December, 1938. I understand corrective measures have been taken in two cases -- I think both are on the Gulf lands. This will be offered in evidence as an exhibit. (Map is displayed on frame, and marked "Humble Exhibit No. 1). I will ask Mr. Dewey to explain this map.

A The red color indicates the gas oil ratios in excess of 5,000 cu. ft. per barrel; the green color those gas oil ratios between 4,000 and 5,000 cu. ft.,; and the blue color those gas oil ratios between 3,000 and 4,000 cu. ft. per barrel. The upper black figures in ink indicate the monthly oil allowable. The middle black figure indicates the gas oil ratios, and the lower black figures indicate the monthly production of water.

Exhibit No. 2 consists of tabulated oil and water production by years for the period 1934 to 1938, inclusive. This data was compiled from the Hobbs Engineering Committee's annual reports. It consists of columns of figures giving the oil production, barrels of water, total barrels of oil, total fluid and water percentage.

On the map identified as Humble Exhibit 2-A, this information shows the year 1938. The upper figures in black ink is the total barrels of oil for the year. The little figures in red ink, the total barrels of water for the year 1938; and the lower figures in red ink is the water percentage of the total fluid.

Exhibit No. 3 is a tabulation of the various potentials adjustments which have occurred to bottom hole pressure adjustments under Plan 2A. In the first column the potentials have been shown. This column represents the potentials just prior to the adoption of Plan 2A. This column is not the last tested potential, as it contains some potentials which were modified under plan 1A. Plan 1A was in effect for only a short period of time. The last columns indicate the amount and the percentage that each potential has been increased or decreased by virtue of bottom hole pressure adjustments under Plan 2A.

The summary sheet gives the amount of potential increase or

decrease, by companies.

On the map identified as Exhibit 3-A the distribution of potential increase and correction, as the result of Plan 2A has been depicted. The green color shows wells that lost their entire potential. The yellow shows wells modified by field average pressure. The red shows units with assigned pressures, rather than actually taken on the February, 1939 survey. The white color shows units on which pressure was taken in the February, 1939 survey. The black figures show shut-in bottom hole pressures prior to the adoption of Plan 2A and on the February, 1939 survey. The percentage figures indicate the percentage of pressure decline over the period since the adoption of Plan 2A.

On the map identified as Exhibit 3-B, the yellow color depicts units with potential increase due to the operation of Plan 2A. The black figures indicate the amount of potential increase; and the percentage figures, the percenta ge increase of potentials due to Plan 2A. The white color shows units that lost potential due to the operation of Plan 2A. The red figures indicate the loss of potential; and the red percentage figures, the percentage of loss attributable to Plan 2A. The packer units have lost about 36% of their potential.

Exhibit No. 4 is a table in which the results of the various shut-in pressures have been compiled.

Exhibit No. 5 is a table entitled "Complete Report Acid Tests, Hobbs Pool, to December 31, 1934", which appears on the Hobbs Engineering Report for the year 1934, at pages 53A, 54A, 55A, 56A and 57A.

Exhibit No. 6 is a tabulation prepared by the Lea County Engineering Committee office at my request to supplement and continue the table identified as Exhibit No. 5. In the table in Exhibit No. 6 company tests are shown prior to acid treatment. As it is not known how these company tests were made, it is distinguished from the data in the column "Prior to acid treatment" in the table in Exhibit No. 5.

Exhibit No. 7 is a table compiled from the information

contained in Exhibits Nos. 5 and 6. It may be noted that of the 263 wells in the Hobbs Field, three are very small wells which are permitted to produce four, five and six barrels, respectively. Of the 260 wells, seventy were never effectively acid treated to increase potential. Some of these wells were producing water wells or high gas-oil wells which the operators deemed it hazardous to acid treat. Some of them were packer wells; others were wells adjacent to water wells. In any event, acid treatment in the Hobbs field arrived at too late a date to permit these seventy wells being effectively acid treated to increase their potentials.

Seventy-five wells were acid treated with 1,000 gallons to increase their average potential 95%.

Twenty-five wells were acid treated with 2,000 gallons to increase their average potential 104%.

Fourteen wells were acid treated with 3,000 gallons to obtain an increase in potential of 241%.

And eleven wells were acid treated with 4,000 gallons, which resulted in a potential increase of 398%.

By platting the potential prior to acid treatment, against potential subsequent to acid treating, for 1,000 gallons, 2,000 gallons, 3,000 and 4,000 gallons treatment, a series of curves were obtained as shown on Exhibit 7-A.

For instance, for 1,000 gallons, 98 wells were used to determine the average curve shown. From this study it appears that up to an initial potential of about 4,500 barrels, there was a straight line relationship between the potential prior and subsequent to the acid treatment. Beyond this point a curve relationship existed which limited the percentage of increase progressively as the natural potential became larger, until a point was reached, at about a natural potential of 23,500, at which there would be no increase in potential due to the use of acid.

In similar manner, the curve for 2,000 gallons shows a straight line relationship there, similar or almost identical with the 1,000 gallon treatment, in the lower part of the curve.

This line brcke into a curve a little farther to the right than that for the 1,000 gallon treatment. Seemingly, the up curvature of the line indicates diminishing returns from acid treatment of the larger wells. The 3,000 gallon straight line relationship then curved sharply upward and with the line projected, this curve passed relatively close to the 1,000 gallon curve through a point at about 23,500, and the 23,500 indicating the casing size limitation factor beyond which acid treatment would be ineffective in increasing potential. As the size of the well potential increases, the limitation of 7-inch casing and 3-inch tubing results in a limited potential.

The curve for the 4,000 gallons formed to coincide with the straight line, in the lower part of the curve, of the 3,000 gallon, but to extend farther to the right. With sufficient data, this curve might have shown an upward curvature present.

Three other curves from the test data, which is admittedly inferior to the official potential test date referred to previously -- a straight line or curve is drawn for the 12,000 gallon treatment. As to both the 4,000 gallon and the 12,000 gallon curve, the straight line relationship, the percentage increases within the limits of the data were 398 and 650%, respectively.

By platting the percentage increase against the number of gallons used, the curve identified as Exhibit 7-B was constructed, using zero-zero as one point. To do curves for 1,000, 2,000 and 3,000 gallons, there was no average percentage relationship that can be applied to this curve, and consequently the curve from zero-zero to 398 is indicated as a dotted line.

While the curves for the acid treatment are far from ideal, there does appear to be a relationship on the average between the acid treatment potential and the amount of acid used. Individual cases will show a wide variation from the curves as constructed. Several wide variations exist in individual wells and the various potential tests. These variations led to numerous potential tests in the area lying in the Hobbs Pool. This series of curves does afford a method of comparison of potentials with natural

flow prior to acid treatment, or with 1,000 gallon acid treatment, or with 3,000 or 4,000 gallon acid treatment. By such adjustment of potentials to some common basis, it would be possible to compensate, to some extent, for the wide range of potentials which exist between the seventy wells never acid treated for potentials of the wells acid treated with 4,000 gallons or more to obtain a potential increase of 398% or more.

Should such a potential adjustment be attempted, it is suggested that the resulting potentials be fixed by averaging, by the method proposed by Mr. Albertson, of Shell, and described on page 99 of the Hobbs Annual Report for the year 1933. That part of the Hobbs Report is identified as Exhibit No. 8.

Exhibit No. 9 is the November Proration schedule for the Hobbs field, with particular reference to that part of the schedule which refers to the Landreth Production Corporation, State C Lease No. 1, which is believed to have a special allowance due to water at the present time.

Q From the study you have made, Mr. Dewey, would you say that the potential in the Hobbs Pool, subsequent to the acid treating you have described, would be more or less in relationship to the oil in place, than it would before acid treating?

A I think the oil in place was there long prior to anybody trying the acid treatment.

Q I don't think you quite get the point. For instance, you have certain relationship potentials in the edge of the pool, in the middle of the pool before acid treatment, and it so happens you have this relationship after acid treatment. I would like to know which relationship would more nearly represent the relationship between the oil in place?

A I just can't answer that.

Q Let me put it another way. Do you think the potentials taken before acid treatment more nearly represent oil in place than those taken after acid treating, in the Hobbs Pool?

A Under the current statute governing New Mexico oil in place, my conception of potential is merely a very poor co-factor, which might be applied with other factors to estimate roughly the oil

in place. I believe that the natural potential prior to acid treating shows the natural permeability adjacent to the well bore better than the potential subsequent to acid treating.

Q Then, if you were to prorate on the basis of using potential as a factor, you would prefer, in the case of the Hobbs Pool, those potentials taken prior to acid treatment, rather than those taken subsequent to acid treating?

A I believe they should be adjusted.

Q Would you also state -- or could you also state that the use of potentials, if potentials were used which were taken before the adjusted potentials secured under Plan 2A, that a more equitable allocation would have resulted?

A I am convinced of that fact.

CROSS EXAMINATION By Mr. Seth:

Q You referred to Plan A2. By that do you mean the plan in effect at the present time?

A Yes, sir.

Q And what was Plan A1? Was that the plan in effect immediately preceding --

A The plan immediately preceding plan A2, and also based on bottom hole pressure.

Q Prior to January 1, 1937?

A I think Plan 1A was in effect the latter part of 1934.

Q Did I understand you to say that the potentials of the seventy wells, had they been treated with acid, their potentials might have been increased?

A The expectation would be, from all of the results obtained on wells which were treated, their potentials, on the average, might have been increased somewhere in the neighborhood of 95%.

Q I understood you to say the potential indicated the permeability immediately around the bore hole of the well?

A It is a co-factor, depending on several other factors, one of which is permeability. Permeability enters into the potential.

Q If it indicates the permeability immediately around the bore hole, it does not necessarily indicate the oil in place?

A No, sir.

BY GOVERNOR MILES:

Q Under whose supervision was this acid treating done?

A As I remember the history, the Atlantic had one well whose potential was apparently out of line with the potentials of the surrounding wells, and they asked the Operating Committee for permission to acid treat this well in order to see if they could not bring their potential up to the potentials of the surrounding units. The potential apparently was so much out of line at the time, and that permission was granted them. What was granted one operator became available to all operators, and started an acid treating campaign in the Hobbs Pool. It was expensive to all operators, and of course, resulted in a re-allocation of potentials among the operators. Prior to the Atlantic asking permission to acid treat this well, there had been a general agreement that no wells would be shot. Of course when one operator did it, it was done by all operators, and it has been the custom for everybody to acid treat their wells.

BY MR. BODIE:

Q I believe you stated a while ago you were of the opinion the potentials established previous to acidation represent more nearly the oil in place -- was nearer. Personally I would rather use it. Then you say in the case of the Atlantic well which was very much out of line, they were allowed to acidize, and in that case that brought it in line with the surrounding wells.

A On that point, I feel when potentials are so erratic, the natural and acid potentials are so erratic, some means should be employed, if they are to be used, whereby they could be smoothed out. That is why I suggest some method, similar to that proposed by Mr. Albertson and referred to as Exhibit No. 8, should be used. I think, if the operators, at the time the Atlantic seemed to be out of line, had averaged potentials throughout the field, it would never have been necessary to acidize that well. It could have been done by averages.

BY MR. HUBBARD:

Q Assuming that the potentials were to play a part in a proration

formula as one of the functions, would more equity occur if these potentials were based on all wells being given an acid treatment of 4,000 gallons, or if some were given a treatment of 5,000, some 1,000, some 14,000 -- would more equity occur if potentials were based on approximately the same size shot?

A I think that is the case -- if all were on a common basis of 1,000 or 4,000 gallons, more equity in potentials would result.

BY JUDGE LOWE: So much data has been introduced, it will be impossible to cross examine this witness -- we would like to have his cross examination deferred until a little later in the proceeding. To cross examine him now would consume a lot of time and would be shooting in the dark --

BY MR. HUBBARD: I tried to make myself clear that we do not have any specific formula to offer as to the method of proration -- that we would give the history of proration, as we saw it, for use of the Commission, and for any recommendation either side of the controversy, or anyone else, might wish to make.

BY MR. WOODWARD:

Q Mr. Dewey, is it true that wells having the smaller potentials before acidation get a larger percentage of increase than the wells having a large natural potential?

A No, that is not true on the smaller wells acid treated up to 3,000 gallons. On the acid treatments above 3,000 gallons the limitations of the data are apt to cloud the issue somewhat. On those treated with 4,000 gallons or better, it seems they got the same percentage of increase.

Q Then the acidation, as used -- or if used on some uniform plan, would have resulted in evening out potentials in the field, or brought wells up to some uniform potentials?

A Yes, I believe that if everybody had the same opportunity to acidize with the same amount, the potentials would have been more uniform. Some operators have been prevented from treating their wells; other operators have used as much as 12,000 gallons.

BY GOVERNOR MILES:

Q Were they all on a uniform basis before that time?

A Well, no wells had been acid treated. All were on natural flow

at that time.

Q That would vary?

A Yes.

Q Did this acidizing assist in bringing about more flow, or a uniform flow?

A The only idea I know of was to increase potentials by the operators who could increase their potentials in order to increase their allocations at the expense of operators whose wells were not available to be acid treated.

BY MR. WOODWARD:

Q Some wells in the field had very large potentials naturally?

A Naturally, yes.

Q Those wells are in a very permeable section?

A Yes, sir.

Q And some wells had very low potentials?

A Yes, sir.

Q And those wells are in a very low permeable section?

A That is right.

Q When acidation was used, is it true it brought about more or less uniformity in permeability underground?

A The low potential wells had their permeability increased relatively more than the larger potential wells could.

Q The high potential wells had been lucky enough to hit a cavernous spot, whereas the low potential wells hit a tight spot?

A That is right.

Q When you acidized in a tight spot, you went down in the well and hand-made a cavern, like nature had done in the other?

A Attempted to.

Q That was the tendency?

A That was the tendency.

Q The low potential well, having increased its flow by acidation, does that indicate to you it may have had as much oil in place as the well that happened to hit a cavernous spot naturally?

A No, that would not be conclusive proof of any same amount.

Q Of course not, but would it indicate the possibility of having it, having as much there as occured possibly over here? (Indicating:.

A It would tend in that direction, but not conclusively prove, to my mind, that this tract (indicating) would have the same amount of oil.

Q Of course not. It does indicate the possibility to be as great in one as in the other, in certain cases?

A In certain cases.

BY MR. BOHART:

Q One or two questions. Oil in place and recoverable oil in place are not necessarily the same, are they?

A No. I don't think I have testified to that, that they are the same.

Q I am leading up to getting your opinion on a certain point. Now, isn't it a fact that recoverable oil in place is the important thing?

A From the operator's standpoint.

Q From anyone -- if you can't get it, it remains in place?

A That is right.

Q Isn't it your opinion, to a certain extent, in numerous cases at any rate, that acidation has aided in indicating the amount of recoverable oil in place?

A In some cases an acidation has been very helpful.

Q Let me give an example: I have in mind a well completed as a dry hole -- it did not produce. It was acidized and did produce. Without acidation there would have been no recoverable oil in place. With it, there was recoverable oil in place, so that the well produced for the benefit of the operator, the royalty owner and the state. There are such cases -- there are actual cases where acidation did assist in recovering recoverable oil in place?

A That is right.

Q Are you familiar with acidation in Michigan? I believe the consensus of opinion among operators is that acidation in Michigan, where the production is in the dolomite limestone --

A I am not competent to testify about Michigan at all.

Q Then I understand it is your idea, in numerous cases, acidation has been helpful in indicating the amount of recoverable oil in

place?

A That is right. Lots of operators have been fooled by it, too.

Q Acidation is not wholly wasted effort?

A It is not an unmixed blessing.

RE-DIRECT EXAMINATION By Mr. Hubbard:

Q I don't believe you are attempting to say that acidizing has no place in the oil industry?

A Oh, no, it has its place; like any other tool, it can be misapplied.

BY COL. ATWOOD:

Q The fact that this dry hole was acidized and was then capable of producing oil, would indicate there was some recoverable oil around that hole?

A Undoubtedly there was recoverable oil around the hole. Without knowing the history of how the well was completed, we don't know what happened before acidation. It may be that another method of completion of the well might have made it a producer. You would have to know the circumstances.

Q I am assuming this well was completed in the ordinary way.

A You would have to know the spacing, for one thing.

BY MR. RAE:

Q On this matter of the seventy packer wells - I think you indicated that in your opinion they were not being fairly treated because they were not acidized. Was that your thought?

A That was my thought. Those wells could not be acidized, whereas the balance of the 260 wells in the field could be acidized, so those wells that were acidized naturally obtained some advantage over wells that could not be.

Q Is it true that those wells that run packers, that in most of them the upper zones have gone to water, and the reason for running the packer is to shut off the water in the upper zones?

A That is true. The operators had a general agreement that nobody should be penalized in potentials due to setting packers to shut off water or gas. That is the assumption I have gone on, that this gentleman's agreement is still in force.

Q Suppose we assume those wells did not have packers on the upper zones. Is it your opinion that with the upper zones almost entirely flooded, they could have gotten good results?

A There is no means of determining --

Q It may be true that packers being run will not allow those well s to carry their potentials, and that consequently the packer wells are injurbusly treated?

A I disagree -- my contention is that potentials that differ, there is a quality factor that can be used with oil in place to indicate to some extent -- perhaps to a minor extent -- the quality acre fee underlying it. What happens to the well subsequent to its having the packer is getting a potential on the basis of the law of capture, which I don't believe we want to consider.

Q I am not trying to have an argument. I am trying to have you point out why you claim, in packer wells, the lower zones having gone to water, and in spite of that the engineer allowed those wells to carry a potential which was made prior to the time the well went to water or gas, still you are trying to argue that when it has gone to water, and acid treatment would not do any good, that well is given lack of equity. I don't see any reason at all for packer wells to claim that they are injuriously treated. I think you distinctly stated the acid treatment would not help if you took the packer out --

A Where the well has gone to water, the chances are it would greatly increase the amount of water.

Q And probably the amount of oil would not be greatly increased?

A No, I think we are together, but not expressing ourselves the same way, Mr. Rae. If it is necessary to use potential in an allocation formula, I would prefer to see the potential frozen on the particular well, and carry on with that potential throughout the life of the well, and if acid treatment had been available at the time these seventy wells were drilled, before they had gone to water, and they could have had acid treatment and increased their potential, that potential could have been frozen and carried on. And that would have given more equity than we have at the present time, in my estimation. I don't know whether

I make myself plain --

Q I think you do. But still that does not explain why those wells have been injuriously treated.

A Wells that have not been acid treated, that had the ability to earn a greater potential --

Q (Interrupting) Wouldn't it be your opinion that wells in a field where there were less permeable areas than other parts of the field, the wells that greatly increased their potential were in that less permeable area, rather than those on top of the structure where there is a gas cap?

A I think the time factor would help those in the gas zone. They have a longer life in which to recover the oil than the edge wells do.

BY COL. ATWOOD:

A If I follow you clearly, you are not giving it as your opinion that potential should be disregarded entirely in the Hobbs Pool?

A No, I have no brief for or against potentials.

Q Your contention is that if potential is to be used, there are other factors that should be considered?

A I think there are certain inequities in the present use of potentials.

Q So your testimony is directed more at the method of computing potentials than the right to use potentials?

A That is right. I am not attempting to present testimony for or against potentials. Just trying to point out some things that seem to me to have become inequitable in the present use of potentials.

Q Then the present ratio of 60 on acreage and 40 on potential could still be followed, but so that the 40 on potential -- that is allowed for potential, it should be computed on the basis of the potential of the well when first drilled in?

A I prefer that.

Q Would you say that regardless of changes in the pressure in various parts of the pool, that that potential should be frozen clear on through?

A I prefer that way to what it is now.

Q Isn't it a fact that if any changes in bottom hole pressure come into existence in a pool, the result is a migration of oil which takes place from the high pressure areas to the low pressure areas?

A I have been unable to apply bottom hole pressure adjustments to potentials in the Hobbs Pool. I should say, in my own mind.

Q If migration takes place in a pool, what causes it?

A Pressure. Differences in pressure.

Q Higher pressure in one place and lower pressure in another, up or down the incline, it would drive the oil from the high pressure area to the low pressure area?

A As a general thing, I think that is right.

Q Is it a fair statement to say that any program for steadily developing a pool is to prevent migration of oil -- to hold it in place so that the owner of that deposit may recover the oil?

A I think that is the function of the Commission to determine. Under the state law they are charged with the duty of conserving the oil, and second, to allocate the oil. I think that is their function, and I would hate to try to allocate the oil in the Hobbs Pool.

Q I said, is it not the objective of any order to prevent the migration of oil and hold the oil in place to prevent migration?

A Theoretically, if you could build a fence around each well's property, to prevent any migration of oil across property lines, we would not have any proration.

BY GOVERNOR MILES:

Q If a company could prevent that, they would be interested in doing it?

A I don't know how they could do it.

BY MR. ATWOOD:

Q I am speaking about the objective. Is not that the objective, to hold the oil in place and prevent migration, so that each man takes the oil in place under his property?

A The state law, I think, covers that point.

Q Then it is a fair statement to say that any plan which is devised

for proration, should be so devised to prevent migration of oil?

A I think conservation is a factor that comes in there too, besides allocation of oil among the operators.

Q Under our law it is recognized that every operator, royalty owner, owner of oil in place underlying their land, they have the right to recover the recoverable part of it. If that oil which is recoverable is permitted to migrate, the State of New Mexico is prevented from recovering a fair share of the oil underlying its land.

A I think it is the duty of any operator, who figures he is being drained by some operator, to present his case to the Commission.

BY MR. HUBBARD: Some of the questions are not quite in line. We have Mr. Dewey present, but he has not qualified on all of these points.

BY MR. ATWOOD: Somebody admitted his qualifications generally.

BY MR. HUBBARD: The only point I want to make, he introduced certain exhibits. These questions are somewhat afield from those exhibits. I admit they are good questions, but I don't think he has quite prepared himself especially well, except on the questions we presented.

Witness dismissed.

BY GOVERNOR MILES: The Commission will be in recess a few minutes.

MR. GEORGE H. CARD,

being recalled for further

DIRECT EXAMINATION By Mr. Seth,

testified as follows:

Q Mr. Card, this map at the extreme right (indicating map stand) Exhibit 3-A, you testified was the southern part of the field; that the present proration formula has deprived several wells, including Nos. 8 and 9, Stanolind, of all potential?

A Yes, sir.

Q Is that the area in green on that map?

A Yes, sir.

Q Are those wells, the majority of them, still producing oil?

A Yes sir.

Q But have no potential under the present proration plan?

A Have no allowable under potential.

Q They get the acreage allowable of 60%, and nothing more?

A That is true.

Q On that map the yellow indicates packer wells?

A Yes, sir.

Q Both wells, under the present proration formula, always had climbing potentials?

A Their potentials have declined. Packer wells have had steadily declining potentials, according to the way the pressure -- the field average pressure of the packer wells.

Q The field average pressure has always declined?

A Well, I believe there are a couple of surveys where the pressure increased, but the reason the packer wells declined more than the field average decline in potential, many wells in the field have increased in potential due to pressure adjustments.

Q The yellow wells, throughout the period, have lost potential?

A Yes, sir.

Q The areas in red represent areas where no pressure was taken, and they are assigned the pressure on the adjoining areas?

A That is true.

Q And the white indicates wells where the pressure was taken?

A Non-packer wells where the pressure was taken.

Q The white and red represent wells that have gained under the present system of adjusted potentials by bottom hole pressure?

A Not necessarily. You might have some low pressure wells down here (indicating on map) that have decreased in potential.

Q The ones gaining in potential largely are located in the white and red areas?

A There are also wells that have decreased in potential in the white and red, too.

Q But the yellow have lost -- they have lost steadily, being packer wells?

A They have suffered decline in potentials, yes, sir.

Q You spoke yesterday of some wells in the northern part of the field producing large quantities of water. Will you turn next to the one that shows water production. What number is that? (Witness turns to another map).

A 2-A.

Q Can you point to some wells in the northern part of the field producing large quantities of water along with the oil?

A This exhibit shows oil production for 1928 and water production for 1938, and the water percentage.

Q Take these wells here (indicating on map), Gulf, the one in the NW¼ NE¼ of Sec. 24; what was the water production?

A Oil, 18122 barrels; water, 83,322; water, 82%.

Q Does that mean that during the year 1938 the well produced four times as much water as oil?

A Approximately, yes, sir.

Q Come over here. (Witness goes over to map). Cities Service, what would that oil and water production be -- in the NW¼ of Sec. 19?

A Oil, 20,808; water, 78,774.

Q Approximately four to one?

A Yes, sir.

Q And the well, the offset?

A Oil, 24,564; water, 67,980; 73%.

Q Immediately north, in the SW¼ of Sec. 18, there are two wells in the S½ SW¼ of 18; will you state their production?

A Oil, 20,589; water, 303,820 barrels; percentage, 93%.

Q Was that about fifteen times as much water as oil?

A About seven barrels of oil to 83 barrels of water.

Q The next one immediately east of that?

A Oil, 24,082; water, 461,258; percentage, 95%.

Q In those wells, Mr. Card, if that water were not produced, would it go on up the structure?

A Yes, sir.

Q What is the general effect of producing that large quantity of water, along with the oil, in the field on the pressure?

A It helps to decline the pressure.

Q If that water were packed off, would it improve the pressure in the field?

A It would help to maintain the pressure in the reservoir.

Q With that water they are producing oil and water together; is that correct?

A Part of the oil probably is coming from a zone that does not have water in it; the other part, the oil and water are coming together.

Q Suppose the Stanolind, down in the southwest flank of the field, had followed the practice of producing large quantities of water with the oil, instead of setting packers; would that have had the effect of holding the oil in place?

A If they had produced the water -- you would have had the effect -- that Stanolind could have produced the oil at that point by setting packers?

Q If they had produced twenty barrels of water for one barrel of oil, would that have had the tendency to have held back the oil in place under their leases?

A Held back the oil in place under the Stanolind leases?

Q Yes.

A Yes.

Q Would it have stopped the water from moving the oil up structure?

A Yes.

Q What effect would it have had on the pressure up structure?

A It would have lessened the reservoir pressure up structure.

Q Would it have lessened the production of oil up structure?

A By lowering the reservoir pressure you allow gas to come out of solution, making the oil heavier and more difficult to flow into the well bore and towards the well bore.

Q Now, will you state again, please, how the potentials of packer wells are adjusted by bottom hole pressure, under the present proration plan?

A Packer wells are assigned field average pressure for the purpose of adjusting potentials.

Q And are pressures taken in the wells?

A Pressures are taken in as many packer wells as possible, but the pressures taken are merely to calculate the field average pressure.

Q But they have no effect to assign pressures in the packer wells?

A No, none at all.

Q What has been the effect of the assignment of field average pressure on packer wells and on their potentials?

A It has had the effect of declining the potential greater than the decline of the average potential of other wells in the field, because of the fact that some wells increase their potential all of the time.

Q Why has this had the effect of always decreasing it, Mr. Card?

A Because of the fact that the pressure, in nearly every survey, has gone down, so if you assign the field average pressure to packer wells, it goes down, whereas wells in the field above the field average, their pressure increases; because the field average, when all wells decrease, the potential of the packer wells decrease because of the decrease in pressure on all wells in the field.

Q Is it the effect of the present proration scheme that a well that keeps above the field average in pressure gets an increase, generally, although its pressure may have declined?

A Yes, sir, as long as it is above the field average it gets an increase, whether or not the pressure goes down or not.

Q Has the potential of these packer wells, under this formula, been declined greater than the field average decline in potential throughout the field?

A Yes, sir.

Q Basing it on the field average has caused a greater loss in potential to them than the average loss throughout the field?

A The packer wells have suffered out of proportion to the other wells.

Q How many packers has Stanolind set?

A They have set a total of nineteen packers, gas and water packers.

Q How many packers altogether have been set?

A Has Stanolind set?

Q No, the number in the field. How many have been set in the field?

A I don't recall.

Q Was it fifty-eight or nine?

A Yes, sir. We have set packers in 33% of our wells, the Stanolind wells. I think we have fifty-eight wells -- our percentage of units in the field is 22.6, so we have set packers in the larger percentage of our wells than we have units in the field, which shows we have suffered more from packers in proportion to our acreage.

Q Did you give, yesterday, the amount of potential that Stanolind would have now -- I mean, how much larger potential Stanolind would have now than it has if the packer wells had been declined on average potential rather than average field pressure?

A We would have approximately 57,000 barrels more than we have at the present time.

Q When Stanolind set their packers, was it a low or high pressure area where they were set?

A High pressure area.

Q If packers had not been set in these high pressure areas in which they were set, what would have been the effect on Stanolind's potentials in those wells?

A Due to the fact of the high pressure area, the potentials, and, therefore, our allowables, would have been increased on every pressure adjustment period.

Q Mr. Card, the gentleman representing Skelly seems to think the setting of packers beneficial. What effect has the setting of packers had on Stanolind allowables?

A It has been very detrimental to allowables.

Q Will you state in what way?

A We have not the opportunity, the same opportunity of producing oil in those packers; we also gave up the opportunity of having potential increases by being in a high pressure area; as a result, potentials have declined.

Q Have you a diagram showing the comparison between the bottom hole pressure and potential in the Hobbs field?

A Yes, sir.

Q Will you produce it, please.

(Witness produces diagram, marked "Stanolind Exhibit No. E).

BY GOVERNOR MILES:

Q These three maps represent the same area?

A Yes, sir.

Q These all represent the Hobbs field? (Referring to three maps put in evidence by this witness on the preceding day).

A Yes, sir.

Q You were talking about up structure. Where is that on this map?

A Here is the low structure, and here the high.

BY MR. SETH:

Q I hand you Exhibit D, from yesterday.

BY GOVERNOR MILES:

Q Will you please state again where the low and high structures are located?

A This would be the low structure (indicating on map). The high structure for the field is through the center. The low structure would be around the edges of the field.

BY MR. SETH:

Q Will you state, for the record, approximately what sections are the high structure?

A It would be Sections 29, 30, 32 and 33.

BY GOVERNOR MILES:

Q What represents the packer wells?

A The water packer wells are colored red. The gas packer wells, in the center of the field, are not shown on that map.

Q In setting these packers in the wells, that had a tendency to push the oil up structure?

A They kept the water from being produced in those wells, and that pushed the oil on up structure.

Q These are not packer wells? (Referring to other wells indicated on the map).

A No.

BY COL. ATWOOD:

Q Generally speaking, where are the Stanolind leases?

A This section on the southeast side of the field, the yellow acreage (referring to map). These leases up here (indicating on map) are in a fairly good structural position.

BY MR. SETH:

Q This exhibit, Stanolind Exhibit E, is designated "Chart Showing Effect of Bottom Hole Pressure Correction Factor on Potential". On the left side are ten wells showing the largest gain in potential, is that correct?

A Yes, sir.

Q And on the right side are ten wells showing the largest loss in potential?

A Yes, sir.

Q Let us take this part first -- cut the chart in two in the middle I guess. (Chart is cut in two parts, and both parts displayed on map frame).

Now, Mr. Card, take the first well up there, Gulf Graham No. 1, Sec. 24, Over on the left is the scale. Explain what that means.

A The upper curves are bottom hole pressure. The scale is approximately 50 pounds to the inch. The lower lines are the potentials in thousands of barrels. The scale is approximately 5,000 barrles to the inch.

Q That is the bottom hole pressure scale (indicating on chart). Is that correct?

A Yes, pounds per square inch.

Q And at the bottom the potential in thousands of barrels?

A Yes, sir.

Q And at the bottom of the diagram those figures represent the years?

A Yes, each square is a year.

Q The Gulf No. 1 started at a bottom hole pressure of about 1375 in 1933. Is that correct?

A Yes, sir.

Q It has various ups and downs -- it is down to about 1235 in 1939?

A In March, 1939, yes, sir.

Q Falling off about 150 pounds?

A Yes, sir.

Q Take the potential of the well -- it started at about 3500 in 1933?

A Yes, sir.

Q What was that in March of 1939?

A The potential was about -- between 32,000 and 33,000.

Q It increased its potential eight or nine times?

A Yes, sir.

Q Along about the end of 1934 there is a straight up and down potential jump, from 7,500 to about 22,000?

A Yes, sir.

Q What was that due to?

A Due to acidation.

Q But since acidation the potential has increased about 10,000 a day has it not?

A Yes, about 10,000 barrels.

Q Although the pressure has fallen off?

A The pressure has fallen off.

Q Probably 150 pounds per square inch?

A Yes, sir.

Q In other words, that well, over a period of about six years, has had its potential increased eight or nine times?

A That is true.

Q Through acidation and through operation of the bottom hole pressure?

A Yes, sir.

Q Although the bottom hole pressure has fallen off fully 100%?

A 150 pounds.

Q The next one is Shell State D-2. That has had now much falling off in bottom hole pressure?

A About 165 pounds.

Q And how much potential increase?

A A potential increase from about 9,000 barrels to 35,000 barrels.

Q And the next, Grimes No. 2, there is a falling off in bottom hole pressure?

A Yes, about 125 pounds.

Q And how much potential increase?

A From about 16,000 barrels to 28,000 barrels.

Q Without going through all of these,-- this map was prepared under your direction?

A Yes, sir.

Q And they represent correctly the official data from the Hobbs field?

A Taken from the Hobbs operators report.

Q It looks like the Stanolind No. 33, and every one of these, the bottom hole pressure has fallen off?

A About 160 pounds on the Stanolind No. 33.

Q And the potential increased how much?

A From about 23,000 up to about 32,000, the highest.

Q Take one of the lower ones there (Indicating the lower half of the chart, as it was placed on the map form).

Take the first one, the Amarada State B-4, in Sec. 29. How much has the bottom hole pressure fallen off?

A About 150 pounds.

Q Has it lost any potential?

A Lost about 18,000 to 16,000 thousand barrels. This was probably acidation. From the time of acidation, 23,000 to 16,000.

Q The acidation covered the period from the end of 1934 and the first part of 1935.

BY GOVERNOR MILES:

Q How is a well's bottom hole pressure brought about?

A Production, by fluid.

Q What do you mean by fluid?

A Oil, water, gas.

Q In acidation, by acidation of the pool, does the well take less pressure? What makes the increase if the bottom hole pressure has decreased -- what makes the increase?

A You mean, the potential increase?

Q Yes.

A Because of the fact that any well with pressure above the field average pressure gets an increase in potential. If the well has a pressure below the field average, its potentials are decreased. The formula works that way.

Q That one over there (indicating the chart) shows there had been an increase?

A All the upper ones (right hand end of chart) show increased potentials. All below show decreased potentials.

BY MR. SETH:

Q Take the Amerada State in Sec. 29, it has had a decline in bottom hole pressure?

A Yes, sir.

Q And yet the Gulf potentials have increased eight or nine times?

A Yes, sir.

Q And the Amerada State has gone off two or three thousand barrels potential?

A Yes, sir.

Q Is that one reason why the Gulf, under the operation of that formula, under the inequitable operation, got two or three thousand barrels increase, and the Amerada got a decrease?

A Yes, sir.

BY GOVERNOR MILES:

Q Based on what?

A Based on the fact that the proration formula is based on the bottom hole pressure of the field, the pool relationship.

BY MR. SETH:

Q Take Stanolind No. -- Stanolind State A-1.

A This well has been a packer well, and of course, received the field average pressure.

Q It has declined in bottom hole pressure about the same as the Amerada State, has it not?

A Yes, about the same.

Q And lost in potentials, or probably gained at the beginning, but from the high point of potential, it has lost a great deal more?

A Yes.

Q Take the Humble Bower over here,- that has had a falling off in bottom hole pressure substantially like the Gulf's?

A Yes, sir, about 170 pounds.

Q And how much has it lost in potential?

A About 12,000 barrels.

Q Mr. Card, during all the years up to 1937, January first, 75% of the field allowable was allocated on potential, was it not?

A That is true.

Q And since 1937 this inequitable operation of the potential applied to three-fourths of that area?

A About 75% of it.

Q And reduced that to two-fifths of the oil produced?

A Yes, sir.

Q Do you know of any principles of engineering, geology, or anything else that would justify any such operation of a formula of this kind, in the way it has operated?

A No, I do not.

Q Take the Gulf Graham, in Sec. 24, the first one, do you know of anything operating to increase the recoverable oil in place to justify an increase in its potential eight or nine times?

A No, I do not.

Q Has anything happened to increase the recoverable oil in place?

A No.

Q All have had a drop in bottom hole pressure?

A That is right.

Q And ten have had a decrease in potential?

A Yes.

Q And ten have had an increase in potential?

A Yes, sir.

Q That is just a group taken at random?

A These are ten wells showing the largest gain and ten wells showing the largest loss.

BY GOVERNOR MILLS:

Q Where would they be located in the pool?

A They are scattered all over the pool. These up here (indicating on

the chart) are in the north end of the pool; these down here towards the south.

BY MR. SETH:

Q Mr. Card, I don't know whether you have already testified to this or not: what will be the effect, in your judgment, on the ultimate recovery of oil from the Hobbs Pool, from these large withdrawals of water up in the north end?

A I believe it will lessen the ultimate recovery of the field.

Q It will weaken the water drive?

A It will weaken the water drive and allow the pressure to go down faster, thereby allowing the gas to come out of solution, making the oil thicker and hard to come out of the bore hole.

CROSS EXAMINATION By Mr. Bohart:

Q Mr. Card, I understood, in your testimony yesterday, that you stated that the encroachment of water constituted waste. Now, perhaps I am not quoting you literally or exactly. If not, would you please state that again?

BY MR. SETH: I think he said the production of water.

Q I believe you were asked the question, "if a property was going to water" if that constituted waste, and you said yes.

A I meant by that statement, the production of large quantities of water constituted waste.

Q This was made in a different place. Do you believe the encroachment of water itself, on a property constitutes waste?

A The movement of water from the edge of the structure up to the top?

Q Yes.

A No.

Q The mere encroachment of water does not constitute waste?

A No.

Q Mr. Card, then it is perfectly normal, as oil is withdrawn from a structure which, before discovery, in a static condition, no movement from one part to another,-- it is perfectly normal for water to encroach and occupy the space evacuated by the oil; is that correct?

A Yes, sir.

Q I perhaps misunderstood your answer to the question yesterday, and I wanted to be sure of your opinion on that point.

Yesterday you made the statement that certain properties of Stanolind, that formerly produced from the so-called upper pay, and in which packers had been set, had had the oil removed from them by water, and thereby you lost some of the oil -- either lost it or abandoned it, and were thereby deprived of it. Could you tell just what properties you referred to there?

A You mean properties where we calculated our losses?

Q Yes, have you got a map you can put up?

A We can put up the water encroachment map. (Witness puts up map). One of these wells is the Byers No. 8, in the NE¼ of Sec. 4 -- this well here (indicating on map). Another well is the Byers No. 11 in the NE¼ of Sec. 4. The Byers 26, in the NE¼ of Sec. 4. The Byers No. 33, in the NE¼ of Sec. 4. The McKinley No. 1, McKinley No. 6 and McKinley 26. State No. 8, in the NW¼ of Sec. 4. State No. 11 in the NW¼ of Sec. 4. State No. 26, in the NW¼ of Sec. 4. State No. 33 in the NW¼ of Sec. 4. State No. 3 in the SW¼ of Sec. 4. State No. 11 in the SW¼ of Sec. 5. Terry No. 8, in the NW¼ of Sec. 9.

Q Now, for example, in which direction do you contend you lost oil from the McKinley property?

A On the McKinley property the oil passed up in this direction (indicating).

Q In what direction?

A North and east.

Q Mr. Card, what causes a liquid or gas in a reservoir to move from one place to another?

A Differential in pressure.

Q Generally speaking, a liquid or gas will move in the direction from the higher to the lower pressure?

A Depending on the permeability.

Q It would not move from low to high?

A No.

Q Then it would move from a higher to a lower. I do not have all of your figures available, but in making a spot check I find in December, 1931, the bottom hole pressure in your well in here,

No. 5 West Grimes, was 1470 pounds. If you wouldn't mind, would you point out about where that is. (Witness points to well on map.) 1470 pounds, on the same date, or approximately the same date, that the Stanolind No. 6 had --

BY MR. SETH: Have you been sworn so that we can cross examine you? You are giving testimony.

BY MR. BOHART: I need this in order to ask a question.

BY MR. SETH: We might want to examine you on that.

BY MR. BOHART: I can ask if that is the pressure.

Q Do you have the statement, or would you tell what the pressure was in December, 1931?

A I don't have those pressures with me.

(Mr. Bohart hands witness a book).

BY MR. SETH: What are you reading from?

A This is the Hobbs Pool General Report.

(To Mr. Bohart): What wells do you want?

BY MR. BOHART:

A The Gulf No. 5 West Grimes, the December, 1931 survey?

A 1470 I believe, as well as I can see it.

Q What was the pressure for the Stanolind No. 6 McKinley, at the same time?

A 1453.

Q Is that an offset, the south offset to the Gulf No. 5?

A Yes, sir.

Q And that is one of the properties you contend you have suffered a loss?

BY MR. SETH: In order that the record may be clear, is that the shut-in pressure or flowing pressure?

A Shut-in.

BY MR. BOHART:

Q And that is a difference of about 17 pounds?

A Seven pounds, shut-in; that does not mean that much in flow.

Q Seventeen, isn't it?

A That does not necessarily mean that much in flow pressure.

Q That relationship is static bottom hole pressure?

A Shut-in pressure, when not producing in the well.

Q What was the pressure in the No. 6 West Grimes on the same date of survey?

A It looks like about 1436 -- the figures are hard to read.

Q What was the pressure of the Stanolind No. 1 on the same date?

A 1458.

Q Well, at that time then, in the case of one pair of wells, there was a slight differential toward the south, the Stanolind?

A Measured by shut-in pressure test.

Q And on the other pair, there was a slight differential towards the north, the Gulf's?

A Yes, sir.

Q What was the pressure of the Gulf No. 5 West Grimes on October 23rd --

BY MR. SETH: We would like to have it shown that is shut-in pressure.

BY GOVERNOR MILES:

Q May I ask what is shut-in pressure and flowing pressure?

A When the pressures are taken, the wells are shut in for from 24 to 36 hours previous to the time the pressure is taken. That does not necessarily mean that is what the pressure is when the well is flowing. One well may have a much lower flowing pressure. The pressure test is when the wells are shut in.

BY MR. BOHART:

Q Mr. Card, isn't closed-in, static bottom hole pressure the pressure of the formation?

A Adjacent to the bore hole.

Q That is the pressure under which the fluid exists in the formation?

A Right adjacent to the bore hole.

Q When you take static bottom hole pressure the purpose is to close the hole a sufficient length of time to permit the pressure to build up to the maximum -- as much as it will build up?

A It takes some wells a good deal longer than others.

Q That is true, but isn't that the general purpose of taking a static bottom hole pressure?

A In a general way, it is, yes.

Q After that has reached a maximum, generally speaking, that represents the pressure of the formation surrounding the well?

A You don't know how far sourrounding it.

Q For some distance back?

A There is no way of knowing how far back.

Q It will not build up any more, so that it has reached equilibrium?

A Some wells will build up for a while -- leave them shut in and then they will build up.

Q When they have reached the maximu, the well has reached equilibrium, and that represents the average pressure of the field?

A Directly surrounding the well. I don't know how far.

Q And that indicates the pressure,- represents the force acting in the formation.

A It indicates the shut-in pressure, but not under flowing conditions.

Q The flowing pressure, or pressure differential while flowing is the drop in pressure from the bottom of the hole to the top of the hole?

A State that again.

Q The differential while flowing -- after oil gets into the bottom of the hole there is a certain differential of the pressure which must act to bring it to the top?

A Naturally the pressure is less on top than at the bottom.

Q If this well has a bottom hole flowing pressure of 600 pounds, and it is flowing on choke -- that is, flowing restrictedly, so that there is a pressure on the gauge at the top, the difference in the pressure is the pressure differential between the bottom and the top of the well?

A As far as the flow is concerned. That is not the differential in the reservoir.

Q What was the pressure in Gulf No. 5 West Grimes on October 23rd?

A 1380.

BY MR. SETH: Shut-in pressure?

A Yes, shut-in pressure, yes, sir.

BY MR. ROHART:

Q You are giving them all on the same basis?

A Yes, sir.

Q What was the pressure of Stanolind No. 6 McKinley on the same date?

A 1363.

Q What is the south offset to West Grimes No. 5?

A Which wells, 5 and 6?

Q What is the pressure of Gulf No. 6 West Grimes as of the same date?

A 1383.

Q What was the pressure of Stanolind No. 1 McKinley, as of the same date?

A 1364.

Q That is the south offset to Gulf No. 6?

A Yes sir.

Q As that is south of Sec. 32, along that part of the pool the formation pressure, the static bottom hole pressure, was less to the south, on the Stanolind side, then?

A The shut-in bottom hole pressure was, yes, sir.

Q That is the pressure in the formation which is tending to expel the oil towards the bore hole?

A No, I would not say it was, exactly. You don't know what the gradient is out to the drainage area.

Q Even while a well is closed in -- assume the bottom hole pressure, which is not usually the case -- assume it is empty. You close the well in, and there is some forces tending to push the oil from the formation into the evacuated area?

A Yes, sir.

Q In the last analysis, it is the pressure in the formation that tends to do that work?

A Yes, sir.

Q At this time there was not a pressure differential toward the north, at least in this area, as reflected by the Hobbs Engineering Report of bottom hole pressures?

A As reflected by conditions surrounding the bore hole. I don't know what they were a short ways away from the bore hole.

Q Well, the pressure could not have been less away from the bore hole than at the bore hole?

A No, probably higher.

BY DR. KNAPPEN:

Q If that is the case in December, 1931, the formation pressure around the wells, giving that 17 pounds difference in pressure, would tend to move the oil from the Gulf No..5 to Stanolind McKinley?

A Yes, sir, in this tabulation here it shows that McKinley No. 6 gained in oil during that year. These tabulations show gains and losses too.

Q And at the same time, according to your figures, there was a differential tending to move the oil from Stanolind No. 1 north to Gulf No. 6?

A That is, the pressure.

Q Do your tabulations show a loss for the Stanolind No. 1?

A In 1930 and '31 it shows a slight gain.

Q So that your calculations cannot be entirely correct, when you had a differential tending to take pressure away from you, when you show a gain?

A It was very small in those years.

Q In October, 1933, there was a pressure differential southward tending to move oil to Stanolind McKinley?

A 16 pounds. That is a pretty small difference for statin pressure.

BY GOVERNOR MILES: The Commission will be in recess until 2:30 P. M.

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Pursuant to recess taken, the Commission resumed the hearing at 2:30 P. M., December 7, 1939.

Mr. George H. Card on the witness stand for further cross Examination.

BY DR. KNAPPEN:

Q You are the same Mr. George H. Card who was on the witness stand this morning?

A Yes.

Q We were discussing bottom hole pressure -- I think you were making a distinction between closed-in bottom hole pressure and

flowing?

A Yes, sir.

Q Can you explain to the Commission why closed-in bottom hole pressure has been taken throughout the last seven years, the life of the Hobbs field?

A The only reason I know, it was just the way we started.

Q Engineers generally agreed at the start that it was desirable?

A They have taken flow pressure on some wells, I believe.

Q But the bottom hole surveys report by the engineering committee are on closed in pressure?

A They are closed in pressure, yes, sir.

Q Why do they not report on flow pressure?

A I don't know.

Q You don't know why flowing pressure is of little significance?

A I think it is of significance.

Q But the engineering committee do not think it sufficiently so to ask for flowing pressure, nor do they think it sufficiently so to publish?

A They have published all that have been taken.

Q They have published all that have been taken?

A I believe so.

Q Do you know how many have been taken?

A No, not exactly.

Q Do you know how many closed in pressures have been taken?

A I don't know.

Q Would it be as much as 25 times, do you know?

A I don't know.

Q You have not paid much attention to flowing pressures in the Hobbs pool?

A Yes, to what was taken.

Q You have not urged it to be used?

A I don't think bottom hole pressure of any kind should be used alone.

Q That is a different attitude than that Stanolind had in 1932 when bottom hole pressure was introduced?

A It probably is.

Q Wasn't the bottom hole pressure introduced by Stanolind because

they had high pressure areas in the field that were being drained?

A I don't know. I was not with the Stanolind at that time.

Q You have not studied your files enough to know whether that is correct?

A I don't know who urged it.

Q You don't know whether any Stanolind engineer urged that bottom hole pressure be used for adjustment of allowables in the Hobbs Pool?

A He may have done so.

Q You don't know whether he did?

A So far as I know, I think he was in favor of it.

Q Who was that engineer?

A Are you referring to Wahlstrom?

Q I am asking you. What was his connection with Stanolind at that time?

A I believe he was field engineer at Hobbs.

Q And he urged bottom hole adjustments in the proration plan for Hobbs?

A I believe he did, yes. At that time engineers knew very little about bottom hole pressure, and still know very little.

Q Do you know how the bottom hole pressures in the Stanolind wells along the north boundary of your properties compared with the bottom hole pressures taken on equivalent wells immediately north of the township line?

A For the most part, I think they have been as high or higher.

Q The Stanolind have been as high or higher?

A Generallyspeaking, they have been pretty close together.

Q If I were to tell you that in December, 1931, the north offsets of the Stanolind wells were two pounds higher than in the Stanolind wells, would you know that is correct?

A I would have to look at the maps.

Q You don't know what the relationship was?

A On most of the maps and surveys, especially recent surveys, our pressures have been as high or higher than those.

Q In recent years, yours are all packer wells, aren't they?

A No.

Q Your wells along the north line are not all packer wells?

A No.

Q I am talking now about December, 1931, the several surveys made by the engineering committee --

A I cannot remember individual wells.

Q And especially that pressure differentials increased to the survey of October, 1933 -- the pressure differentials at that time were ten pounds -- that is, the Stanolind wells were ten pounds less, on the average, than the north offset wells, taking the wells where actual measurements were made, not taking any assigned pressures or packer wells. Is that the true situation in 1933?

A I would have to look at the record of the two surveys.

Q Assume for the purpose of the question, that in the first survey the Stanolind wells were two pounds less in pressure than the north offsets, and two years later, ten pounds less. Would that indicate the oil was moving northward?

A I don't think it would indicate anything definite. In the first place, you cannot read bottom hole pressure charts within ten or fifteen pounds. In that case, you could have a variance of forty pounds, up or down -- that is, static pressure, you are talking about. You have got to know the pressure under flowing conditions.

Q Granted there may be an error in the reading of the charts involved -- there could be some error in the reading of any chart -- but if they were consistently lower, and another set of measurements, under static conditions, still showed they were lower, could an engineer say he could not tell with definiteness that those pressures were lower?

A One engineer can read a chart and get ten or fifteen pounds difference, higher or lower.

Q If the same group of wells were measured, if they constantly ran higher on the north, would that mean the engineer could not read the chart?

A I did not say he could not read the chart -- he might make a mistake.

Q If they constantly ran lower, would that mean the Stanolind wells had lower pressure than on the north?

A You are talking of static pressure?

Q Static, closed in. If the same group of engineers, reading the charts, constantly found the pressures higher in the wells north of the township line than south of it, would that indicate the closed in, static pressure in the Stanolind wells was less than in the wells to the north?

A It might be a general indication. It would be hard to say. There are many cases where you see the static, shut-in pressure running higher. That does not mean anything.

Q Would it be a coincidence if the error were always against the Stanolind on a whole series of surveys? I am not asking about those tests on wells where pressures taken --

A (Interrupting) What surveys are you talking about?

Q December, 1931 and October, 1933.

A I don't believe I have those.

Q It would take too much time to check up. I am asking if that situation is presumed to be correct, whether it would indicate the Stanolind wells had lower static pressure than those to the north?

A Any survey, or group of surveys, could make the same mistake, you mean?

Q Alright, I see you don't want to answer the question, so I will ask you another.

BY MR. HUBBARD: I don't believe that is called for.

BY MR. SETH: The witness is trying to get the data to answer the question of the gentleman. Evidently he does not want him to produce it.

BY DR. KNAPPEN: I am asking if that proposition were shown to be true --

BY MR. SETH: I think we ought to have the evidence. Let him produce the evidence that they are lower.

A You can look at just as many surveys and maps as you want, and see that the Stanolind wells on the north line were a few pounds higher, and then lower --

BY GOVERNOR MILES: You may produce the record.

BY DR. KNAPPEN: Mr. Chairman, I think we can get together and tabulate this data. It is scattered over a large chart. I think it might be best to pass that question for the present. With your permission I should like to consult with the witness and tabulate that data.

Q You introduced an exhibit, I believe Stanolind Exhibit D, was it not, which showed packer wells, the wells in which packers had been set in the Hobbs Pool?

A Yes, sir.

Q That exhibit showed only wells in which packers had been set to shut off water?

A That is true.

Q Many were set to conserve gas, were they not?

A That is true.

Q Do you know how many gas packer wells there are?

A I have a map here that shows it. (Witness produces map). There are approximately 43 gas packer wells.

Q And how many water packer wells?

A 35.

Q So there are more gas packer wells than water packer wells?

A Eight more -- I believe that 43 is correct.

Q I think it is very close to accurate. You did not show the gas packer wells on that map?

A No, that was a water encroachment map.

Q There are something like eight more gas packers set than water?

A That is true.

Q When a gas packer is set, the operator abandons the production from the formation above, in exactly the same way as with a water packer?

A It depends on whether there is any more water left in the area packed off.

Q My question was, does he abandon the formation in the same way he does with a water packer?

A Yes, there is less likelihood of any oil -- more that situation with a gas packer.

Q They abandon production in the same way as with a water packer?

A Yes.

Q When gas packers have been set, has every bit of producible oil been taken from that formation?

A Not necessarily. I believe under the conditions in the Hobbs Pool, there is more likelihood of the oil being depleted than with water packers.

Q There is some oil left behind, probably, or above the packer when a gas packer is set?

A It is hard to say -- maybe a small amount.

Q What is the reason for setting a gas packer?

A To reduce the gas-oil ratio.

Q The setting of a gas packer is a real conservation factor, is it not? The operator setting the packer is attempting to conserve gas for use of other parts of the pool, is that correct?

A Well, yes, the wells adjacent to the one he sets.

Q Certainly, on his own lease as well as others, but he is endeavoring to conserve the gas, for the benefit of production of other wells, his own as well as others?

A That is true.

Q When water packers are set, are they set to shut off water, or are they set because the operator can no longer produce his well unless he sets the packer?

A I don't think that is the case in the Hobbs Pool. There is no reason why he could not produce that water.

Q Have wells in which water packers have been set continued to produce their allowable up to the time of the setting?

A It probably has been necessary to pump some wells.

Q Any wells gone dead and had to be swabbed?

A Naturally, a well producing a lot of water would go dead occasionally. That is no reason it could not produce.

Q Many wells did go dead before water packers were set?

A I imagine they did.

Q Would it be safer for an operator to produce his allowable oil after setting a water packer than previously?

A You have got to take into consideration how much oil you are

going to get. I think the operators on many leases would have been ahead if they had set packers.

Q In terms of actual data on operation costs, would an operator's costs go up or down after he sets packers?

A It costs more money to operate a well pumping than a flowing well. You have got to consider the ultimate profit.

Q Forget the ultimate profit -- we are talking about operating costs. The setting of packers does result in saving operating costs?

A It should. If it does I don't understand why all operators in the north end have not set packers.

Q Any operator successfully setting a water packer does save in operation expenses?

A There should be a saving.

Q I agree. What determines the time when a water packer is set -- when an operator decides it is time to set a packer?

A Well, a lot of the wells make a small amount of water -- some a large amount of water --

Q What is the basis that you, as a Stanolind engineer, use to decide it is desirable to set a packer?

A Probably when they are having trouble treating the oil.

Q Take as an example Stanolind McKinley No. 26; do you remember the water percentage before setting the packer, was it 87% water?

A I don't recall exactly.

Q If it had been 87% would it have resulted in a saving to set the packer, in, after setting the packer, of having no water to produce from that well?

A We would not have to handle the water -- probably a small saving.

Q Do you know whether that well was making its allowable when you set the packer?

A I don't know.

Q Do you know whether that well was making its allowable, or making its allowable without swabbing?

A I could not say definitely. I know with the last two packers set, it was necessary to swab before setting the packer.

Q What does it cost to set a packer and pump at a depth of around 4,000 feet?

A That depends on the type of equipment used to set the unit -- probably $3,500.00.

Q Would that well, producing 50 barrels of oil and 17 times as much water -- if your well was making 87% water and producing 50 barrels of oil per day, how many barrels of fluid would that be?

A Nine barrels of water for every barrel of oil would be 450, approximately.

Q So you don't know the basis upon which you decided to set water packers on those packer Stanolind wells? Was it just a gamble, or when did they decide to do it?

A The last two wells, they were having trouble operating the wells. At the same time they started out to set packers others did too-- I think the Texas Company was the first one to set a packer, it was recommended by the Engineering Committee that a packer should be set there, and the Stanolind and other operators followed the same recommendation.

Q When did you decide, when a well was making 2%, 25%, 50%, or when the operating costs became excessive?

A A lot of packers have been set when I have been out of touch with the Hobbs field. I don't know exactly every one.

Q Water packers are set in order to reduce operating expenses, aren't they?

A And conserve the energy in the pool, yes.

Q Does the setting of a gas packer reduce the operating expense?

A Sometimes you set a gas packer in a well because it is making so much gas it is not making very much oil.

Q Does that involve operating expense?

A It involves revenue.

Q But does not involve operating expense?

A No.

Q Whenever a gas packer is set it is purely a conservation proposition, but a water packer is set purely to reduce expenses?

A I think it is just as important to conserve water energy in the

Hobbs Pool as gas energy.

Q This is an exhibit Mr. Dewey introduced (showing exhibit to witness) marked "H. Exhibit 2-A". That shows the daily oil production in barrels, by units, in 1938, and the unit water production in barrels?

A Yes, sir.

Q And the water percentage?

A Yes, sir.

Q There was some testimony this morning about some units where a rather high percentage of water was being produced. I notice Stanolind No. 8 Terry, in the NE¼ SE¼ of Sec. 9, Twp. 19 S., R. 38 E., that shows 50% water production. Would you think it desirable to set water packers there to conserve the energy in the field?

A Which well is that? (Exhibit is shown to witness). If a water packer would be set to do any good. There are two wells in this area where we have set water packers without any effect.

Q Stanolind No. 29 State, in the SW¼ SW¼ of Sec. 10, T. 19 S., R. 38 E., making 64% water, what about that?

A We set a water packer in that well, and then removed it.

Q Why did you remove it?

A We didn't get a good shut-off. We are going to do some more work on it. We set a packer in McKinley No. 26 three different times before we got an effective shut-off.

Q Is it possible there are wells in the pool where you could not set a water packer and not get good results?

A Where it gets into thick "pay". It depends on the pay.

Q What about No. 33 Byers, in the SE¼ NE¼ of Sec. 4? That shows 32.5% water. Could you set a packer in that well and shut off the water?

A The well would have to be deeper. It is only producing from the first horizon.

Q So that you could not set a packer in that and shut off the water?

A At the present depths, no. You could by going deeper.

Q If the water and oil are coming together, you cannot set a packer to shut off the water?

Q You can set a packer to shut off the water in most cases if you have oil in other "pays"?

If the water and the oil are coming together in the same pay?

A If all of the oil and water are coming in the same pay, you cannot.

Q So in the case of No. 33 Byers, all of the oil and all of the water coming in the same "pay", you cannot set a packer to shut off the water?

A Not until we have the well deepened.

Q Until you go deeper to get production in another horizon?

A Yes, sir.

Q What about some wells in the northwest end? Is not water and oil coming in the same "pay"?

A My understanding is that most of the water is coming in the second "pay".

Q Do you know that some companies have set packers repeatedly without shutting off the water?

A There have been packers set in the north end of the field that did not get a shut-off. I don't know how many times they were set. The thing is, the north end of the field is much thicker in section than down on this fringe here.

Q If you have set a packer and tried to produce from above, and have gotten water and oil, and below, and have gotten water and oil, when you tried to produce from ablve and below and still get water and oil, would you conclude that a water packer would not help?

A There are some wells they have not helped, and some wells they have plugged back.

Q Would you conclude, if you could not successfully shut off water in one well, that you could not in any well in that area?

A Not necessarily. It would look like the possibility was preggy good.

Q You would conclude, in the southeast end where you have set packers that have not shut off the water, that you could not set them in any well there, and yet you have criticized other operators for not setting them?

A I did not say that. I said we were going back in and try to

successfully set them. What I was pointing out that in this section where these Stanolind wells are making a high percentage of water, the section is much thinner than in the north end of the field, and for that reason there should be a better chance of success.

Q Stanolind Exhibit B, which is a cross section of the Hobbs Pool along the township line between Townships 18 and 19 South -- I am not clear as to what the testimony was yesterday. The area in blue indicates --

A The blue section indicates water encroachment.

Q Does that cross section indicate the direction of the encroachment?

A Not necessarily. That is an east-west section.

Q So the water did not encroach from the left hand section across, but the water encrcached at right angles?

A It probably came in from the southwest.

Q Would you infer that water appeared in this well (indicating on exhibit) before it did in this one? Is that the idea, that it gradually moved in this direction, but that the water appeared farther eastward?

A Not necessarily. I think one well farther east here is marked "1932" and the rest are marked "1933".

Q So the water appeared in this well marked "November, 1932" about three months before it appeared in the wells marked "February, 1933"?

A That is just an item. An east-west section of the field showed a blanket encroachment of water. It does not necessarily mean it came from the west to the east.

Q I got the wrong impression. Sorry. You have wells marked "March, 1932", and to the west, on the section, is a well marked "October, 1932". It means the water appeared in these wells some seven months earlier than in these (indicating on exhibit)?

A Yes, sir. The contours appearing on the water map shows that this well is in 9-32 and this one in 10-32.

Q Would you explain to the Commission how the water encroached?

A Well, from the record, these contours, the water encroached from

that direction --

BY GOVERNOR MILES: (Interrupting) What direction is that?

A Northeast to southwest.

BY DR. KNAPPEN:

Q What do these contour lines along here indicate -- for the purpose of the record,-- in the western part of Sections 4 and 9, what are those contour lines indicated in the section?

A Section 4 appears to be moving this way (indicating).

Q Northwestward?

A Northwestward.

Q In the southern part of Sections 4 and 9?

A East.

Q It appears to be moving eastward. In the N½ S½ of Sec. 4, do those contour lines indicate the direction of the encroachment?

A There has not been any encroachment in Sec. 35. The reason those at the top are there, the wells to the north flow faster than on the south.

Q In the N½ of Sec. 4, the movement has been --

A (Interrupting) I think the water encroachment in that area has been to the northeast.

Q Then as the water has encroached in Sections 4 and 9, there has been a driving of the oil into the heart of the Stanolind block, and in the N½ of Sec. 4, part of the drive has been into the Stanolind block and part moving northeastward?

A I think you can say the water encroachment here has been across our part, and from the reports on wells, some of these show that some of this oil had gone to our own wells, we did not include that.

BY GOVERNOR MILES: We will be in recess for ten minutes.

----oOo----

Pursuant to recess taken, hearings were resumed in ten minutes, with Mr. Card still on the witness stand for further cross examination.

CROSS EXAMINATION By Mr. Sanderson:

Q Mr. Gerd, I would like to ask a few questions about the loss which you estimate Stanolind suffered over the past years by reason of the proration plan that has been in effect, and the water drive you talk about. Will you state again how much oil you estimate Stanolind has lost?

A Since the beginning of the development, 1,560,000 barrels. Since June first, 1935, 518,000 barrels.

Q Have you computed those losses by units or leases?

A By units, yes.

Q Will you refer there, please, to Stanolind Buyers lease, in the NE¼ of Sec. 4, and the NW¼ of Sec. 4.

A Yes.

Q Will you state there how much you estimate you have lost off of that lease?

A The list here is by units.

Q You don't have the total?

A Buyers No. 8, in the NE¼ of Sec. 4, 17,600.

Q What is the next?

A Buyers No. 11, in the NE¼ of Sec. 4, 13,400.

Buyers No. 26, in the NE¼ of Sec. 4, 7,400.

Buyers No. 33, in the NE¼ of Sec. 4, shows a gain of 98,600. That is a high potential.

Q Take your Buyers No. 8 -- strike that. Take your Buyers No. 11, will you state what the allowable is on that unit now?

A I would have to have the proration schedule. (Witness is handed proration schedule).

BY GOVERNOR MILES: These losses stated, is that total loss?

A That is the total, yes.

Which well did you want, Mr. Sanderson?

Q No. 11.

A These columns must be mixed up -- under November Daily Allowable it does not show any figures at all. (Witness examines schedule). 53 barrels.

Q No. 26?

A 67 barrels.

Q No. 33?

A 75 barrels.

Q Do you know how much oil would be allocated to those units on a 100% acreage basis?

A In November the allowable was 46 barrels.

Q That would not be the allowable that would go to those wells if you were on a 100% acreage basis, would it?

A Forty-six.

Q What is the allowable for the pool, the Hobbs Pool?

A The total field allowable is 10,539.

Q How many units?

A A total of 250 units, but four of those have special allowables, 248 potential units.

Q Can you calculate quickly what that would be per well?

A Well, if Hobbs were on a straight acreage allowable, like other fields, it would be practically the same in the field.

Q What would that be, approximately, on the acreage basis?

A Approximately 46.

Q No. 11 is getting 53 barrels, and would get 46; 26 now has 67 barrels, it would bet 46 under your plan; No. 33 now has an allowable of 75 barrels. Under your plan it would get 46, on a 100% acreage basis?

A That is it.

Q Then, as I understand, you are proposing a 100% acreage basis to correct the situation which has existed in the past, which has caused you to lose amounts of oil, and every one of these units would get a smaller allowable?

A You have got to consider the whole picture. Some wells would be increased and some decreased.

Q Would you point out where those wells, or that lease is on the map?

A This is it (pointing).

Q Under the acreage plan, which Stanolind is championing, these wells which he has named would get 46 barrels of oil per unit, or per well. At the present time those wells have allowables of 53, 67 and 75 barrels, respectively, therefore, I am asking how the lower allowable of these wells would correct the situation under which Stanolind claims they have lost various amounts.

A You have to consider all of our leases.

Q Where would this oil go that you are going to get?

A It would be distributed among wells not getting as high as that.

Q Where are those wells? Just point to them.

A All the wells with allowables less than 46 barrels at the present time would be down in this section (pointing on map).

Q Under this plan you would actually lose on some leases, but you would gain enough more on other leases to more than offset the losses on those you say you have suffered losses?

A I think the balance on the NE¼ of Sec. 4 show gains, on the NE¼ of Sec. 4.

Q That would be true, but of the individual units?

A You have to consider this thing more or less as a whole.

Q Take State A lease, how much have you lost there, according to your estimate?

A There are quite a few along there -- which section?

Q Tract No. 1?

A What section?

Q Section 4, the NW¼ of Sec. 4?

A The NW¼ of Sec. 4, well No. 8, 5,400 barrels.

Q And the others?

A No. 11, the NW¼ of Sec. 4, 16,200 barrels. No. 26, NW¼ of Sec. 4, 12,800 barrels. No. 33, NW¼ of Sec. 4, 27,300 barrels.

Q That is the total -- over half a million barrels of oil which you claim to have lost off that lease. Will you state from the proration records here what the allowable is on that lease at the present time?

A No. 8, 51 barrels. No. 11, 43 barrels. No. 26, 56 barrels. No. 33, 34 barrels.

Q That is a total of 184 barrels, or an average of how much per well?

A 184, that is 46 barrels per well.

Q On a 100% acreage basis, what would you get?

A Approximately 46 barrels.

Q The same amount of oil?

A Yes, sir.

Q This 61,700 barrels you calculate you have lost off of this lease, on the 100% acreage basis you would not be compensated

for that?

A On that particular state lease we might not get anything. On other leases we would.

Q How much would it increase the allowable in the Hobbs Pool if the Commission adopted the 100% acreage plan, over what it is at the present time?

A It would increase about 3% over the total field allowable.

Q How many barrels would that be a day?

A About three hundred barrels.

Q So that the Stanolind, under this plan, would get 300 barrels more oil. It would go to the south end leases, would it not?

A Not necessarily. A lot of the leases on the southwest flank have allowables less than the top allowable.

Q You think this 100% acreage plan should have been in effect at the beginning?

A I think at the beginning of the field, some consideration should have been given to pay thickness.

Q If you adopted a 100% pay thickness --

A (Interrupting) I did not say 100%, I said some consideration.

Q But not 100%?

A No -- you mean at the beginning of the field?

Q I am just trying to find out when you think the 100% acreage would be good? Good now, but not previously -- when would the 100% acreage begin to be proper?

A I think at the beginning of the field, I think some consideration should have been given to pay thickness and some consideration to acreage.

Q But not 100% acreage?

A In the beginning of the field, no. I think the 100% acreage is the right thing at the present time, with possibly some modification.

BY MR. BOHART:

Q Is there any other operator that would benefit to that same extent by the adoption of the 100% acreage plan -- benefit to the same extent, -- 300 barrels?

A No, I don't believe so. I don't think any other operator has lost as much oil as we have.

BY MR. FLEETWOOD: I would like to ask the witness a few questions.

BY MR. WOODWARD: I want to let the record show that we object to the Barnsdall Oil Company taking part in this hearing; they have no acreage in this pool, and I would like the record to show that we object to their cross examining this witness.

BY MR. FLEETWOOD: Mr. Chairman, I am planning to ask some questions that apply to the Monument field. This is important to us. The notice of this hearing and the hearing in the Monument field were combined, these two fields, and Mr. Card testified that the Hobbs and the Monument fields were so similar that there was no reason for any difference in the proration plan. I think this is competent.

BY MR. WOODWARD: I understood they were taking them up separately.

BY MR. FLEETWOOD: We did too, but there has been testimony as to both.

BY MR. WOODWARD: There has been no evidence here that would have any bearing on the record in the Monument field.

BY GOVERNOR MILES: Has there been testimony here in regard to the Monument field?

BY MR. SETH: Merely that it was similar to the Hobbs field.

BY MR. FLEETWOOD: He proceeded further and said there was no reason for any difference to exist in any proration plans between the Monument and the Hobbs fields. Under the circumstances, when he has bound us in this way, I think we should be allowed to cross examine the witness.

BY MR. SETH: When the Monument hearing comes on there will be ample time to go into that matter.

BY MR. CUSACK: As I understood Mr. Fleetwood, he did not think there was any difference between the Hobbs and the Monument fields.

BY MR. FLEETWOOD: No, Mr. Card testified to that.

BY GOVERNOR MILES: The Monument case is coming up, so that no reference should be made to the Monument field in the testimony in this case, if he did testify to that -- make statements concerning the two fields, it should be stricken from this

record. Mr. Fleetwood will be overruled at this time, and we will bar any testimony, comparing the two fields, from this record, and bring that up when the Monument field is being considered.

BY MR. FLEETWOOD: Did you rule that would be considered improper at this time?

BY GOVERNOR MILES: Yes.

BY MR. FLEETWOOD: Will you direct that Mr. Card be available for the Monument hearing?

BY GOVERNOR MILES: Yes.

RE-DIRECT EXAMINATION By Mr. Seth:

Q How much oil would the Gulf lose, under straight acreage, as compared to the present plan?

A I can't say for sure. I knew those figures several months ago.

Q You know it would be a considerable amount, would it not?

A It would be a considerable amount.

Q Two hundred barrels a day, probably?

A Somewhere in that neighborhood, I believe.

Q Now, you talked about the element of "pay" thickness. I believe you testified your own engineering committee estimated that Hobbs had produced about half of its total, is that right?

A Several years ago the engineering -- the Hobbs engineering committee estimated the ultimate recovery from the Hobbs field would be 150,000,000 barrels.

Q Of that figure, about half has been produced up to this time?

A There has been between eighty-seven and eighty-eight million barrels produced.

Q In working out an equitable formula for the protection of what is left, would the taking of the original pay thickness into consideration permit a lot of wells again to produce, or produce more than they are already producing?

A It would give them an allowable out of proportion to what the present pay thickness is.

Q The original pay thickness, as half of the field production, would give a decided advantage over what is left in the field?

Q That is true.

Q Some of the gentlemen that have examined you have assumed, or tried to assume that Stanolind pressures were two pounds, or seventeen pounds -- something of that kind -- less than the Gulf's. Have not many surveys showed that Stanolind's, in the wells right along that township line, to be higher than the Gulf's?

A Higher than the wells immediately north, static, shut-in pressure.

Q That is, on these pressures, static, shut-in pressure?

A The earlier actual pressure.

Q Some of the surveys show the actual pressure in Stanolind wells higher than those immediately north?

A Yes, sir.

Q They vary back and forth?

A Yes, sir.

Q I believe you testified the pressures perhaps are not accurate?

A I would say fifteen pounds -- probably now ten pounds.

Q Better now than at first?

A Yes.

Q At first they were notoriously inaccurate?

A About ten pounds, potentials, in reservoir pressure.

Q In early surveys, the possible error was greater?

A Yes, sir.

Q Now, what do you call the pressure when a well is flowing?

A Flowing pressure? Yes.

Q What is that pressure when a well is flowing, higher or lower than shut-in?

A Lower than shut-in.

Q At the bottom of the hole?

A Yes, sir.

Q It has to be lower or there could not be production unless it was lower?

A The pressure in the bore hole has to be lower than the surrounding formation.

Q The drop is considered between the shut-in pressure and the flowing pressure?

A Not necessarily. In some wells it is considered. Depends on the rate of flow.

Q How much lower would you say, roughly?

A That would be hard to say. You would have to know the well, you would have to know the conditions.

Q Vary fifteen pounds, up or down?

A Depending on the rate of flow, yes, sir.

Q Are the wells usually flowing the greater part of the time?

A Yes, sir.

Q The shut-in pressure is a built-up pressure, with the well not producing from 24 to 36 hours, isn't it?

A Yes, sir.

Q And that does not represent conditions while the wells are operating at all?

A Not adjacent to the well, or the boundary line between the wells.

Q Does shut-in or flowing pressure indicate conditions at the boundary lines?

A No, sir.

Q Merely indicates the condition immediately adjacent to the bore hole of the well?

A That is true.

Q Any drainage -- to determine whether drainage exists, you would have to know the conditions at the boundary line of the unit?

A Yes, sir.

Q Now, these gas packers, state whether or not they are usually set after the oil is almost entirely gone in that particular "pay" that is packed off?

A As a general thing, I would say the oil is pretty nearly depleted.

Q So much gas that in certain ones, the well would not produce the allowable in twenty-four hours?

A Not all cases. There have been cases like that.

Q In the case of the water packers, the oil is there with the water and could be produced?

A Yes, sir.

Q You spoke of an engineering report recommending the setting of water packers. Have you that available?

A Yes, sir.

Q Will you please state what it is, and read it into the record?

A This is the Hobbs Pool General Report, on page 57. The sentence is as follows: "The production of water reduces reservoir pressure the same as oil or gas production. For this reason, the Engineering Committee recommends the setting of packers as a means of maintaining reservoir pressures." This is the recommendation of the Engineering Committee.

Q This is the official report of the Hobbs Engineering Committee?

A Yes, sir.

Q Would you give the date of it?

A It was published in 1933.

Q And is there anything further in there when wells go on pump, in that same report, immediately following, isn't there something about that?

A No, sir.

CROSS EXAMINATION By Mr. Woodward:

Q The effect of setting packers, in the south end, reduces the total flow of fluid from the wells?

A Yes, sir.

Q You said a while ago that the difference in the bottom hole pressure when shut-in and flowing depends on rate of flow, permeability, and other factors? Is that correct?

A Yes, sir.

Q Does the pressure drop faster in these southern wells or in the northern wells?

A It would in particular wells.

Q When it drops, as a usual thing, there is drainage from the high pressure areas to the low pressure areas, isn't that the usual rule?

A The pressure is lower during flowing stages at the boundary line between units.

Q Where a well is producing great quantities of fluid, as those wells in the north, and in the south they are not producing so much fluid, the pressure would drop to the north because of the

fact that the tendency would be a movement from the south to the north on account of the greater production of fluid there during the times the wells were flowing?

A We would have to know the flowing pressure of the wells to say whether that is true or not.

Q The greater the fluid production, the greater the drop in pressure?

A That is only true in individual wells.

Q There would be drainage to that well that had the low pressure?

A If they have a variation in pressure.

Q The greater pressure drop, the greater drainage possibility if the well pressures varied?

A Yes, sir.

Q In respect to setting gas packers, the accumulation of gas is due to the production of oil, isn't it?

A Yes, sir.

Q The setting of a water packer is due to the fact that the oil is pushed out and water comes in?

A Yes, sir.

Q That oil has been pushed on to some other place, and produced in some other well?

A In large percentage, yes.

Q The setting of a gas packer is to preserve and keep the oil there so that it may be produced in that well; the setting of a water packer is for the production of a well where water has pushed out the majority of the oil?

A The setting of a gas packer, as a general thing, there is very little oil above the packer -- very little oil left in the gas horizon. Usually quite a little oil can be produced from the well producing water where it is packed off.

Q With respect to this point, a great deal of time has been consumed asking you questions in regard to closed-in pressure. Mr. Bohart questioned you at length about the difference in pressures between the bottom of the hole and the top of the hole. Has that got anything to do with the production of oil in the field?

A Naturally, you have to have --

Q (Interrupting) Has it got anything to do with proration?

A No.

Q Have any bearing on the operation pressure, and the flow of the fluid through the sands? Some people believe one thing, and some believe something else, is that true?

A Yes sir.

Q Would you prefer theory to fact, where they have no fact?

A I would prefer fact.

Q Is it a fact that you know the water encroachment is from the southeast and towards the center of the field in a northeasterly direction?

A That is a fact.

Q Would that water, as a fact, push the oil ahead of it?

A Yes, sir.

Q Do you know of any way to keep the water flow from pushing the oil away?

A I don't know of any.

Q You know the water did push the oil up structure?

A Yes, sir.

BY COL. ATWOOD:

Q Will you state that this intrusion of water has pushed the oil to the northeast? Do you mean to say all the oil has been pushed out by the water?

A No.

Q As a matter of fact, the production of water --

A (Interrupting) It has been produced in the upper zones. We did not make any claim we had lost all of the oil.

Q As a matter of fact, you have no way of computing how much oil has been pushed away?

A Yes, you can calculate.

Q How can you if the oil has been pushed awa y by water encroachment, how can you tell how much?

A It is set out in the report I read yesterday.

Q Can you compute how much has been produced?

A You know the production, yes.

Q You don't know how much has been pushed away?

A You can make a very --

Q That is theory, not fact?

A You know the water has gone up over the field.

Q Did it go to take the place of oil removed at the surface, or did it go to take the place of oil that went some place else?

A Both, but mostly that had been taken out.

Q How much?

A It is easily calculated.

Q You know how much has been taken out?

A Yes, sir.

Q But you do not know with the same degree of certainty how much has been pushed away, if any has?

A You have got a pretty good idea.

CROSS EXAMINATION By Mr. Rae:

Q You made a statement that the setting of water packers was detrimental to the interests of the operator. Is that correct?

A I said that the operators on the southwest flank feel they have lost oil by setting packers.

Q I thought you made the statement, in answer to Mr. Seth's question, that the setting of a water packer was detrimental and not beneficial.

A I said the operators on the southwest flank feel they have lost oil.

Q I would like to ask you three questions: One is, would you, as an operator, desire to produce ten barrels of water for one of oil?

A If we could get more ultimate recovery.

Q Then what potential is assigned to that well,- what adjusted potential? Is that based on the production of the lower zone you are producing from, or based on the production of the upper and lower together, and the upper has been flooded out by water - is it based on the productivity of that particular pay, the production pay, or is it based on the productivity of the upper pay, now flooded out, plus the lower pay?

A Like all potentials in the field, it is based on the well's

after acidation. It is true, you have packed off part of the pay. The operators in the north end there have probably found lots of water, it makes no difference whether it is north or south.

Q If your potential is based on the upper and lower "pays", your allowable must be; the present rules really allow you to produce both zones from that one particular zone?

A The engineers recommended that when water first appeared, to conserve energy.

Q The engineers were very generous to those operators and gave them allowables based on present fluid production, didn't they?

A The operators at the north end of the field, based on fluid production, their potentials are going up and ours are going down.

Q Do you think you could get a larger potential on those water packers than with fluid?

A The pressure would be higher.

Q Do you think it a reasonable statement to make that the water packer wells have not been given a lot of real consideration in allocation of oil?

A Due to the proration formula, they have had higher allowables than they have at the present time.

Q Most all wells took new potentials as water packers were set after acid treatment, didn't they?

A They would have had higher pressure and they would have had potentials increased by bottom hole pressure adjustments.

Q You say the water packers would have had higher --

A That is high pressure area.

Q A well making 95% water today, that was making clean oil a few years ago --

A (Interrupting) I am talking about adjusted potentials, not actual potentials. Probably not a well in the field is producing its potential.

BY MR. WOODWARD:

Q You read a reference from a report in the record. I believe I understood you to say you had operated in accordance with those recommendations?

A I believe we have.

Q You do believe in the maintenance of reservoir pressure where possible?

A I believe it is a good thing for the reservoir.

Q I infer from that, the engineers did not have in mind maintaining the pressure in any particular part of the reservoir, but the reservoir generally. Isn't that your understanding?

A That is it.

BY DR. KNAPPEN:

Q Referring, Mr. Card, to the water encroachment map, your Exhibit E, it is a fact that water has encroached across the area in which the red squares have been mapped showing the location of packers in wells, is it not?

A Yes.

Q Suppose it were physically possible to build a concrete wall along the township line, extending clear down from the surface, to say, 614 feet below sea level, so that all of Twp. 19 South would be completely shut off from Twp. 18, from the north, and the Hobbs Pool operated as two entirely separate pools; would water have encroached to within 313 feet of the concrete wall at any time during the productive life of that pool?

A You mean, half of the distance from the wells to the line?

A That is right.

A I think there are wells 330 feet from it.

Q Would water have encroached to those wells, assuming this concrete wall could be built?

A Water would eventually get to those wells.

Q We thoroughly agree on that. Mr. Woodward asked you a series of questions which he stated as facts. It is a fact that there was water in every one of the wells where packers were set?

A Yes, sir.

Q It is a fact that a large volume of oil has been withdrawn south of this concrete wall I am talking about?

A Yes.

Q It is also a fact, if that wall had been there, water would have encroached in the wells nearest to that wall?

A It would have taken a much longer time.

Q Water would have come in to replace the oil, wouldn't it?

A It would have taken a very much longer period of time.

Q Is that fact or theory, the longer time required?

A I thoroughly believe it, whatever you call it.

Q You know that where there is water in the wells, you know the water came in to replace the oil, but you don't know whether the water pushed any oil across the township line?

A Any way you want to calculate shows a loss of oil.

Q The facts are that the water would have encroached in those same wells, merely replacing the oil, if there had been no possibility of pushing the oil out?

A The higher withdrawals up in the center of the field, it is very reasonable to assume it pushed the oil out.

Q It is an assumption that the water pushed the oil across the township line -- you have made a statement based on assumption?

A You could make two or three different types of assumptions to show losses, varying degrees of losses.

Q I can set up a theory that no oil has moved across the well's boundary -- I don't believe that is correct. What I am getting at is the difference between facts and theory. The fact is that water has come in to replace the oil, and it is theory that the oil has been pushed ahead of the water --

BY MR. SETH: (Interrupting) I insist that Dr. Knappen be sworn if he is going to testify.

A How fast this water moved from -- during the years 1931, 1932 and 1933,-- how fast that water moved in those years, the production of oil could not possibly account for it.

Q Is that fact or theory?

A The production of oil south of the township line could not account for it.

Q You told the Commission you did not know the porosity -- you did not know what the porosity was, and therefore did not know how much oil there was. Perhaps it was limited and water simply replaced the oil as it came across.

A Based on calculations --

Q You assume average conditions throughout the field, and you have divided the 175,000,000 barrels by acre feet, and you found 110 barrels production per acre foot. You assume one acre foot has as much oil under it in Twp. 18 as in Twp. 19. That is theory.

A That is a pretty wide area, that water encroachment. It should average out as well as the rest of the field.

Q The average of the field, whether the flank or the top?

A No, I say that area covered.

Q Is the average porosity the same on top as on the flank?

A Nobody knows.

Q Has that always been the theory of the Stanolind and the Midwest?

BY MR. WOODWARD: If you had the concrete wall, you know the oil would not move up structure.

BY MR. GRAY:

Q You mentioned some gas packer wells had been unable to make their allowable prior to the time the packers were set?

A That is often the case. They are making so much gas they did not make their allowable.

Q Was that the case in any well in the Hobbs Pool?

A Right offhand I could not say definitely.

Q You do not know that some wells did not make their allowable?

A Not definitely. I would have to refer to the records. That is very often the case in any field, and probably true of some of the wells in the Hobbs field.

Q I don't want to prolong this cross examination, but I wish you would refresh your memory on that point. Stanolind State No. 11, in the SW¼ of Sec. 5, in 1932 didn't you start to plug back that well to shut off water?

A I could not say definitely. I have heard there is one well they started to plug back.

Q Did they finally plug it back to the point where the well would produce no oil or water?

A I do not know.

Witness dismissed.

ROBERT W. TESCH,

being called as a witness on behalf of the plaintiff, and being first duly sworn to tell the truth, the whole truth and nothing but the truth, was examined by Mr. Seth, and testified as follows:

DIRECT EXAMINATION

Q Please state your name.

A Robert W. Tesch.

Q What is your profession?

A Petroleum engineer.

Q By whom are you employed?

A The Stanolind Oil & Gas Company.

Q Please state your qualifications.

A I received the degree of Petroleum Engineer from the Colorado School of Mines in 1933. Shortly after graduation I was employed by the Stanolind Oil & Gas Company in the Permian Basin, where I have worked for two years. Since that time I have an office in Fort Worth, where I do sub-surface work.

Q You are about to conduct an experiment here. Will you state, in a general way, what you intend to do.

A I have two purposes: I wish to show with this experiment -- I have kept the experiment as simple as possible to save time and so that it can be readily understood. The first thing I want to show with the experiment is to show you can have two wells of the same "pay" thickness, and yet may have a variance in rated potential, and yet still have the same amount of oil in place. In other words, under certain conditions, potential is not any indication of oil in place.

Second, I wish to show that where you have two wells, one in a formation of high permeability and one well in a formation of low permeability, it is necessary for you to have a greater variation in flowing pressure in order for that well to have an opportunity to recover its oil. In other words, if you don't have that, that well will never recover its oil in place.

I have two tubes here (Here the witness sets up a frame holding two test tubes of glass filled with sand). We will

say this is an oil well, and this is an oil well (indicating the two tubes) of relative porosity. That well happens to be drilled into a part of the formation that is very permeable. As a result, it has high potential. This well (indicating the other tube) is drilled into a part of the formation relatively impermeable as compared to the other, yet these two wells -- the two tubes -- hold the same amount of fluid. Both oil wells have the same amount of oil in place, but one well produces a greater amount in the same time. I am going to fill the tubes to show they hold the same amount. (Here the witness produces two other glass tubes, apparently of the same size, both filled with water. By the use of rubber tubes he attaches a water filled tube to each of the tubes filled with sand).

Q Is there a difference in the sand in the two tubes?

A Yes, there has to be a difference in the diameter of the sand grains to have a difference in permeability. You have fine grains of sand in this tube (indicating one tube) and large in this tube (indicating other tube).

BY MR. HUBBARD: You mean, one is tight and one is loose?

A Relatively speaking, that is correct.

BY MR. HUBBARD: When you say they have the same porosity, you mean one holds the same amount of oil in place, or water, as the other?

BY GOVERNOR MILES: Let me see if I understand. The two tubes are the same porosity?

A Yes, sir.

BY GOVERNOR MILES: But one is more permeable?

BY MR. SETH: Bigger grains of sand.

BY GOVERNOR MILES: And you claim both hold the same amount of fluid?

A Yes, sir. I am going to show that water runs through this tube (indicating one tube) much faster than through this one (indicating the other tube).

BY MR. SETH: Proceed.

A In the one case where the sand grains are larger, the openings between the sand grains are necessarily larger. In the other, the sand grains are finer and the openings smaller but many more of them, and the void places between the grains total up the

same.

GOVERNOR MILES: Where the sand is finer, the grains are set closer together?

BY MR. SETH: Smaller openings, but more of them?

A Yes. That is a common source of misunderstanding, even among engineers -- that is the primary reason for this demonstration.

BY GOVERNOR MILES: Does it take more pressure in the one that has the finer sand to make the oil go through?

A Yes, sir. I am going to give both the same pressure, and as a result, this well will not flow as fast. You have to have a greater differential in pressure in order to get the oil. If you don't --

BY MR. HUBBARD: (Interrupting) What would determine the amount of oil in the tight one?

A Have a bigger potential. This is my source water (indicating the water filled tubes). It has 224 cubic centimeters of water. I am going to put the water into this tube first (indicating one sand filled tube). In a minute you can see the change as it comes up, and it will take a few minutes for it to fill. The water is going down here (indicating a water filled tube) as it fills. When it gets up to the top I will shut it off to show how much water has been displaced.

BY MR. HUBBARD: Is that the permeable one?

A That is the less permeable one. At the conclusion of the experiment I will take some of the sand out of each tube so that the difference in the grain size can be seen.

BY MR. HUBBARD: The area is the same?

A Yes. This one is now full. The reading is 176 (reading on water filled tube).

BY MR. SETH:

Q How many cubic centimeters does that make in the tube?

A 48. Now, we will fill this one (indicating the other sand filled tube). You will notice this is filling up much faster. (Tube is now filled). This tube here holds slightly less, about 46 cubic centimeters. They both hold practically the same. Both of these tubes are now full. I want to connect the two reservoirs

and let the water run out and show you the relative production of both tubes. I am going to displace this area so that it will be even. I will fill this to the top. (Fills tube with water). I am going to run the water through into these tubes here, and will put in a little dye so that you can see (puts red dye in one tube and gree in other tube which will receive the water drained from the sand tubes). Now this tube here is low permeability, and this tube here is high permeability. I am going to remove the stoppers and let the water run (does so). Notice the production out of this tube -- they both started at the same mark.

BY MR. SETH:

Q Same pressure?

A The same pressure.

BY GOVERNOR MILES: In that calculation, the size of the grains of sand is taken for granted in each one?

A You would have to determine the effective diameter of the sand. You do that by screening.

May I call your attention to the fact that this one (indicating) is allowing the water to drip through almost twice as fast as this one, but these both hold the same amount of water.

BY MR. ANDREAS: Is that the same procedure in both lime and sand?

A More true of lime than sand.

See, this tube here has produced about 21 cc. of water, while this tube has produced less than 10 c.c. This tube (indicating the first one) is twice as permeable.

BY MR. SETH:

Q While this experiment is going on, I would like to ask Mr. Tesch some questions. Is there any book or published authority on this matter of potential, what elements go to make up potential?

A Yes, probably one of the latest and best books that has been written is by Mr. Muscat, "Flow of Homogeneous Fluids Through Porous Mediums".

Q Is that Mr. Muscat sitting over there (indicating a man in the room)?

A They tell me that is who it is.

Q Have you that book?

A Yes, sir. Let me get it.

Q Would you read from Mr. Muscat's book and explain on the diagram that you have?

A On page 153 of his book, he has included a formula which shows the total fluid from sand to the well. I have taken that formula out of his book (indicating a chart which the witness has produced). (Marked Stanolind Exhibit F).

Q Is this Exhibit taken out of Muscat's book?

A Yes, sir, it is taken out almost exactly the same.

While we are doing this, this permeable tube has already recovered its oil in place (indicating tubes on the table).

Q Does this beaker hold the 50 c.c. originally put in?

A Yes, which is all this tube held.

(Turning attention to Stanolind Exhibit F): "Q" represents the well bore per unit of time; "K", which is permeability; "H" which is sand thickness; "P-1", pressure at edge of well; "P-2" the pressure of the well at flowing -- "P-2" has to be lower than "P-1" in order for the well to flow. Below the line we have "V", which represents viscosity of fluid; "R-1" represents drainage areas; "R-2" represents the radius of the well bore. In that formula -- it will be noticed that there is no schedule in that formula that has anything to do with oil in place. It is measured by the rate it will flow through that formation.

I have stated in the beginning, we have to assume that where you have two wells of equal thickness -- two wells of equal drainage radius, the tension at the well bore in that well is dependent upon the permeability of that section.

Getting back to the experiment again, everything is constant here except permeability. Both tubes held the same amount of water, yet one you get twice as fast as the other.

Q What does that mean in respect to potentials?

A Well, it simply means this to me: The potential is no measure of oil in place.

Q In other words, this more permeable tube produces its oil in

place more than twice as rapidly as the other?

A Yes, sir.

Q So that rate of flow represents potential?

A That is right.

Q This well, by having higher potential, would have gotten rid of its oil in less than half the time the other one would have?

A That is correct.

Q If it continued to produce oil, this well would have to get its oil from some other place?

A That is the only way it could.

Q It takes more pressure to get oil out of the less permeable well?

A It takes more pressure to get it out at the same rate.

Q If you produce the oil in the same elapsed time, it would take --

A Twice as much differential in pressure.

Q For this well to produce its oil in the same time, it would require a pressure drop of twice what this well of low permeability requires?

A Approximately.

Q Do you have anything further from Mr. Muscat's book?

A No, I think that is enough.

Q You can see this has gone down almost twice as fast (referring to the experiment).

A This tube of low permeability is still laboring along -- it takes a while longer.

BY GOVERNOR MILES: This diagram you speak of, has that been considered at all in the production in this field?

A No. In other words, it has always been taken in the past that potential is the measure of oil in place, which, to my way of thinking, under the conditions you have in the Hobbs Pool, is entirely wrong. If you will notice, this formula (Exhibit F) is taken from this book (Hands the Governor the book the witness has been using).

This tube has already recovered twice the amount of oil in place. This tube has only recovered slightly less than 80%. I would like to add this for the record: In a field like Hobbs, where you have such variances in permeability, that

that what I have shown here is more true than ever - even more reason why you should not use potential as a measure of oil in place.

BY MR. SANDERSON: Why don't you use two lime cores, rather than sand?

A I used this for the purpose of illustration. This is an experiment to show what can happen. We couldn't get cores from limestone.

BY MR. CHRISTIE:

Q If these two tubes were connected, as if one one reservoir, would you get oil from the lower permeability tube into the higher?

A You mean if they were connected up as one tube from the same reservoir?

Q Perhaps down the center of the tube somewhere, and had higher pressure in the higher permeability tube, would oil flow from the lower one into the higher one?

A I still don't get what you mean.

Q I think I can put it this way -- that would not be true if the pressure was higher in the higher permeability tube -- we have areas of low pressure and high pressure --

A I get what you mean -- rather that would drain that one?

Q Yes.

A It is possible, very.

Q Drain from the lower into the higher if the pressure was higher?

A You would probably, in general, you would have had the time element -- your potential is only taken over a two hour period.

BY DR. KNAPPEN:

Q I notice the level in the two graduates, or tubes, is very different at the present time.

A That is right.

Q The level is lower in this one because of excessive production.

A In a reservoir that would be the same, it would have greater differential, and --

Q (Interrupting) Let me continue. The fluid is lower in the graduate connected to the high permeability tube, is it not?

A That is right.

Q And the fluid level is lower because of the greater production

through that tube?

A That is right.

Q The lower the fluid level, the higher the pressure on top of the high permeability tube than on top of the low one?

A That is correct.

Q If bottom hole pressure were introduced to pinch back the flow, you would get production on the two at the same time, if you pinch that back?

A The chances are it would be approximately the same in the reservoir.

Q The reason we want bottom hole pressure factor is to correct certain inaccuracies. Is that not what Mr. Wood has said, that potential is a good first measure of oil in place, but that potentials need to be rapidly corrected by bottom hole pressure. He has stated that if a well is allowed to produce at too excessive a rate, it drains the oil from adjoining lands --

BY MR. SETH: Is the Doctor testifying again?

BY DR. KNAPPEN: - - - - - then there would be no drainage. Is not that what Mr. Wood, Chief Engineer for the Standard Oil Company of Indiana, has written?

A I don't know.

This well has now recovered all of the water back -- 48 c.c. back; but in the meantime this tube has produced 136 c.c. In other words, this tube has produced twice as much. Obviously this water, or oil, has come from some place else, as it only had this much.

BY MR. SETH:

Q If you had bottom hole pressure on the two even, what would happen? The same thing?

A Approximately. As a matter of fact, if you keep the same pressure on this tube, you would have had greater production.

BY MR. SETH: That is all.

CROSS EXAMINATION By Dr. Knappen:

Q It is true the more permeable tube produced about two and a half times as much?

A Yes.

Q If bottom hole adjustments had been made on the potentials rapidly during the process of the experiment, so as to keep the bottom hole pressure equal, make adjustments to do that, the effect would have been to get just the amount of water in place in each tube at the same time.

A No, it could not, at the same time.

Q You made no bottom hole pressure adjustments. If you made them frequently enough, it would have been possible to produce the same amount of water from each tube.

A You mean by pinching back, that will be the result?

Q Yes.

A How would that change the head?

Q So that the pressure remained the same in the two tubes, then you would have kept exactly the same pressure.

A I don't see how that would happen at all in a reservoir.

Q If you had adjusted the fluid flow so as to keep the levels in the tube on top the same, you would have had identical production.

BY MR. LIVINGSTON: If the Commission may suggest, will the gentleman put his examination in the form of questions for answers, because this form would tend to confusion, making statements in the nature of testimony.

BY DR. KNAPPEN: I am sorry. I understood on cross examination that type of question was permissible.

BY MR. LIVINGSTON: If you put it in the form of an interrogation, something that the witness can answer.

Q Would it be possible to make fluid adjustments at the rate of flow from the high permeability sand so that the water level in the two graduates would have been kept the same?

A Yes, if you had increased the head on the other, and decreased it in this one, it probably would.

Q Would it have been possible to change the flow through the more permeable one to keep exactly the same head in the two graduates?

A It would.

Q Is not that exactly analogous to the bottom hole pressure -- to pinch back the production in the one which is producing at such a rate so that bottom hole pressure drops below the field average?

A No, sir.

Q Why?

A If you get a well of low permeability, you have got to have a differential in pressure.

Q Are you speaking of differential in flow pressure or static?

A Flow pressure.

Q Bottom hole pressure is made at static?

A Yes, that is why it is higher.

Q They are made at static?

A They have been in the Hobbs field, yes.

Q Is it your theory that a well producing at an excessive rate will produce a low pressure area around the well, so that the low pressure area will be compensated for by bottom hole pressure?

A On the other hand --

Q (Interrupting) Is that the theory of bottom hole pressure adjustments?

A I don't think so.

Q Will you explain to the Commission what it is?

A I am familiar with the scheme down in the Yates field. That bottom hole pressure adjustment there was to keep oil potential, as the bottom hole pressure of the well declined. It does not mean anything, but that is one of the purposes it has been used for.

Q What is the theory of bottom hole pressure in the Hobbs field?

A You have got me -- I could not tell. Many don't think there is one.

Q If you are familiar with the background and reasons for introducing it, you could not say what that theory is?

A I don't know what the reason was. I know it has not worked out at all.

Q I thoroughly agree with that. The bottom hole pressure has not been sufficiently severe.

A The whole theory is wrong.

BY MR. WOODWARD:

Q If you kept the level in the top of the graduates level, and gave the low permeability well an opportunity to produce its

oil relatively in the same time as the other one, that would have been straight acreage, wouldn't it?

A I don't follow.

Q That would have been tantamount to straight acreage, equalization to get the same production?

A That is true.

BY MR. LIVINGSTON:

Q And would you have had the bottom hole pressure maintained the same?

A No.

Q Perhaps I should have said the differential pressure the same.

A Those are entirely distinct characteristics.

Q The bottom pressure in the reservoir would have been the same if you had equalized the potentials from the two sands?

A Yes, sir.

BY DR. MUSCAT:

Q Do you consider this field gas drive or largely water?

A Largely water.

Q That in spite of the large amount of gas there?

A You have produced the field slightly too fast.

Q At least, the water drive is not sufficient to maintain the pressure?

A It is not now. The rate is greatly reduced the last few years.

Q The pressure is still declining?

A Slightly.

Q So at least the water drive is not completely effective?

A Not 100%.

Q Isn't that true that the pressure in a field declines as oil is recovered?

A Not necessarily.

Q How many exceptions are there?

A I know in the Yates field there is no appreciable change in the pressure.

Q Do you know of any others? What about the Hendricks?

A The Hendricks was produced under the rule of capture.

Q The East Texas field?

A It was produced too fast.

Q In such a field where the pressure declined, would not a field be considered to be completely exhausted when the pressure falls practically to zero, or of very little value?

A You mean water drive?

Q Those having sufficient gas drive do decline.

A And have no water drive?

Q Those which are not completely water drive, because, if you cannot say, when such fields where the pressures do decline, when they decline to the approximation of zero, are they then not considered to be completely exhausted?

A Not unless the reservoir were exhausted -- that would be true in a field like Hobbs.

Q When the pressures have declined slightly?

A Slightly.

Q When the pressures have declined to low value, you will consider the oil has been recovered --

A No, sir.

Q The recoverable oil has not been recovered?

A I say it will not decline to zero. If it was you would be --

Q (Interrupting) At any stage does not the average value of the reservoir pressure give a measure of the oil content?

A The oil and gas content, yes.

Q Why does the pressure decline?

A The water is not keeping up quite as fast as the oil is recovered and the gas comes out of solution.

Q That gas comes out of solution only by virtue of pressure decline?

A That is right.

Q The more free gas space present in the reservoir, the more oil has been recovered?

A You mean the free gas formed after the reservoir begins production?

Q Yes.

A Surely, provided the pressure has not been declined too fast.

Q What else could that be due to?

A It may come out of oil still in the reservoir.

Q All free gas space was formerly occupied by oil. When you have

great free ---

BY MR. LIVINGSTON: It seems to me Mr. Muscat makes statements, whereas an examination should be questions, rather than statements.

BY JUDGE LOWE: It seems to me they are progressing pretty well.

BY MR. WORDEN: Let him ask questions.

Q Is it not true that decline in reservoir pressure is the measure of the oil that has been recovered?

A To some extent, yes.

Q In those regions of a field where the pressure has declined, is that not an indication that greater amounts, or maximum amounts or greater relative amounts of oil has been recovered?

A What do you mean, what regions?

Q Those regions that have lost pressure?

A No, sir.

Q If all pressures were uniform at one time, and still one has dropped --

A (Interrupting) What pressure?

Q The reservoir pressure.

A How do you know what it is?

Q I am not talking about that -- assume, for the moment, you do know what the reservoir pressure is, then those regions which have declined by the maximum amount have recovered the greater proportion of the recoverable oil.

A I don't get what you mean. State it again.

Q Well, sir --

A Ask a direct question. You make it so long.

Q Is it not true that those parts of the field which have declined the most in reservoir pressure have been depleted of most of the original recoverable oil?

A If you knew what it was.

Q I am not talking about the reservoir pressure -- I am not referring right now to reservoir pressure --

A If you knew it.

Q It is true that -- isn't it true that the bottom hole pressures, as they have been measured, are lowest in the southeastern end of the field?

A As they have been measured, yes.

Q Isn't it also true, on average potentials, they have been lower than elsewhere?

A Yes, it is more impermeable.

Q They have recovered less oil than in the rest of the field?

A Yes, they have had lower potentials than the rest.

Q In spite of that, isn't it true that pressures have declined more than the rest of the field?

A I don't know.

Q Isn't it true that the measured static, bottom hole pressures have declined more than the rest of the field, in spite of the fact that withdrawals -- recovery has been lower?

A Yes.

Q If those measured bottom hole pressures do represent reservoir pressure, would that not be an indication that that region has had less recoverable oil in place?

A No, sir.

Q Why not?

A Because you can't measure, in a limestone like the Hobbs field, you can't measure reservoir pressure by bottom hole pressure --

Q (Interrupting) I said if the static, bottom hole pressure were to represent reservoir pressure, would it not be true that originally they had less?

A I said in the beginning you had to have greater differential pressure in these low permeability wells in order for them to recover the oil.

Q If you did know the actual reservoir pressure, and if that should have turned out to be lower in the southeastern end of the pool, in spite of the fact that withdrawals or recovery had been lower, would that not be an indication that originally they had less oil in place?

A No.

Q Why not?

A Because it is going to take them longer to get it out.

Q Wouldn't you say that reservoir pressure, if you knew exactly what it is, would (could no' hear rest of question).

A If you had free gas formed, yes.

Q Didn't you have free gas formed?

A Not down there.

Q What is taking the place of the oil coming out?

A Down there?

Q Yes, in the southeastern end of the field?

A It has probably been, to a slight degree, water.

Q You have not drilled out to the edge of the field -- you have dry wells?

A Not every side of it.

Q In those wells that are still dry, that do not contain water, isn't it true in those cases, that gas must have come out of solution?

A To some extent.

Q Is there a vacuum left there?

A I don't think so, no.

Q For every barrel of oil taken out, there must be that much free gas left, if water has not come in?

A I am predicating my theory on the fact that the reservoir pressure away from the wells is much higher than at the well bore. I don't think what you measure at the well bore means much.

Q If you did know the reservoir pressure in the southeastern area, and if you found those to be lower than elsewhere, in spite of the fact that less oil had been recovered, and considering the fact that water had not come in to displace the oil recovered, wouldn't that be evidence of the fact that originally they had less oil in place?

A Go through that again. (Question is read to witness).
I believe that is right.

BY DR. KNAPPEN:

Q Is the formula you have shown on this chart the proper formula for calculating the oil through permeability?

A Through the well bore, yes.

Q You believe the formula is satisfactory?

A For what?

Q Movement of oil. You have introduced it.

A Not entirely so.

Q You have introduced the formula.

A Not entirely so, because you do not know what the pressure is on the drainage area.

Q The formula assumes you know. If you do not know --

A I think your own man said so.

Q You think he is a competent petroleum engineer?

BY GOVERNOR MILES: We will be in recess until eight o'clock this evening.

Pursuant to recess taken, the Commission resumed the hea rings at eight o'clock, P. M., December 7, 1939, with Governor Miles, Mr. Worden and Mr. Andreas attending.

BY MR. SETH: We rest.

L. L. GRAY,

being called as a witness by the Gulf Oil Company, and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Judge Lowe, and testified as follows:

DIRECT EXAMINATION

Q State your name.

A L. L. Gray.

Q Where do you live?

A Tulsa, Oklahoma.

Q Who do you work for?

A The Gulf Oil Corporation.

Q How long have you been working for the Gulf Oil Corporation?

A Since 1928.

Q You are an engineer, are you not, Mr. Gray?

A Yes, sir.

Q I wish you would state your qualifications to the Commission.

A I am a Bachelor of Science --

BY MR. SETH: (Interrupting) We admit he is a qualified engineer.

Q Have you been associated much with the development of oil in the Lea County field?

A Yes.

Q For how long a time?

A Since 1931.

Q Have you been familiar with the proration plans in force since that time?

A I have.

Q Were you a member of the operators committee at the time of the committee's adoption of rules and regulations?

A Yes, sir.

Q Have you prepared a statement showing the history of that?

A Yes, sir.

Q I wish you would read it to the Commission.

A (Reading) The first well in the Hobbs Pool was drilled by Midwest Refining Company on the State lease in the northeast quarter of Section 9, township 19S, Range 38E. The top of the Hobbs lime was encountered at 4065' and at total depth of 4220' the well flowed 700 barrels per day. Subsequent development was first southward where several relatively small potential oil wells and two dry holes were completed. The initial well was completed in December, 1928.

Rapid development of the pool did not begin until after the completion of Humble Bowers No. 1 located in the southeast quarter of Section 30, township 18S, Range 38 E, approximately three miles northwest of the "Midwest" discovery well. This well was completed in January, 1930, and encountered the top of the Hobbs Lime approximately 100' higher than the discovery well. It produced 7,275 barrels of oil per day based on a 23 day average.

Early during the year 1930 it became apparent from the falling crude oil market, the approaching chaotic condition of business generally, the rapid development in the Hobbs pool

and the limited expected pipe line outlet, that proration must soon be applied.

Discussions which lead to the adoption of the Hobbs Proration Plan were begun during May, 1930, about the time the Humble Pipe Line was completed. The Atlantic Pipe Line was under construction and construction of the Shell Pipe Line which was to connect to the Texas Pipe Line was about to be started.

At that time four general types of proration plans had been operative in other states; (1) Deferred drilling plan, (2) The Potential Plan, (3) The Hendricks Pool Plan, and (4) The Yates Pool Plan.

The deferred drilling plan although attacking the problem of over-production at its source had the disadvantage of conflicting with the requirements of lease contracts. The plan usually provided for open production after the wells were completed so that it did not satisfactorily fulfill the requirements for control of the vast amount of over production as threatened the Hobbs Pool. In addition most operators believed that restricted flow would effect greater conservation than open flow from a lesser number of wells. Since the problem was to equitably distribute the available limited market and the conservation of reservoir energy, the deferred drilling plan was not given further consideration.

The potential plan which provided for distribution of the market outlet in proportion to the potential of each well was favored by a number of operators. It was opposed by other operators on the ground that short time potential tests would not reflect the well's relative ability to produce as accurately as open production so that a modifying factor should be introduced. It was also recognized that if the pool became a major producer and the apparent market did not increase there was danger of the smaller wells being prorated below the amount necessary to profitably continue their operations.

The Hendricks Pool Plan (Winkler County, Texas) provided for allocation of allowable to square 40 acre units; the

allowable being distributed 50% equally to the units and 50% in proportion to the total unit potential."

(Comment): This means if there are four wells on a 40-acre tract, it would be the total potential on all four wells.

(Reading): "The total unit potential was the sum of the potentials of all wells on the unit. In the opinion of most operators too much oil was allocated on a per unit or "so called acreage" basis and not enough on the ability to produce. Also, although a number of operators believed that one well per forty acres was adequate for efficient drainage the "total potential" clause resulted in many unnecessary wells being drilled merely to increase the total unit potential.

The Yates Pool Plan provided for allocation to 100 acres units; the allocation being distributed 25% equally to units and 75% in proportion to average unit potential. The average potential was the total potential of all wells on the unit divided by the number of wells on the unit. The average unit potential eliminated the bad feature of the Hendricks plan which tended to over-develop the unit but it did tend toward unequal spacing and density of wells. If the first well on a unit had a very high potential the operator was naturally hesitant about drilling more wells since if they had smaller potentials the unit's allowable would be decreased. If the first wells on a unit were low potential more wells were usually drilled in the hope that a very high potential well might be obtained with a resulting increase in the unit potential. The resultant well density ranged from less than 10 acres to 100 acres per well.

The Hobbs Pool operators then selected the best features of several plans. Agreement was reached on the following provisions:

(1) Allocation on the basis of 25% equally distributed to units (so called acreage) and 75% in proportion to average unit potential.

(2) The unit was fixed at a square 40 acres in accordance with regular subdivisions of sections by government surveys, this being the largest area most operators believed could be

efficiently drained by one well in any portion of the pool.

(3) A policy of drilling only one well per unit, but more than one well was not prohibited since it might conflict with contracts and lease provisions.

(4) A policy of conserving reservoir energy.

(5) The organization of a representative General Operator's Committee an Executive Advisory Committee and an Engineer Advisory committee.

(6) The employment of a Proration Umpire and staff.

(7) Miscellaneous minor operating features.

The initial Hobbs Proration agreement was signed by all operators, approved by the Commissioner of Public Lands and The State Geologist and became effective July 10, 1930.

The plan was extended and revised from time to time but the basic factors remained in force until December 31, 1936.

Initially all potentials were obtained by producing the well open through the casing, only a few of the wells being tubed. It was realized that a better gas-oil ratio could be obtained when producing the normal allowable production by tubing the wells. It was also the opinion of some that opening the wells for potential tests might encourage encroachment of water. For this reason it was decided to tube all wells with 3" tubing and obtain potential tests through 3" tubing. It was a practice at that time to take potential tests for each proration period of 15 days.

After further study it was found that the potentials taken through 3" tubing were not in proportion to the potentials taken through the casing such that the wells having potentials of over 6,000 or 7,000 barrels received a proportionately small potential as compared to open flow. In order to correct this situation tests were made of all wells through tubing alone and also through both tubing and casing. This information was plotted on cross section paper using the production through 3" tubing as the abscissa and the production through both tubing and casing as the ordinate. In general these points fell along

a curve and a line drawn through average points were termed the experience curve and denoted the relationship between tubing and open flows. There were a number of points, however, that did not fall near the curve, but it was generally found that such wells were producing at higher than average gas-oil ratios. After further study it was found that a gas-oil ratio correction factor could be applied to the production through tubing so that the point would fall upon the curve. Both the tubing-casing experience curve and the gas-oil ration correction factor curve were then embodied in the proration agreement. The frequency of taking potentials was at first 15 days, was extended to three months, later to six months and finally extended to an indefinite period.

Water was encountered in six wells at the time of their completion but these were either edge wells or were drilled to a depth below the initial water table which was 600' to 615' below sea level. The first well to which water encroached was Stanolind State No. 11 in the southwest quarter of Section 5. This well began producing water in June, 1931. The water encroached rather rapidly. It did not, however, encroach evenly around the field. The water encroached most rapidly progressively up structure in the areas adjacent to Stanolind State No. 11 in the southwest of Section 5 and apparently followed the lines of lease resistance, which was areas having high permeability and porosity.

A gas cap quickly developed in the higher portions of the structure --

BY GOVERNOR MILES: What do you mean by "gas cap"?

A Gas cap is a term applied to the top area of the structure where gas has accumulated because it is the highest part of the pool. Where pressure is low, gas comes out of solution.

(Reading): "Initially t ere was either no gas cap or it covered a very small area. By August, 1931, it covered an area of approximately 500 acres and was still spreading.

The operators became alarmed by the rapid movement of water and spread of the gas cap and charged the Engineering

Committee with the responsibility of determining a solution for the problem. After several meetings and a concentrated study the Engineering Committee concluded that the only remedy would be unit operation. This conclusion was reached in August, 1931. From that time until early in 1933, the operators held a series of meetings in an attempt to reach an agreement on a basis for unitizing the Hobbs Pool. The Engineering Committee worked up innumerable plans which embodied acreage, potential, structural position, and attempts were made to modify these plans to take care of water encroachment and spread of the gas cap. A general potential survey was made of the pool in May, 1932, in order to have current information on the relative productivity of the basic units and in order to determine the rate of potential decline for these units. On several occasions it appeared that success was imminent in that the operators owning 95% of the properties agreed in principle. It was not possible however, to reach an agreement on certain details of the plans and the negotiations were discontinued in early 1933. The Plan which most nearly reached an agreement was one based on 42-1/3% potential, 42-1/3% structural position (Thickness of producing formation) and 15% acreage.

Immediately following attempts to unitize the pool, one company proposed that the basic factors of the Hobbs Proration Plan be changed, suggesting that since water was encroaching up structure replacing the oil on edge properties a factor should be incorporated into the plan which would be essentially the inverse of structural position or thickness of producing formation. That is, the factor would allow an edge property to produce at a higher rate so that such properties would be more nearly afforded an opportunity to recover their oil in place before the water reached the properties. This company likewise objected to the apparent slightly lower pressures on offset properties than existed under their own properties. Another operator objected to the very low pressures in the southern portion of the pool. A few other operators proposed increasing the acreage factor. After a great deal of discussion, agreement

was finally reached to allow, at the option of the operator, units that were producing water to be prorated on the basis of 60% average unit potential and 40% acreage. Units not producing water continued on the 75% potential and 25% acreage basis. In addition it was agreed to apply a bottom hole pressure correction factor to the potential.

The first bottom hole pressure adjustment plan was termed Plan 1A and was patterned after the plan which had been applied to the Yates Pool. It was to serve a twofold purpose; to adjust the potentials in order to eliminate periodic physical tests which was believed wasteful of reservoir energy and to reduce or eliminate differences in bottom hole pressure thus minimizing the underground movement of oil from one unit to another.

The bottom hole pressure adjustment in the Yates Pool changed the potential of each unit by a fraction: Present bottom hole pressure as the numerator and the previous bottom hole pressure of that unit as the denominator. It was provided the pressure would be obtained by taking regular bottom hole pressure surveys of the pool. The plan did not fit the Hobbs condition because it was generally agreed it was not drastic enough to materially change the pressure differentials in the reservoir. It was proposed that 1000 be subtracted from both numerator and denominator of the fraction in order to make it more effective. That is the fraction 300/400 would be less than the fraction 1300/1400.

One company objected to the plan because the 1000 subtraction was arbitrary and had no basis on experience and that when all bottom hole pressures had dropped to 1000 lbs. all potentials would be eliminated. It was pointed out, however, that from January, 1931, to May, 1932, there was a potential decline of 14% and the application of Plan 1A with the 1000 subtraction to pool average bottom hole pressures would have resulted in a decline of 16% which was within reason. With the understanding that the bottom hole pressure situation would receive the immediate attention of the Engineering Committee and the plan revised later, Plan 1A was accepted and incorporated

into the Proration Plan effective November, 1933.

The Engineering Committee prepared a number of bottom hole pressure adjustment plans and after a thorough study recommended plan 2A. Since the bottom hole pressure adjustment had a twofold purpose, to decline potentials and to minimize bottom hole pressure differentials, the adjustment was made by applying two fractions as follows:

Present adjusted potential = Previous potential x

$$\frac{\text{(Present pool average BHP - 1000)}}{\text{(Previous Pool average BHP - 1000)}} \times$$

$$\frac{\text{(Present Individual Unit B.H.P. - 1000)}}{\text{(Present Pool Average B.H.P. - 1000)}}$$

The first fraction was for the purpose of declining the potential. The second fraction was to effect increases or decreases in allowable depending upon whether the unit was maintaining its pressure higher than or depleting its pressure reserve faster than the pool average.

Plan 2A, bottom hole pressure adjustment was adopted and substituted for Plan 1A in the proration agreement. The plan still utilized the 1000 subtraction factor, but since it apparently was equitable when used with current existing bottom hole pressures in the pool and since no agreement could be reached on some other subtraction factor the operators believed it advisable to adopt the plan immediately in order that necessary and desirable adjustments could be made. Plan 2A is still in force except that in 1935 the subtraction factor was changed from 1000 to 2.3 of the previous pool average bottom hole pressure. In the beginning of the bottom hole pressure adjustment plan, surveys were made very three months in order that necessary adjustments could be made as quickly as possible. Only two bottom hole pressure surveys per year, however, have been made since 1936.

The first proration agreement provided that wells would not be shot except after receiving special permission from the general committee since it was the opinion of the operators that there was already too great a potential production in the

pool. In 1933 acid treatment of lime and dolomite wells became a production practice for the purpose of increasing production. Special permission to treat one small potential well was granted the Atlantic Production Company in March, 1933. The treatment resulted in a potential increase from 2,981 to 6,350 barrels a day and later to 14,580 barrels. The success of this acid treatment changed the views of the operators and treatments were permitted on all wells. It was soon found, however, that large increases could be obtained on large as well as small potential wells. It quickly became a practice to treat wells not once but several times in order to compete with offset operations. The frequent acid treatments resulted in frequent potential tests and the operators frequently exercised their option of taking open flow potential tests rather than through the tubing alone. In addition operators generally made one or two tests before the official test in order to determine the manner in which they could obtain the highest potential. The frequent taking of potentials was believed not in keeping with true conservation and since most of the wells had been treated, in general, the relative potentials remained essentially the same although the actual potential of both large and small wells increased. The operators, therefore, agreed that effective January 1, 1935, the taking of new potentials would not be allowed except on newly completed wells or wells that had been drilled deeper. This agreement was reached in October, 1934, which left a period of three months for all operators to complete their acidizing program.

As mentioned previously gas began to accumulate in the higher portions of the structure soon after the pool was produced and the gas cap spread rather rapidly. Also water was rapidly encroaching in certain areas and some wells were threatened with early abandonment. In the interest of conservation efforts were made to reduce the production of gas and water by various means such as bottom hole chokes, positive chokes and the restriction of production to less than the normal allowable. Some of these effected temporary improvement but was not a

lasting solution to the problem. In November, 1932, the Texas Company set a packer in McKinley No. 2 which shut off the upper producing zone. Although the well had previously produced more than 90% water, after the packer was set water free oil was again obtained. This definitely proved that the pay zones could be separated and offered a possibility of reducing gas-oil ratios. All of the operators favored conservation of reservoir energy but were reluctant to set packers because it would necessarily reduce the potential of the well, also large quantities of oil still remain in the zone it was necessary to pack off and the spread of the gas cap would eventually move this oil off the property. In order to promote voluntary conservation of reservoir energy and to afford the operator an opportunity to more nearly recover the initial oil in place under the property it was agreed that the existing potential at the time the packer was set would remain in effect except that in case there was a general potential survey the potential of packer wells would be declined in accordance with the average of tested wells.

When the bottom hole pressure factor was put in force it was agreed that packer wells potentials should be adjusted in accordance with pool average bottom hole pressure, that is, the packer well potential would be declined by the fraction having as a numerator the present average pool pressure minus 1000 and the previous average pool pressure minus 1000 as the denominator. This provision of the plan is still in effect.

In October, 1934, a special allowable which was greater than the normal allowable was granted to one well. This special allowable was granted because the well had produced for a long period of time at less than its normal allowable rate and because the well was on the edge of the pool two locations away from any other production and, therefore, could probably not drain other producing properties.

In the souther portion of the pool there were six wells on three units which had been drilled prior to the beginning of proration. Since these wells had been drilled prior to the

time it was known there would be 40 acres square units and since there was 80 acres in the lease on which each unit was located it was agreed that these units would be divided along the long axis of the 80 acres instead of into the regular square 40 acre units. These wells were Hepollo Crump Nos. 1 and 2, Walter Terry Nos. 1 and 2 and Stanolind State in Sections 15 Nos. 1 and 13. The change gave these companies one additional unit each and became effective October, 1934.

Shortly after the New Mexico Oil Conservation Commission was created a hearing was held in Santa Fe to consider Hobbs Pool Proration and essentially all features of the prevailing Hobbs Proration Plan were embodied in the Commission's subsequent order. There was still some dissension among the operators with reference to participation factors. Two companies favored an increase in the acreage factor, however, the majority of the operators opposed changing the plan.

A hearing was held in Santa Fe in December, 1936, and after a great deal of evidence had been presented the Oil Conservation Commission requested that all operators again attempt to reach an agreement on a plan. No agreement was reached and upon being so informed the Commission again requested that the operators again attempt to reach an agreement. At that time the 75% potential and 25% acreage plan of allocation had been in effect from the beginning of proration except for bottom hole pressure adjustment and the 60% potential and 40% acreage optional plan for wells producing water. In the opinion of the majorit of the operators the plan in effect was most equitable, but since other methods of allocating production had not been used there was no supporting data to definitely prove their contention and since two companies insisted on a change, agreement was finally reached with the understanding that after it had been applied for a period of time information to support the various contentions would be available. The new plan eliminated the special allowable for water wells and changed the allocation factors to 40% for potential and 60% for acreage."

BY MR. HUBBARD: You didn't read the last three sentences (referring to copy which Mr. Hubbard has). Don't you have "Present information indicates --

A (Interrupting) I think you have an old copy.

BY MR. HUBBARD: Will you pardon me, please if I read that into the record? (Reading) "Present information indicates that certain features of the Proration Plan should be changed. In the beginning packer wells potentials were to be declined in accordance with the average potential decline of all the wells tested in the regular potential survey. No general surveys were made, however. When the bottom hole pressure method of adjusting potentials--" The sentence stops there.

BY JUDGE LOWE:

Q What was the packer adjustments the committee was in favor of?

A At the present time?

Q Yes.

A I believe packer wells should be adjusted in a different manner than they are at the present time. As stated, it was the intention of the operators to decline the potentials of packer wells in accordance with the average potential decline of all wells tested. When bottom hole pressure came along it was decided to use bottom hole pressure in order to decline potentials. The fraction used was the same as that used for the field average, that is, the first half of the fraction used for normal wells. The second half of the fraction was not applied. That feature has caused packer wells to decline more rapidly -- I believe packer wells have declined between thirty, thirty-five or thirty-six, and normal wells between five and ten. Since it was the intent of the operators, in the beginning, to decline packers in accordance with the field average decline in potential, I believe you can, in fact, adjust packer wells, from the time the packer is set, and decline these potentials with the pool average potential decline in that well, giving packers quite a little increase in potential.

BY JUDGE LOWE: Any cross examination?

CROSS EXAMINATION By Mr. Seth:

Q Are you also in favor of wiping out fictitious potential?

A We no longer have potential in the Hobbs Pool.

Q What do you have?

A We have what should be termed a pressure potential factor. Bottom hole pressure had no reference to potential -- it merely attempted to --

Q (Interrupting) Do you recall the first well shown on Exhibit E, introduced by Mr. Card? This was one of your wells which after acidation, its potential increased eight or nine times.

A Not from bottom hole pressure.

Q Bottom hole pressure declined a hundred and fifty or sixty pounds during that period, yet potential increased eight or nine times.

A No, not due to bottom hole pressure.

Q What justification is there for that increase?

A With the view that oil, or recoverable liquids, cannot flow against pressure, a well with high bottom hole pressure cannot drain another area.

Q You think that eight or nine times increase is justified?

A There has been no well in the field increased eight or nine times due to bottom hole pressure.

Q It was due to that and acidation?

A As shown, that well increased from 3,000 barrels to the present of about 32,000. The acidation increased it from 3,000 to 26,000 barrels.

Q And bottom hole pressure declined 150 pounds or more?

A Yes sir.

BY MR. HUBBARD:

Q Do you believe, Mr. Gray, that every operator in the pool should currently or ultimately have the opportunity to recover the oil in place?

A I believe he should ultimately be allowed to recover the oil.

Q Would you say the west edge operator in the Hobbs Pool would ultimately have a shorter life than on top of the pool,- the wells operated there?

A Yes, sir, but due to water drive from the west being stronger than on the top.

Q That being true, would you say the inclusion of potential in

the formula, would give the operator on the edge more or less chance -- opportunity to ultimately recover his oil in place, than the formula in which potential was not included?

A Are you speaking about all of the edge, or just the west edge?

Q Just the west edge now.

A I believe potential will help the operator in obtaining the oil in place ultimately.

Q I don't want to change the trend of thought too much, but there are one or two things I would like to find out. Would you say, in general, a pool which is flooded out by water has a more efficient oil recovery than one produced by the expansion of gas?

A I thin, in general, a water drive pool will recover a somewhat higher percentage than a gas drive pool.

Q Would you say materially or slightly?

A I believe as much as 100% higher in some cases. A ratio of 25 for a gas drive pool as against 50 for a water drive pool.

Q In that case it would appear we would have more efficient production of oil in the structure in Lea County, including Hobbs, if as much of the formation as possible were flooded out by water instead of having an expanding gas cap come down to meet it?

A I believe a field should be so operated to keep the pressure high and to keep as much gas from coming out as possible.

Q In the case of Hobbs, would we get a more efficient recovery if at the time the oil is depleted the original gas cap covered about the same area it did at the start of operations?

A I believe so.

Q It would be reservoir pressure operating a field. In that case if you attempt to keep the gas cap in the same area throughout the operation, and neither decrease nor increase it, it would be impossible to deplete the pool, and production would only dissolve the gas?

A Yes, I believe it would be if the pressure were maintained at original pressure, that would reduce the allowable to so operate it.

Q Assuming we are allowed an allowable that will allow us to produce at a profit?

A Yes.

BY MR. CUSACK: In your opinion, Mr. Gray, with the present formula that has operated in the Hobbs Pool, as to bottom hole pressure -- in your opinion is that a field formula that does do equity to all producers?

A I question whether it is perfect in that way.

Witness dismissed.

DR. R. S. KNAPPEN,

being called as a witness by the Gulf Oil Company, and being first duly sworn to tell the truth, the whole truth and nothing but the truth, was examined by Judge Lowe, and testified as follows:

DIRECT EXAMINATION.

Q State your name.

A R. S. Knappen.

Q By whom are you employed?

A I am employed by the Gulf Oil Corporation.

Q Since when?

A Since 1926.

Q I wish you would go ahead and tell what educational and practical qualifications you have to testify as an expert.

A I have the degree of Bachelor of Science from Southern Wesleyan; Master of Science from the University of Wisconsin --

BY MR. SETH; We admit his qualifications.

BY JUDGE LOWE: I want him to go ahead and state them anyway.

A Doctor of Philosophy from Columbia University; honorary Doctor of Science from Wesleyan University. In the course of that collegiate training I specialized in geology, although I took a good many courses in civil and mining engineering at the University of Wisconsin, some at Columbia. I was employed by the United States Geological Survey during the summers from 1913 to 1916, inclusive;

served overseas as Colonel of Engineers; at the close of the war I served as geologist with the Second Army, A.E.F.; returned to the United States and was employed by the Illinois Geological Survey in the summer time of 1919 and 1920, and then was re-employed by the United States Geological Survey, summer and part time employment during the next years from 1921 to 1926, inclusive. I resigned from the United States Geological Survey in 1926, and entered the employment of the Gulf Oil Corporation, and I have been employed by various Gulf companies since that time.

Q Have you taught in any schools or colleges?

A Yes, I was instructor in geology at the University of Chicago for a year; I taught in the University of Kansas from 1920 to 1925, in various grades from assistant professor to full professor. I taught at Stanford University as visiting professor the summer of 1923. I was visiting professor of geology at Harvard in 1925 and 1926.

Q You were teaching at Harvard when you entered the employment of the Gulf company?

A Yes, sir.

Q Since you have been with the Gulf, what has been the nature of your work?

A I was first a member of the Board of Directors at Pittsburg, paying special attention to engineering phases and geology; in 1928 I transferred to Tulsa, where I am Assistant to the Vice-President, and work on various problems of geology, production and engineering.

Q Have your duties included work in connection with the proration of oil in various pools?

A I have had a good deal to do with proration rules and regulations, and the application of rules and regulations.

Q In the course of your duties have you had occasion to examine production and proration of oil in the State of New Mexico?

A Yes, I have.

Q For how long a period of time?

A I was interested in the purchase of leases -- I was not in

charge of lease purchases, but when we bought the first leases in southeastern New Mexico I sat in on all conferences; when the first leases were purchased I was consulted on design and other features of well drilling in New Mexico, and I have been familiar with the drilling of every well since that time.

BY JUDGE LOWE: I might ask the reporter to mark all the exhibits straight through. (Maps handed to reporter are marked Exhibit O to 12, inclusive.

Q Dr. Knappen, the first map is marked "Gulf Exhibit O", you may state what that purports to represent.

A That is simply a map of the Hobbs field showing productive acreage within the pool, and is simply introduced as a convenient means of showing the location of the pool in Townships 18 and 19 South, Ranges 37 and 38 East. All of the yellow colored acreage is covered by the Proration Plan at the present time. All of the units colored yellow have production restrictions under the Proration Plan - the formula Mr. Gray described. The one pink unit, on the west side, has a special allowable. As I understand, the special allowable was granted when it was first drilled. It appeared unlikely it would produce enough oil to pay costs unless it were given a special allowable. The three units in green were unable to make their allowable, given to them under the Proration Plan, so those units were given permission to operate at full capacity. The other units all come under the provisions of allotting to units 60% allowable for pool distribution equally between the units, and 40% distribution on what is miscalled "potential basis" - actually it is a distribution on potential as adjusted by the bottom hole pressure - the 40% pool allowable is distributed among the yellow units adjusted by the bottom hole pressure.

BY JUDGE LOWE: I desire to introduce that in evidence.

Q Turning next to Exhibit - that is Exhibit -

A (Interrupting) That is Gulf Exhibit No. 1.

Q That map was prepared under your supervision?

A Yes, all of the maps were prepared under my supervision.

Q Go ahead and explain to the Commission what that map purports to

represent.

A This map, like all the other maps we shall present, with one exception -- I am not certain of that exception -- are all on the same scale, four miles to the inch. This shows all of the wells drilled in the Hobbs Pool. This is simply the same map shown previously, but here we colored the acreage of the various operators in distinctive colors. I believe there are twenty-five operators and we ran out of colors -- one or two leases that have no colors. We have colored all of the leases belonging to an operator, where one operator has more than one lease, we have colored all of their leases the same. The Gulf leases are shown in green, scattered through the central and northern portion. The Stanolind are bright blue, concentrated largely in the southeastern part of the pool - this 160 acres in the W½ of Sec. 5. The bulk of their leases are in Twp. 19 S., extending up into 18 S. I can readily point out the properties of any other operator in the pool, and this map is introduced for convenience in locating leases.

Q Is that data as to ownership on record in Lea County?

A It was prepared from the Proration Report of the Conservation Commission.

BY JUDGE LOWE: I desire to introduce that exhibit in evidence.

Q You may explain Exhibit No. 2, that it is intended to represent and the information it is intended to convey.

A Gulf Exhibit No. 2 is the same map -- same scale. In this case we have drawn contour lines on the map as they have been drawn by the Engineering Committee. Contour lines, to an engineer or anyone accustomed to using them, indicate structural conditions. To make it perfectly clear, in this case we have a contour line on top of the white lime, the principal producing formation in the Hobbs Pool. It practically all comes in the white lime - less than one per cent comes in any other. A contour line is a line drawn through equal elevations -- the same distance above or below sea level; as it goes around, that contour is very easily followed. This line can be called the shore line (indicating a line on map). If everything above the pay at

Hobbs were torn away and the white lime exposed, this line (indicating) would be the ocean level, and this line (again indicating) would be 450 feet lower than the ocean level. Stand on the side of the Hobbs Pool, on the contour line of -450 feet, along the contour line which is most easily seen, with the green below and yellow above, and the ocean level lay beyond this line (indicating).

These contour lines are drawn 25 feet apart. Every contour line goes through a line of equal elevation. Where the contour lines are far apart, as they are along the southwest flank, through the center of the field, one must go down slope a considerable distance to reach the next one, which is another way of saying that one goes a long ways to go down 25 feet. Where they are bunched together it means one drops 25 feet in a very short distance -- the spacing of the contour lines in there (indicating an area on the map) is something like seven lines to a quarter of a mile, which means the slope is 175 feet to 1000 feet, about a 9° slope. The highest contour lines on the map are the producing area in Sections 32 and 33, 325 feet below sealevel. A number of wells inside that contour line reached the top of the white lime at that elevation, and has unquestionably identified the contour up slope and down slope. For instance, Cities Service No. 4, in the center of this area (indicating), that lies above the -400 foot contour line, and lies below the -375, so from the map you know it must be more than 375 feet below sea level, and less than 400 feet. This same contour appears between these lines in the same space.

I have taken some time to explain this contour map. This is a map on top of the white lime, shows the structure on top of the pay at Hobbs. From the center of the structure, the crest, to the northwest, the fartherest well would be 243 feet lower than the highest well on the structure, which lies at -312 feet. The drop from the highest well -- from the center of the structure to the southeast the slope is gradual, dropping down to the lowest, No. 1 Selman, which is found at -550, which is 238 feet lower than the highest well in the pool. To the north-

east the slope is much steeper than either to the northwest or southeast, to the center of the pool. The lowest well for which we have any data is the Two States Oil Company No. 1, in Sec. 21, which is -583 feet, or 271 feet lower than the highest well in the pool. It is possible the Samedan have one still lower in Sec. 34, but we have no elevation on the top of that well, but the exact elevation is immaterial.

To make it easier we printed the flanks of the structure in green. The area printed in green is where the thickness of the pay is less than 150 feet. The yellow is where the pay is more than 150 feet thick. The two breaks in the green printing is where no well has been drilled in the section of less than 150 feet. Not having a control, we did not carry the contour lines through that part. Similarly, in the northwest, there are no wells drilled in this part of Sec. 18, (indicating) of Sec. 18, T. 38 E., or these parts of Sections 13, 14, 23 and 34.

No wells in the less than 150 feet area does not mean the structure stops, but nobody has drilled out in that section where the pay has thinned, and we do not have anything to show the contour on production around the northwest end of the pool.

Q What do the colors indicate?

A The colors indicate the area where we know the pay is less than 150 feet thick, if it is green; or more than 150 feet thick if it is yellow.

Q What importance is attached to the position on the structure in the initial development of a field?

A If one knows where the top of the structure is, naturally he wishes to buy leases on top, which has the thickest pay and the longest time before water reaches it, and should have the largest volume of oil under the lease which he purchases. Accordingly every operator hopes his lease will be on top of the structure -- but many are disappointed in those hopes.

BY JUDGE LOWE: We desire to in roduce this exhibit in evidence.

Q Exhibit No. 3 is the next?

A Yes, sir.

Q You may explain that map.

A Exhibit No. 3 is a duplicate of Exhibit No. 2, except we have not colored, on this map, the productive part of the pool. The contour lines are here. On this map are indicated a series of wells extending from near the northwest end of the field down to the southeastern end of the field. The wells have been selected so that we might, in the next exhibit, present a cross section of this field. If some gremendous giant, armed with a great meat cleaver, could sweep away the overlying formation from on top of the white lime on all of the territory southwest of the irregular red line, he would then stand off to the southwest, and looking northeast, see the white lime as it shows on the cross section in the next exhibit. We would like to have taken wells in a straight line, but lack of geologic information on some wells, and lack of other information on other wells, we had to select wells where we had available geologic and engineering data. The section shown on the next exhibit is not a straight section from northwest to southeast, but is a tolerably regular cross section which will, we hope, give a good idea of the character of the structure in the Hobbs Pool, in, of course, that direction. Other sections might have been drawn, but we felt this was all we could do with the geologic and other data available.

BY JUDGE LOWE: We wish to introduce the exhibit in evidence.

Q Now explain Exhibit No. 4.

A Gulf Exhibit No. 4 is, below the structure map shown on the previous exhibit, and here (indicating) it is repeated here but turned out at an angle so as to place the red line directly beneath the cross section.

Q The top of the lime, made with the giant cleaver?

A That is what is left after all above has been torn away on the southwest side -- if one stands on the southwest side of the field looking northeastward, he sees the top of the lime, following this irregular line, rising from the northwestern well -- not the highest well nor the most northwestern in the pool -- it rises from Samedan No. 3 -- rises from there to the top of the

top of the structure, to 5 State A33, then drops off more rapidly to the southeast, to Stanolind No. 6, a dry hole at the southeast end of the pool. All of this section, shown on this exhibit, is supposed to have been filled with oil - the field as it is supposed to exist when the first well was drilled in the field. Certainly the higher portion was filled with oil, unless there was a very small gas cap right on top of the structure. A gas cap is a region in which gas has collected. All petroleum geology and all petroleum engineering is based on a very simple, well known fact, that oil is lighter than water, and gas is lighter than oil. If one would take oil and gas and water and put them in a bottle, or any other container, the gas would accumulate on top, unless it were all dissolved in the oil, and the oil would accumulate on top of the water. Over the period of geologic time in which oil and gas has been accumulating in the Hobbs Pool, the oil has separated from the water and flowed on the water field top on the Hobbs structure. The structure is very much larger than indicated on the map. We have simply indicated the oil production zone on the area. The northwest slope was toward the northeast, and somewhat less sharply to the southwest. The bottom of the oil zone is somewhat indefinite. Naturally no operator wants to drill a well until he encounters water. So far as we know, only one well inside the production area has been drilled down into the water underlying the oil. That well is Stanolind No. 1 State, in the NE¼ of 9, Twp. 18 S., R. 38 E.

Q Indicate that.

Q It is shown at this point (indicating on map). Being the first well in the pool, the operator had no way of --

Q (Interrupting) Twp. 18 or 19?

A 19 -- I am sorry. Since it was the first, there was no way of knowing. The operator was dissatisfied with the oil production at shallower depths, and found water at 618 feet below sea level. The same operator drilled No. 6, right in Sec. 14, same township. That location was supposed to be outside the oil zone. It was drilled in very tight composition and at -614 they encountered

water -- 614 feet below sea level. One or two wells along the southwest flank, between 600 and 614 feet below sea level, and it has been generally accepted and published in the reports on the Hobbs field that the bottom of the oil pay is at -614 feet -- 614 feet below sea level. That 614 feet below sea level marked the top of the original water, and the bottom of the oil in the structure. In so far as the upper space is concerned, perhaps oil is almost entirely up to the top -- there is some uncertainty as to whether there was a little free gas on top of the structure. I am in no position to express an opinion as to whether practically all of the gas in the Hobbs pool was dissolved in the oil, and the oil filling the upper space from the top of the structure, at 312 feet down to somewhere in the neighborhood of 614 feet below sea level, almost exactly 300 feet of oil pay in the central portion, with the thickness of the pay diminishing in all directions from the northeast corner of Sec. 2, Twp. 18 S., R. 38 E. While I have described that as being filled with oil, I certainly do not intend to leave the impression that there is oil in every cubic inch of rock -- much of the rock is too tight -- too dense to have liquid of any sort in it. The descriptions by various geologists of the Hobbs Pool, the reports of the company geologists, all I can learn from others about the pool, indicate there is at the top of the structure from 15 to 30 feet of very tight, impervious rock, in which little or no oil exists, then comes the first pay, then the prolific pay. It is exceedingly porous on top, and diminishes in porosity from the top, and becomes much less porous towards the southeast, northwest and down the northeast flank and the west side. The porosity of that pay diminishes outward from the highest point on the structure.

Probably the best article that has been written on this pool was written by two Midwest -- Stanolind engineers --

Q (Interrupting) Have you that article with you?

A Yes, I have. Mr. Ronald K. DeFord and Edwin A. Wahlstrom. Mr. DeFord was division geologist for the Midwest Refining Company at the time of writing the article.

Q Before proceeding, give the volume, the year, the name of the magazine, and the date of it.

A The magazine I have is the Bulletin of the American Association of Petroleum Geologists, Vol. 16, No. 1, of January, 1932. The article was written by Ronald K. DeFord, Division Geologist of Midwest, which, at that time, was 99% owned subsidiary of the Stanolind of Indiana, and Geologist and Engineer Edwin A. Wahlstrom, of the same company, the Midwest. The article is entitled "Hobbs Field, Lea County, New Mexico." Much of the geological data I am presenting here in their article have been checked by our company geologists and others. I might, at this time, make it perfectly clear that I have never been stationed in Lea County -- I have been there, but I am not so familiar with the details of operations as if I had been located at Hobbs. I have general information which I am trying to present of the general situation relative to oil and gas geology and production and engineering in the Hobbs Pool.

Q Are there any particular parts of that article you desire to read to the Commission?

A I think the Commission might be interested in a statement in this article as to the porosity of the white lime at Hobbs, page 76 (reading) "That the porosity of the 'White lime' at Hobbs is related to its structure is obvious. In general, the limestone is most porous on the crest of the anticline, less porous on the flanks, least porous beyond the limits of the oil pool.

Determinations of the actual porosities of limestone reservoirs are not practicable because the really productive openings are so large (ranging in size from 'mouse holes' to caverns) that core recovery is almost impossible. As previously stated, core loss is better indication of a limestone 'pay' than the recovery of porous material that bleeds oil. The only index of porosity in the Hobbs field is initial production of oil."

Then on page 70 and part of page 71, is a statement that there is a cavernous condition on top of the structure evidenced by loss of returns -- when mud is pumped down through the

drill stem, if the formation is so porous as to take up all of the mud pumped down, the returns to the surface are lost. Then they speak of rotary tools suddenly drill downward in some wells without any apparent resistance, or cable tools drop as into an open space. That happened, they cite, at Midwest No. 33 Byers, in the NE¼ of Sec. 4, Twp. 19 S., R. 38 E. -- this well about which Mr. Card talked today. This well was never drilled below the top of the pay, because when the Midwest was drilling the well, "the tools suddenly dropped the full length of the stroke and swung free. The drillers, suspecting the truth, ran from the derrick floor, and a few moments later the top of the control head was blown off by a great rush of oil that shot over the crown block. When the well was again under control, hourly gauges indicated a daily rate of flow of 21,249 barrels."

On page 77: (Reading) "The top productive member of the 'White lime' is cavernous on the crest of the structure, fairly porous on the flanks, and off structure is in places only very slightly porous, in other places somewhat porous."

BY MR. SETH: Did you leave out part of the sentence?

A In what I just read? I certainly did not. I read the entire sentence, beginning at the bottom of page 77, that paragraph.

Then again, on the development of porosity: (Reading)

"One not yet committed to any theory may reserve his judgment concerning the origin of the porosity in the lower part of the 'White lime', but the condition of the top porous member seems to significantly related to structure to be thus passed by. It is cavernous on the top, porous on the flanks, and off structure almost dense, and these remarks apply as well to the pre-Brown lime structure of the 'White lime' as to the present structure of that formation."

Q That article used the word "anticline". Explain the use of that term in application to this structure.

A An anticline is an elongated dome -- the dome on the ceiling here (indicating the dome in the room used for this hearing), if it were stretched out in one direction, would be an excellent illustration of an anticline -- a structure longer that it is

wide, and sloping down in all directions from the crest. The crest is normally roughly horizontal for some distance, with the ends of the crest pinching off, in just the same way the dome in the ceiling might be stretched out to form a typical anticline structure, longer in one direction than in the other. So that Hobbs is a typical anticlinal structure. It is almost a text book structure. I suppose in years to come maybe the Hobbs Pool will be included in text books as an excellent illustration of such an accumulation of oil.

Q In your experience, is high porosity on the top usual or unusual?

A It is more usually the case. There are exceptions to the rule, but I should say that eight or nine times out of ten the highest porosity comes on the top of the structure, and, of course, the thickest pay is almost invariably on top. The only exceptions are where the pay is of uniform thickness and in impervious material. Most of the porous pay, and therefore, most prolific, normally comes on the crest of the anticline.

Q Is that the reason an operator tries to get on top of a structure?

A An operator, of course, desires to get the most oil for his money. Naturally, until the structure is well defined he does not know how far down the flank the oil and gas occurs. He tries to play safe and get clear on top. He has practical certainty of oil or gas if he is on top of the structure.

BY JUDGE LOCKE: I desire to introduce the exhibit in evidence (Referring to Gulf Exhibit No. 4).

I notice it is five minutes of ten o'clock.

BY THE GOVERNOR: Proceed.

A One item I did not point out on this cross section -- that is the depths of the wells are indicated by making these lines, which go down to the proper elevation below sea level. The depth to which this well (indicating a well on the map) is drilled is indicated by drawing a line on the section down the proper distance below sea level. You will see these wells were completed at varying depths below sea level. These wells were completed, in general, 550 to 600 feet. An operator naturally

desires to drill his well as deeply as he can without encountering water. He does not wish to drill into water production.

Q What is that middle line through the red section?

A That line marks the top of the sand break, a geological marker recognized by most of the wells in the section. The big pay lies above that big sand break; the second pay, on the southwest flank, also lies above it. The Capps, sometimes referred to as the lower pay, lies a short distance below the sand break. The various pays being separated, most probably all by tight, impervious material, there is gas, but no oil. Gas there which cannot make oil except by following some well drilled through.

Q Is the pay below the middle line available to all operators?

A No, not available to all operators. You will notice the sand break drops below -614 at this point (indicating on map), which is Stanolind No. 26, in the NW¼ of Sec. 10. From that point southeastward there can be no production below the big sand break. The original water line lies above the place where the lower pay exists. No doubt the low pay is out in here (indicating) which contains water, as indicated by the discovery well and by the drilling of Ohio No. 1 State, in the SW¼ of Sec. 9, all of which portray the lower pay, lower than -614.

Q Would you expect more oil or less than normal conditions where you have two pays?

A You have just twice as many chances if you have two pays instead of one. The chances are with two pays, the operators have two chances for pay production. However, a foot of pay in one horizon is a very different thing than a foot of pay in another. I would rather have a foot of pay in 35 feet of porosity than to have ten feet of pay in ten feet of porosity.

Q Will you turn back to No. 1 and indicate the section or area in which there is only one pay?

A Roughly the area in which there is only one pay is very narrow zone along the southwest side and a much wider zone at the southeast end, a narrow zone up around the flanks in the northwest end of the field. The highest wells drilled have been drilled where there are three pays. Probably wells might be drilled out

here (indicating) that would encounter only one pay, but no such wells have been drilled.

BY MR. CUSACK: While we are on that northwestern edge, wasn't there a dry hole drilled in Sec. 14 -- didn't the Tidewater drill a dry hole up there?

A The Humble drilled a dry hole -- the Landreth in Sec. 7, the Shell in Sec. 14.

BY MR. SETH: On your Exhibit No. 3 -- or No. 2, my recollection is you said the reason you didn't draw the green area around that part of the field was because nobody had seen fit to drill out here (indicating). I just want to call your attention to this well (indicating a well on the map).

A We used this well down here (indicating).

BY MR. SETH: You did not show the thickness here?

A No, we used that well (indicating).

BY GOVERNOR MILES: Will you go back to No. 2 just a moment, because I am going to ask -- maybe you stated this before -- but how many companies are represented by those different colors? How many companies are represented in the field?

A There are twenty-five different operators in the pool. We ran out of colors, so we did not color this lease of the Getty Oil Company and the Two States Oil Company -- we left them in white as we ran out of colors.

BY GOVERNOR MILES: In acreage, that represented by the green figures what percentage of the total acreage?

A This tract down here, the Repollo -- there are four -- six out of 248 -- I miscounted -- there are two wells drilled in one forty that have been listed as one well -- another well in this forty (indicating on map) -- there are seven -- three units in here -- three units in Sec. 15, Twp. 19 S., R. 38 E.; four units in Sec. 28 of 18 S., R. 38 E. -- seven -- 2.46% -- just under 2% -- 1.97%. Does that answer your question?

BY GOVERNOR MILES: Yes.

A This is Gulf Exhibit No. 5 (turning to next map on stand), the contour map we have used in two or three of the other exhibits. This contour map has colored bands representing fifty-foot thick-

nesses. On this thin color the upper contour line is at 300 feet -- 325 feet, and the lower at 375 below sea level. The thin color is spread over an area fifty feet in depth below sea level. The green is fifty feet, from 375 to 425, fifty feet. The lavender is from 425 to 475. The brown is all the distance from 475 down to 600 -- 575 is the lowest contour down there. The depths of penetration of wells have been calculated within these zones. On the very top, where it would be level, the yellow is from 312 to 325. The wells are drilled at 217 feet below the top of the white lime. In the next zone, the geologists of the various operators recognized they would not have quite so much possible pay and the wells average 182 feet below the top of the structure. The zone of 375 to 425, the average is only 156 feet; 425 to 475, the average is 112. On the brown zone, the fringe of the field, the average is 60 feet, but that brown zone covers a full hundred feet, and that has been calculated, the two figures with 72 feet of penetration toward the top and 44 feet for the deepest penetration in the lowest and thinnest possible pay in the field. In other words, the operator who did not have the lucky wells, found out in the center, recognized there was no chance of getting oil at such depths, therefore drilled successively shallower depths in the southeastern portions of the field, the northeastern flank. In the northeastern and southwestern areas the average penetration is only 60 feet. The penetration increased to the top from 112 on up to 217 feet. The operator in the brown area had one foot of pay for every 3.5 feet of pay possible to the operator on top of the structure. In addition to having much greater thickness on top, you will remember DeFord and Wahlstrom said the pay is much more porous on top, so having the 3.5 to 1 advantage, I should say they had many-fold advantage on account of greater porisoty, which means, the more porosity, the more space to be filled with oil, which would mean more oil in place on top of the structure, and far more oil in place there than in the brown zone where the pay is thin and comparatively tight.

BY JUDGE IOLE: I desire to introduce Gulf Exhibit No. 5 in evidence.

Q What exhibit have you there?

A Gulf Exhibit No. 6 (turning to next map).

Q You may explain that exhibit to the Commission.

A This exhibit, map No. 6, is a bottom hole pressure survey made in the Hobbs Pool. It is a map of the pressure shown in the wells when the wells have been shut in from 34 to 36 hours, all pressure measurements being made at 400 feet below sea level, if that is possible, or if made at different depths, the correction formula was applied to ascertain the actual pressure at that level. I am sure you understand that before the first well was drilled, the oil, gas and water stands there under pressure. The water on the sides of the pool, and water coming up through the porous zones on the flanks would tend to push the oil to the top of the structure. There was impervious structure through which the oil and gas could not escape, and the oil was held there, and there being non-porous beds above, and flooded with water below, the pressure of the water balanced the pressure of the oil and the pressure would be uniform throughout the field. We have no pressure survey before the first well was drilled, but the oil had accumulated over a period of some hundreds or millions of years. If there were differentials in pressure in the various portions of the pool, those pressure differentials would have forced the oil to flow from the areas of high pressure to areas of low pressure, and the pressure differentials would have been equalized. When the first well was drilled into the pool, from the best evidence of pressure at a depth of 400 feet below sea level, which is the depth of the survey made by the Engineering Committee, that pressure was somewhere between 1500 and 1525 pounds per square inch. That pressure existed on all oil in the structure, and existed on the water around the flanks. When the first well was drilled, that pressure was available to push the oil into the hole, up the casing, up the tubing in the well, on up to the surface. As soon as some oil was produced from the first well, an area of lower pressure developed around that well. That is inherent in the production of oil from a structure. Removal of oil from

the pay necessarily makes a place of lower pressure, to which the oil tends to travel from other parts of the field. As soon as the second well is drilled in the area, that is slightly reduced. If the permeability of the pay was high, then the pressure drop at a well would be very slight and oil would readily move into take the place of oil taken out and the pressure would be re-established. If the permeability was low, the removal of oil would require a greater time for the equalization of the pressure. But any time a low pressure area exists in a pool, there is a tendency for oil to move from the area of high pressure to this low pressure area. Movement of oil and water in any geologic structure is across -- over or across an area of low pressure. The same rule applies to the movement of water in a water distribution system -- it moves from the place where the pressure is exerted. In water supply mains, with a standpipe or reservoir, the water in the reservoir exerts the pressure, but if the water in the reservoir and standpipe is at the same level, the water pressure in the mains becomes constant --

BY MR. SETH: (Interrupting) Like this exhibit we had here this afternoon.

A Like the exhibit we had this afternoon. As long as he kept the water at the same elevation in the two tubes, he had the same pressure.

The Hobbs Pool was discovered in December, 1928, the official completion date. I believe the discovery of the first oil occurred in June or July of 1928, but the first well was officially completed in December, 1928, Stanolind No. 1 State, in the NE¼ of Sec. 9, T. 19 S., R. 38 E. Stanolind owned most of the acreage in the southeastern portion of the field. I should say the Midwest Company -- the Midwest Company was operating at that time and the Stanolind succeeded it -- they drilled wells in the southeastern area and production was found in a number of wells. A dry hole was drilled in Sec. 14, No. 6 Wright. It was not of any importance -- and on the map we did not use it. No great excitement until Humble drilled in No. 1 Bowers sometimes in 1930, in Sec. 30, T. 18 S., R. 38 E.

BY GOVERNOR MILES: What was the date of the first well?

A December, 1928, then the next well was January, 1930. The first big well was the Humble No. 1 Bowers.

BY GOVERNOR MILES: This first well drilled, was that considered a big well?

A No, it was not a big well. I do not remember the exact initial production.

BY MR. SETH: 700 barrels.

A Approximately 700 barrels was the figure I had in mind also.

Other wells were drilled after the first one, also of limited initial production because they were drilled in an area where the possible pay was thin. As it developed, Mr. DeFord and Mr. Wahlstrom pointed out, the porosity was poor as compared to the top of the structure. When the Humble No. 1 Bowars came in, it was immediately offset, and the Hobbs Pool developed at a rapid rate; in the course of the next fourteen months 140 wells were completed in the Hobbs Pool and the pool was fairly well outlined, although there has been subsequent development in the northeast and northwest sides of the field. The production outlet was poor -- in fact, the first pipe line was completed into the field in May, 1930, and the pipe line prorated the oil until July of 1930, when the operators united in a proration plan -- the Engineering Committee was established which Mr. Gray has described, and the first bottom hole survey was made by the Engineering Committee about December, 1931. The Hobbs survey was made of a number of different wells, and naturally, as there was only one gauge at the pool, it had to be made on different days, and the making of the survey spread over a number of days, in December of 1931, and the data was all published in the January report of the Hobbs Engineering Committee. We produced that data on this map, platting equal pressure lines through those equal pressure wells, the same as making a contour map of equal elevations. All points along this line here were points where the shut-in pressure was 1425 pounds; all points along this irregular line No. 2 shows a pressure of 1425 pounds. The white areas which are enclosed by the pressure

line of 1450 pounds -- that is to say, all points along the line enclosing the white areas had 1450 pounds per square inch; points inside the line had higher. The green area applied to areas having 1350 to 1400 pounds pressure. There are two sections of green in the northern portion and a rather broad band in the southeastern portion. The blue marks the zone of from 1300 to 1350 pounds pressure, and the muddy part is 1250 to 1300 pounds.

On that map of pressure differentials the lowest pressure well is the Stanolind No. 24 in the NW¼ of Sec. 15, the lowest pressure of 1275 pounds. The highest pressure is the Shell No. 1B McKinley in the SW¼ of Sec. 20, where the pressure is 1483 pounds. There is a pressure differential of 208 pounds. A pressure of 208 pounds will practically run a small locomotive boiler under low steam, and will tend to push the oil from the Shell well into the Stanolind well. The high pressure wells in Sections 33 and 34 and 4 and 3 to the south, the high pressure areas where the pressure is in excess of 1450 pounds -- I believe 1479 is the highest pressure within that area, so that from the Stanolind No. 8 State in the NW¼ of Sec. 4, there was a pressure differential of 204 pounds operating over a distance of roughly two miles, which would tend to push the oil down into the southeastern part of the field. Those pressure differentials were the result of the operations before the adoption of the proration plan. Before the adoption of the proration plan, every operator produced as the market permitted, as the pipe line could take it. The 25-75 plan was adopted in July, 1930. Unfortunately we have no survey as of that date. We do not know whether pressure differentials in the pool at the time the proration plan was adopted were greater or less than at the time of the first survey. This is the first time they knew how the pressure existed in the field and at that time there was a difference of 208 pounds, too much for a really satisfactory operation of the pool.

Q What does the yellow sections indicate, in general terms?

A The yellow sections indicate an area ranging from 1400 to 1450 pounds.

Q What are the ideal conditions under which oil could be produced in a field, in regard to bottom hole pressure?

A The ideal condition would be to have no variations in pressure across the field. Under those conditions there could be no movement across border lines from one lease to another.

Q What is the effect of the variance in pressure?

A The effect of the variance in pressure is to force the oil from areas of high pressure to those of low.

Q Have you any literature with you in regard to the ideal methods just stated?

A Yes, sir, I have.

Q Will you produce it?

A (Witness produces book) This is a report of the Committee of the American Petroleum Institute on the allocation of production. This was a committee appointed about 1929 and consisted of ten or twelve petroleum engineers who were instructed by the American Petroleum Institute to develop and recommend the most satisfactory method of allocating oil within a prorated pool, taking into consideration the best engineering information available. This is a revised progress report of that committee as published by the American Petroleum Institute on October 26, 1933.

Q What bulletin?

A It is a re-print from the production bulletin No. 212 of the American Petroleum Institute entitled "Essential Engineering Factors in the Allocation of Production."

Q Who wrote the report?

A The bulletin consists of a report by the Chairman of the Committee, Fred E. Wood, and a series of supporting papers in which various features are discussed of the recommendations of Mr. Wood in the general report.

Q Who is Mr. Wood?

A He is production engineer of the Standard Oil Company of Indiana,

Q Just read from his report.

BY GOVERNOR MEES: We will be in recess until tomorrow morning at nine o'clock.

DECEMBER 8, 1939

9:00 o'clock A. M.

Pursuant to recess taken on December 7th, the Commission resumed the hearing in the foregoing matter at nine o'clock A. M. of December 8th, all members of the Commission being present, whereupon the following proceedings were had, to-wit:

BY MR. SETH: The reporter calls my attention to the fact that I did not offer in evidence Stanolind Exhibit E.

BY JUDGE LOWE: I think if either Judge Seth or I fail to introduce an exhibit in evidence, they can be considered as introduced.

DR. R. S. KNAPPEN

resumed the witness stand for further Direct Examination by Judge Lowe:

Q Mr. Knappen, when we adjourned last evening you were about to present an article prepared by Mr. Wood. Will you please proceed.

A I think I had given the title and date of the publication, stating it was a publication of the American Petroleum Institute and was a report of a committee appointed by the American Petroleum Institute to study the difficult and puzzling problem of the best method by which to allocate the oil within a pool. The committee was not attempting to determine how to allocate oil between operators, but simply over the pool. Under the old law of capture, each operator was permitted to produce oil as fast as he could. It depended upon the operator --

BY MR. SETH: What is the date of that last one (referring to book which the witness had).

A This is simply another copy. The date is October 26, 1933 -- I beg your pardon, this was originally prepared in October, the 26th, and revised November 14, 1934.

The introduction of proration made it impossible for an operator to produce except under definite restrictions --

Q (Interrupting) Are you reading from the paper?

A No, I am still explaining the background of the committee.

The restrictions naturally should be such as to give each operator the right to produce the oil under his land. That is the state law in New Mexico, I understand, but I do not mean to go into the law. The committee was appointed to study the proper type, and to recommend the proper methods by which the production in pools should be controlled so as to do equity between the various operators. The committee -- strike that -- the committee was composed of a large number of men, ten or twelve petroleum engineers. With no exception, I believe, they were all employed by major oil companies. Since the committee was to write a general report, not applicable to any one particular pool or to any one particular area, but just intended as a general report on the country as a whole, the report is couched in general terms, general rules which seemed fair to the various members of the committee. The Chairman of the committee, Mr. Fred E. Wood, is production engineer of the Standard Oil Company of Indiana, located in the home office of the company.

At a series of meetings we arrived at a general agreement on principles. Mr. Wood, as chairman, was asked to state the principles in definite terms, and present the report to the committee, which is the report I have in my hand. We thought the report certainly was not to question rules, but to elaborate upon them, and accordingly asked various experts to discuss various factors considered in the report of the committee. This pamphlet contains both the report of the committee and the series of papers written by different men at the request of the the committee, and indicate in the reports the different factors to be included in the proration order.

For instance, Mr. Albertson wrote a paper on "Acreage and Sand Thickness as Factors in Proration". Mr. R. B. Kelly, of the Pure Oil Company, wrote a paper on "The Potential or Productivity Factor in Allocation Formulas". Mr. R. D. Myckoff wrote on "The Relation of Well Potentials, Sand Permeability, and Well Pressures to Allocation of Production". Mr. E. V. Moore, of the Humble Oil, wrote on "Application of the Principle

of Volumetric Withdrawal to the Allocation of Production". Mr. D. R. Knowlton, of the Phillips Petroleum Company, wrote a paper showing the effect of the application of this plan to Oklahoma City; his paper being entitled "Effect of Volumetric Withdrawal on Physical Waste in the Oklahoma City Field". Mr. Moore, of Humble, wrote another paper on "The Effect of Curtailment on Ultimate Recovery". I believe each of those gentlemen were members of this committee, as well as others.

At the present time I wish to read particularly from Mr. Wood's report, written for the committee and adopted by the committee as its recommendation. Of course, he discusses many things besides bottom hole pressure -- that is only one of the factors in prorating a pool, but since we are talking particularly about bottom hole pressure, I should like to invite the attention of the Commission to this part of his report, reading from the top of page 3, he writes:

"The total allowance of each well should be modified so as to favor substantially wells having low gas-oil ratios, in order to discourage inefficient production practices and minimize drainage toward inefficient wells. In pools with gas cap (where there is a market for the gas) the contents of the reservoir should be apportioned between the oil and gas areas so that relative volumetric withdrawals will not cause movement of oil into the gas sand, hereinafter discussed under 'volumetric withdrawal'. The principles of volumetric withdrawal may be applied where necessary to encourage low water-oil ratios".

Reading the fourth paragraph down, still on page 3:

"The committee recommends that an allowable computed under any formula should be subject to correction periodically, in order to decrease subsequent allowables previously found to be excessive, or increase subsequent allowables previously found to be deficient."

Then reading the last paragraph on the same page:

"Where there is more than one well to each proration unit, it is recommended that the productivity factors of all wells on that unit should be suitably averaged, and the result be used

as the well productivity factor for that proration unit. Productivity is properly regarded as an indication of the producing quality of the strata within the drainage area of the well."

Reading still further, the paragraph headed in heavy black, bold faced type, entitled "Pressure":

"In most cases a formula for allocating production may well include the static bottom-hole pressure as a corrective factor. If, for any reason, the allowable assigned to a well or proration unit is larger than it should be, then the pressure in the well or unit should decline more rapidly than in the rest of the field; and at the next allocation period the inclusion of lower pressure in the formula will lower the allowable, and tend to correct the situation. Conversely, if the allowable assigned is smaller than it should be, pressure should decline less rapidly; and at the next allocation period the allowable will be increased as a result of the unit having a higher pressure than the rest of the field. Thus, by including the static pressure as a separate term in the formula, it will have no effect if the other factors in the proration schedule are properly balanced; whereas its inclusion will tend to correct the schedule if the other factors are out of balance."

I think perhaps, if the Commission wants me to read --

BY MR. SETH: I suppose you wish to introduce that as an exhibit?

A Not at present, a yway. I might note the revised report, the addition being dated July 15, 1936, printed on a blue sheet. The additions to the former paper have been printed in italics, and are additions which the committee felt should be made to the original report, and I call particular attention to the addition which the committee felt, after two years of study, should be added -- that is to say, after two years experience with the provisions of the paper, the committee felt should be added:

"If a well cannot produce its minimum allowable without waste it is highly desirable that the production of such well be subject to the principles of volumetric withdrawal as computed for the remaining wells in the field. The computation of

volumetric withdrawl will reduce the oil production below the minimum allowable, but this is considered desirable as a conservation measure."

Q Has the proration plan in the Hobbs field been in accordance with the recommendations of the committee?

A The plan as written has been in accordance with the recommendations of the committee. The numbers that have been used in the plan have not been in accordance with the recommendations of the committee, because changes in the plan have been made which have increased bottom hole pressure, where the recommendations of the committee were that any changes should decrease bottom hole pressure. But the plan does follow the general terms of the recommendations of the committee. It provides the acreage be uniformally treated, and the allowable based on a forty-acre unit. It provided for the inclusion of potential in the formula, and it provided for the correction of that potential, because it was recognized that even though potential is the first yardstick you have of the amount of oil in a pool -- it is the first yardstick -- the first indication of whether you have prolific pay or poor pay, but that yardstick should be corrected by the bottom hole pressure. If an allowable is too large, the bottom hole pressure will show it is below the field average, and if it is too small, it will be above the field average. So that if the allowable is too large, the allowable of that unit will be decreased in the future. On the other hand, if the allowable had been too small, the bottom hole pressure will be too low, and it will be increased, and five that unit a chance to catch up with the average. It tends to drop the pressure at the top of the pool, to maintain uniform pressure conditions, because the oil, gas and water all observe the same rule, to move from an area of high pressure to an area of low pressure, and if the pressure is uniform, there is no movement.

Q I wish at this time you would explain to the commission what you mean by bottom hole pressure.

A To begin with, pressure is simply a force acting on any substance tending to push that substance in some direction. If I push down on this stick, I exert pressure on the floor. The floor pushes back, and there is no movement. On the other hand, If I apply the stick to the water glass, and the pressure exerted is sufficient to overcome the friction, the glass has to move along the desk. The pressure tending to move it exceeded, or is greater than the pressure holding it stationary.

In the case of a liquid, if I fill the glass with liquid, and move a spoon in it, there would be pressure against the water tending to move the liquid to one side -- the movement of the spoon in the water would increase the pressure on one side and decrease it on the other, and the water would apparently run around behind the spoon and fill in behind it, because the liquid would move from the area where the pressure was applied to an area of low pressure. As I push the spoon, there is higher pressure on the side of the spoon moving ahead, and the water runs around from the area of high pressure to the one of low pressure.

In the Hobbs Pool, oil and gas have accumulated in the porous zone, the white lime, on top and the pressure from the water below would, before the first well was drilled, keep the pressure uniform throughout the pool, the top the same as the rest of the pool. If it had not been the same, the liquid would have moved from the area of high pressure to one of low, and down to a balance. When I say pressure at the top of the pool, I am [illegible], and throughout the discussion, assuming the pressure was the same in the same level.

So, referring to Gulf Exhibit No. 4, the cross section of the structure, all the pressures in the Hobbs Pool have been measured at a level of 400 feet below sea level. If they were not measured, then they were corrected to determine what it would have been if the pressure had been taken at that level. If we ass me the pressure was 1500 pounds at the level of 400 feet below sea level, that means a drop of oil standing at that le[illegible] would be under a pressure of 1500 pounds per square inch, upward,

downward and sideways. The pressure would be the same in all directions. A hollow container of any sort would be under crushing pressure and 1500 pounds per square inch would tend to collapse it. If we had a hollow box that had a capacity -- a cubic capacity of one inch, an inch on every side, and would put 1500 pounds of pressure on top of the box pushing down, 1500 pounds of pressure on the bottom pushing up, and on all sides, it would be an identical proposition. It follows if that box were lowered from the -400 foot to the -500 foot level, the pressure would increase; it would be not only under the 1500 pounds at 400 feet, it would also be under the pressure of the liquid between 400 and 500 feet. For that reason, because pressures, even during absolutely static conditions in the pool -- because the pressure varies with the change in elevation, there has to be some horizon at which all pressures are measured. Otherwise, you might compare a pressure in this well at -500 feet and a pressure in this well at -400 feet, and you would see a higher pressure in the deeper well. The pressures would have to be measured at the same level. And that may be corrected if there is some obstacle in the hole, so that the pressure is taken at 300 feet, and to that pressure would be added as well an estimate from the pressure at 300 feet down to 400 feet, in order to determine the actual pressure at the 400 foot level.

That is what is meant by bottom hole pressure. It is a force exerted on the rock and on all liquid contained in the rock. The same force that acts on the liquid acts on the material containing the liquid, and tends to move the liquid from an area of high pressure to one of low. That is pressure measured by engineers as required by the report -- static pressure.

Static is the only measure of pressure existing in the formation. Static means standing still, and means when everything in the well is standing still you measure the pressure. At the instant when a well is shut in, the pressure in the well 400 feet below sea level will not be the same as the pressure in the formation 500 feet away. The well has been flowing and the pressure has been reduced in the well, because the liquid has been moving out of the well -- because there is a decrease in

pressure inside the well as compared to the pressure existing in the rock outside. So at the instant the well is closed, the pressure in the well is less than the pressure in the surrounding rock. Closed in, the pressure at 400 feet rises, Liquid continues to move from the areas of high pressure, either side, above and below, the liquid continues to move to the point of low pressure. The movement then tends to equalize the pressure and when the pressure is equal, the movement stops. With a record -- I am getting a bit ahead.

The pressure in a well is measured with a gauge. A gauge is simply a device which determines the amount of pressure. Steam gauges attached to boilers are well known. The first bottom hole pressure gauge I know of was made by W. V. V. Eddy, of the Texas Company, and he used only the essential element out of a steam pressure gauge. He simply lowered into the well the inside workings of a steam pressure gauge to find out what was the pressure in the bottom of the hole. In principle, all bottom hole pressure gauges are the same as a steam pressure gauge. They differ in the method of measuring the pressure, but the principle is the same, to find out what is the pressure -- the force in the formation, the pressure in the formation. So the bottom hole pressure gauge is lowered into the well, and it indicates the pressure at the point where the gauge stops. The first pressure gauges manufactured showed only the maximum -- were what are called maximum indicating gauges. They had some type of device that showed the highest pressure to which the gauge was subjected. That was not entirely satisfactory. One thing we wanted to know was how the pressure was changing. Accordingly, a number of the oil companies developed gauges on which there was a chart of some sort which had a record made on it by clock-works, the clock-works turning the chart to the point where it stood still, or the chart stood still while the automatic marker turned around, and the pressure could be read when the gauge was withdrawn from the well. The pressure the gauge exerted could be determined from the chart every minute the gauge had been in the hole. So looking at one of these records, which

makes a record, not only of the pressure, the bottom hole pressure in the well which has just been shut in, the pressure immediately after shutting in, and leaving it in for a period of seventy-two hours, which is the common limit of many of the gauges, we will see that the pressure rises rapidly at first, then more slowly, making a characteristic curve which is known to all petroleum engineers working with bottom hole gauges -- the pressure rises rapidly at first which indicates there is considerable bottom hole pressure; then more slowly as the pressure begins to equalize, and finally reaches the maximum point, above which pressure does not rise because the pressure in the well and the surrounding ground has been brought to the same level. An engineer looking at the curve, can tell whether the gauge stayed in the well long enough to get the maximum pressure.

It is possible, by mathematics, to calculate how much more pressure would have been added if the gauge had been left in the hole for a longer time. In the Hobbs field there is high permeability so that practically in every case the gauge will come up to maximum pressure within a 24-hour period. There are a few places where the permeability is so slight it takes more time.

Under Mr. Staley's direction there have been more wells measured to determine what pressure will result over a period of time. The Engineering Committee, working with Mr. Staley, has rapidly checked that data. To the best of my knowledge, no engineer has objected that 36 hours is too short a time to take static pressure in a well.

I have said "static pressure" several times. I believe there has been some testimony as to the flowing pressure. The flowing pressure shown by gauge and record as set in the well while the well is producing. There is no proration plan in effect in any pool where the flowing pressure determines the amount of oil that may be produced from a well. The reason is, the flowing pressure means nothing except the resistance of the well to the movement of fluid outside.

When a well is flowing, the pressure inside the well de-

pends upon the weight of the column of oil and gas, and perhaps water also, above the gauge, plus the friction of the tube through which the liquid is moving, plus resistance of the surface equipment, which commonly includes a choke and valve to restrict the flow, and the pressure in the tank into which the oil is flowing. The flowing pressure is entirely within the control of the operator, within limitations. You cannot reduce the flowing pressure to zero -- there will always be some pressure in the well -- you can take off the valve -- if it is flowing through a choke, it can be increased or restricted -- by maintaining a high pressure on the ( ) he can increase the flowing pressure in the bottom of the hole. By using different sizes of tubing he could increase or decrease the flowing pressure. The flowing pressure of a well varies from time to time, and may vary sharply within five minutes time as a result of a change in some condition. Flowing pressure means nothing except resistance of the well to the fluid out of the well. You cannot use pressure under control of the operator, that can be so easily changed, as a measure of the pressure existing in the formation, but by shutting in the well and letting the pressure equalize between the rock and the well, you can determine the pressure surrounding it. And if you maintain the pressure equally on adjoining leases, there will be no movement, and if the pressure is uniform, every lease will produce the oil underneath that tract, no more, no less, up to the limit of the recovery of the oil on the leases.

Does that cover the question on bottom hole pressure?

Q I think so. Have you a list of some fields in which the bottom hole pressure was considered by the various state boards allocating oil?

A I have a list which, I have no idea, is complete, because I know of no place I can look for a report of the proration methods at various pools. The various states of the nation simply write general information and announce it to the petroleum industry.

I know that in New Mexico, bottom hole pressure has been

used in proration at Hobbs and Monument. That is why we are here today. In Texas it has been used in the Goldsmith Pool. It was first used in Texas in the Harts Pool; it was used at Rodessa Pool, over on the east side, and used in the Van Pool. I have no doubt there are many other places in Texas where bottom hole pressure is used in proration.

In Arkansas bottom hole pressure is used in five pools, Atlanta, Buckner, Magnolia, Schuler and Village.

In Oklahoma they use bottom hole pressure in prorating the South Burbank Pool, Moore Pool.

In Louisiana it is used in Cotton Valley, Lisbon and Sligo.

In the most important pool in California, Kettleman Hills, the basis of their formula is bottom hole pressure.

Bottom hole pressure is used to determine the potential in most of the wells in Kansas, under the requirements of the Corporation Commission for determining the potentials of wells in Kansas on which proration is based. We determine static bottom hole pressure, with rate of production of oil from the well. As far as I know, no operator has ever objected that static bottom hole pressure in a well in Kansas did not accurately measure the pressure in the surrounding field.

I have no doubt there are other fields, but those are the only ones with which I am familiar.

Q Are many of the major companies operating in the fields where pressure is used as indicated by you?

A Oh, yes, in Harts Pool we have the Standard of California -- of Texas, as it is now called, the Gulf Production Company, and a considerable number of other operators.

In the Van Pool, the Gulf, Humble and Pure. In East Texas I suppose every operator in the mid-continent area is interested, including every operator represented here this morning, as far as I recognize them -- I am not sure of Mr. Cusack, whether he has a well over in East Texas, but I think all of the rest have. Certainly East Texas has all the major operators in the mid-continent area, in addition to a vast number of small independents.

Q What information do you have that the bottom hole pressure taken

by the umpire in the Hobbs Pool represents the formation pressure?

A By the fact that when the well is shut in it builds up -- the pressure curve rises rapidly, then more slowly, and finally reaches maximum, which indicates the bottom hole pressure in the well is the pressure in the formation. If the pressure in the well is less than the pressure in the formation, the pressure would gradually continue to rise in the well until the pressures were equalized.

Q Does the completion of new wells to offset old producers have any bearing on the formation pressure?

A Yes. One can determine pressure in a newly completed well midway between two old producers. If the pressure in the formation is greatly different from the pressure -- the static pressure in the wells which have been producing for some time, in a new well midway between two old wells you would find a much higher closed-in pressure than we find in the old wells. A good illustration of formation pressure and static pressure, as compared to pressure in adjoining wells is Continental No. 3 Grimes, which was completed June, 1935, in the NW¼ SE¼ of Sec. 28, Twp. 18 S., R. 38 E. Prior to its completion the north offset, Samedan No. 1 Grimes and the south offset, Continental No. 1 Grimes had both been completed. The pressure at that time in the Samedan well to the north was 1268 pounds. The pressure in Continental No. 1 Grimes, to the south, was 1293 pounds. There was a difference in pressure then between the two wells of 25 pounds. There was a pressure differential tending to move oil northward to the Samedan No. 1, a pressure of 25 pounds over half a miles of distance; that is, estimated from the static pressure in the wells. If the static pressure actually represented the formation pressure around there, when Continental No. 3 Grimes was drilled, midway between the other two wells, they should have found a pressure just midway between the pressure of the wells to the north and south. On the other hand, if static pressure does not represent formation pressure, then Continental No. 3 Grimes should have had a very high pressure, because drilling on the boundary between the two wells provided an exit. The average pressure of the wells to the north and south would have been

1281.5. That is the pressure to be predicted in Continental No. 3 Grimes. The actual pressure, measured by the combined pressure of the other two wells. In August, 1935, after the Continental Grimes No. 3 came in, it was 1285 pounds, a difference of 3.5 pounds from the pressure that would be predicted, a pressure difference that is within the accuracy of the gauge, and I think all engineers agree perfectly to the fact that the static pressure of the wells north and south were accurate pressures in the formation. Continental No. 3 Grimes, at the time the pressure was taken, had produced less than one-half per day of its potential, so that the production from the well, prior to the taking of its pressure, could not have seriously affected the pressure in that well.

I think that is as good an example as I could find of the relationship of pressure between the boundary drainage areas of wells and static pressure measured in the wells themselves.

Q Do you know of any fields where it is known the length of time it requires to build up the pressure after a well has been flowing?

A It is very difficult to state a time for a field, because if permeability is high, the build-up time may be very short. For example, in some wells where you have high permeability, we cannot find a difference between the flowing pressure and static, the drop in pressure is too slight to make any difference, if it is less than two pounds. In other wells in this pool, we have found it took as much as 36 hours to build up the pressure if it was during static conditions, and so, in any pool you might ask for, there will be some wells where the build-up is rapid, and others where the build-up is slow, but the rate of build-up depends on the permeability of the surrounding rock.

Q Return to Exhibit No. 7, I think is the next one. You may explain that map, what it is intended to represent.

A The last exhibit, No. 6, showed the first bottom hole survey that had been made in the Hobbs Pool. This exhibit shows the bottom hole pressure made under the umpire's direction in October, 1936 -- I beg your pardon -- October, 1938. The reason for selecting

that date is that is the last survey made before the proration plan at Hobbs was changed. Up until October, 1933, proration was on the basis of 25% allowable, allocated as a flat allowable for every unit in the pool. The remaining 75% was allocated on the basis of potentials of the wells --

BY MR. SETH: What date is that?

A October, 1933.

BY GOVERNOR MILES: What determines a unit?

A A unit is forty acres. If more than one well is drilled on a forty acre unit, the potential of the wells is averaged.

On this map there are two high pressure areas indicated. One is along the township line between Sections 31 and 32, in T. 18 S., R. 38 E., and the other between Sections 19 and 30, in T. 18 S., R. 38 E. -- the only two low pressure areas indicated, one of small extent in the northeast part of Sec. 36, and the three offset wells, and the other of considerable extent in the southeastern portion of the pool.

On this map -- on this survey, the highest pressure is 1383 pounds, in the Gulf No. 6 West Grimes in the SE¼ SW¼ of Sec. 32, and the lowest pressure is 1245 pounds in the Repollo No. 2 in the NW¼ NE¼ of Sec. 15. There is a difference in pressure of 138 pounds between those wells -- I regret I must change my testimony -- I had overlooked a high pressure well in the extreme -- I said two areas -- there is a third high pressure area in the southwest end of the field as developed at that time -- three high pressure areas. The highest pressure well on this map is the Amarada No. 3 Hardin in the NW¼ SW¼ of Sec. 18, T. 18 S., R. 38 E. The pressure in this well is 1395 in the northwest end of the field, and 1245 pounds in the southeast makes the pressure difference across the field 150 pounds.

The field, up to this time, had been operated on a basis of 25-75. I think this is so easy to understand there is no need to discuss that phase. It had so operated since proration went into effect in July, 1930, a little over three years under the 25-75 plan. From the first survey to the survey of October, 1933 there was a decrease in pressure differentials. There was a

pressure differential of 200 pounds; now it is 150 pounds. Operation under the 25-75 plan acted beneficially on bottom hole pressure adjustments; the pool had approached uniform bottom hole conditions. There was less tendency at the time of the October, 1933 survey for oil to migrate from one lease to another than on any previous survey made by the umpire. The 25-75 plan apparently did do equity between the leases. It was tending to iron out inequities, to slow down the rate of pressure decline at the low points. Where there were five high pressure areas in October, 1931, as shown on that map, there are only three now. Where there were three low pressure areas in the 1931 map -- and the pressure differences had been reduced by one-quarter under the operation of the 25-75 plan.

BY JUDGE LOWE: We desire to introduce that exhibit in evidence. Start the next exhibit.

A I might at this time, if I may volunteer, call attention to the high pressure area shown -- this area at the bottom part of Sections 31 and 32 lies immediately north of Stanolind McKinley wells, from which, the testimony yesterday indicated, a considerable amount of oil had moved northward. With high pressure surrounding the well on the township line, to me, as an engineer, it is incomprehensible that oil can move from this low pressure area to this low pressure area (indicating on map). The high pressure area is an effective barrier against the migration of oil in that particular case.

The survey of 1931 shows a high pressure area around Gulf No. 5 Grimes. The position is reversed here in Gulf No. 6 Grimes and the south offset; shows a pressure differential of 17 pounds, in one case and 18 pounds in the other, in the opposite direction, so you will see, if you can say the pressure is in balance, the oil does not move under balanced conditions, one must have a difference in pressure to move it. We had a balanced pressure in 1931, and three and a half years later we find an increase in the pressure immediately north of the township line, as compared to wells to the south. Such movement as occurred had to go from the wells in the north to the south. That change, difference in pressure, is a suitable subject for bottom hole pressure correction.

Following the survey of October, 1935, there was introduced into the Hobbs plan for the first time a bottom hole pressure correction plan, which was a desirable addition to the plan. The correction allowed the continuation of the 25-75 plan, but at that time a feature was introduced that was unfortunate -- There was an allowance for water wells based on 40% for acreage and a 60% allowance for potential, as determined by the water coming in. That allowance was apparently excessive, because (turning to next exhibit), as shown by Exhibit No. 8, a bottom hole pressure survey made under the direction of the umpire, the survey of August, 1936, we find the bottom hole pressures nowhere near as uniform as they had been three years earlier. At this time the highest pressure is still in the northwestern part, Shell No. 2 State, in the NE¼ of the NW¼ of Sec. 24, T. 18 S., R. 37 E. The lowest pressure well was Repollo No. 1 with a pressure of 1000 pounds; the Shell well has a pressure of 1320 pounds, a pressure differential of 320 pounds, where it had been only 150 pounds three years earlier. Probably the 1000 pounds pressure, indicated in the Repollo well, is not the lowest pressure, because there are three wells south of it in which the pressures were not taken. Those wells have had lower pressures than the Repollo well, so the pressure differentials were probably greater --

BY MR. WOODWARD (Interrupting): What is the date of that map?

A August, 1936.

BY JUDGE LONE:

Q Now, referring to Exhibit No. 8, it is colored. Explain that.

A This map has been colored as the other map was colored, using yellow for the most common pressure zone. The yellow represents pressures between 1300 and 1250 pounds -- 1250 to 1200 pounds; the blue, 1150 to 1200 pounds; the bluer from 1100 to 1150 pounds, and so on down until you get down to the pink, which represents pressures below 1000 pounds.

After this survey the Commission changed the proration plan at Hobbs to allow 60% on production of the pool to be distributed on the basis of acreage -- 60% of the pool's

allowable distributed on units, acreage, amounts to only 40% of the allowable on the basis of potential. The bottom hole pressure adjustment factor to be applied to only 40%. Accordingly, a well might have a very low bottom hole pressure, and might be producing much more oil than the reserves justified. Bottom hole pressure might reduce the potential to zero, and the well might still produce more oil on the acreage allowance, so that the amount of oil produced on an acreage allowance might be more than the reserves justified. A test of a well producing more than the reserves justified was well stated by Mr. Wood in his report, that if pressures decline more rapidly than pool average, the well will produce too much, and in the amended committee report, made in 1936, it was their judgment the minimum allowable should be subject to bottom hole pressure adjustments, because it is unfair to everyone to draw across lease boundaries from other properties.

So I do not intend to criticize the Commission for its order of January 1, 1937, but the next map, Gulf Exhibit No. 9, shows the effect of the order of January 1, 1937, as well as the effect of the previous orders. The Commission had representations made to it that the 60-40 plan would be more reasonable, more equitable than the existing plan, and as there was no testimony to the contrary, the Commission accepted those representations, so that what I have to say is not a reflection upon the Commission, but the effect of that order, changing the acreage allowable from 25 to 60 -- perhaps I should say, or call it the unit allowable from 25 to 60, and reducing the effect of potential and bottom hole pressure from 70% to only 40% of the pool's allowable, is shown by the existance of a bottom hole pressure drop in the southeastern part of the field, and a somewhat less, but nevertheless a low pressure area developed on the northeast side of the field. And we have on this map the highest pressure of 1245 pounds in the Samedan Nos. 2 and 3 State, in Sec. 24, and the same pressure in the Continental No. 2 State in Sec. 13, 1245 pounds pressure, and the lowest pressure, 871 pounds in the Texas No. 1 Selman, in the most

southeastern end of the pool. We have now a pressure differential of 374 pounds --

BY M. GODDARD: (Interrupting) Onwhat date?

A In September, 1939.

We have now a pressure differential of 374 pounds, and that pressure differential is a quarter larger than it was before the order of January, 1937 --

BY GOVERNOR MILES: I don't understand --

A The pressure differential is now 374 pounds across the field.

BY GOVERNOR MILES: Did that pressure differential decrease on an even percentage basis?

A It decreased more rapidly in the south than in the north. It has remained very nearly constant in the north. The result of the sharp pressure differential is a drop of 319 pounds in the space of three and a half miles in the southeastern part of the field, and the effect of the pressure differentials in moving oil, which varies with the distance, is that a 300 pound differential over two miles would cause the oil to move much faster than over six miles.

BY JUDGE LOWE:

Q I notice on the map, Exhibit -- the one you had before, there are a great many more colors on this map than on the others. What does that indicate?

A It means there is a much greater pressure differential. The pressure is declining, extending up into the first area, and becoming more accentuated -- there was a pressure differential of only about 125 pounds before 1933. With the change in the proration from the 25-75 principles to the principles we now have, the differential is 319 pounds across the same area.

Q Does that indicate excessive withdrawals in the southeastern part of the pool?

A Yes, sir, the withdrawals have been greater than the reserves justified for the southeastern part, as compared to withdrawals in the rest of the pool.

Q What is the effect of that on the migration of oil?

A The effect of that is that it causes the oil to move from the

yellow area in the northwest to the southeastern part of the pool, in Sec. 4, T. 19 S., R. 38 E., the oil is moving from the yellow area into the area of low pressure.

Q That is the area that will always drain when there is increased acreage in the allocation?

A If there were an increase of the acreage in the allocation at this time, and the pressure differentials would be sharply increased under the conditions here, there would still be a greater tendency for drainage from the northwest into the southeastern area.

BY JUDGE LOVE: We desire to introduce the exhibit in evidence.

Q You may explain Exhibit No. 10.

A Gulf Exhibit No. 10 is a repetition of the cross section which was shown on Exhibit No. 4. The cross section is repeated exactly, but this time, instead of repeating the map underneath the cross section, we have introduced a chart showing the bottom hole pressure surveys on those four maps -- the bottom hole pressure maps we have just been discussing. The highest line on the chart shows the bottom hole pressure in the holes shown up above on the cross section. The highest line shows the December, 1931 survey, the first survey made. The line has certain irregularities, but in general it follows across at an average pressure of 1432 pounds. There are irregularities which, theoretically shoul have been flattened out, and I think could have been flattened out, but, in general, it indicates a satisfactory development, a satisfactory production from the pool, and because the pressure differentials are small, there is little drainage from one lease to another. Unfortunately pressures were not taken in the southeastern wells for the 1931 survey. I wish we had projected this line to show the estimated value, but we discussed the matter and decided to show actual measured values as shown by the umpire, and not inject any personal element. If that line had been shown, it would have shown low pressure, and this pressure line would drop down in some such fashion as indicated by this pencil -- pressures do drop down.

The second line presents the survey of October, 1933. It

is more uniform than the 1931 survey, indicating that the 25-75 plan kept the pressures more uniform -- at any rate, there appears less variation than there was in the 1931 survey. And while there is a low pressure area in the southeastern part of the field, it is not so marked as in the 1931 survey. Conditions were getting better while operating under the 25-75 plan.

The third line shows the pressure in those wells as they were in September, 1936, after the large allowables had been given to water wells in the southeastern part of the pool, as well as water wells in the rest of the pool. The allowable was made to all wells producing water. It is, I think, apparent that the water allowables were excessive, because we find a sharp drop in pressure in the southeastern part, as compared to the slope of the line as it was in 1933.

The last line shows the survey of September, 1939. Through much of the pool there is a fairly uniform pressure, average bottom hole pressure now of about 1164 pounds. A correction, if I may -- this chart was prepared for the hearing in May, and it shows the February, 1939, rather than the September, 1939 survey. If the chart had been re-drawn to show the September, 1939 survey, which is the survey we showed on the map, it would have shown the same condition, except a greater drop which has resulted between February and September. Accordingly, the high rate of withdrawals in the southeastern area, compared to the reserves, has resulted in a steadily steepened pressure curve toward the southeast, and oil and gas flow down that course exactly as water comes down a gully. This difference in pressure, in two miles across the pool, has resulted in a steady migration of oil and gas into the southeastern area. If the straight acreage plan were adopted, that curve there would be still greater, with a greater loss of oil from the northeastern part of the pool. In general the slope across the pool is southeasterly, the general slope is in that direction, then breaks off quite sharply into the area of very excessive production.

BY JUDGE LOVE: We introduce that exhibit in evidence.

Q Exhibit No. 11 -- explain Exhibit No. 11.

A This is a map which shows the units which gained 20 barrels or more per day under the order of January 1, 1937, and the units which lost more than 20 barrels per day under that order. That order, dated sometime in December -- I refer to the order of January 1, 1937, that executive order. Under that order, which changed the 25-75 plan to 60% for acreage and 40% for potential, with bottom hole pressure adjustments, the red units are those which gained more than 20 barrels a day. The increase is largely concentrated in the southeastern part, with a few scattered units around the margins. The green units are those that suffered losses of 20 barrels or more a day, scattered through the central and northwestern parts of the field. Of course, there were changes on practically every unit in the field. We thought it would be interesting to see where the gains were concentrated under the60-40 plan of January 1, 1937, and we found it gave a sharp increase in allowable where the bottom hole pressure was already low and drainage already existed.

Supplementing that exhibit, we have prepared Exhibit 11A, which is simply a repeating of parts of the previous exhibit. At the left we have a bottom hole pressure map, still of the southeastern part of the field as it was in October, 1933, showing a pressure differential not greater probably, not more excessive perhaps -- not more than would be expected in the operation of any pool.

Here in the center we have showed the location of the units which received large increases in production under the order of January 1, 1937.

Over at the right we show a bottom hole pressure map in September, 1939. This is not the February map I showed, but is, as you can see, a few sections of the map - the bottom hole pressure map of the same area. The increases of allowables in the southeastern part of the field have changed the pressure differencial across the southeastern area from 150 pounds in 1933 to 329 pounds in 1939, the present time. The order of

January 1, 1937 was not entirely, but largely, responsible for the large drop in pressure in the southeastern area. If we were to go to straight acreage, as has been recommended, there would be a large increase in this area. That is in the very units where potentials have been wiped out.

It is true, the wells in here can make several hundred barrels of oil per day, and I do not -- I am sure the Commission does not understand that because the umpire's books show no potential, no one would contend the wells have gone dry. It simply means the potentials have been absorbed by bottom hole pressure, or due to some other cause. But on only 40% of the pool's allowable, even though all that potential allowable is wiped out, there is too much oil being given for acreage, and the pressure differentials have increased and the wells are producing, in large part, producing oil not under the land originally, but under this 300 pound differential, they are draining part of the leases to the northwest.

BY JUDGE LOVE: We introduce the exhibit in evidence.

Q The next exhibit, please explain the next, Exhibit No. 12.

A So far we have been talking about bottom hole pressure, and have been theorizing from those as to the movement of oil. I have been drawing conclusions -- I believe that is competent -- that oil moves from an area of high pressure to an area of low pressure, and there must be some movement of oil into the low pressure area. The question is raised whether that could be quantatively determined.

That has been calculated on this exhibit. Three wells, extending in a northeast-southwest line, their location being in the SE¼ SW¼ of Sec. 3, the NW¼ NW¼ of Sec. 10, and the SE¼ NE¼ of Sec. 9, on which wells we have potential tests, low pressure tests, and from which --

BY [illegible]: Will you repeat the location of these wells?

A The SE¼ SW¼ of Sec. 3, Stanolind No. 26 Capps; the NW¼ NW¼ of Sec. 10, Stanolind No. 8 State; and the SE¼ NE¼ of Sec. 9, Stanolind No. 26 State. On these wells we had long time records of production, and productivity could be determined from the

chart given in the Hobbs Engineering Committee's January report. We had pressures declining rapidly on the three north offset wells and the three south offset wells. To determine the rate of flow through porous formation, one has to use the formula introduced yesterday afternoon by Mr. -- Fisch -- Tasch, showing the drainage of oil, the amount of oil which will move through porous formation, known permeability, thickness and differences in pressures. The pressure differences are known every six months across that line. From those pressure differences the amount of oil moving from the northwest to the southeast, across the line, can be calculated. The volume of oil that has crossed the red line to the three 40-acre units, by that calculation, is 551,000 barrels of oil. That formula calculation does not include another production unit to the northeast, because we did not have the pressure measurements; it does not include two units to the southwest, because, again we did not have the pressure measurements, so to the north and south it would not be accurate mathematically to extend it.

It is not correct to say, because we have taken only half the line across which migration has occurred -- it is not correct to say that because the line across which there has been drainage is twice as long as the one studied, that the movement is twice as great, but certainly the movement must be greater than that calculated, because we have two units to the southwest and one to the northwest, but the exact migratory values are not known --

BY MR. MCCORMARD: (INTERRUPTING) Did you mention the percentage of recovery there?

A I have not, but I will.

So across the red line the migration, based on information as good as we could get, has been 551,000 barrels and a somewhat greater amount because of the three units, in an equal length of line, which were not taken into the calculation.

During the time this portion of the pool has been under development, up to September, 1939, the production west of the red line has been 3,433,000 barrels; the migration of 551,000

barrels across that line constitutes 15.8% of the total amount of oil produced in that area.

The pressure differentials, which increase with the passage of time, with changes in the proration orders, migration across the red line, including the known extentions to the northeast and southwest, calculated under that formula, is 362 barrels every day.

BY GOVERNOR MILES: What is that township and range?

A T. 19 S., R. 38 E., the southeastern portion of the Hobbs Pool.

BY JUDGE LOWE:

Q That is the area that would be allowed more oil if we get the straight acreage basis?

A Yes, sir.

Q And the drainage would be greatly increased?

A The drainage would be greatly increased. That is the area in which potentials have been wiped out by the bottom hole pressure factor.

BY MR. BOHART:

Q Dr. Knappen, if we were not concerned with drainage as a matter of equity or obligation, which we are, we would be compelled to be concerned with it by law, would we not?

BY MR. WOODWARD: We object to that -- he didn't qualify as a lawyer -- nearly everything else, but not a lawyer.

Q If it is generally agreed that the factor influencing the movement of oil is pressure, then, as I understand it, from the testimony that has been offered, there has been some objection -- or at least, some distrust expressed of the instrument with which bottom hole pressure is measured -- the pressure itself was not, as I understand, challenged, but it was the accuracy with which pressure could be measured with an instrument, and also whether or not bottom hole pressures taken by the umpire represent formation pressure. Is there any reason that you know of, from your experience and knowledge of instruments, why instruments of this kind could not be built that would measure the pressure at the bottom of a well, as well as at the top?

A No, it is purely a matter of care in the design as you take the

instrument.

Q Are we dependent on only one instrument, or are there more than one on the market?

A No, there are at least four. The Dunble makes an excellent bottom hole pressure gauge; the Indian Territory Oil Company makes a bottom hole pressure gauge that is widely used at Hobbs because it is smaller in diameter and will go into the small tubes; the Geophysical Research makes an excellent one, and Amarada builds an excellent one,and modesty prevents me from saying how good is the Gulf gauge.

Q There are a number of gauges manufactured by different concerns?

A There are at least those mentioned, and there may be others.

Q Are all field instruments extremely accurate?

A No.

Q Is it necessary for all field instruments to be extremely accurate?

A No. Frequently you sacrifice extreme accuracy in order to secure greater ruggedness, the same as a watch. Sometimes it is desirable to have an instrument that will stand all sorts of abuse.

Q If the accuracy is in proportion to the work to be done with the instrument, is that sufficient?

A That is sufficient, if one remembers there is that degree of inaccuracy. The pressure gauges used in locomotives need not be nearly so accurate as bottom hole pressure gauges -- an error of ten pounds in a steam boiler gauge is not important.

Q Bottom hole pressure gauges are more accurate than some field instruments?

A Very much more accurate.

Q Hobbs is not the only place, I would understand, that bottom hole pressure gauges have been relied upon?

A Yes, there are listed some fourteen or fifteen places where they are used to correct the allowable, in various states. And of course, in addition to that, bottom hole pressure gauges are used by the engineers of the various companies to control their own operations, used to obtain information they need.

Q Is there any difference in the design and manufacture of gauges

made for one set of conditions?

A Not in the essential principles. There is a difference in the gauges used under 100-pound pressure, as compared to 200-pound pressure, and again for 400-pound pressure the gauge is different.

Q Does that mean the manufacturer has attempted to build for the specific purpose for which it is to be used?

A That is it. He modifies the instrument to get the most satisfactory results for the pressure under which it is to be used.

Q Have you any information in regard to the gas-oil ratios?

A Yes, sir, I have.

Q You may state what it is.

A A table has been prepared from the reports of the proration office in Hobbs showing the gas-oil ratios in the southeastern portion of this pool, approximately the area colored in red on this map (indicating), covering thirty wells southeast of a general line following the red line shown in Gulf Exhibit No. 12. In December, 1936, according to the records of the umpire, the gas-oil ratio was 1520 cubic feet per barrel of oil. By July, 1939, the gas-oil ratio had increased to 2742 cubic feet, an increase of 1222 cubic feet of gas for every barrel of oil produced in that area.

To see whether that was a reasonable increase, we took the records of all the rest of the pool, clear up including the northwest end, making no deductions for the water lifted by the gas in many places, and the gas-oil ratio in the central and northwestern part of the pool -- all the rest, except the thirty wells already mentioned. In December, 1936, the gas-oil ratio was 1629 cubic feet per barrel. In July, 1939, the gas-oil ratio in that same area, on the rest of the pool, was 1872 cubic feet. In the southeastern end of the field the increase in the gas-oil ratio was 1222 cubic feet; in the rest of the field the increase in the gas-oil ratio was only 243 cubic feet. The increase in the southeast end is five times the increase in the rest of the pool, over the identical period, from December, 1936, the month before the start of operations under the 60-40 plan, up to July, 1939 -- in that period the gas-oil ratio in the south-

eastern part of the field was 5 to 1 as compared to all the rest of the field.

BY JUDGE LOAF: The information given was obtained from the umpire's office?

A Yes, sir.

BY GOVERNOR MILES: We will be in recess for five minutes.

Pursuant to recess, hearing was resumed, with Dr. Knappen on the witness stand:

BY MR. SANDERSON:

Q Dr. Knappen, will you refer, please, to the Exhibit No. E -- Stanolind Exhibit E, showing the increase in so-called potential for the Gulf Graham No. 1. Will you explain what caused the increase in the first part of the curve?

A Gulf Graham No. 1 -- or Gulf State No. 1, in Sec. 24, according to the exhibit -- and I have no reason to think the figures inaccurate, although I do not want to testify to their accuracy until I have had an opportunity to check them, was completed with an initial production of 3,000 barrels -- my recollection is it should be about 3,500 barrels -- that is immaterial. The potential increased, to February, 1934, to 7,000 barrels. That may have been bottom hole pressure adjustments, or it may have been the first acidation of the well. The potential increased again in September or October of 1934 from 7,000 barrels to 23,000 barrels as a result of acidation. A new potential test was made after the well was acidized and the new test showed a capacity to produce 23,000 barrels of oil daily. After that time there was a series of adjustments up and down, mostly up, which, I assume, were all made as the result of bottom hole pressure correction factor. I am confident that is the reason for the adjustments up and down from 23,000 barrels to about 32,000. That is a high pressure well in danger of being drained by low pressure units in the rest of the pool, and the bottom hole correction factor required the upward adjustment of the potential in an effort to have the allowable overtake the increase in pressure in that well to the relative pressure in the pool as a whole.

Perhaps I should say, in this connection, the pressure in that well has declined from the original shown at 1375 pounds, to the present pressure of abo t 1225 pounds, but the pressure in that well is higher than the average pressure in the pool, and according to my recollection, has been higher on each pressure test; and so long as it is higher, there must be drainage from that well. The potential has been adjusted by the bottom hole pressure factor to give the present potential. No one would contend this is a 32,000 barrel production well. You might just as well have left the potential at the last figure, and added a certain percentage to allowable because of the high pressure. That might have eliminated some confusion if it had been handled in that way. The umpire's report shows the adjusted potential. I am certain no one thinks that is the actual potential. I think all recognize it is the potential with adjustments made to that number so that the allowable will be increased because the pressure in this well is higher than the average, and consequently in danger of being drained.

Q That large decline in bottom hole pressure, that does not indicate a relative decline -- or rather, other wells in the pool were also declining at the same time that decline occurred?

A That is true. The pressure decline was about 150 pounds, where the decline in the pool, or correction, was 200 to 250 pounds.

Q It did not decline as much as the average of the pool?

A It did not decline a' much as the average of the pool.

Q That large increase in potential was brought about by acidation?

A Correct.

Q And every other operator in the pool had the same opportunity to acidize their wells?

A That is true.

Q And had the opportunity to drill more wells?

A No legal restriction.

Q Whatever was done there, it was not done out of disregard for any other well -- they had the same opportunity?

A On the contrary, we were forced to acidize a lot of wells to keep up with the other operators who were also acidizing their

wells; if not, we would have suffered very serious losses in potential and closed-in pressure.

Q Gulf did not start it?

A It did not.

Q This quite large increase in potential due to bottom hole adjustments, do you know how many barrels of oil per day that adjustment has increased the allowable of wells at this time? In other words, how much more oil is Gulf getting today than it would have gotten had there not been any bottom hole pressure adjustments?

A I am not certain whether the adjustment from 23,000 to 25,000 is due to the second acidation or bottom hole pressure adjustments -- if 25,000 -- the last three potential tests, it has been increased approximately 8,000 barrels in that well; the adjustment result from the last proration allowable is about 2.2 barrels per thousand for that well, increasing it about 17 barrels.

Q At the present time?

A At the present time.

Q Do you know whether some of the Gulf's wells were reduced in allowable by that adjustment?

A I cannot testify as to that; I have not checked it up.

BY JUDGE LOCKE:

Q Part of the article introduced yesterday purports to have been written by Mr. Barnes, an employee of the Gulf Oil Corporation. Was Mr. Barnes an employee of that company at the time the article was written?

A He was not at that time, no, sir.

Q What is he commenting upon in the part introduced?

A He was commenting upon an article in the Oil and Gas Bulletin written by H. A. Rounds.

Q Do you have that quotation?

A Page 75, Pennsylvania State College Bulletin, No. 12:

"A map purporting to show profiles of consistency of porosity was prepared by Mr. Rounds for the Hobbs Pool in New Mexico. The lines were established by connecting wells of approximate

equal initial production. It would seem that such lines are lines of consistent permeability, rather than consistent porosity, and serves to illustrate the unfortunate confusion which prevails concerning the two properties". Then he gives the quotation from Vol. 29, Oil and Gas Journal, page 70 and 110 of December 18, 1930.

Q Dr. Knappen, there has been considerable evidence introduced in regard to the installation of packers, and the number of packers installed by Stanolind, but no information as to packers installed by other companies. Is Stanolind the only company that has installed packers?

A No, sir, packers have been installed by most, if not all, of the major operators.

Q Do you know how many Gulf has installed?

A We have set twelve packers. We have twenty-two wells, and have set packers in about 50% of our wells.

Q You testified at some length. As a result of your investigations and the evidence you have given, have you any definite plan to propose for the future?

A It would be my recommendation to go right back to the 25% acreage; that is to say, 25% of the pool's allowable to be distributed equally between the units, which would give each unit enough to pay operating expenses; and distribute 75% on potential with adjustment for bottom hole pressure, to be made every six months, in an earnest effort to equalize pressure throughout the pool and to prevent drainage of the oil from one lease to another.

Q You do believe some adjustment of packer wells should be made?

A I believe some adjustment should be made as outlined by Mr. Gray last night. It was the intention of the operators that the operator who set a packer would not be penalized, as setting a packer to shut off gas was making a very real contribution to the pool. The pool would then give them the right to produce the well's former allowable from a pay which represented only part of the original formation. The arithmetical adjustments has been worked out that a man who sets a packer is penalized. The packer wells were not intended to be penalized. I think the

plan should be changed so as to give the packer wells the benefit originally intended to be given to them. The change in the packer well plan will cost the Gulf Oil Corporation some twenty barrels of oil daily, but it is the fair thing and the carrying out of the original intention, and I think the change should be made.

BY THE GOVERNOR: In packer wells, what is the object in setting a packer? What is to be accomplished by that?

A If all production, Governor, is coming through the same part of the formation, oil and gas and water are coming into the well at the same place, there is no way a packer will do any good in that case. But if we have two production horizons, as indicated by the chart and the pamphlet which I hold here, and if gas is present in the upper horizone and oil in the lower, a packer may be set around the tube between the upper and the lower formations, then if there are holes in the bottom part of the packer, below the packer, or the tube is open below the packer, oil will come in from the lower formation and pass up through the tube. The gas tries to come in, and the casing head closed in so that the gas cannot escape, and the gas saved benefits the pool as a whole.

It is precisely the same condition if there is water in the upper formation and oil in the lower.

I think without exception every operator produced his well until the time came he was producing so much water the operating costs were wxcessive, the operating costs equaled the value of the oil recovered, and in most cases the well went dead, and the operator was then faced with the problem of plugging and abandoning the well or setting a packer. If the water was confined to the upper horizon he could set a packer in the upper and produce from the lower, and the water would be shut off -- not come out at the top. If the water was in the lower horizon, he could plug off the lower part. If the undesirable fluid was coming from below he could set the packer in the impervious zone and the fluid would be shut off.

So setting a gas packer is a real conservation measure, and conservation of gas is needed for the pool, and the operator is

looking out for his own interests, as well as the interest of the pool. He will get the benefit as well as some other well -- some other lease. The operator who shuts off water does nothing but make it possible for him to operate that well.

If oil and water are both coming in the same horizon, the setting of a packer will not shut off the water. If they come together, they must be taken out together.

BY THE GOVERNOR: Bottom hole pressure adjustment, when do you mean by that? Do you have some method of making that adjustment?

A An adjustment is a calculation made in the umpire's office. If a well has a pressure higher than the average of the pool during a previous survey -- and surveys are made every six months -- then the potential of a well is increased by a percentage corresponding to the amount the pressure is above the pressure in the previous survey. If the pressure is below the average in the pool, then the potential is reduced below that, with the result that the potential, by a series of successive subtractions, may be reduced and finally may be completely eliminated. The calculation is made by algebra and is complicated, as I think Mr. Staley understands -- it is a calculation made in his office, the correction is made in his office, and if a well has too high a pressure, it is decreased, and if it was too low, it is increased.

BY MR. BOHART:

Q There has been a great deal of evidence as to whether potential is an indication of oil in place. Technically -- I would be interested to know, and I am sure the Commission would, as to whether there is any practical recognition of potential as an indication of oil in place, and it occurs to me the evaluation reports, might give us some information on that point. Have you ever made up evaluation reports, and studied them?

A I have made a great many evaluation reports in connection with the purchase and sale of property and the exchange of interests.

Q Is it a common practice, in making up an evaluation report, to study the report and give weight to the potential of wells?

A The potential of the well is about the third item considered. The first item is the description; the second, the number of

the wells; the third item is potential; the fourth is the present daily production; and the fifth is the reserves.

Q People, in buying and selling, actually study and consider a well's potential?

A I never knew of any sale of producing property where potential is not given very serious consideration. Potential is not the only yardstick, the only thing considered, but one of the very first items looked into.

BY MR. WOODWARD: You say potential is the second item?

A The second item is the number of the wells, in our evaluation report.

Q Then the purchaser of a producing property is primarily interested in the oil under the property he may recover?

A From the potential and other data, he calculates the reserves under the property which can be recovered.

BY JUDGE LOWE: You may cross examine.

BY GOVERNOR MILES: We will be in recess until 1:30 this afternoon.

Pursuant to recess, the Commission resumed the hearing at 1:30 in the afternoon, with Dr. Knappen on the witness stand.

BY JUDGE LOWE: I have one additional question I would like to ask.

Q Dr. Knappen, you reviewed the history of production in New Mexico. What are your views as to the efficiency with which this pool has been operated?

A This pool has been operated more efficiently than any pool in New Mexico, and more efficiently than any pool in the United States. There are minor inequities against which we are protesting, but on the average, it has been especially well operated.

Q There was one correction you wanted to make in your testimony this morning?

A Yes, in the number of packers the Gulf has set. My memory failed and I used the wrong figures. The Gulf has set ten packers and has twenty-three wells, so the number of wells in which packers

were set is 42% or 43% of its wells. That was a mis-statement when I said twelve.

There was also another mis-statement on my part, or a mis-understanding as to one other statement, and I would like to correct that. I am told I said all of the wells in the Hobbs Pool would come up to maximum pressure in a thirty-six hour period. A great majority came up to maximum in a 36-hour period, and all of the wells, in thirty-six hours came up to the point where the maximum could be calculated -- not all came up to 99½% in thirty-six hours, for a few of the wells did not reach maximum pressure within the thirty-six hour period.

CROSS EXAMINATION By L. H. Rankin (Repollo)

Q I believe it has been stated there is a gas cap on the Hobbs Pool at this time?

A That is true.

Q Could you roughly outline where it is?

A In a general way, it lies in here (indicating on map); that is to say, in Sections 32, 33, a portion of 29 and I believe a part of 28.

Q Would you explain to the Commission again the cause of a gas cap?

A A gas cap has been formed by the release of gas from solution in the oil. The oil contained all the gas it could hold in solution at a pressure of 1500 pounds per square inch. Now that the average pressure has dropped 20%, the amount of gas is released -- necessarily a certain part of that gas has come out of solution in exactly the same way gas dissolved in ginger ale or soda pop comes out when the cap is taken off.

Q The drop in pressure, I understand, is caused by excessive withdrawals?

A It is caused by the removal of oil faster than the water keeps up.

Q There are a number of Gulf leases in this area under this gas cap?

A Oh, yes, the Primes.

Q Is there a gas cap down here (indicating on map)?

A I don't know. There is a great deal of free gas in the pay. I don't know that there is any separation in the gas above the oil in the southeastern part of the pool. There is free gas in

that area. It may be present filling some cavities, or it may be present as a gas cap in that area (indicating on map).

Q Turn to Exhibit No. 12, Mr. Knappen. About four years ago contour maps of the Hobbs field were terminated at about this point, Sec. 24, T. 18 S., were they not?

A I don't know that they were.

Q Isn't it true that the development of Sections 13 and 24 was a subsequent development?

A That is true.

Q At that time, sometime about the year 1934, the contours in Sec. 24 and Sec. 18 were terminated -- that is, T. 18 S., 37 and 38 E., were terminated in much the same manner as in Sections 6, 8 and 9, T. 19 S., R. 38 E.?

A I don't know that that is true of four years ago, but certainly that is true that the contours could not have been drawn for the north end of the field until it was developed.

Q We have a production slope of -583 sub-sea?

A Yes, that is true. The Ohil well in Sec. 9, T. 18 S., R. 37 E., and the Two States Company well in Sec. 21 -- I beg your pardon -- The Ohio well in Sec. 9, T. 19 S., R. 38 E., and the Two States well in Sec. 9, T. 18 S., R. 38 E. had the white lime at -583.

Q As a geologist, wouldn't it have been reasonable to suppose that development would be contiguous, and project a line parallel with the last known contour?

A It would have been reasonable to draw a contour roughly parallel. It ~~xxxxx~~ was not done because there was no development in there and on account of the irregular slope immediately north of Sections 5 and 4. Where you have an irregular slope it is dangerous to project --

Q Would it deface your map too much to parallel the -425 foot contour which has been established, with the -575 foot contour?

A No, I am perfectly willing to do that.

Q Would you make a light line?

(Witness makes a line with pencil).

Q From such a line as that it would be reasonable to estimate the position of that line?

Q Can you tell -- first, there are a number of dry holes between the -475 and the -525 foot contours the way you have projected the lines?

A In the area of Sections 5, 6, 8 and 9 of T. 19 S.

Q So that area is not good production?

A I wouldn't care to drill in it.

Q According to your formula, the average Lea County well is 45 barrels per well?

A I thought it was 46 or 47.

Q According to your formula, one-fourth of that would be allocated only on properties falling within your average thickness map, not 60%?

A No, one-fourth of the allowable of the Hobbs Pool would be divided equally between the production units.

Q But if a well had no allowable, it would be one-fourth of 45, or 11.5 barrels?

A That is approximately correct.

Q You would not drill a well for 11.5 barrels?

A I don't believe you could drill a well in that area and get that.

Q According to your map, which you have referred to in your testimony, you have wells lower sub-sea than that?

A Certainly. I don't believe there is commercial oil in that area, at the present time. If I had known the field in 1929 I would have been willing to recommend a well there at that time, but certainly not today.

A No, I would not today. On the basis of that formula?

A No, on the basis of water encroachment.

Q You know the water is coming from this direction, through this area (indicating on map).

A I believe --

Q (Interrupting) And not through here, from the southwest to the southeast?

A I think from the southeast to the northeast in that particular area, as Mr. Card said.

Q How many undeveloped units in the blank space, as outlined here? (Indicating on map).

A About twenty.

Q What percentage are state units?

A I am not certain, but I recognize four -- there may be more.

Q 20%?

A Four out of twenty, -- yes, 20%.

Q You just definitely condemned that area?

A Yes, I certainly would not drill in that area.

Q There is the area that Mr. Cusack drilled, you dondemn that, in Sec. 34, T. 18 S., R. 38 E., is that capable of making its allowable -- the average Lea County allowable?

A I don't know that you would condemn that. That does not have the same producing conditions. The Samedan Turner lease does not have the same producing conditions as 5 and 6. There is no water encroachment approaching from the east side of the field -- if one had knowledge Mr. Cusack's well was high enough on the structure.

Q If it was a low well?

A If it was a low well there would be no reason to expect water encroachment, as there is on the southwest side.

Q Assume someone came along that does not know that area as we do -- what would it cost to drill a well?

A A well or a dry hole?

Q A well.

A $30,000.00 to $35,000.00.

Q And gravity is 34 to 36?

A Yes.

Q The average price of pipe is 37¢?

A That is right.

Q And we assume the lift will cost 37¢?

A That is far too high for flow.

Q It may make a little water? Could he make a net of 80¢?

A That is not unreasonable.

Q And of that eighty cents, ten cents, or one-eighth goes to the royalty owners?

A Yes, probably eleven cents.

Q Well, eleven cents. So can you figure with a net profit of

seventy cents a barrel, and an allowable which would be established by your formula of eleven barrels a day, how long it would take to pay out $35,000.00 before he would get a cent of revenue back?

BY JUDGE LOWE: I don't like to object, but I don't know what this has to do with the program we have before us, how long it would take to pay out at a certain price.

BY GOVERNOR HILLS: I don't know what he is going to show. I don't know enough abo t it to follow the lead as to what his thought is.

BY MR. RANKIN: I am trying to show whether there is a possibility, in Dr. Knappen's estimation, or whether there is no chance to get production in this area; and I am trying to show the effect the proposed formula would have on development and possible future investigation in that area; and I am trying to also show how long it would take to pay out on a well under that formula, the drilling of which would result in conservation measures, as far as oil is concerned.

A You want to assume bottom hole pressure would be so low that there would be no potential?

Q We would naturally assume bottom hole pressure would be so low that no credit would be given a well for potential.

Q That might be your assumption. Certainly it would not be mine, because bottom hole pressure was originally 1500 pounds; there is no reason to expect a lower pressure unless there is drainage from the area. If that is an oil producing area, the pressure should be at least as high as the average, perhaps higher. If, on the other hand, if this shoul be an area in which no potential were allowed because the pressure was so low, and it was draining oil from the rest of the pool, then the well would take between ten and eleven years to pay. But such a well has no business to be drill d if it is dependent on draining oil from other parts of the field.

Q How many places in the United States -- or in Texas, or in New Mexico, that if the acreage was so low as you set out, would pay t e cost of operation? You say 25/ on acreage will pay

the cost of operating a well?

A I didn't say pay the cost -- I said that figure was set up in 1930 to pay the cost of drilling and operating a well.

Q I think this morning you set out a formula of 25% on acreage and 75% potential, corrected by bottom hole pressure every six months?

A That is correct.

Q I think you went further and said the 25% on acreage would pay for the operation of the well.

A I did not say that. I said that was the thought when the plan was put into effect at Hobbs. If conditions change, it may or it may not.

Q I thought that was included in your formula?

A It was not intended to be.

Q Exhibit No. 8, now. In your opinion, do wells in an area of low permeability have as rapid a build-up as wells in an area of high permeability?

A No, they do not.

Q And bottom hole pressure measurements are made on the basis of the record in the bore hole in a given length of time?

A That is true.

Q In an area of low permeability it would take much longer for fluid to build up to a given point?

A That is correct. Don't overlook the high permeability over here (indicating on map). It will build up in half an hour in many wells. Where they are down in lower porosity, it will take thirty-six hours.

Q And it might take longer?

A And it might take longer. Hobbs, in a 15-day shut-down, made a series of tests. I took the bottom hole pressure in seven wells in the southeastern area. The wells had been shut in for from six to nine days -- the average was seven days. During the seven days the wells built up to within an average of three pounds in each well. That indicates that at the end of thirty-six hours those wells had practically come --

Q (Interrupting) That is a reflection of permeability?

A That is a reflection of permeability?

Q The fact that it took them so long to build up?

A No, it will build up -- they were within three pounds of maximum in thirty-six hours. The remainder of the three pound build-up probably was the result of drainage of more than 360 barrels per day, the condition in the northwestern and southeastern part of the field.

Q Where is the exhibit with the red line across it? (Witness turns to Exhibit No. 12). Where did you derive the information on the 367 barrels?

A A calculation of the productivity of the three wells along the line and the difference in the pressure in the three north offsets and the three south offsets, the pressures being determined by the six months surveys.

Q How did you arrive at the figure of 360 barrels?

A The result of the formula introduced yesterday by Mr. Tasch, applying the differences in pressure between the southern line of wells and the northern line of wells and their production.

Q And Mr. Tasch derived that from Dr. Muscat?

A From Dr. Muscat's book.

Q Have you ever been interested in pipe lines - the pressure in pipe lines - those laid in a straight course as compared to lines with a considerable number of angles per mile?

A Yes, sir.

Q My understanding is that in a linear mile, that if there were sixteen angles, turned in the manner pointed out here (indicating), one angle -- two angles -- three angles -- sixteen of them to a linear mile, it amounts to a plugged line.

A I don't know about that --

Q I have talked to pipe liners, and they have said that in a field of that sort it would break the line before they got anything through.

A Those sixteen angles will greatly reduce the possibility of a line. Every time you put an angle in a pipe line, you reduce the capacity of the pipe line. The pressure is reduced every time the oil goes around an angle, and at the next angle it is reduced again -- it seems to me quite practical, as the oil

moves up to the angle, it will be slowed down to go around --

Q (Interrupting) But a much less rate?

A At a slower rate. Every time you throw an angle into a line, you decrease the amount of oil that will go through it.

Q That number would not plug it, but tends to move it so slow it is the same thing?

A You can't get any through with the line plugged.

Q I believe you quoted two pressures -- I believe you said there was a large differential in pressure between the north part of the field and the southeast part (pointing to map). Which were those two wells you mentioned?

A The highest pressure shown was in the December, 1951, survey, at the Shell No. 1 McKinley, 1483 pounds. That is the highest well on that map, and the only well that had that pressure.

Q What is the lowest?

A The lowest was 1275 in the Stanolind No. 24 State, I believe is the name of the lease. At any rate it is No. 24 in the NW¼ of Sec. 15.

Q That was a difference of 208 pounds?

A That was a difference of 208 pounds.

Q In what distance?

A Approximately five miles.

Q Let us assume you have a pipe line running right straight from the Shell well down to the Stanolind, with a head up stream side of 208 pounds, with delivery pressure zero. What influence would the pressure have on resistance to flow --

A There is less oil movement through a two-inch line over five miles than one mile.

Q Would it be asking too much to ask Dr. Muscat to figure that?

A I don't have the tables for a five-inch line under 208 pounds pressure. I should think the delivery scale would be in the neighborhood of 800 barrels a day.

Q And a two-inch line under that pressure?

A That is almost --

Q (Interrupting) It would be very little through a two-inch line under 208 pounds?

A That is true.

Q Isn't that a far more ideal condition? You would have oil migrating through an area of very low permeability and porosity, would you sill have a transfer of oil over a distance of five miles, from this point, the Shell well, down to this Stanolind? Wouldn't the resistance to flow be far greater in the formation than in a pipe?l Could you have a transfer of 800 barrels?

A I am not certain how much greater. You will have a band a mile wide, two mil s wide in places, and of unknown width in places. I have not said there was a transfer of 800 barrels from the northwest to the southeast end of the field. Our calculations along the red line do not indicate any such figure. Your two-inch line under that pressure would probably bring more oil down than came, in '31 under these conditions.

Q You would not get much?

A Depend on whether you think 800 barrels is much or little. A two-inch, five mile line -- I don't know. We estimated any such movement as 600 barrels across the red line at that time. At that time you will notice you have a pressure differential of 200 pounds in two miles, from the Stanolind No. 8 State, in the SW¼ of Sec. 4, you have 200 pounds pressure, which is almost equivalent to 208 pounds.

Q You have 208 pounds from this point down to the Stanolind well - 206 pounds?

A That is correct.

Q Right in the center of the field you only have a differential of 200 pounds?

A Correct.

Q I fail to see how there could be drainage of oil down to the Stanolind area.

A There is probably no drainage from the northwest end of the field -- perhaps from the high pressure area in 31. Such drainage as occurred in the southwest end of the field undoubtedly was coming from this area (indicating on map).

Q Take the Stanolind wells in the SW¼ of Sec. 10, T. 19 S., R. 38 E. Those are in an area of remarkably low pressure?

A Yes, sir.

Q But it is also in an area of rather low permeability?

A You are speaking of the southwest of ten?

Q Yes.

A Yes, that is an area of low permeability.

Q As you get away from the well bore to the center of the property, the pressure must necessarily go up?

A Not more than two or three pounds two or three pounds higher than the static in the well after a 36-hour period.

Q Wasn't there testimony this morning about some well up in the northeast part of the field?

A Continental No. 3, completed between three producers; in the NW¼ SE¼ of Sec. 28 -- was completed between two producers a quarter of a mile to the north and a quarter of a mile to the south. The producers had already been on production for some time. There was something like 26 pounds difference in pressure between the northern and the southern well. The Continental well was midway between, and should have given a good measure of the pressure at the boundary. One would anticipate the pressure to be between the two, which, as I remember, would be 1381.5. It measured 1385, a difference of three pounds.

Q Do you have a later bottom hole pressure map than that (indicating the exhibit)?

A Yes, turns to Exhibit No. 7). This is a bottom hole pressure map nearly two years later.

Q The only thing I want is the permeability in this area (indicating). Have you compared this well, No. 3 Grimes, in Sec. 28, T. 18 S., R. 38 E., with the pressure and permeability in the southeast part of the field?

A It could be done. I have not made such comparison.

Q However, if bottom hole pressures are a reflection of permeability --

A (Interrupting) Bottom hole pressure is no measure of permeability.

Q In other words, in your opinion, the pressure would build up just as quickly there as in a permeable area?

A No, you asked if bottom hole pressure was a measure of permeability.

Q Are they a reflection of permeability?

A Bottom hole pressure in a well is no reflection of permeability. The build-up in a well is a reflection of permeability.

Q What causes the well to build up?

A The difference in pressure between the formation -- the equalization of the pressure between the well and the formation.

Q If that oil can run through bigger holes, rather than through small holes, it would reach the well bore much sooner?

A Certainly.

Q And big holes are in areas of high permeability, and small holes are in areas of low permeability?

A Yes, sir.

Q So the build-up in quicker in the well in an area of high permeability? Is that not true?

A But the wells, in areas of low permeability, the build-up is just as high in time, and as I say, in areas of high permeability in all pools, you could get a complete build-up sooner; if a well has low permeability, you would have to wait 24 to 36 hours. The rate of increase of the bottom hole pressure is the measure of permeability, but actual static bottom hole pressure is not the measure of permeability. Do I make the distinction clear?

A No --

A Bottom hole pressure in an area represents the pressure under which fluids exist, the static bottom hole pressure in the well. When the pressure has reached its maximum, it is the same pressure in the well and in the surrounding area, because if the surrounding area had a higher pressure, then the pressure would continue to build up in the well.

Q You mean to say there is only -- in this area down in here (indicating on exhibit), there is only possibly three pounds difference in the bottom hole pressure in the center of the lease and the edge of the lease?

A After the well had been shut in and had built up to the maximum, I would not expect more than a three-pound difference between the margin of the lease and the well.

Q From the center of the lease is approximately 600 feet. Do you

think you could construct a tube 800 feet long, having perfect porosity, of say 33%, and very effective permeability, or effective porosity, and have a three pound pressure up stream side, and still, going up stream side, have oil come out of that tube 800 feet away?

A Certainly.

BY MR. RANKIN: That is all.

BY MR. RAE: I believe you made thestatement that bottom hole pressure was used in the allocation plans in other pools, did you not?

A I did.

Q You have property in the South Burbank Pool, a nd are familiar with the plan there?

A No, I am not familiar with that plan. I know that bottom hole pressures are used in adjusting pressures in the pool every six months.

Q You probably know the plan was designed by the Engineering Committee of the pool?

A I assume it was. I do not know.

Q You are probably familiar with it enough to know that the plan designed by the Engineering Committee had certain penalties, and that those penalties were cut one-fourth of their original effect by the Secretary of the Interior, after due hea ring?

A No, I am not familiar with that. I don't deny it, but I do not know it as a fact.

Q The only point I was making, as an engineer, the number of corrections to be applied, and how often, and the type of corrections -- that you have no hard and fast way to compute the time of the correction, the amount of it, and other factors as applied to an allocation plan to be put into use?

A As an engineer, I would say the more often the correction is applied, the more equitable -- the more closely you correct, the more equitable --

Q (Interrupting) If I were to tell you the Secretary of the Interior changed the number of times the South Burbank made corrections, that he said they made them too often, that pro-

bably the engineers were too enthusiastic, would you say the Secretary of the Interior was wrong?

A He and I have differed on engineering matters frequently.

Q Of course, you realize the Secretary of the Interior's decisions were made by technical men with hom you are probably acquainted, and he simply acquiesced in the decision?

A It is not becoming in me to attack or defend the decisions of the Secretary of the Interior. I do not know the situation -- I do not know why he made the decision. I am in no position to attack or defend the Secretary.

Q You think bottom hole pressure can quickly be recognized in the field, so they might be nullified?

A Might be gradually reduced. With tremendous bottom hole pressure as set up in the Hobbs Pool, that is not going to be wiped out in sixty days or six months.

Q Would it be more important to wipe out bottom hole pressure, or allow every property to produce the oil in place?

A I think you should allow the property to produce if there was not movement of oil from other leases.

Q I believe the maps show, under the present Hobbs plan, that the pressure decline is slightly faster around the edge of the pool?

A They are declining much faster in the southeastern end of the pool, and declining less rapidly in the northwestern end.

Q What would be the life of the pool at the edge, compared to the life at the highest point?

A It would depend on the part of the edge.

Q Do you have any way of knowing at this time from which side of the pool, and the amount, the water encroachment will come?

A Not with great precision. We do know there is water in the central southwest side, and the northwest end, and to a less extent around the southeast end. There are certain areas on the northeast side where water has not come in at all.

Q Suppose the northwest end would only have a life of eight years, and the top would be fifteen years, knew that was a reasonable estimate. Would you still say you wanted to go along and have

such adjustments as would tend to equalize every one over the pool?

A Yes, I would, because you cannot in any other way prevent drainage at the east boundary.

Q How can you give a man the oil under his property unless you allow him to produce over a term of years that will allow him to recover the oil under his property? To put it in another way, suppose you had a property on the northwest side that had a lower bottom hole pressure, and only had a life of eight years, compared with properties on top of the structure which had a life of fifteen years. Would you think it reasonable to commence to decline the low pressure property and not allow it to produce its oil before it is wiped out?

A Not at all. It would not have a lower pressure today -- it has a lower pressure only because of over-production.

Q You would not give that property the oil under it? You would not allow each property to produce at a rate that will allow it to recover the oil under it?

A Certainly, because there is no migration across the boundary if pressures are equal.

Q You might have low pressure and have water?

A You are saying low pressure, and I am saying they start at equal pressure.

Q That is right, start at equal pressure.

A Both properties would produce in proportion to the reserve if you keep the pressure equal, there will be no pressure -- differential pressure.

Q I would say that property on the edge of the pool, the advance of water is caused by the oil field in general, not that property, but with water sweeping across that property, the life may be seven or eight years as compared to twenty-five years on top.

A We are overlooking the fact that water sweeping across a property, that water build up a higher pressure. A man might be entitled to produce more and keep the pressure down level with his neighbor.

Q There are certain parts of the field where the water builds up pressure?

A No, I know of no evidence that water builds up any pressure anywhere in the pool. Let me explain -- the water comes into the pool only as oil is removed. The water comes in and takes the place of the oil. If water comes as rapidly as the oil is taken out, the pressure is high, and the well should be allowed to produce more rapidly. We are learning a lesson from hydrostatics; fluid moves only under different pressures; if you keep the pressure the same, there can be no movement across the property lines, then the lease which is against water may produce at a much higher rate than the lease that is removed, but if you do keep the pressures the same, then there is no differential in pressure.

Q We will assume the pressure on the edge lease is the same as the rest of the pool -- we are assuming the water encroachment is not caused by the production of that lease alone, but on the structure the water continues to replace the oil taken out --

A No, I have not said --

Q (Interrupting) If you have a water drive it will move along and gradually move up structure, and the water tends to advance according to the differential in pressure?

A Certainly.

Q It displaces the oil higher in the structure and the effect is felt on the edge leases?

A Certainly.

Q Assume the pressure is even -- take, for example, the Cusack lease; suppose water goes over that lease and wipes out the property after eight years of production life, as compared with fifteen years up structure. How are you going to give a man his oil unless you give him a reasonable allowable compared to the other leases?

A The man on the edge will be allowed to produce at a higher rate. He will get his oil out in eight years, where the man farther up will not get his out so quickly.

Q I thought your map showed lower pressures around the edge of the pool?

A No, I specifically pointed out places where excessive production

and water had caused higher pressures. The highest pressure is in the northwest end of the pool, right up against the water, in most of the maps.

Q Wouldn't you say that the large operator would be able to average up his edge wells, the loss of oil recovery, that his high wells would give him his recovery, but the small operator, with wells only on the edge of the pool, he would consider that short life a much more serious factor than the large operator?

A I would take care of the operator on the edge of the pool, whether large or small -- as has been said, every lease must stand on its own feet. There is no reason that you should be allowed an advantage if by producing that lease you have to take oil from your neighbor. Every lease should be handled as a separate unit. Everyone should make bottom hole pressure tests frequently, and you do produce your edge leases in shorter time, at a faster rate, and you get all off the edge lease through the wells on that lease.

Q Suppose, or assume you are able to have uniform pressure over the pool, and uniform pressure on all leases, the production -- allowed production to be equalized; what is there in your formula to allow for the fact that the wells have a shorter time, or life on the edge leases?

A Nothing.

Q Wouldn't you think the higher wells, using the same pressure, would produce a much greater volume of the oil underground than the edge lease would in eight years?

A I don't think because of the accident of location, any lease is entitled to take from other leases; you recognize a man's oil is under his own lease.

Q Anything in your plan to protect the edge wells, which have a shorter life? Assume they are going to be produced to keep an equal pressure? Is there anything to compensate for a shorter production?

A They wouldn't need any compensation.

Q Are they allowed to produce three times as fast?

A They would be if bottom hole pressure were properly applied; they would be allowed to produce three times as fast if that were necessary to maintain equal pressure.

Q I suppose you know that in East Texas some of them got together and gave the edge of that field additional pressure so that they produced, in the lifetime of the wells the oil under the lease?

A Yes.

Q I still can't see, in your formula, how every lease would be allowed to produce the oil under it.

A It will figure out if you make the bottom hole pressure equal, and maintain it; if the pool has no differential in pressure there can be no drainage across boundaries.

BY MR. LIVINGSTON:

Q Would that be true of adjoining properties if the permeability were different on each property?

A Yes, sir, the high permeability property would have high potential, would be allowed to produce more oil on the potential basis, than the low permeability. If the potentials do not properly adjust them, then the bottom hole pressure will adjust it, so that if one is allowed too much on the basis of potential, the next time a survey is made, you will find it low, and it will be cut. If one is not allowed enough, the pressure will be high, and the next time it will be increased, permitting that well to produce faster.

Q But does not adjusted pressure, with different permeabilities, involve a larger element of time?

A I am not certain I understand the question.

Q Stating it in different words, in the experiment we witnessed yesterday, from one tube the liquid, under apparently equal pressure, flowed faster than it did from the other, said to be tighter. I understood you to say the pressure will equalize notwithstanding the variability of permeability. But now, what I have in mind, does not that equalization take into consideration the element of time? In other words, down to twenty-four hours, or perhaps thirty-six hours, in the course of time, would the matter not be taken care of with sufficient time?

A Perhaps I can answer in this way: In the experiment yesterday, he started with equal pressure on the two tubes. Had the fluid level in the two graduates up on top,-- had the water level been kept the same; if that had produced what corresponds to six months in a well, and the fluid level lowered every time to the level of the fluid in the tube for the high permeability, that would correspond to a going well -- where you find the bottom hole pressure low, then Mr. Staley would say this well is producing too fast, and he would apply a pinch-off on it to slow it down, the rate of production for that well, until the fluid level in the two graduates were the same. That would have brought about what corresponds to equal bottom hole pressure. And then he would operate those two wells so as to keep the fluid level the same level, which would correspond to the same bottom hole pressure. If he had done that, and the porosity was the same, they were entitled to the same volume of oil production. So by the repeated making of corrections, when you find the bottom hole pressure too high, increase the rate; when you find it too low, decrease the rate, and in that way keep the bottom hole pressures alike, then the oil cannot migrate from one property to the other. You must shut in each well occasionally to find out what the pressure is, and long enough to let the well reach the maximum. In some wells, two or three hours is sufficient -- in some wells, half an hour is sufficient. Other wells, thirty-six hours might not be sufficient to give the maximum, but sufficient so that the engineer can calculate it. If you do leave the well shut in a sufficient length of time, with a good engineer, you will find his calculations within a few pounds of what it would reach.

BY MR. DEWEY:

Q Is it safe to infer from your testimony on pressures, that out in a field where the wells are drilled in the center of each forty acres, and all completed at approximately the same time, that you would only need one factor to prorate that field, shut-in bottom hole pressure?

A Let me repeat that to be sure: You are assuming equal spacing

of wells, simultaneously completed, within reasonable limits, and you are asking whether, with those conditions, if bottom hole pressure alone is sufficient for proration in a pool?

Q To obtain recovery of the oil in place.

A Yes, that is true. Perhaps I might elaborate on that answer and read a statement by W. S. Farish, of the Standard Oil Company of New Jersey, as presented to the Temporary National Economic Committee, commonly known as the T.N.E.C. I am reading from the statement as published in the Oil & Gas Journal of October 26, 1939. Mr. Farish's statement so accurately explains this point to petroleum engineers and petroleum executives that it has been widely circulated. Mr. Farish says: (Reading)

"Optimum production may be defined roughly as 'the most oil at a reasonable cost,' that is, the most oil that can be obtained without spending more on the addition to the supply than that addition is worth. The concept therefore embraces economic aspects as well as considerations of physical waste. The idea of optimum production involves several things: (1) The most economical recovery for a pool as a whole should be established at a rate that will maintain the bottom-hole pressures. (2) There should be proper well spacing to avoid unnecessary drilling costs. (3) Withdrawals of oil should be made ratably from each property owner's holdings, protecting correlative property rights and maintaining equilibrium within the reservoir. Under a condition of optimum production as thus defined, it will be possible to avoid almost entirely the injurious consequences of the rule of capture. This is the job of proration."

BY MR. WOODWARD: What was that first one?

A (Reading) "The most economical recovery for a pool as a whole should be established at a rate that will maintain the bottom-hole pressures."

Q You mean to say maintaining the pressure and equalizing the pressure are the same thing?

A It is possible to maintain pressures in part of a pool and not equalize the pressures -- going ahead with No. 3 (Reading)

"Withdrawals of oil should be made ratably from each property owner's holdings, protecting correlative property rights and maintaining equilibrium within the reservoir."

Q You mean to tell me the maintenance of the reservoir pressure is equalization?

A Exactly, equilibrium means equal balance.

Q You would not suspect he means acreage?

A Perhaps if field pressures are identical throughout the pool when you drill the first well.

Q With respect to the gas in solution --

A (Interrupting) Certainly, he wants equilibrium -- he has stated that far better than I could.

BY MR. CRAUSE:

Q Dr. Knappen, getting back to the allocation to individuals within the Hobbs Pool, you think the Hobbs Pool has been operated and regulated to obtain conservation?

A As a whole, yes, sir. There are exceptions to that rule, but as a whole it has.

Q You think the operation and regulation is better than the average pool in the United States?

A I think it is better than the average.

Q Have you any recent information to indicate the pool has been over-produced?

A I don't know what your definition of over-production is.

Q At such a rate that water encroachments are not keeping up with withdrawals?

A Certainly water is not encroaching as fast as oil is withdrawn.

Q Is that serious?

A I think not.

Q Have you any information that it is serious?

A I have no information indicating it is serious.

Q There is some positive information that is available, that is, the bottom hole pressure tests that were made?

A I know a number of tests were made.

Q Do you know what they show?

A Yes.

Q Will you tell us?

A They showed the pressures in the various parts of the pool were different, exactly as they were different on the surveys shown there (indicating map).

Q Any great difference at the beginning of the shut-down and the end of it?

A An increase in pressures in the southeastern end, as a result of drainage from the northwest.

Q Take an average.

A I don't know that there was.

Q Any great change?

A No great change that I know of.

Q Would that indicate that the water was keeping up, before the shut-down, at some reasonable rate, for the pool as a whole?

A I don't see that you can draw any conclusion from a seven-day test. The pressure did show a slight increase, but they were small. Certainly you would not expect, in seven days, to have water come in to make up for all the oil production of eight or nine years.

Q If the pool was currently over produced, as a whole, would there not have been a great increase in bottom hole pressure during that seven days?

A If there were serious over-production I would have expected pressures to increase considerably.

BY MR. RANKIN:

Q You told us that during the seven days, in this area, the pressures had increased three pounds?

A I told you the average was some three pounds.

Q As it ran, you mean?

A It may have been more in some places.

Q And you just got through telling us the seven day shut-down showed drainage from the northwest to the southeast?

A Yes.

Q You would not say the water, during the seven days, tended to increase, rather than the migration of oil from the northeast to the southeast?

A I don't believe the water drive in the southeastern area is very effective. The water encroachment map Mr. Card submitted showed it was slow.

Q Would you not think oil with gas in solution, coming from the northwest to the southeast, would encounter far greater friction, going through porosity, than the water in adjacent properties would have coming into the property itself?

A There is greater friction resistance with gas --

Q (Interrupting) You would say water is the prime mover?

A I don't think I said that, but it is true that water holds the oil in the pool to begin with -- water provides the original.

Q If you were going to drill an oil well, you would get as close to an oil well as possible?

A I would want to.

Q If you had a property with a well producing on it, and you wanted to drill another well, you would get just as close to the oil well itself as possible?

A No, I would move a reasonable spacing distance away.

Q That is the policy here. We have water abutting our property, and it is natural to suppose that water, as you say, traveling far more easily than oil, is going to travel down here, so that --

A (Interrupting) If you had the same pressure, if you equalize the pressure to the average?

Q The formation pressure would depend upon the water drive.

A No, because the water drive is not keeping up with the removal of oil.

Q Is that the reason the average field pressures have dropped?

A That is the reason the average field pressures have dropped.

Q In order to keep the pressures up, the water drive is to be considered the force that keeps the pressures up?

A I don't know to what extent, due to the policy at the present time, it is maintaining it, or whether it is simply residual pressures; both are factors.

Q I think we understand each other pretty well. Will you refer to this map (Exhibit No. 4). Will you please identify in this cross section wells Nos. 16 and 17?

A No. 16 is Repollo No. 1 Crump, and No. 17 is Repollo No. 2 Crump, in the NW¼ NE¼ of Sec. 15, T. 19 S., R. 38 E.

Q Now, we will take each well going up structure from Repollo Nos. 1 and 2 Crump. I believe practically all of the wells have allowables greater than either No. 1 or No. 2?

A I don't remember the allowable of each well. I doubt if the Stanolind, in the SW¼ of Sec. 10, has any greater allowable. I think most of the other wells have a greater allowable. Before I testify I will consult the record (Witness consults records). Your question was whether all the wells northwest of the two Repollo wells had more than the minimum allowable. The answer is that three wells have the minimum allowable, Stanolind No. 24 State, in the SW¼ of Sec. 10; Stanolind No. 26 B. L. Thorp, and Stanolind No. 8 in the SW¼ of Sec. 10. All the wells southeast of where I hold this pencil (indicating on map), all the wells southeast of the southeast corner of Sec. 4, on that section, have the minimum allowable. The wells northwest of that point have greater than minimum allowables, so far as I remember, and as I remember all do have more than minimum allowables.

Q The two Repollo wells produce from one zone?

A I believe that is true.

Q The rest of the wells to the northwest are higher on the structure, and also participate in that structure?

A That is true.

Q Every barrel taken out to the northwest, going up structure, it must necessarily, in a perfect water drive field, be replaced by a barrel of water coming in on the Repollo property?

A Not necessarily. The water may be coming in over other property to replace the oil.

Q You think the bottom hole water coming up when a number of wells have been completed, the water would not come into these wells?

A None of the water in the lower horizons, but in all of the wells farther northwest drilled in the lower horizon -- the water has not yet reached the bottom of the wells in the lower pay.

Q But you can say that wherever the thirty barrels the Repollo Oil

Company takes from their property alone, there must necessarily be thirty barrels of water to replace it, as they are on the edge?

BY GOVERNOR MILES: The point has been repeated, and the witness has answered. You should interrogate the witness and not argue with him.

BY MR. RANKIN: The only point I was trying to bring out, that every well along this profile is participating in the oil underneath the Repollo lease, and for every barrel of oil taken out, a barrel of water must come in to replace the oil, and that water comes on the Repollo lease, and therefore those wells should have a greater allowable than the wells higher up the structure.

Q Do you agree?

A I certainly do not, because oil does not move from areas of low pressure to high pressure areas. You do not have oil moving from a lease which has 900 pounds pressure up on to a lease with a pressure of 1100 pounds.

Q I am not trying to argue, but I fail to understand, if there is migration -- there was some testimony to the effect that there was high bottom hole pressure in this area, and I cannot understand why they continue to decline as they are, if they are replaced by migration.

A The answer is that migration is too slow through this area. You are taking oil out, 900 barrels per day. Well, calculate that the movement into this area is 360 barrels per day, and in addition to taking out more oil than you calculate is moving into the area, you are also taking out far more gas, and the pressures continue to drop, even if the oil comes in as fast as you take it out.

A I will admit there is slow migration, even of water, into the prop rty, due to the fact it is so impervious, which accounts for the fact the bottom hole pressures do not build up any faster than they do.

BY GOVERNOR MILES: We will be in recess for five minutes.

BY MR. CUSACK: We have a lease owned by J. P. Cusack, Inc., which is carried on the proration sheet under the Samedan Oil Corporation. It is carried that way for the reason that the Samedan is operating the property, but have no vested rights.

My purpose now is to make clear my reason for making any statement, which reason is that on the NE¼ of Sec. 28, T. 18 S., R. 38 E., when the potentials were originally taken, we had potentials there as the yardstick of 3500 barrels. Under the present formula, as used by and at the instructions and instigation of the Committee, it is now 1500 barrels. J. P. Cusack, the individual, is not here to complain about the present set-up. It simply comes to my attention at this time how unfair we have been treated by the present set-up. I will plead guilty to my share in that.

After listening to this testimony, which, in itself, is confusing -- you can take one side or the other, and -- and disadjust any fact. I am not a Harvard graduate or an engineer who can disadjust any fact -- it is just a question of belief in the testimony, but one thing I know, the bottom hole pressure has been unfair -- I think that has been admitted by everyone here, with the possible exception of the Gulf. I think Mr. Gray's testimony said it was questionable. That, in itself, means he doubts the formula. If you will take bottom hole pressures out, and put potential back, the 1934 formula, which was in effect at the time bottom hole pressure was brought in, so far as J. P. Cusack, Inc., is concerned, we are agreeable.

We are not contentious in the matter, but if there is an error, we certainly do not want to freeze that error. There are some here who seem to like to freeze things that are unfair.

The second problem, as I see it, is this: With the majority of the testimony and the fact that you can take these things and wind them around and do what you want through the engineering factor and more glib terms, and that is not very helpful -- is to place all on an equal basis. This may not be admissible. I am not testifying, but I believe at some place, at some time,

these various companies that are here today, have given all of these matters consideration, and have agreed to a flat allowable. On that basis, the leases on the edge of the pool, when they have gotten their allowable, and have been wiped out, it will show that the water pressure will drive the oil up to the top of the structure, and when the leases are wiped out, those companies who have been fortunate enough to get leases on top will still have oil in place after we have been wiped out on the edge. On the other pools they may agree to that, but if their testimony in prior meetings -- if their testimony was right then, it must be wrong now, or if it was wrong then, and right now, we should try to find out what should be done.

I thank you.

BY JUDGE LOWE: We think the principles we are advocating are sound and practical, and we are willing that they should be initiated in every pool in the state.

DR. KNAPPEN,

on the witness stand for further Cross Examination:

BY MR. WOODWARD:

Q Dr. Knappen, when did you say you went to work for the Gulf?

A In 1926.

Q And prior to that time you had been teaching school?

A I had taught at various universities from 1919 to 1926.

Q Prior to 1926 you had had no experience in the petroleum industry?

A If I might state -- I had been employed by various universities and by the United States Geological Survey and in the petroleum section of the Illinois Geological Survey, in the economic geological section, which includes oil and gas operations.

Q Since you came with the Gulf, what has been your experience with respect to production?

A I have been in the geological department at the home office in Pittsburgh for a period of slightly less than two years, and I was occupied particularly with the relationship of engineering and geological problems. In 1928 I was transferred to the executive department at Tulsa, and I have been occupied with the scientific

aspects with respect to production and pipe line operations.

Q Have you, during any of that time, been in the field?

A I have visited the field for conferences about problems. I have not been stationed in the field.

Q The principles you have announced here today, with respect to drainage, are principles well established by the text books and experts have given them a great deal of study?

A Including petroleum engineers who have worked in the field.

Q The soundness of the theory respecting drainage from high pressure areas to low pressure areas are generally admitted?

A That is correct.

Q Then, if there are any conditions in the Hobbs field which do not make that true, all the testimony you have given here is for naught?

A Why for naught?

Q Let me repeat the question: If there are any conditions in the Hobbs field that would prevent drainage from high to low pressure areas, then all the testimony you have given is for naught?

A That is not true.

Q What value is it in respect to the Hobbs field?

A Facts are facts; science is science, and truth is truth. You may have conditions in one particular place that is not taken into consideration.

BY MR. WOODWARD: Will you read the question to the witness?

(Reporter reads question).

A The answer is, that is not true.

Q You think the Commission should accept it and use it?

A I think the Commission should accept it and use it until some evidence -- until evidence is introduced to show conditions are not as I have said, are not true.

Q If it is established that there are conditions in the Hobbs field which would prevent drainage from high to low pressure areas, will you agree to the Commission that you are wrong about it?

BY JUDGE LOWE: I object to the manner of the question, what his testimony is worth -- he is asking him to pass on his own testimony.

BY MR. WOODWARD: I am asking a hypothetical question.

BY GOVERNOR MILES: It would seem to me that the testimony is the sworn statement of the witness, the testimony to the Commission, and it would be up to the Commission to determine whether it was of any value to them or not.

BY MR. WOODWARD: That is true. The point I want to make is that if facts are shown which make the application of the principles practically impossible of application, then I wanted to know if the witness would agree that the formula is wrong.

BY GOVERNOR MILES: If you prove that to the Commission, then this is not necessary.

BY MR. WOODWARD: Whatever the witness might say would not have anything to do with it.

Q Dr. Knappen, I want to draw your attention to your Exhibit No. 6, (Witness turns to map, Exhibit No. 6).

Now, Dr. Knappen, you drew a comparison between the Shell well in Sec. 20 and with the Stanolind in Sec. 15. Is that correct?

A Yes, sir.

Q The pressures you have assigned on your Exhibit No. 6 to the two wells in question is 1483 pounds pressure for the Shell well, and 1275 for the Stanolind well. Where did you secure those figures?

A From the reports of the Engineering Office at Hob s.

Q For what period?

A For the survey shown there, I believe is December, 1931.

Q Will you produce that report? (Witness produces report). Will you point out for me the Shell well, McKinley B-1.

A I have it here. It shows a pressure on December 10, 1931, of 1483 pounds.

Q Will you point out the Stanolind well?

A Would you give me the name and number of the well?

A The Stanolind Leach No. 24.

A The pressure was 1275 on November 19, 1931.

Q Is that -- will you check that sheet again, Dr. Knappen? Is that in the '30 column or the '31 column?

A Is which?

Q The Shell well first.

A The Shell well was taken December 10, 1931.

Q What column appears at the top -- what number?

A Column 1-A, dated 12-11-31.

Q Check the top of the column in which the Stanolind well appaars.

A The column reads 11-16-30. The date "11-16-30" is apparently a mistake, because there are three prior surveys in 1931, and opposite the Stanolind is the date "11-19-31", twenty-one days earlier than the Shell McKinley.

Q Then you attribute that to an error in the column?

A Yes, sir.

Q I am inclined to agree with you. I believe you testified last night that there was drainage from this well to the Stanolind?

A I do not believe I made that statement. I said there was drainage from the area in the northwest to the low pressure area, but I doubt very much if the drainage from the northwestern end of the pool, say Sections 29 and 30 and 19, I doubt very much if drainage from Sections 19 and 20 passed the high pressure area in Sections 33 and 4. There was only eight pounds difference in pressure between that high pressure area (indicating) and the high pressure area in Sections 33 and 4, so that at that time I do not believe there was drainage from that area.

Q Do you want now to chan e your testimony and say there was not drainage from that area?

A No, I am not changing my testimony. I previously testified I did not believe there was drainage from the northwestern end of the pool to the southeastern end at that time.

Q Do you think there is drainage now from the Shell well to the Stanolind?

A Yes, in this way. I am not sure that any identical barrel of oil has drained from Sec. 19 to the southeastern part of the field, but oil has come from Sec. 4 to the southeast, and the oil from Sec. 4 has been replaced by oil from Sec. 33. I am not certain that any barrel of oil has drained from that point to this point (indicating on map), from the northwestern end to the southeastern end, but oil has drained from Sec. 4, and replacing the oil from Sec. 4 has been oil from Sec. 33, and

and the oil going out of Sec. 33 has been replaced with oil from Sections 29 and 32, and the oil moving from Sections 29 and 32 has been replaced by oil from Sections 19 and 20.

Q You do not claim any direct drainage?

A Not direct drainage, not by directly moving a barrel of oil clear to the southeastern end. The oil coming from Sections 19 and 20 may not have gotten past the south line of Sec. 30. It has moved into that territory to replace the oil goingfarther southward, and in that way the southeastern area has drained the northwestern territory.

Q Dr. Knappen, I will ask you if you know what pressure is reflected by the last survey of the wells along the south line of Sections 32 and 33?

A There is only one pressure shown along the south line of Sections 32 and 33, the Gulf No. 5 West Grimes -- 1242 pounds.

BY JUDGE LOWE: What date?

A In September, 1939.

BY MR. WOODWARD:

Q I will ask you what the bottom hole pressure of Continental State No. 3 is?

A The Continental State 3-B, in Sec. 33 had a pressure of 1210 pounds at that time.

Q Drop half a mile south and tell what the pressure was in Stanolind State No. 26?

A 1220 in Stanolind State No. 26 in the NW¼ of Sec. 4.

Q I will ask you what the pressure was in Stanolind Byers No. 8?

A The pressure is not shown -- I beg your pardon, I was looking at the wrong well - Stanolind Byers No. 8 is 1210 pounds.

Q It has the same pressure as the Continental well?

A It did.

Q And the Stanolind state lease is ten pounds higher?

A It was.

Q How could oil jump over or under that?

A Because of the lower pressure -- Byers No. 8 and Stanolind No. 26 had 1200 pounds pressure, in Sec. 29, to the SW¼ NW¼ of Sec. 3, there is a ten pound pressure across there.

Q That is south of this well?

A Alright.

Q This pressure - higher pressure here is also -- what did you say, 1210 pounds pressure. Certainly on your theory the oil would not move past the low pressure against the high pressure?

A No.

Q It would not move against the high pressure?

A No, it would not move against the high pressure. It moved in the direction of this pencil (indicating on map) from the northwest to the southeast. At the same time the oil was moving straight south from the Byers No. 8, and at the same time oil was moving eastward from Stanolind No. 26, and you would have a low pressure area draining from the higher pressure leases.

Q Dr. Knappen, according to your theory, the oil just drained around the high pressure wells?

A Oil never moves from low to high pressure, naturally.

Q Moving from this high pressure down to the low pressure, with these high pressure wells in between, would you have it moving around the Stanolind No. 26 well some way to get down there?

A In moving from the Continental No. 3-B it would not pass through or close to that area (indicating).

Q Who owns those wells?

A Stanolind, Texas, Repollo, the successor of Shell.

Q And if there is any drainage, it was from Stanolind leases on to those you have mentioned?

A So far as the movement south from Stanolind it was to Stanolind or the others, and there was also drainage --

Q (Interrupting) I don't understand how it drained around that well.

A There is a general differential pressure between Continental 3-B and Stanolind No. 29 Byers; that passed here, this mark between here (indicating) some 1800 feet away from the Stanolind well, which is shown by the high pressure here (indicating).

Q Let's look at the 1935 pressure map.

A I have 1936 and 1933 -- (looking) We don't seem to have it here.

Q May we put the 1935 pressures on the 1939 map in pencil?

MR. CARD: Reading: Continental State No. 6, Sec. 33, 1270 pounds.

Q Continental State No. 5, in Sec. 33?

A 1280 pounds, putting it in in pencil.

Q Gulf Grimes East No. 1, in Sec. 33.

A 1258 pounds.

Q Stanolind Turner No. 29, in the SW¼ of Sec. 34.

A 1308 pounds.

Q Stanolind Byers No. 8, in the NE¼ of Sec. 4.

A 1283 pounds.

Q Stanolind Byers No. 8 in the NW¼ of Sec. 3.

A 1280 pounds.

Q Stanolind Byers No. 26 in the NE¼ of Sec. 4?

A 1282 pounds.

BY MR. WOODWARD: addressing Dr. Knappen:

Q Drawing your attention to the map, do you find that Continental State No. 6 is 1270 pounds, and State No. 5 is what?

A 1280 pounds.

Q The Gulf No. 1 East Grimes is 1258. Let us drop below the north line of Sec. 4, and we find Stanolind Byers No. 8 is what?

A 1283.

Q Is that higher or lower than any above the line?

A Lower than any of the wells --

Q You mean 1283 is --

A It is higher.

Q State No. 26 Stanolind, 1282, is that higher or lower than the wells above?

A It is higher than any of the wells you have indicated in Sec. 33.

Q Take Stanolind Byers No. 8 in the NW¼ of Sec. 3, 1280 pounds. Is that higher or lower than any of those wells?

A 28 pounds more than the SW¼ of Sec. 34.

Q Take Stanolind Turner No. 29?

A 1308 pounds.

Q Is that higher or lower?

A Higher than the south offset by 28 pounds.

Q Dr. Knappen, why didn't you prepare an exhibit of the pressures

in 1935?

Q We prepared four exhibits, showing the time when the proration plan was changed, and we were afraid more would tire the Commission.

Q You did leave out the 1935 survey?

A We left out many surveys. There was a survey made every six months.

Q Explain how the oil gets down to the southeast end of the field, does it go over or under this high pressure area?

A From over here in this high pressure area (indicating).

Q You mean to say the oil comes way around here (indicating)?

A No, I don't mean the oil travels through this, to the low pressure area down in here. There is a high pressure area on the north line of Sec. 4, the northwest corner of Sec. 3, at the time.

Q It does not come right across that?

A It does not come in a straight line. It always moves from high pressure to low.

Q Let us turn back to the map with the hump (Witness turns to Exhibit No. 10).

You are familiar with the wells that have set gas packers?

A In a general way. I have prepared a map showing the gas packers, if you would like to have it.

Q Could you approximately outline where the gas cap comes to by the gas packers?

A No, I couldn't without the data. I will have the gas packer map in a minute. (Produces map). There is a map which shows the gas packers and the water packers.

Q Let us go to this big hump, now, from your map --

BY GOVERNOR MILES: (Interrupting) Is this map which you are reading from now been introduced as an exhibit?

A No, it has not. I did not intend to show that. It may be material and we may enter it as an exhibit.

BY MR. WOODWARD: It may become very material.

A We are perfectly willing to introduce it as an exhibit.

BY JUDGE LOVE: We have no objection.

Q From your packer map, will you indicate in the record what kind

of a map you call it?

A A verticle section.

Q Will you indicate on that vertical section the Shell McKinley No. 4 in the W½ of Sec. 19?

A It is not on that section.

Q You have the wrong cross section. (Witness turns to Exhibit No.4). Now can you locate the approximate location of the McKinley No.4?

A The Shell McKinley No. 2 is the offset to Shell McKinley No. 4.

Q Will you make a dot there?

A Whatever you say.

Q Now, at what sub-sea depth is the packer set in that well?

A We don't possess that data. I don't know.

Q Do you have that data with you, Dr. Knappen?

A I am not certain whether we have it or not. It is in the report of the Hobbs Engineering Committee.

BY MR. CARD: I have a map showing it, if you want to accept it.

A I am not sure --

BY MR. WOODWARD: We will leave it subject to your inspection.

For the purpose of this examination I am not asking you to agree or disagree with facts.

A As soon as I am satisfied they are facts, I will readily agree. I never disagree with facts.

Q Have you got McKinley No. 4?

A The depth of the first setting or the recent setting?

Q The last?

A The last was set at -474.

Q Will you put a dot on that map approximately where that falls?

A (Making dot) Approximately there.

Q Take McKinley No. 3.

A McKinley No. 3 is the diagonal offset to this same McKinley No. 2.

Q 476 sub-sea depth?

A Only two feet different than the other numbers. The packer, according to our record, is -533.

Q Let us turn to Humble Bowers A-1, in the SE½ of Sec. 30, is that No. 1 or A-1?

A It is A-1 and B-1.

Q The NE¼ of 30 -- the SE¼ of Sec. 30, that should be No. 5 -- A-5. The Bowers A-3 in the SW¼ of Sec. 29, the sub-sea depth is 461?

A 461.

Q This one was 471 (indicating on map). Now, Stanolind State No. 26, in the SE¼ of Sec. 33?

A 459 feet.

Q Correct. Now, Dr. Knappen, we will lay a straight-edge across this cross section of yours where the packers have been set. Does that mean everything above here is gas? Is that all gas up above there?

A In the particular wells where packers have been set it has been abandoned for oil production, yes, sir.

Q This gas cap, standing up here at the top, has pretty well cut this off?

A No, I would not say that, because you have this here (indicating).

Q I asked if the gas cap had not pretty well leveled this formation off? Here the gas will cut off everything above the gas?

A Not the adjoining wells.

Q Where there is gas, everything above that in adjoining wells has been cut off?

A Not the neighboring wells.

Q Where the packers have been set, everything above the gas, then?

A Still not in the neighboring wells.

Q Everything above in that well the gas has cut off?

A Not in the neighboring wells, that one yes.

Q In the production section, down here, past the center, toward the south, are the production sections toward the north in these wells, it is approximately the same, isn't it?

A I am not sure I know what you mean. That the production section is approximately the same on the south and north?

Q Yes.

A The total thickness of that pay is approximately the same, yes.

Q That is better. What is the matter with straight acreage then?

A If you mean to say that because the thickness of the producing pay is the same, you are ignoring the quality of the pay. The

quality of the pay is very different in different wells. The only way to determine that is --

Q (Interrupting) Just answer my question.

A As an expert witness I have a right to explain an answer. To say the same thickness of pay will produce the same amount of oil is to make a mis-statement, and I will not do that.

Q The production section is approximately the same?

A I told you it was, but the quality is different.

Q I thought you said it was, but the quality was not.

A The production section is approximately the same thickness, but not the same quality.

Q You have extended this section out here to the Stanolind dry hole. What was the closest producing well to that inside of your cross section?

A The first producing well is the Repollo No. 2. The closest producing well is the Texas No. 1, south.

Q That should have been cut off right along there (indicating on map) to stay within the production area?

A Yes, that is quite true. It is entirely possible the bottom of the section should have been drawn to 595, producing a cross section at this level (indicating on map). That was drilled in tight, impervious section. At that time, at the same level, it is entirely possible there was oil production. We have been generous and drawn the line here (indicating).

Q This map would be an inch and a half too long, taking this dry hole?

A No. As I tried to explain, when you would not listen, the exact position of the water line is not known. In No. 1 State they found oil at 610 -- I don't mean that is the highest where oil was found --

Q (Interrupting) Wait a minute. This is a cross section?

A From the northwest to the southeast.

Q This is the length -- this represents the length (indicating)?

A That is lying vertically.

Q You kept on going until you hit a dry hole?

A Surely.

Q What is the scale of this cross section in length?

A The horizontal scale, measured sideways, is one inch to 1500 feet.

Q What is the scale, the perpendicular scale?

A One inch to 25 feet.

Q If you put the horizontal scale on the same basis as you did the perpendicular, how long would this be (indicating cross section)?

A It would be sixty times as long as it is now.

Q Are you sure of that?

A Sure.

Q Would it really be that long? How long is it here?

A Roughly, two feet -- two feet -- 26 inches.

Q Sixty times that would be 120 feet long?

A That is right, if the vertical were the same as the horizontal.

Q If these bumps were stretched out sixty times this long, would that be reduced (indicating cross section)?

A No, the difference would be there.

Q This difference that you have, that would not be the true condition?

A It will be the true condition as a geologist would draw a cross section. I said last night that the slope is only four and a half feet in two miles and a half, it is so flat the slope is only one degree to the southeast, a slope so gentle it is barely discernable.

Q In the field?

A I made no point of these particular pumps.

Q In the field there is a very, very regular thickness of the pay section?

A No, sir, not at all. That is what I pointed out.

Q You testified this --

A (Interrupting) They pay section only occupies a portion of this. You keep going back to the bumps. There is a very uniform slope to the southeast, very gentle -- this is greatly exaggerated in this section. The slope down from the crest to the southeast end is one per cent, barely perceptible. From the northwest it is one third of one per cent, only a man with his eyes trained could see it.

Q If you have uniformity in the production section, would you say that acreage would be entirely wrong in allocation?

A No; if you have uniformity in quality you would have uniformity in bottom hole pressure.

Q What makes the variation in uniformity?

A Variation in porosity in the pay -- variation in the porosity and permeability.

Q Is there varying porosity in this field?

A Tremendous.

Q How do you measure the porosity in a lime field?

A By taking cores of rock.

Q Did you ever see a core from the Hobbs field?

A I have not.

Q Did you ever take a core here (indicating)?

A I have not.

Q Did you ever take a core here (indicating)?

A I am inclined to think there were a few cores taken in the northwestern part, and no cores taken here (indicating).

Q Don't you know, as a geologist and a scientist, that you can't take cores in a lime field?

A No, sir, we can.

Q That represent porosity?

A We average an 80% recovery in a limestone core. It has been said you can't take cores in limestone, but the Gulf does. We do.

Q You are better than most then.

A Perhaps you would like to have me make an explanation.

Q If you can.

A You cannot get a core from a cavity. When you have a cavity four feet across, you get no core. Accordingly there are sections where you get no core; but with an area of this kind, we will get two cores out --

Q (Interrupting) Then you say there are cavaties through the field?

A I said there were cavaties on top, not the flanks.

Q How do you go about taking a core in one of the caverns?

A I just explained you could not. I said where you have caverns, you get no core.

Q How do you know there is uniformity in porosity throughout the top of the structure?

A I don't know there is. I have testified repeatedly there are variations in porosity and variations in permeability in the top of the structure.

Q The more cavernous a formation is, the more permeable?

A Yes, assuming the caverns are connected, and they almost always are.

Q Would you say permeability has anything to do with porosity?

A Not necessarily. Permeability is the measure of the composition of the rock to permit fluids to move up through it. Porosity is the measure of the open spaces. It is possible to have high porosity and low permeability. Pumice may have so much porosity it will float on water, but have no permeability. Nor is high permeability associated with high porosity.

Q I take it from what you say it is possible to have just as much oil in the tight sections as in the porous sections up here (indicating on map)?

A As a theoretical proposition, it might occur. Bottom hole pressure shows --

Q (Interrupting) What do you say bottom hole pressure is?

A The pressure of the fluid in the reservoir.

Q What causes bottom hole pressure in the Hobbs field?

A Originally it was caused by the water on which the oil floated. The pressure at present is caused by the pressure of water from the flanks and pressure of gas escaping from solution.

Q Then we have a gas cap pressing down from the top and water pressing in from the edges acting to maintain the pressure in the field?

A That is true.

Q We find on this section there are different parts of the field where you find different bottom hole pressures?

A Correct.

Q What does the bottom hole pressure represent, any portion of the original pressure?

A If that has not been destroyed by the removal of oil - they

have been restored by the movement of oil and gas.

Q What causes pressure to be greater in spots than in others?

A As a general rule, if you have wells of equal depths, near one another, the well with the higher pressure -- the well with the high pressure has re oved a smaller percentage of the oil around the well.

Q Wouldn't you say the water coming in from the edges and the gas pressure would cause that?

A They are things that maintain the pressure. That, and also a great deal of residual pressure that has been there since the field was opened up.

Q You do not have an intrusion of water or an expansion of the gas cap until the oil has been removed?

A No.

Q Isn't it reasonable to suppose that the well that has removed the most oil would have the higher pressure?

A No more reason to suppose that than to suppose the opposite -- the one removing the most oil; other things being equal.

Q Let me call your attention to this, in applying a pincher to a bottle, as in the experiment here, the bottle does not have outside pressure, and that is where your theory falls down?

A That is not where the theory falls down -- you have distribution of pressure through the field. That is the reason you have migration of oil. The pressure is all the time attempting to move the oil from the areas of high pressure to those of low. Down in this area (indicating) you are taking the oil out faster than the oil and water will come in, and they are making an area of very low pressure.

Q Permeability is the measure by which a fluid will move through a porous medium?

A That is correct.

Q Then the more permeable a well is, the more readily water will come in?

A The more readily any fluid will move through it.

Q We are talking about water.

A That is only one factor affecting water encroachment.

Q The more fluid that moves in, the greater the pressure build-up?

A No, water is not coming in fast enough to build up the pressure.

Q I call your attention to the southwest flank?

A You are overlooking the distinction between maintenance and build-up. Water is not coming in fast enough -- the encroachment has maintained the pressure to some extent.

Q The fact that water comes in more easily, the pressure will be maintained, and you said it came into the more permeable well easier?

A Yes.

Q Then it must be so that wells with high permeability have the highest bottom hole pressure?

A Not necessarily.

Q What is the supposition?

A The bottom hole pressure in the well is a question of what percentage of oil has been removed and how much drainage there has been to or from it.

Q Therefore, the more oil you take out, the more water will come in, and the easier it comes in, the more pressure you have got in the bottom of the hole?

A If you have an adequate supply of water to come in there. As I tried to explain, the operator being flooded must take the oil promptly. Therefore, the bottom hole pressure is high, and he is entitled to take the oil faster, but he is not entitled to take the oil from below his neighbor and he should not be permitted to take oil from his neighbors. He is entitled to get the oil before water encroachment floods his property.

Q You said the permeability is no measure of the oil in place?

A That is true.

Q If it is no measure of the oil in place, why should a high potential well, a high bottom hole pressure well have any greater allowance than a low one?

A Because the oil moves to the area of low pressure from the high, to equalize the pressure. The high pressure property is entitled to produce the oil and reduce the bottom hole pressure to an equality with the rest of the field. That is true whether it is

permeable or slightly permeable.

Q You have admitted a high pressure well would not have any more oil in place?

A No, I didn't admit that. I said theoretically it was true if you have high permeability. I don't know what the facts are. The only measure of bottom hole pressure, if you take oil out, the pressure must go down. If you take more than your share, if my bottom hole pressure is greater than that of my neighbor, the oil goes there.

Q Someone questioned you about the intrusion of water from the edge, and I think you said there was no intrusion there of water?

A No, I said it was slow, I did not say there was not any intrusion. All of these wells in the southeastern part of the field produce large volumes of water. To correct that, to hold your well's equilibrium, it is necessary to set packers, therefore it is possible to produce water as fast as it intrudes, and that is the reason the water is not moving across the field. That often happens.

Q Dr. Knappen, which will move through the formation more easily, oil or water?

A If you are trying to start an oil well, and if the oil occurs with the water, it will move through more easily.

Q We do have some water intrusion down here? (Indicating on map).

A Certainly.

Q Why dosen't the water come into the field from the southeast flank?

A It may be you are producing water just as fast as it comes in. We have a number of pools where it is produced just as fast as it comes in, and the water has not advanced across the pools.

Q Do you have high or low permeability?

A Low permeability.

Q As a matter of fact, isn't it true that with low permeability, that the water will not come through as fast as the oil?

A No, I will not say that. It will not come through much faster.

Q If the water will not flood this area (indicating on map) until this oil comes down here (indicating) you have one type of permeability --

A I do not say you have the same sort of permeability on Sec. 10 The permeability is higher on the north, therefore you have a better chance for the oil to come in than for the water.

Q I don't quite understand. If this is so low in permeability that the water will not come through --

A (Interrupting) We are assuming it is the same permeability all across there (indicating on map).

Q I am talking about the southeast end.

A That is not true.

Q Is there any great distinction in permeability in the southeast area?

A Yes, sir.

Q How far up?

A There are very high potential wells on the south line of Sec. 4, and the south line of Sec. 3. I don't mean 20,000 barrel wells, but you do have ten and fifteen thousand barrel potentials, while a mile south you have one to five thousand.

Q Weren't these wells acidized?

A Yes, I presume they were.

Q Do you know what the potentials were before acidation?

A I don't know as to the particular wells. I know the acidation campaign was very unsatisfactory because the permeability is so low.

Q It is a fact we did not get as large potentials by the use of acidation as the more permeable wells?

A Certainly.

Q There was a greater percentage of increase in the low permeability well than the high?

A Oh, yes, when you add a thousand barrels to a thousand barrels you have a greater percentage of increase than if you have 20,000 to start with.

Q By acidizing these wells, you made from your three to five thousand barrel wells, twenty to some, approximately, 23,000 barrel wells?

A You say three to five thousand barrels?

Q Yes, and by acidizing they were from three to five times as good?

A You say three to five times as good as the best wells. You see

you have different permeability along the south line, low permeability, as compared to the high permeability along the north line.

Q Dr. Knappen, I want to ask you this question: If the oil had not been in place when you used the acid, how could you increase the potential? If the oil had not been down in the ground, how was it possible to increase the potential?

A You couldn't.

Q The oil was there?

A Certainly.

Q When you used acid you increased the permeability?

A Increased the permeability immediately around the hole.

Q The potential is a measure of permeability?

A Potential is a measure of permeability, yes.

Q Then when you prorate that field on potential, you are prorating it on permeability?

A Surely.

Q And permeability is no measure of the oil in place?

A No. Let me explain that. If the well potential is not satisfactory as a yardstick, and needs to be corrected by bottom hole adjustments, you may get too high a potential, that is the reason you do not prorate any pool on potential alone.

Q Do you say, Dr. Knappen that permeability is not a measure of bottom hole pressure, or bottom hole pressure is not a measure of permeability?

A No.

Q Tell me why, then, when this pool is shut in, all the pressures do not equalize?

A They will if it is shut in long enough.

Q If permeability has nothing to do with bottom hole pressure?

A Give it time and you will have the same pressure. In twenty years you will have very fair bottom hole pressure. High permeability simply gives an opportunity for bottom hole pressure to equalize. Do you get the distinction?

Q I get the idea, as in this room, the more windows you open, you get more wind blowing through?

A Yes, sir.

Q And the more pressure you will have in the room?

A That depends on what windows you have on the other side.

Q And in this case, the more permeability, the more pressure?

A No.

Q If that is not true, and permeability has got nothing to do with pressure, why isn't --

A (Interrupting) May I say, permeability provides the opportunity for the pressure to equalize. When a well is producing, and you reduce the pressure in and around the well, if the permeability is high, the pressure will equalize at the intake quickly; if it is low, it may take twenty-four, thirty-six, forty-eight hours for the pressure to equalize. As between two areas a mile apart, it takes the maximum to equalize across a distance. Where the permeability is high, the pressure equalizes more rapidly.

Q Because the pressure will work more easily?

A It will drain off from high to low.

Q It will --

A (Interrupting) The wind will never blow into a room where there is a pressure trying to force the air out.

Q Dosen't that presuppose permeability is a measure of bottom hole pressure?

A No, you are confused. Permeability is a measure of the rock the fluid can travel through, if the fluid traves through easily, it has high permeability. You could drain every drop of fluid out of a structure, and your permeability would remain exactly the same, but bottom hole pressure would be tremendously different.

Q You are familiar with the 15-day shut-in they had at Hobbs?

A I have heard of it.

Q Are you familiar with the bottom hole pressure measurements made at Hobbs?

A I know a number were made.

Q You know it to be a fact that a great deal of difference was found in those pressures?

A Surely.

Q Why didn't they equalize?

A Because fifteen days is far too short a time for the bottom hole

pressure to drain the oil from the northeast down to the southeast. Doing the best it could, 360 barrels a day is not enough to make up for the 900,000 barrels produced over the past five years.

Q You have an average of a three-pound build-up?

A On some seven or eight wells.

Q What was the equalization up on the higher permeability?

A No difference after the first twenty-four hours.

Q They built up much faster in the permeable area?

A Yes, on the west line lease, high permeability, we have had wells we cannot discern the difference by the bottom hole pressure in a shut-in. There must have been one pound difference to bring the oil into the well, but this was so slight when it was producing it was not discernible.

Q You did have high pressure?

A Yes, sir, and we had an awful lot of oil.

Q You did have a high permeability section?

A Yes, sir.

Q You still say permeability is not a measure of oil in place? You could have a tight section and have as much oil as you had in this section?

A No.

Q The porosity then?

A You cannot have as much oil in porous rock as you can in a cavern, if you have 100% floor space, you would have more space to be filled in than if the room were filled with furniture. We may have had more than you could have had in any rock of low permeability.

Q You have calculated this drainage down into the Stanolind area, you calculated that as 518,000 barrels?

A 551,000 barrels.

Q On what basis did you calculate that?

A On the basis of the differentials in pressure of the wells north of, and the wells south of the red line through the wells previously described. The differences in pressure which show consistently on every pressure survey that has been made, showing the tendency of the oil to move from the north to the south across

the line, using the formula Mr. Tasch explained to the Commission.

Q You used the formula in Mr. Muscat's book?

A That is right.

Q Isn't it a fact that formula is confined to homogeneous fluids?

A No, I don't know it is.

Q Isn't it a fact that the same book of Mr. Muscat's says the problem is determined the same way to determine the flow of hetrogeneous fluids --

A (Interrupting) We have used the formula on the basis of flow through rock, on the assumption that the oil did not carry a large volume of gas. We reduced it from 1.8% to 1.25% so as to take care of possible gas coming out of solution.

Q Your figures are on the basis that that oil coming down structure had no gas in it?

A I did not say how much oil -- I said the drop in pressure would move the oil.

Q As an engineer, wouldn't you say that gas had come out of solution?

A Yes, it probably was coming out.

Q Some gas in the solution?

A Certainly.

Q Would you say there were any other properties mixed with the oil?

A You can't mix properties.

Q Would you say any other fluid was coming down structure with the oil?

A There was no indication there was any water in that.

Q Then what you did was apply the formula which is designed to determine the flow of homogeneous fluid?

A That is right.

Q I want to ask this: We determined all the upper part, in certain wells is gas?

A That is true.

Q That is, in the upper formation?

A Perhaps I should qualify that and say that primarily the gas operates as a shut-off.

Q This shut-off operates so there is no possibility of the oil ever

passing to the lower formation and being produced through that?

A That is true.

Q If this upper formation is primarily gas, how could you drain the oil down to the southeast part of the field?

A This upper formation is continuous. The oil is contained in the formation on the northwest side, around the northeast flank and on down the southeast part of the pool.

Q You don't claim the fluid moves through the cas cap?

A No.

Q The movement is around it?

A The movement is around it, and part travels through the wells from the upper to the lower, and moves over into the low pressure area. Unfortunately we do not have a map that shows that exactly.

BY GOVERNOR MILES: We will be in recess for five minutes.

(Dr. Knappen continues on witness stand for cross examination)

BY MR. WOODWARD:

Q Dr. Knappen, did I understand you to say a moment ago that in calculating the amount of drainage you claim from the north to the south, to the Stanolind leases, you had made some adjustments in permeability because of gas in solution?

A Yes, sir.

Q What adjustments did you make?

A We reduced the productivity factor from 1.8 to 1.25 -- approximately a 33% decrease.

Q How did you calculate that reduction?

A Experimental curves, in laboratory work, which showed there would be a 75% decrease at the maximum decrease for such conditions, as compared to the initial condition in the pool. The productivity was determined after a drop in pressure of 20%. Normally, a 20% drop in pressure should correspond to such a decrease. We thought we should make a 37% adjustment. We made a 65% to be sure.

Q Has there been any published or accepted formula?

A Dr. Muscat published a paper on the change in permeability of gas and oil sands saturated with gas and oil, after the pressure

is reduced and the gas comes out of solution.

Q These calculations you made from laboratory experiments represent conditions as they exist at Hobbs?

A As closely as we could, yes.

Q Now, if you were positive those conditions were accurate in the laboratory, why did you put in this additional factor?

A Because, as I said, we wished to be generous and set the figure plenty low.

Q You were not sure of the figures obtained from the experiment?

A Not precisely, no, we did not know, we had no way of knowing what percentage of the original oil in place had been produced from the formation.

Q Then the figures you obtained must be more or less guess-work?

A No, not guess-work, engineering calculations.

Q You have given an additional factor, over and above the laboratory work, to make sure of being generous. If you were sure of your figures, it was not necessary to give that additional factor so generously?

A Every capable engineer puts a factor of safety into their work to take care of any possible flaw.

Q Dr. Knappen, when you multiply two by two, do you put in any safety factor?

A No. Do you?

Q Now, Dr. Knappen, with respect to drainage that we were talking about a moment ago, from north to south, which you said could have gone around the northeast edge --

A (Interrupting) If I might interrupt right there -- I was not entirely fair. I said it had gone around the northeast side. It could also have gone over the top, because you will see the oil in this area, the northwest part of the field, it is higher than the top of the sand break in the central part of the field. This section (referring to map) is not drawn to the highest part of the field. If it had been drawn so, we would have shown the northwest end of this section at a point indicated by my finger (pointing on map), and we would then have had our oil shown some 80 feet higher than the top of the sand break in the highest part

of the pool, although there has been so many wells set with packers, there is nothing to prevent the oil migrating through the lower portion of that.

Q It did not migrate through the gas cap?

A It could very easily, while a packer has been set at such a point as this, 450 feet, it does not mean that area is barren of oil. As a conservation measure, if it was abandoned, shut off from production, as shown, it may still have had 50% of the original oil when it was abandoned.

Q Isn't it a fact that packers have been set, either for water or for gas, along the center of the field, from east to west, directly north of the north line of Sections 4 and 3?

A What is that?

Q Isn't it a fact that packers, for either oil or water, have been set in wells, from east to west, along the north line of Sec. 4?

A Yes, that is true, and along the north line of Sec. 5 there are packers in every well.

Q And part of Sec. 3?

A No, there are no packers in the three offsets, according to my information.

Q The Samedan well out on the edge, Terry Nos. 1 and 2, I should say are high pressure wells, aren't they?

A There is a little too much detail to remember (looks at records). In one the pressure is 1225 pounds, and the other the pressure is 1185 pounds, on the last survey.

Q It isn't likely there has been very much drainage through those packer wells, or around to the extreme northeast edge of the field, is there?

A Not through the packers. There will be drainage through all of the forty.

Q Does the fact that packers have been set indicate a gas cap?

A Gas or water.

Q And there is very little oil to be drained?

A No, we have set packers when we were producing 10,000 cubic feet of gas with one barrel of oil. We may have abandoned a formation when we have less than 50% recovery of oil. We do not want to

waste the gas in the pool; it is for the benefit of all. We may have left large amounts of oil in the gas cap. The northwest end of the pool is higher than the sand break in the center, and under the influence of the higher pressure, there may be a large migration of oil above the packer, through the lower portion of the gas cap.

Q You agree with me that the oil did not move from here clear down to here (indicating on map)?

A I said no single barrel of oil had moved from the northwest to the extreme southwest.

Q Now you say it will?

A I have not said that. I said if oil moves a mile, and that oil is replaced by oil that has moved from there, and that has gone on consecutively, you have taken oil away from the extreme northwest to the extreme southeast.

Q The only migration of oil that may have gone out of the gas cap is oil abandoned by the operators?

A It has been in that particular well. In the West Grimes lease we have set a gas packer, and we are producing from that same pay horizon. It has been abandoned because of too high gas-oil ratios, and we are still down on the flank recovering the oil.

Q Therefore, there was no drainage from your wells up structure?

A In that particular case they were taking part. The well pressures were still too high, and there is still drainage to the low pressure areas.

Q Going back to pressure, I call your attention to the exhibit of Stanolind. There are twenty wells represented there on the exhibit. I believe the testimony showed ten wells had an increase of potentials, and ten wells had decreases, although all twenty wells had decreases in bottom hole pressure. (Referring to Stanolind Exhibit E).

A Oh, yes, the average pressure in the pool has declined and I know of no wells that have maintained their original pressure.

Q You testified that bottom hole pressure was used in some 12 to 15 pools you were familiar with?

A I happen to know those, possibly there are many more.

Q Do you know of any pool where potentials are increased in the face of dropping bottom hole pressure?

A Yes, sir.

Q Where?

A The South Burbank Pool, and it was done on a few leases in the Moore Pool.

Q Don't you know the present plan is that bottom hole pressure in the South Burbank and Moore will be discontinued?

A I know they will discontinue it and that your company is in favor of the plan and it was of great benefit to the Gulf in the Moore Pool.

Q As to the proration formula you suggest, 75% potential and 25% acreage, would that not increase the allowables of the high potential wells at the north end of the field where large quantities of water are being produced?

A I presume it would.

Q Wouldn't that lead to waste?

A No, it is the only means of operating the high pressure wells so the operators could recover the oil under the property. There is no place those operators are draining oil, and the only way they can recover the oil is to take it before the water comes in. The only fair thing to do with a high pressure property wherever you have one, is to give it an increased allowable so that the operator can secure the oil before another operator drains it away.

Q The more water you produce, the more reservoir pressure you lose, isn't that a fact?

A No.

BY MR. WOODWARD: I believe that is all for the present. I would like to have the opportunity to ask Dr. Knappen some more questions tomorrow if we find it necessary.

BY GOVERNOR MILES: In view of the fact that we have another hearing on the oil and gas ratios set for tomorrow at ten o'clock, whihc it is necessary to hear -- I know Mr. Andreas has to leave, and some of the others here -- I doubt whether we are going to be

aole to finish all the testimony. How much longer do you think it is going to take in this particular case?

BY MR. WOODWARD: I have two or three other questions to ask after consulting with the engineers here, and if anyone else has any questions to ask, I would suggest that we go ahead.

BY GOVERNOR MILES: You would be able to finish from nine until ten o'clock in the morning?

BY MR. WOODWARD: I can finish tonight.

Q You read from an exhibit last night in which, I believe Mr. Wahlstrom and Mr. DeFord were discussing the physical charatteristics of the Hobbs Pool. Do you have that?

A I believe I have, or a copy of it.

Q Will you turn to page 77? You will find a paragraph which has this statement, "It may be said it was the most productive member of the White lime". Dr. Knappen, will you read to the Commission the paragraph on page 77 which commences "The top productive member of the White lime --"?

A I am reading from page 77 of the article by Ronald K. DeFord and Edwin A. Wahlstrom, published in the January, 1932 Bulletin of the American Association of Petroleum Geologists, the article being entitled simply "Hobbs Field, Lea County, New Mexico", on page 77 you will find the paragraph I am reading:

"The top productive member of the 'White lime' is cavernous on the crest of the structure, fairly porous on the flanks, and off structure is in places only very slightly porous, in other places somewhat porous. On the flanks, the lower porous member, particularly the 'Caps pay((all relatively unimportant on the crest), generally yield much more oil than the top member."

Q Now, Dr. Knappen, you read the same paragraph yesterday, didn't you?

A I am not sure I read it. I may have. I read a number of paragraphs.

Q The record will show. Why didn't you read the last sentence of that paragraph?

A I said I don't remember whether I read that paragraph or not.

Let's see -- I introduced the exhibit for the benefit of the Commission. I had no intention of omitting the last sentence, "On the flanks, the lower porous members, particularly the 'Caps pay' (all relatively unimportant on the crest), generally yield much more oil than the top member." The Capps pay was unimportant. The acidation of the Capps pay on top of the structure has tremendously increased the pay on the top zone. I had no thought of misleading the Commission. If I did, I am sorry.

Q I believe you claim, Dr. Knappen, that bottom hole pressures are not indicative of oil in place. Do you claim that?

A Bottom hole pressures are not indicative of oil in place, except if you have high bottom hole pressure, as compared to a neighboring area, that indicates that the area has not produced its fair share of oil. A low bottom hole pressure would indicate it had produced more than its share. Obviously that refers only to pay. One might drill a water well off structure and have a very high bottom hole pressure, but if you have very high bottom hole pressure with all water, he would never get an allowable.

Q You do not contend that because a well has high bottom hole pressure, it does not have any more oil than the low?

A It is not a measure of the amount of oil, but the percentage of the oil one will produce in comparison to what another will produce.

Q Is it not a fact that instead of being a measure of the oil produced, it has been a measure of the oil and water and gas that has come out of solution?

A No, it is not a measure of those things. Remember, bottom hole pressure simply indicates the oil being drained underground and from high to low areas.

Q What compensating factor do you have for the water produced?

A I don't think any compensating factor is necessary. When the operator produces all the oil under his land, he will plug in the hole.

Q Wells are still producing oil and have produced a large amount of water; how have they been compensated?

A In part by the bottom hole pressure adjustments, but it has been applied to only a small part -- if it were applied to 75% of the allowable -- we do not have the pressure map of Hobbs survey as made in 1939.

Q It is true the relationship -- rather say, there is no relationship between the oil in place and the shaft pressure adjustments?

A At the present time -- when you say "shaft pressure", you mean bottom hole pressure?

Q Yes.

A At the present time bottom hole pressure is negated, and we have developed low pressure areas with drainage of oil from the rest of the pool. I am not sure I have answered the question.

Q The think I am trying to bring out is the fact that you are contending for bottom hole pressure adjustments?

A Exactly.

Q But you make no compensation for the great amount of fluid produced previously?

A I see no reason. It is the present bottom hole pressure as compared to other areas. If the pressure is too high, oil is being drained.

Q Do you want to give every property the opportunity to recover the oil under it?

A Just as far as we can, and the only way we can -- the oil is never going to come from low pressure areas and move against high pressure.

Q You seem to be in the minority among engineers I have talked to.

A Perhaps they would like to testify.

Q You testified this morning respecting factors used in determining the value of properties for purchase?

A I named a few, not all by any means.

Q Do you, as a purchaser of property, do you consider and inquire into what the shut-in pressure may be of a lease or property?

A Most certainly.

Q How much weight do you give that?

A It depends on the property and the pool. Shut-in pressure frequently gives the best measure of the recovery reservoir under

the property. I don't mean I apply that to every property -- there is a wide difference between pools. We do certainly investigate the shut-in pressure.

Q You know the west side leases, in East Texas, have the highest pressure?

A I think --

Q And you know the western, or west side leases have the least oil in place?

A Certainly.

Q It would not work in that case?

A I did not say --

Q You would not work with that alone?

A I would use shut-in pressure as one factor.

Q You would work ~~with~~ bottom hole pressure either way?

A No, not either way. The west side leases in the East Texas Pool are entitled to produce at a higher rate; the oil is leaving the west side properties, and they are entitled to a higher rate of production a day. If they don't get it now, the oil will get away.

Q The same thing is true of the edge of the Hobbs pool?

A If a lease's history is one in which the pressures are high, those leases must get the oil shortly, or they will lose it. I tried to say to Mr. Ray that some properties may be depleted in eight years, some in twenty-five, and the man whose property will be depleted in eight years should be allowed to keep down to the pool average. Nobody should be allowed to put pressures below the pool average.

Q That was not the case with the Stanolind, on the southwest flank, they were not given such pressure adjustments?

A I don't know the application of the proration rule. They should have been given a pressure adjustment factor if the pressures were higher than the pressure in other leases in the pool.

Q You know by setting packers, we did not have the advantage of the pressure adjustments you have been talking about?

A I testified, or Mr. Gray testified the packer adjustment has not been sufficient to take care of the packer wells. I testified

adjustments should be made, though it will lose the Gulf money.

Q You don't know how much?

A The Engineering Committee has a definite formula. It will cost the Gulf some oil, but it is the fair thing to do and should be done.

BY MR. WOODWARD: I believe that is all.

BY COL. ATWOOD: Cities Service does not desire to avail itself of the opportunity to cross examine this witness, or to recall the witnesses who have gone before. We are anxious to save time and get the matter to a close. After hearing the testimony submitted here by the proponents of the different plans, I am authorized to state that Cities Service has receded from its position of wanting the status quo maintained, and now favors the plan proposed by Gulf, of 75-25%.

BY MR. FLEETWOOD: I would like, for reasons of expediency, to ask if I could be permitted to state one question -- I will guarantee that it will be only one question, because of the objections here, I would like to state the question and have the Commission pass on whether Dr. Knappen may answer.

BY GOVERNOR MILES: We will allow you to state your question.

Q Dr. Knappen, eliminating all reference to the testimony heretofore given at this hearing as to this particular field and the characteristics of the Hobbs Pool, and asking you to keep in mind only the general characteristics of oil in place, bottom hole pressure differentials, drainage, migration, thickness of pay, porosity, permeability and desirability of the proration formula, we wish to ask if the general geological, engineering and production facts to which you have testified here, are they applicable to other pools to the same, or similar degree as they are to Hobbs, and if so, would they apply to a pool such as the Monument Pool in New Mexico?

A Certainly the general principles that I have been discussing apply to Monument, Eunice, or any other. Some of the factors present at Hobbs are not present in some of the other pools. There are geological variations, and variations of various types which, to the best of my knowledge, are present in all

pools. However, the potential, ownership of the oil and the geological principles involved in proration are just as applicable to Monument, or any other pool, and I think they should be applied.

BY JUDGE LOWE: If applied to Monument, would it be necessary to take open flow potentials before thinking of a plan?

A No, sir, it would be entirely satisfactory at Monument to make tests to determine the productivity factor; that is, the number of barrels of oil which a well will produce for every pound of pressure in the ground. They would give the same information, and such tests would be recommended for a pool like Monument.

BY MR. RANKIN:

Q Do you know of any field in Lea County that is of the same structural shape as the Hobbs Pool?

A No, I do not.

Q It is the only one in Lea County of that type, to your knowledge?

A That is true.

Q In the Hobbs Pool, in the crest of the structure, one zone is gas drive, and another zone is water?

A Yes, the northeast side, you have no water encroachment because the formations are tight. You do have water encroachment in the southwest. So that is surely gas at the northeast end.

Q I believe you said the water level around the anticline sometime was level, just like, or something like a dome with the rim of the dome being water?

A So far as water in the pay, but on the northeast side the dolomite changes to anhydrite. The pool, especially in the dolomite on the northeast side of the field, the anhydrite and clay are found to such an extent there is no water drive on the northeast side. There may be some places where the water is coming in.

Q There probably is water around the structure?

A I am not at all sure. Such evidence as we have indicate there probably is no water along much of that northeast side.

Q We will assume this is the apex of the structure right down through the middle (indicating on map). This side of the apex (indicating) you wouldn't have a very effective gas drive, where-

as to the other side of the apex you do have an effective water drive?

A No, sir, you have an effective gas drive, but on the northeast side it is not driving it up toward the crest, but down toward the flank. The gas cap formed on top there pushes the oil down into the low pressure areas.

Q As a geologist, would you say there is any relationship in the structural conditions between a text book anticline and this Hobbs reservoir to the other pools in this area?

A There are many similarities.

Q The structural conditions are not the same in any way whatsoever?

A I would not say they are not the same in any way whatsoever.

Q You could not compare the production characteristics of both types of reservoir as being identical?

A No, sir.

Q You could not use the conditions at Hobbs as a --

Q (Interrupting) No, your statement is too sweeping. Many of the conditions and many of the suggestions I have made about Hobbs could be used elsewhere.

Q Anywhere else where oil and water and gas are in it?

A Exactly.

Q The structural conditions are not at all identical?

A They are not identical; there is some similarity.

BY MR. WOODWARD:

Q Do you know of any field where bottom hole pressure is used, where you have ascending potentials and descending potentials, although you have decreasing bottom hole pressure?

A I think in most places, instead of increasing the potentials, they increase the allowable. We have, in the Hobbs Pool, increased the potential by adjustments for bottom hole pressure in order to increase the allowable. Most pools have not changed the potential numbers, they have changed the allowable.

Q You know of no place where bottom hole pressure is declining and some wells get an increase and some a decrease?

A Yes, that is what bottom hole pressure adjustments are for.

Q You don't get the question. Do you know of any pool where you

have both a declining bottom hole pressure and one well gets an increase and another a decrease?

A Yes.

Q Where?

A Kettleman Hills and Yates. You said where you had a declining pressure. You didn't say declining at the same rate. I know of no place where it is declining at the same rate, where both started from the same level, but I do know many where they are not declining at the same rate. That is what bottom hole pressure adjustments are for. Both will start at a different level, and one will decline and one will persist above the average of the pool, --

Q Wait a minute --

A You wait a minute. You keep talking about potentials. The umpire does not say "potentials", he sayd "adjusted potentials". It is the old original potential after adjustments for bottom hole pressure have been made. Nobody claims -- in a well with 10,000 potential, nobody claims that is actual potential.

Q Adjusted potentials is what you want to base allowables on?

BY GOVERNOR MILES: Is this testimony pertinent to Hobbs?

A Yes, sir.

Q Don't you know, as a matter of fact at the Yates pool, that any time there is an increase in bottom hole pressure, they get an increase in allowable?

A Exactly.

Q And decreased in the same way?

A That may be because the pressure is maintained very uniformally. Just as soon as Yates pressure begins to drop, you will find the same thing.

Q They are both decreasing at Yates?

A I don't know.

Q What is the pressure formula at Yates?

A I don't know. I testified that bottom hole pressure is used at Yates.

Q You testified it operates like this one.

A I don't think I testified to that exactly. I testified the

the allowable is changed as the pressure went up and went down.

Q What is the formula at Kettleman Hills?

BY GOVERNOR MILES: It does not seem to me this is necessary.

BY MR. WOODWARD: I want to make this statement. He has been testifying positively about these things --

BY GOVERNOR MILES: He has been testifying about the conditions in the Hobbs Pool.

BY MR. WOODWARD: He said Kettleman Hills had bottom hole pressure, and I want to show he does not know what the formula is. That is all.

BY MR. HUBBARD:

Q I would like to ask one question. Dr. Knappen, you are acquainted with what I presume is the rather erratic distribution of adjusted potentials in the Hobbs Pool?

A I am familiar with adjusted potentials, yes.

Q Would you, or would you not call the distribution of potential extremely irregular, not to say erratic?

A No.

Q Same pay thickness on the same contour?

A It may easily be that some people would call it erratic. I would say that adjusted potentials have not been adjusted fine enough to take care of the wide differences in bottom hole pressure; that means there must be an erratic potential. We know we had erratic porosity to start with.

Q Would you or would you not say that to achieve your stated end, of equalizing pressures over the Hobbs Pool, that the goal could be reached much more quickly if your true potential were used entirely, and start adjustments based upon bottom hole pressure?

A If you make sufficiently large bottom hole pressure corrections, yes.

Q Then, as a matter of fact, to achieve your end, you would prefer using potential with the same weight as bottom hole pressure, and thus throw out potentials?

A No, not with the same weight.

BY MR. HUBBARD: That is all.

BY GOVERNOR MILES: I want to be sure -- is there someone who wants to bring out any other points? I don't want to close off any testimony.

BY MR. HARRIS (Two States Oil Company):

Q I would like to ask a series of questions leading in the direction of the practical operation of a plan, thinking primarily of the problem of water. We are in the northeast section of the pool. You testified you thought it probable that was sealed off. On the other hand, I think the water must be encroaching across the north end of the field?

A It is coming from the northwest and moving southeast.

Q We have very real interests in that direction. As I understood, you said you did not approve of a flat allowable plan, or the same allowable for all wells?

A No, certainly not.

Q In a water drive field, would you consider it advisable or practical to let the water drive work, to use the water drive as a source of energy?

A Certainly.

Q Under your theory of production, is it desirable to keep the bottom hole pressure as high as possible?

A As high as possible without having any inequalities between different leases.

Q Under your theory of operation, is it desirable to keep all leases with constant equal bottom hole pressure?

A So nearly as that is possible, yes.

Q This stops oil moving across boundary lines?

A This stops oil moving across boundary lines.

Q Would you attempt to do this actually if permitted to use your theory?

A Certainly.

Q Why?

A Because under operation as it is at present, a great many inequalities have developed, and vast quantities of oil have been moving from one lease to another. The only way an operator can secure the oil that remains under his land is by bringing his

pressures to an equality, to a substantial equality, a 50 or 75 difference over the pool is probably as close as one could hope for.

Q I would like to make this thing specific, and my remarks are directed to the northeast and northwest corners of the field, where, I understand, we do have water drive, and still have high bottom hole pressure; have we any reason to believe water is moving into the structure from the southeast?

A Yes, that is true.

Q Which leases are first exposed to that water?

A The west side of the pool, the northwest side of the pool.

Q We are said to have normal high bottom hole pressure -- or high bottom hole pressure, is that a normal condition?

A I am not sure of what you mean by "a normal condition".

Q Would you expect that to be so?

A I would not expect to have so high a pressure as they have if they had been adjusted by bottom hole pressure.

Q Where will this arrangement be able to reduce the bottom hole pressure, to bring the pressure down to an equal basis?

A By giving a greater allowable.

Q Of oil or water?

A Allowable in terms of oil.

Q And how much fluid will have to be produced to hold, or to reduce the bottom hole pressure?

A I don't know; that would depend on each individual well.

Q Instead of using a well, let us use it as an area. In other words, to make it a line of wells, or a section in which the wells have water, would you be able to answer that question?

A No, I could not tell.

Q Would it be reasonable to suppose they would have to produce as much water as had encroached for that day, plus their allowable oil?

A They would have to produce as much water as had encroached that day in order to keep the pressure constant. They must, therefore, produce more fluid than the volume of water coming on to the lease, to reduce the pressure.

Q We have two factors, as I understand, working in our favor; we have the factor of the gas cap, which is released gas due to reduced pressure; that is a displacement item, is it not, takes up some room?

A- It takes up room. I don't know that you would call it displacement.

Q I am trying to remove that from the question. The other item, in order to maintain anywhere near equal pressure, is the amount of water encroachment?

A If you are going to maintain the pressure constant, yes.

Q That means, therefore, that subject to this gas displacement, if any, we must have water encroachment of some kind?

A I don't see why it is necessary. Necessary to what?

Q You must have water displacement when you remove the fluid, to take up the space and hold that pressure, you must have something to maintain it?

A Oh, yes.

Q And that source of maintenance is encroachment of water, is it not?

A Yes.

Q Now, to get back to your theory, we have assumed that that well, to reduce its pressure, must produce more water than encroached on the lease that day?

A That is correct.

Q Then as to a line of wells -- whatever it may be, they must, in effect, replace the oil which has been -- it must produce the oil -- if they must produce as much oil as would encroach on that lease every day, that goes back to the previous statement of yours -- if the water were produced, what would the encroachment or displacement factor be?

A I don't know what you mean.

Q What I am trying to do is to fill a void, a void created by withdrawals.

A When you take out a barrel of oil, you must fill the space with gas or water, or seal it off.

Q The only way to fill it by gas is to reduce the bottom hole

pressure?

A You do reduce the bottom hole pressure when you take out a barrel of oil.

Q Getting back to the perfect working of your theory, we arrive at the point where this line of wells must produce all of that water to maintain their relative position with the rest of the pool, and if we produce all of the water we have taken away at least one of our sources?

A All of the water? You mean during that day?

Q Yes.

Q You wouldn't have to produce the water. You can produce an equal volume of oil.

Q That is correct. The factor then works to the effect that these -- we have to come to another assumption -- the water encroaching would displace production to certain portions of the field, and probably in several parts there is an encroachment or increase of water?

A Several places water is coming in to replace the oil taken out.

Q However, if one produces the fluid, whether it be oil or water, the withdrawal of that fluid for those leases would equal the total production of all the rest of the field, would it not?

A No.

Q Modified by the space taken by the released gas?

A I think I see what you are meaning. Yes, every barrel of oil taken out of the field must be -- the space must be filled by water or expanding gas, or gas coming out of solution. Every barrel of oil taken out must be replaced by water coming in or gas coming out of solution.

Q Then to make -- we are the edge lease owners -- to make my point clear, you have stated that bottom hole pressure factor is not adequate, if you are going to work upon that basis. On the other hand, that would mean certain wells were being flooded, and certain wells are being currently flooded, and as the factor comes across here, those wells, under your theory, must be allowed to produce an equal amount of oil with the lease -- with the rest of the field?

A No, not an equal amount.

Q Of fluid?

A No.

Q Would that be approximately so?

A No, nowhere near that.

Q What would be the condition?

A You have a vast gas cap that can and will expand to replace that.

Q Then we run into the offsetting disadvantage, that by these tremendous withdrawals, if we gave half of that oil to that area, we have a pool allowable, and the middle section immediately gets penalties to make up for these washed over leases?

A That is right.

Q Then if we do anything less than that, the bottom hole pressure, on the average in the pool, will drop?

A Yes, they have been dropping right along.

Q If I actually attempt to handle the water in the northeast corner of the pool, in which, as I understand -- I believe your own testimony said that -- the oil and water are coming in together.

A I believe that is true in the northwest.

Q So that we will have to handle oil and water. We are handling fluid instead of oil, whatever that may be, and if we do not adjust the big pressures daily, at the rate the fluid is withdrawn, which means the water taken out and the oil taken out, then we will have a resultant general loss of energy for the pool?

A Well, the energy used to raise water and oil to the surface.

Q You have assumed the gas cap would expand. We have to protect the washed over leases. That is what we are attempting to do, and when the lease has been washed over --

A (Interrupting) It has produced the oil there.

Q As long as the water is from that direction and is washing the oil with it?

A I would not say that as long as a lease is producing oil, it has not produced all the oil.

Q We get to this point: This lease gets where it must necessarily produce a lot of fluid, whether oil or water, to keep its relative position; if it be water, and if we attempt to maintain an equal

rate of flow per well, in the middle of the pool, we are going to be withdrawing fluid more rapidly than now?

A That is what I have been urging from the high pressure property.

Q What you are trying to do now is keep a balanced pressure?

A Yes.

Q With the result that the gas cap builds up and the bottom hole pressure goes down and the field is injured by all this water before it gets into the field. I question whether that be conservation. May I ask this question: the water drive is here; shouldn't we use it in the interest of conservation, and if we do, wouldn't we get into an impossible situation in the ultimate working of the theory, from the standpoint of conservation, and if so, why pick on the specific point, 25-75, or 40-60, or 50-50? Why that particular one, 25-75?

A There is no magic in that number. It is the percentage that worked satisfactorily before. You could use a different set of percentages, if you would make the bottom hole pressure take care of the difference. But the smaller you make that figure, purely on the unit basis, the larger you make the adjustment figure, the more quickly you stop migration of oil from high to low pressures.

Q You would not assume, under the proposed plan, you would level out pressures?

A Oh, no.

Q My question here is, you would make no such assumption, if there is a certain amount of slippage in it, then why name a percentage?

A What do you mean?

A In other words, it gets down to a question of what is practical, and there are lots of factors involved in what is practical, among them being the economic factor, the production of the lease. Can we logically assume, that is -- have we any absolute control on the percentage as picked out?

A In order to apply the principle the Commission must use certain numbers. As I said, there is no magic in my numbers, 25-75. It might be 10-90, 20-80 or 70-30. The smaller they make the amount of oil on a flat unit basis, the more quickly they will stop in-

equities. Some number must be written. I would not presume to dictate, and couldn't if I would, and would not if I could.

Q Practically, my questions all derive from protection for the edge wells against the big middle, with equity to them, in that they are allowed to produce their oil; if you don't go the whole way, there is an amount of slippage, and those wells or property is being damaged.

A Amount of slippage? I am not sure --

Q I mean the difference between being theoretically perfect and positive operation, or practical operation.

A I don't want to be unfriendly, but I don't understand.

Q What I am trying to say is this, the theory perfectly worked, whatever its ultimate result with regard to what the leases produce, the oil, would maintain positive pressure as among all units?

A Positive?

Q Constant, equal pressure between all units?

A That is true.

Q When we commence to get into the question of practical application of the plan, we must vary from the perfect theory in some respects?

A Certainly.

Q And when we get away from this perfect theory, in operation, we immediately get away from perfection, in operation, as soon as we depart from perfection?

A We are no longer --

Q (Interrupting) The difference between perfection and operation -- as shown by actual operation under any plan which may be used, that is what I call slippage.

A Now I understand, Perfect, theoretical perfection would mean no allowable in the pool on the basis of acreage, and all allowable would be distributed on bottom hole pressure. I would not recommend any such plan. Theoretically the wells there would have absolutely no protection. Things might be set up, theoretically desirable things to most quickly achieve a uniform pressure throughout the field which would be absurd in practice. 25-75 was the ratio or percentage under which the pool operated for

a period of six years and gave quite satisfactory results. We thin, if we would go back to that, we would again move closer to the thought of equity. It would not give absolute equity; there would still continue unfair drainage to lower areas.

Q As between wells, or properties, even with this system, we would not attain absolute equity, but we would, in your opinion, approach it?

A We will approach absolute theoretical equity. Absolute equity would require the shutting of all the low pressure areas until the high pressure drops down to their level, and of course, that is impossible.

BY MR. WOODWARD: Would you recommend pulling the packers from those wells to get equity?

A I would not recommend it --

Q (Interrupting) They would still have high pressure? The only thing a man can do that has set packers is to pull them out and get a big potential on his well?

BY MR. RAE:

Q Speaking about the value of potentials, does the amount of gas available near a well have anything to do with the amount of oil that the well flows?

A Certainly.

Q May it not be true that the Gulf's high potentials are due to the fact that they are near the gas cap and had enough available oil to make an abnormal flow?

A I think not. If they are in the gas cap, they have so much gas coming out of solution that the oil will not come.

Q I suppose you understand that with 20 or 30 feet of gas, and if the well is drilled two or three hundred feet lower, the natural consequences might be that it would add to the flow, enough to give a better flow?

A It would assist in giving a larger flow.

Q Those big wells do have a great porosity in the upper zone?

A Both in the upper and lower zone.

Q I think all statements indicate the upper zone is more porous?

A More porous.

Q You think, in this area, the gas is forcing the oil down toward the flanks, and that it is possible the Gulf leases are really somewhat depleted?

A It is unquestionably true that a lot of oil has been taken out of the upper pay in all wells where packers have been set.

Q In reference to the part of the packer pays, suppose you require the Gulf to produce from the zone in which the packer has been set, from the gas zone. Isn't it true that the high gas ratios would cause the Gulf pressure to decline very fast, and the reason the pressure is high is simply due to the fact that the Engineering Committee allowed the Gulf to shut in the gas, which kept them from knocking the pressure down, and at the same time, take oil from the lower zone, and not being penalized, but using the field average; that you consentrated on the second zone -- isn't it possible that some of the wells have really lower pressure than the field average, and are getting oil from other leases?

A If you were to open up production above the gas packers, we could produce oil from above the gas packer.

Q And your pressure would decline?

A Surely, but we would waste a terriffic amount of gas and decrease the field pressure.

Q Wouldn't you assume the gas-oil ratio would prevent waste, abnormal waste?

A I hope there would be a control.

Q If that would happen, you would not be able to waste that gas, and it might not be possible for the Gulf to produce enough gas to make its allowable?

A No, because we have low gas-oil ratio.

Q With packers set in the wells, which are keeping you from producing your allowables in the depleted zones from which you have established potentials?

A True.

Q Wouldn't you think it fair to force operators to produce from the zone they are supposed to come from, and not from another zone? If bottom hole pressure is so important, we would make each lease ride on its own feet.

A You wouldn't want to try to set packers?

Q I certainly don't want to go bottom hole pressure entirely. The point I am making, the Engineering Committee have done a great deal for the operators in allowing them to produce from the lower zone, and if the pressure goes down, they are not penalized. Then if you are going to use bottom hole pressure to build up potential and the field is put on a basis of 75 potential to 25, I would say you should compel the operators to produce the oil from the particular zone on which pontentials were extablished. We know that with high gas-oil ratios, the pressure would decline. I think if the operators were compelled to do that, the high pressures would quickly disappear. If you are setting bottom hole pressure as the measure, the oil should come from the zone where the potentials have been set up. Suppose you have a gas-oil ratio of 2,000 feet per barrel, and the Gulf would try to make its allowable --

BY JUDGE LOWE: Are you questioning the witness or making a statement?

Q Then the condition set up in the various parts where you have built up potential, that would be insufficient. I have agreat deal of doubt whether there is oil left in the upper zone. The Stanolind wells have largely gone to water in the upper zone. That has pushed the oil up. Your statement was those that have gone to gas have pushed the oil down, and I thin, if we are going to bottom hole pressure, probably, Dr. Knappen, you might say, or give your opinion as to whether you are getting undue credit for potential, or getting credit for the higher pressure, that you should be compelled to produce oil from the zone in which the pressure is set up.

A I don't think that would be fair. If I were to speak for the company, I would be glad to eliminate the advantage given by gas packers. We have only four or five gas packers, and if I were to speak solely from a company point of view, we could pick up 25 to 50 barrels a day allowable if we were to eliminate that advantage given to packer wells. If that were done, we would find people operating wells without packers, we would find a terrible waste of gas. I think the program the Engineering

Committee has followed, of giving some advantage to the well for setting packers, is conservation engineering, and conserves the energy and the gas in the field. I think the program is a reasonable program. I don't know if we can balance out on every well and say how many barrels -- but setting packers is the same situation as trading anything -- it may be a good trade for us. The operators have made a trade among themselves. We have said we want to conserve in this field, and we will, therefore, give an advantage to any man who sets a packer, give him an advantage for setting a packer.

Q That is the very point I was making, the reward for setting the packer has been given the owner of the well, in letting the operator produce oil from the lower zone. Then after that operator has been duly rewarded, then he comes in again and wants additional advantages --

Q (Interrupting) The pressures are not taken in the packer wells.

Q You wouldn't want them taken there, if reserves are drawn on severely and the pressures are lower.

A I frankly don't see, if pressures are not taken --

Q (Interrupting) You are producing oil from an entirely different zone from which it is supposed to come from, and have been rewarded for that.

A And that is the trade made.

Q What you are asking for is a reward for setting a packer, which is given to you, and an additional reward as you were producing oil in the zone from which it should come from, you would have lower pressure.

A I am afraid I don't follow you.

BY MR. RAE: I wish to offer in evidence, in view of the articles which were put in evidence by Mr. Wahlstrom, the testimony given by Mr. Wahlstrom at a hearing on December 12, 1936, in case No. 6 -- I think that is on file with the Commission, and let that record be submitted as part of this case.

BY MR. GODDARD: If the Commission please, in view of the nature of the testimony offered here, I know it will take the Commission some time to consider it and digest the matter, and I would like

to ask the Commission for a substantial time to file a statement with the Commission before they decide the matter.

BY MR. DEWEY: Is it proper to have all reference to Monument stricken from this record?

BY GOVERNOR MILES: Yes, if that is agreeable to all operators.

BY MR. SETH: Could we have fifteen days after the transcript is prepared?

BY (Reporter could not get the name): There are a number of companies whose representatives are not here now, and in view of the representations made, they would like to be heard. Could we recess until nine o'clock in the morning, at which time a full quorum of the operators in the Hobbs Pool would be here?

BY GOVERNOR MILES: Any other statements to be made? If not, the Commission will take the matter under advisement until tomorrow morning, and the Monument case will be heard at nine o'clock, and then the oil-gas ratio hearing will be at ten o'clock, and the Commission will take this matter under advisement until then.

DECEMBER 9, 1939

Pursuant to recess the Commission reconvened at nine o'clock, A. M. on December 9, 1939, whereupon the following proceedings were had:

BY GOVERNOR MILES: The Commission has decided that this matter is closed. If anybody has any objections, they can write to the Commission. I don't think we want to consider further testimony; they can make their statement in writing, and the testimony that has been put in in this case will be all that will be considered in this case.

---oOo---

C E R T I F I C A T E

I hereby certify that the foregoing and attached two hundred and twenty pages of typewritten matter are a true, correct and complete transcript of the shorthand notes taken by me on the 7th and 8th days of December, 1939, in the hearing before the Oil Conservation Commission, in Case No. 14, to consider revising the Hobbs Proration Order.

Witness my hand this 3rd day of January, 1940.

Esther Barton

OIL CONSERVATION COMMISSION

SANTA FE, NEW MEXICO

December 30, 1947

Mr. Glenn Staley
Proration Office
Hobbs, New Mexico

COPY

Dear Glenn:

The Commission adopted Order No. 738 allocating 133,000 barrels of oil daily for the month of January 1948.

Pursuant to Order No. 562, Case 49 (Loco Hills Maintenance Plan Order), the top allowable for the Loco Hills Pressure Maintenance Project shall be 33 barrels of oil daily for the proration month of January 1948. For Loco Hills Gas-Oil ratio use 3,000.

The Commission approved nomination of 4,300 barrels per day and schedule of reallocation of allowable for Maljamar Cooperative Repressuring Area for January 1948.

Very truly yours,

RRS:bpw

cc: N. M. Oil & Gas Ass'n. 313 White Bldg., Roswell, N. M.

American Petroleum Institute, 50 W. 50 St., New York, N. Y.

Frank Gardner - Sinclair-Prairie Oil Co., Midland, Texas

Case No.

14 FILE 1

Application, Transcript,
Small Exhibits, Etc.

MINUTES OF THE MEETING OF THE OIL CONSERVATION COMMISSION HELD SEPTEMBER 12, 1941

The Commission met in the Governor's Office in Santa Fe, New Mexico, September 12, 1941.

PRESENT: Governor John E. Miles, Chairman
State Geologist John M. Kelly, Secretary

The Commission transacted the following business:

The Commission promulgated the following orders:

The Commission adopted Emergency Order No. 396, to endure for the last half of September, 1941, bimonthly proration period, for the continuance of Emergency Order No. 258, in the matter of temporary proration for the Artesia-Grayburg-Jackson-Maljamar Area, Eddy and Lea Counties.

The Commission adopted Order No. 397, to endure for the last half of September, 1941, bimonthly proration period, for the continuance of Emergency Order No. 259, in the matter of application for gas-oil ratio adjustment.

The Commission adopted the following order:

BEFORE THE OIL CONSERVATION
COMMISSION OF THE STATE
OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:

CASE NO. 14
ORDER NO. 398

THE REVISING, MODIFYING AND AMENDING
THE EXISTING PRORATION PLAN FOR
HOBBS FIELD, LEA COUNTY, DESIGNATED
AS ORDER NO. 48, OF THE COMMISSION.

ORDER OF THE COMMISSION

BY THE COMMISSION:

WHEREAS, ORDER NO. 329 promulgated by the Commission December 31, 1940, for the revision of Order No. 48, the Proration Plan for the Hobbs Field, Lea County, reserved in the Commission jurisdiction for further determination as to all other matters in said Order No. 48 not affected by the changed provided for in Order No. 329;

WHEREAS, the Oil Conservation Commission [illegible]
June 25, 1941, [illegible]
be necessary for [illegible]

IT IS NOW THEREFORE ORDERED [illegible]
day of [illegible]

Sec. 2. Productive units shall be classified as marginal and non-marginal, a marginal unit being one that cannot produce the acreage unit allowable, and a non-marginal unit one with an average daily potential production equal to or larger than the acreage unit allowable. Marginal units shall be allocated approximately the amount of oil they can produce.

Sec. 3. The total allocation to marginal units shall be deducted from the total daily field allowable and the resulting number of barrels shall be designated as the total daily non-marginal field allowable.

Sec. 4. As far as possible, the field shall be divided into forty (40) acre tracts in the form of a square, constituting regular subdivisions of sections according to the Government surveys. Each such tract shall be considered a unit for the purposes of proration hereunder. If it should develop that there are tracts of land owned by individual operators or lease holders constituting less than a unit as above defined or in such form as not to constitute a unit as above defined, then the Commission in its discretion may create and outline fractional units or units of a form other than a square. However, 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.

Sec. 5. The following 40-acre units not in the form of a square shall be considered as regular units for proration purposes:

Walker Terry G, N-1/2 SW-1/4 SE-1/4 and N-1/2 SE-1/4 SE-1/4 Sec. 10, T. 19S., R. 38E.

Walker Terry G-a, S-1/2 SW-1/4 SE-1/4 and S-1/2 SE-1/4 SE-1/4 Sec. 10, T. 19S., R. 38E.

Honolio Crump B, N-1/ NE-1/4 NE-1/4 and N-1/2 NE-1/4 NE-1/ Sec. 16, T. 19S., R. 38E.

Honolio Crump B, S-1/2 NW-1/4 NE-1/4 and S-1/2 NE-1/4 Sec. 16, T. 19S, R. 38E.

[illegible] N-1/2 NE-1/4 NW-1/4 and N-1/2 NW-1/4 [illegible] T. 19S, R. 38E.

[illegible] S-1/2 NW-1/4 NW-1/4 and S-1/2 NE-1/4 [illegible] R. 38E.

[illegible] pool of the non-marginal field [illegible] among the various units without [illegible] of pressures; all forty [illegible] and each fractional [illegible] allocation [illegible]

Sec. 8. The Commission each [illegible] bottom hole pressure of each well in the field, provided that for each well in which the bottom hole pressure cannot be determined for mechanical reasons, such well shall have assigned to it the bottom hole pressure of the nearest well in which a bottom hole pressure is taken, or if equidistant from two or more wells in which bottom hole pressures are taken such well shall have assigned to it the average of the bottom hole pressures of said equidistant wells.

Sec. 9. The Commission shall notify the operator of the day and hour that a well is to be shut in for bottom hole pressure test. The bottom hole pressure shall be measured not less than 24 hours nor more than 36 hours following said specified time. Notice to the operator shall be given by the Commission not less than 24 hours before the time for the well to be shut in. The well shall produce its regular allocation during the 24-hour period ending at the time the well is shut in.

Sec. 10. Pressures shall be taken as nearly as possible at a common datum level of 400 feet below sea level and all pressures shall be adjusted to that datum, and correction shall be made in ~~gas or oil~~ depending on the medium in which the bottom hole pressure gauge is stopped.

Sec. 11. Wells completed during a proration period [illegible] between bottom hole pressure surveys will be allocated the average non-marginal unit allowable for the field until static bottom hole pressures can be taken. Then these pressures shall be used in determining their allowable for the following periods.

Sec. 12. Allocations to the Hobbs [illegible] shall be determined according to the plan of Order No. 1 of the Commission, "General State Proration Order", adopted June 20, 1935, and Order No. 45, "Revision of Order No. 1 of the Commission 'General State Proration Order'", adopted November 12, 1936. Allocations to the field and the wells therein shall be included in "General State Proration Orders" of the Commission. This order supersedes any provisions of Order No. 1 or other orders [illegible] is in conflict, is in lieu of Order No. 33, [illegible] Order No. 48. The Order herein shall become [illegible] first day of the proration month next following [illegible] adoption.

OIL CONSERVATION [illegible]

(SGD) JOHN H. MILES

JOHN H. MILES [illegible]

Albuquerque
July 19, 1951

The Honorable Joe L. Martinez
Attorney General
Santa Fe, New Mexico

Dear Mr. Martinez:

I respectfully request your official opinion with respect to the constitutionality of the New Mexico Oil Conservation Act of 1935, as amended, (New Mexico Stat. Ann. Sec. 69-203 et seq. 1941) as against the challenge that it constitutes an unlawful encroachment upon the appointive power of the Governor and attempts an unconstitutional delegation of legislative power to the executive branch of the Government, that is, to the Oil Conservation Commission, in violation of Article 3 of the Constitution of the State of New Mexico and as against the contention that certain provisions of the Act are void for the reason that they are not clearly expressed in the title of the Act as required by Sec. 16 of Article 4 of the Constitution of the State of New Mexico.

A more detailed summary of the grounds on which the constitutionality of the Act is challenged may be stated as follows:

(a) Because the legislature has named the members who constitute the Oil Conservation Commission, the Act is unconstitutional, as invading the executive power of appointment, in violation of Art. 3.

(b) The Act is unconstitutional because it

delegates to the executive department of the government, in violation of Art. 3, powers which are in their nature essentially legislative in so far as the Commission is vested with the power:

(1) To restrict production of oil when the Commission determined this to be necessary to prevent waste;

(2) To make rules and regulations to prevent waste;

(3) To establish state, field, and well allowables (the power to establish "state" allowables is, of course, embraced in the power to restrict production);

(c) The Act is unconstitutional because it does not establish a comprehensive standard defining and prescribing the conditions and circumstances under which such Commission can exercise the delegated powers. (This may also invoke the due process clause of the state and federal constitutions, although no reference is made thereto).

(d) The Act is unconstitutional because its provisions authorizing the Commission to make rules, regulations, and orders for the prevention of waste are so vague, indefinite, and uncertain as to establish no ascertainable standard governing the exercise of such powers (this being clearly the same objection as set out in (c) above, stated differently).

(e) The Act is unconstitutional, as violative of Article 4, Section 16 of the New Mexico Constitution, because the delegated power, by issuance of orders, to limit production of oil in the state when it determines this to be necessary to prevent waste is not clearly expressed in the title to the Act.

As you will see from the enclosed motions in the matter of U. S. v. Paul S. Brown, et al, one to dis-

miss and one to suppress, a number of procedural objections are levelled at the conservation and proration orders of the Commission. In the event any of these orders were adopted without a hearing having first been held pursuant to notice, or without the attendance of a quorum of the Board at any hearing held, would such defect, in your opinion, render such an order invalid.

Please accept my thanks for your courtesy in this matter.

Very sincerely yours,
EV[illegible] M. GP[illegible]
United States Attorney

MAURICE SANCHEZ
Assistant U.S. Attorney

MS:h

U. S. Supena Duces Tecum

DISTRICT COURT OF THE UNITED STATES

The United States vs. Humble Oil and Refining Co., and Humble Oil & Pipe Line Co. et al.	)	No.	16,498 16,499 16,500 Criminal

To: Mr. R. R. Spurrier, Director of the New Mexico Oil Conservation Commission, Santa Fe, New Mexico.

YOU ARE HEREBY COMMANDED to appear in the DISTRICT COURT OF THE UNITED STATES FOR THE District of New Mexico, at the Courthouse, in the city of Santa Fe, in said District, on the 13th day of August A.D. 1951, at 10:00 o'clock A. M. of said day, and also that you bring with you and produce at the time and place aforesaid the following:

The written minutes of all meetings of the New Mexico Oil Conservation Commission relating to Commission Orders Nos. 398, 637 and 798, and proceedings had in reference to said Orders or to antecedent Orders affecting or relating to Orders Nos. 398, 637 and 798, including any and all Notices of Hearings and records of Hearings with respect to said Orders and any antecedent Orders related thereto.

Also, all written minutes of the New Mexico Oil Conservation Commission relating to the following monthly proration Orders:

1948 Month:	N. M. Oil Conservation Commission Order Number
January	398 - 235 637 ~~798~~ 738
February	~~749~~ - P. 275
March	~~753~~ P. 277
April	~~757~~ - P. 279
May	~~762~~ - P. 282
June	~~771~~ - P. 285
July	~~773~~ - P. 289
August	~~782~~ - P. 292
September	~~783~~ - P. 293
October	~~789~~ - (illegible)
November	~~790~~ - Set Schedules
December	~~797~~ - do

	New Mexico Oil Conservation Commission Order Number
1949	
January	804
February	811
March	812
April	813
May	820
June	822
July	827
August	833
September	834
October	837
November	841
December	845
1950	
January	852
February	A-2
March	A-3
April	A-4
May	A-5
June	A-6

together with the record of all Hearings with respect to any and all of said orders, and all Notices of said Hearings, with Proof of Service or Publication thereof.

then and there to testify on behalf of the Defendants and not depart the court without leave thereof.

WITNESS, the Honorable CARL A. HATCH District Judge of the United States, this 16 day of July A.D. 1951, and in the 176th year of the Independence of the United States of America.

WM. D. BRYARS
Clerk

By /s/ Mayril Warner
Deputy Clerk

(SEAL)

U.S. Attorney.

Affidavit of Publication

State of New Mexico, } ss.
County of Santa Fe }

I, C. B. Floyd, being first duly sworn, declare and say that I am the (Business Manager) (~~Editor~~) of the ~~Santa Fe~~ ~~New Mexican~~, a daily newspaper, published in the English Language, and having a general circulation in the City and County of Santa Fe, State of New Mexico, and being a newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 of the Session Laws of 1937; that the publication, a copy which is hereto attached, was published in said paper ~~once each week~~ for one time ~~consecutive weeks, and on the same day of each week~~ in the regular issue of the paper during the time of publication, and that the notice was published in the newspaper proper, and not in any supplement, ~~once each week~~ for one time weeks consecutively, the first publication being on the 14th day of April, 19 45 and the last publication on the ~~day of~~, 19~~45~~; that payment for said advertisement has been (duly made), or (assessed as court costs); that the undersigned has personal knowledge of the matters and things set forth in this affidavit.

Manager

BILL

time at $ 5.88

times $

Tax $

$ ~~6.88~~

Subscribed and sworn to before me this 16th day of April A.D. 1945

Notary Public

My Commission expires

June 30, 1945

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION
COMMISSION

The Oil Conservation Commission hereby as provided by law hereby gives notice of the following hearing to be held at Santa Fe, New Mexico, at 10 a. m., May 14, 1945:

CASE No. 62
In the matter of the petition of the Gulf Oil Corporation for revision of Statewide Proration Order No. 558 to provide for increasing the oil allowable progressively according to depth for pools producing below 6,000 feet.

CASE No. 63
In the matter of the application of Stanolind Oil and Gas Company for an order of approval of the Mascho Area Unit Agreement, Lea County, New Mexico, embracing as the Unit Area:

In Township 21 South, Range 33 East
All of Section 36
In Township 21 South, Range 34 East
All of Sections 31 and 32
In Township 22 South, Range 33 East
All of Section 1
In Township 22 South, Range 34 East
All of Sections 5 and 6
Embracing 3835.20 acres."

CASE No. 64
In the matter of the application of the Continental Oil Company for an order of approval of the Alston Unit Agreement, Roosevelt County, New Mexico, embracing as the Unit Area:
"In Township 7 South, Range 35 East
All of sections 5, 6, 15, 17, 19, 20, 21, 22, 27, 28, 29 and 30
Section 9-S 2
Section 15-S 2 N 2 and S 2
Embracing 9069.52 acres."

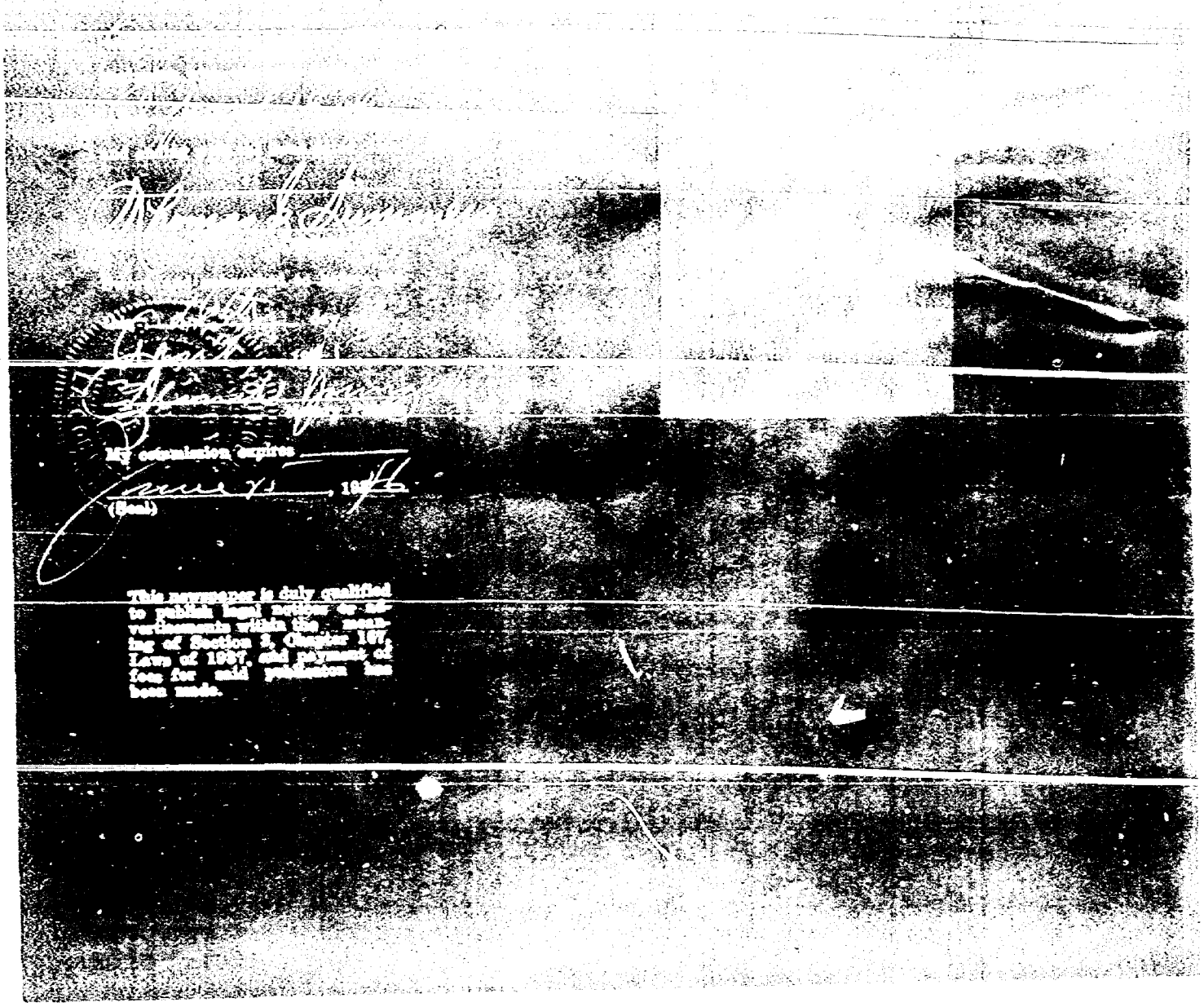
CASE No. 65
In the matter of the petition of P & G Drilling Company for an unorthodox spacing of P & G Drilling Company Santa Fe No. 1 E NENE, 31-18N-6W, Hospah Field, McKinley County, as follows: 30 feet South of the North line and 40 feet West of the East line of said section, which location has been made by surface error and subsequent footage of hole having been made before discovery of error.

CASE No. 66
In the matter of the petition of C. W. Colgrove supplemented by the petition of Charles Schmidt for an unorthodox spacing for C. W. Colgrove State Well No. 1 in NW Section 31, Township 20S, Range 11W, N.M.P.M., Grant County, New Mexico. Said well is 1450 feet South of the North Line and 50 feet East of the West line of said section—said location having been made by error and subsequent footage having been made before discovery of error.

Given under the seal of said Commission at Santa Fe, New Mexico, on April 13, 1945.

OIL CONSERVATION COMMISSION.
By (Sgd.) JOHN J. DEMPSEY, Chairman
SEAL
JOHN F. MILES, Member.

Pub April 14, 1945



My commission expires
, 19
(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.

a copy of which is hereto attached was first published in said newspaper

in its issue, dated

and was published in the weekly issue of said newspaper, and not in any

supplement, thereafter for the full period of one-

secutive weeks, the last publication thereof being in the issue dated

JOHN [illegible]
Member. 10-16

T. L. Bell

Subscribed and sworn to before me on 4-26-45

Notary Public

My Commission 12/24/45

Publishers Fees $2.24

[redacted] 1945, in the Matter of the Petition of the Gulf Oil Corporation for revision of Statewide [redacted] Order No. [redacted] to provide for increasing the oil allowable progressively according to depth for pools producing below 5000 feet, and that the foregoing transcript constitutes, to the best of my knowledge and belief, a true and correct copy of all the oral statements and exhibits presented before the Commission.

Vastie Fowler

Vastie Fowler, Reporter.

Pursuant to notice by the Commission, duly made and published setting May 14, 1945, at 10 o'clock A. M., for hearing in the above entitled matter, said hearing was convened on said day, at said hour, in the Coronado Room of the La Fonda, Santa Fe, New Mexico, the Commission sitting as follows:

HON. JOHN J. DEMPSEY, Governor, Chairman.
HON. JOHN E. MILES, State Land Commissioner, Member
HON. CARL B. LIVINGSTON, Chief Clerk & Legal Adviser

R E G I S T E R

NAME	COMPANY	ADDRESS
Hugh L. Sawyers	New Mexico Oil & Gas Ass'n.	Roswell, N. M.
J. L. Griffith	Humble Oil Company	Midland, Texas
Leo R. Manning	Barney Cockburn	Maljamar
R. J. Heard	Grayburg Oil Company	Loco Hills
Glenn Staley	Lea County Operators	Hobbs, N. M.
Barney Cockburn	Cockburn Oil Company	Artesia, N. M.
W. R. Bollinger	Shell Oil Company, Inc.	Hobbs, N. M.
Chas. C. Moripaugh	Shell Oil Company, Inc.	Midland, Texas
H. K. McKinnon	Shell Oil Company, Inc.	Midland, Texas
J. C. Gordon	Byrd Frost, Inc., and Plains Products Company	Dallas, Texas
W. E. Scott	Buffalo Oil Company	Artesia, N. M.
Robert L. Bates	State Bureau of Mines & Mineral Resources	Socorro, N. M.
John M. Kelly	G. P. Livermore, Inc.	Lubbock, Texas
Harry Leonard	Leonard Oil Company	Roswell, N. M.
D. A. Powell	Drilling & Exploration Co.	Hobbs, N. M.
Chas. Schmitz	Sole Owner	San Francisco
Joe Dexter	Grayburg Oil Company of N.M.	Artesia, N. M.
T. J. Lorsey	Atlantic Refining Company	Dallas, Texas
C. H. Gray	Repollo Oil Company	Midland, Texas
Harve H. Mayfield	Magnolia Petroleum Company	Kermit, Texas
D. D. Christner	Continental Oil Company	Ft. Worth, Texas
W. C. Stout	Continental Oil Company	Ft. Worth, Texas
John R. Moran	Continental Oil Company	Houston, Texas
George M. Sellinger	Skelly Oil Company	Tulsa, Okla.
J. N. Dunlavey	Skelly Oil Company	Hobbs, N. M.
H. B. Hurley	c/o Continental Oil Company	Ft. Worth, Texas
M. H. Dubrow	Continental Oil Company	Ft. Worth, Texas
S. V. McCullum	Continental Oil Company	Ft. Worth, Texas
L. F. Shiplet	The Texas Company	Midland, Texas
A. E. Willig	The Texas Company	Ft. Worth, Texas
C. B. Williams	The Texas Company	Ft. Worth, Texas
W. E. Hubbard	Humble Oil Company	Houston, Texas
Neville G. Penrose	Neville G. Penrose, Inc.	Ft. Worth, Texas

the Oil Conservation Commission, created by law having
given notice of the time and place of hearing at Santa Fe,
New Mexico, at 10 A.M., [illegible]

CASE NO. 62.

In the matter of the petition of the Gulf Oil Corporation for ratification of Statewide Proration Order No. [illegible] to provide for increasing the oil allowable [illegible] according to depth for pools producing below 5000 feet.

Given under the seal of said Commission at Santa Fe, New Mexico on April 13th, 1945.

OIL CONSERVATION COMMISSION

BY (SGD)

JOHN J. DEMPSEY
CHAIRMAN

JOHN T. MILES
MEMBER

SEAL"

P R O C E E D I N G S

BY MR. J. D. [illegible] Attorney for the Commission, I appear in behalf of the [illegible] Commission of the Oil Conservation Commission [illegible] the Gulf Oil Corporation [illegible] which [illegible] in connection [illegible]

ditional consideration in regard to allowable, and over the past several months the matter has been discussed with my operators. So far as I know none of the operators object or disagree with the idea. In order to bring the matter to a head, the Company decided to file an application with the Commission for a hearing on the matter, in addition to clarifying the situation. For the convenience of the Commission and other operators, the Company decided to draw up a proposed order and submit to the Commission, which was done. This order was circulated to the various operators in the field. It was not with the idea this would be the same order, but rather it would clarify the situation and give something definite to work on. We realized from the beginning there will doubtless have to be some modifications of this order in order to conform with the present orders of the Commission, but we thought this was a better way to

[illegible]

[illegible]

in some [illegible]

to pay out. [illegible]

is desirable to develop these deeper reservoirs because the present fields are exhausting [illegible]

I was surprised with many marginal wells in Lea County, at this time I think thirty of them - I think we should encourage the development of these deeper horizons.

GOVERNOR DEMPSEY: You think there should be/no limit of time as to how long this allowable is permitted?

MR. SANDERSON: The way we have the thing figured out, is to make the pay out on these deeper wells approximately the same as on the shallow wells. This present proposal does not quite accomplish that, it is a little too low.

GOVERNOR DEMPSEY: You think/after the period when you have recovered the additional amount you should still have the additional allowable?

MR. SANDERSON: Yes sir.

GOVERNOR DEMPSEY: Colonel do you think the Commission has the authority in the present law to do this?

MR. ATWOOD: It is my opinion under the present conservation law the Commission can make classifications for proration purposes and for extension of [illegible] so long as the classifications are on a reasonable basis [illegible] can be made. [illegible]

Or [illegible], I will [illegible]

[illegible]

this is merely a suggestion of the Gulf, [illegible] feet for the beginning of the so-called deep production).

As I understand it, this plan is not so much to take care of the 5,000 foot situation as it is to take care of the deeper stuff, and we have a witness with figures we would like to put in the record, but first would like to have the Commission or anyone interested to ask any questions.

GOVERNOR DEMPSEY: We now have an allowable to deep wells as discovery wells, should that continue with this as additional?

MR. SANDERSON: Yes sir, I think so. Because the original well, just one well in the pool gets the allowable.

GOVERNOR DEMPSEY: For a term, a certain period - What would be the effect upon the discovery well in this condition?

MR. SANDERSON: Wouldn't be affected at all. The discovery gives a certain number of barrels of oil which must be produced within a years' time.

GOVERNOR DEMPSEY: You contemplate they get both?

MR. SANDERSON: Yes.

MR. ATWOOD: It is my understanding a discovery well nearly always costs more than th subsequent wells. That is the reason for giving the bonus is to offset that unusual cost.

GOVERNOR DEMPSEY: Any other persons desire to ask any question?

MR. NEVILLE PENROSE: You estimate your cost on your present development one to one hundred fifty thousand dollars?

MR. SANDERSON: That is right.

MR. ATWOOD: your question in regard to [illegible] sections 11 and 12 of [illegible] application [illegible] those two sections you can grant that authority.

(After being duly sworn to tell the truth, the whole truth and nothing but the truth, Mr. Lloyd Gray testified as follows)

MR. ATWOOD: Where do you live?

MR. GRAY: Tulsa.

MR. ATWOOD: What is your official connection with the Gulf?

MR. GRAY: Chief production engineer.

MR. ATWOOD: For how long?

MR. GRAY: 17 years.

MR. ATWOOD: How long in the present capacity?

MR. GRAY: 5 or 6 years.

MR. ATWOOD: You have heard the introductory statement by Mr. Sanderson with reference to the increased cost of drilling to deeper depths, have you compiled [illegible] drilling costs in New Mexico [illegible] operators?

MR. GRAY: Yes.

MR. ATWOOD: [illegible] evidence, after first having [illegible] this exhibit a [illegible] depth?

[redacted] cost figures, I believe, will fairly represent an exploration [redacted]. The cost of drilling these deep wells is enormous. I don't believe at the present time the return on investment is satisfactory. As a matter of fact, it is entirely possible if the allowable is not increased the natural resources might not be exploited.

MR. ATWOOD: Any member of the Commission desire to ask any question?

(No questions)

MR. ATWOOD: Have you prepared any estimate or sample costs for wells at 7 and 10 thousand feet, to show the time required for paying off on those costs on the present allowable basis?

MR. GRAY: Yes sir.

(Exhibit B presented to the Commission)

MR. ATWOOD: The figures for the 10,000 foot well, go ahead and explain those items.

MR. GRAY: This is a sample calculation showing the required pay for wells of a greater depth than the present wells. One is 10,000 feet and [redacted] 7,000 feet. The 10,000 foot well [redacted] and the estimated operating cost for [redacted] that would be conservative.

MR. ATWOOD: On the [illegible] the allowable?

MR. GRAY: Yes sir.

MR. ATWOOD: If the wells should not flow you would have a pumping cost in addition to the cost you have shown here?

MR. GRAY: That is correct.

MR. ATWOOD: Any member of the Commission have any question on that exhibit?

GOVERNOR DEMPSEY: No.

MR. ATWOOD: Mr. Gray, based upon these figures, I believe you have stated it is doubtful there will be any general development on the present allowable basis.

MR. GRAY: That is correct.

MR. ATWOOD: With these figures set forth in a petition, using the present allowable as the basic unit, and step up as suggested in the petition by increasing the depth, about how much time would be required then?

MR. GRAY: I have not made a calculation on that, but I would estimate in the neighborhood of 7 or 8 years.

MR. ATWOOD: What is the normal pay out time the Company figures on the wells?

MR. GRAY: I don't believe they could operate much longer than 7 or 8 years.

MR. ATWOOD: You heard Mr. [illegible] deep wells the Gulf is drilling in Lea County [illegible] other wells they are [illegible]

MR. GRAY: [illegible]

MR. ATWOOD: [illegible]

MR. GRAY: [illegible] to right.

MR. ATWOOD: Those figures there represent the average expense incurred [illegible]

MR. GRAY: Correct.

MR. ATWOOD: Doesn't that consider risks sustained in drilling dry holes?

MR. GRAY: No sir.

MR. ATWOOD: Is that item likely to be a considerable item in the Lea County area.

MR. GRAY: It usually is a sizeable item in the early stages.

MR. ATWOOD: Hasn't there been a number of dry wells drilled already in Lea County?

MR. GRAY: I think that is correct.

MR. ATWOOD: That [illegible] all for me gentlemen.

GOVERNOR DEMPSEY: Any questions from any of you gentlemen?

(No questions)

MR. SELLINGER: In drilling a well through necessity by offsetting operator [illegible] would that be your [illegible] unnecessary well?

MR. GRAY: No [illegible]

MR. SELLINGER: [illegible] operate that well?

MR. GRAY: [illegible]

[illegible] well at $150,000.

MR. WILLIAMS: That is correct.

MR. ATWOOD: It occurs to me [illegible] wondered is that your estimate of the cost of the wildcat well or discovery well?

MR. WILLIAMS: On our original well $150,00 was the cost, and the 2000 foot well $135,000. That would not be on regular exploitation. Those other figures were drilling cost and service equipment.

MR. ATWOOD: Do you believe after a discovery is made in the field where the depth is 7,000 feet the cost of the subsequent wells and development of the field would average $130,000?

MR. WILLIAMS: I don't believe it would miss it very far.

MR. ATWOOD: Your estimate is based on the operation in the Drinkard Area?

MR. WILLIAMS: That is correct.

MR. ATWOOD: Do you feel one could go far enough to predict a 7,000 foot well in some other part of Lea County would cost the same?

MR. WILLIAMS: I think the drilling conditions in the various portions of the County would be essentially the same.

MR. ATWOOD: Then you feel the allowable proposed should be set up as a basis for determining the permanent allowables of all future wells drilled in [illegible]?

MR. WILLIAMS: [illegible] example a [illegible] 3800 foot well.

MR. ATWOOD: In the [illegible] less than they do now, is that right?

MR. WILLIAMS: That is right. I feel the ratio of cost for various depths is right. In a few years when there are normal conditions the ratio of 7,000 feet and 3800 feet will probably be similar.

MR. ATWOOD: Your factors are based primarily on economics or reasonable profits?

MR. WILLIAMS? Yes sir.

MR. ATWOOD: Do you not feel there are many other factors in determining the permanent allowable of the field other than just the depth of the well?

MR. WILLIAMS: I don't know how they could be brought into form. New Mexico has been outstanding. They have had a formula for allocation and so far as I have been able to observe everybody has been quite happy with the use of the formula. What we have tried to do is to cut this depth factor into the old formula.

MR. ATWOOD: Yes I agree our basis of allocation of allowables in the past has been quit satisfactory, but in order to determine the efficient rate on which a well should be set, should one consider the character of the reservoir. The type of the reservoir, type of energy you have with the formation such as water deposit or gas deposit.

MR. WILLIAMS: I think those items should be considered but the study of that will naturally be taken [illegible] individual [illegible]

[redacted] Do I understand after the first 4 or 5 or 6 wells in a pool are completed and more information on the type of reservoirs is available, it would be hard to consider those various factors in order to determine for the allowables for those wells?

MR. WILLIAMS: I think that could be done. To my knowledge we have never gone back and studied the matter.

GOVERNOR MILES: What do you refer to about formula?

MR. WILLIAMS: Our allocation formula, regular formula for individual well and also allowable for pool.

GOVERNOR MILES: The object of the past development, generally speaking, most of that production has come from the sand area section, it is quite likely the character of the reservoir is more uniform than at the deeper zones.

MR. WILLIAMS: The reservoir energy of the deeper pools is substantially greater than on the shallow horizons. 7,000 feet probably for 2200 or 2300. The gas in the solution on shallow horizons are from 400 to 600 Cu. Ft. I think in general the deeper horizons wells [redacted]

GOVERNOR MILES: [redacted]

[redacted]

MR. PENROSE:

It might [illegible]

New Mexico?

MR. WILLIAMS: I do not believe it would help - at the present time there is a number of wells in Lea County unable to make their allowable. I believe we should discover more wells to maintain the wells in the state.

MR. PENROSE: There are a lot of operators in Lea County I don't suppose have $150,000 to drill a well. A lot of wells in Eddy and Lea County still in the red - when was your application made?

MR. WILLIAMS: About a month ago.

MR. PENROSE: In the length of time there has been a great many changes in the world conditions and in the oil business, and I would say we have every reason to believe we will get smaller allowables soon. Sooner or later as the allowables of the state are reduced it is going to have to be proportioned with the owners of the smaller wells. In the last two or three weeks there have been two or three places in Texas crude has gone into storage, no demand for it.

MR. WILLIAMS: I think the additional allowable for deep wells has been shown to be justified. In Oklahoma one field the allowable is 150 (to 150) barrels a day, so we are well within what other states allow.

MR. PENROSE: Our allowable is now [illegible] would have to be cut, wouldn't the [illegible] allowable?

MR. WILLIAMS: [illegible]

you [illegible]

[illegible]

[illegible]

should be expected to [illegible] indefinitely.

GOVERNOR DEMPSEY: That was the first you asked for.

MR. SANDERSON: I think that as conditions change, it is necessary that these orders be changed, as Mr. Williams suggested, the cost of drilling should drop to half what it is at the present time it would be uneconomical to use these old figures. I think the Commission should take care of those conditions.

GOVERNOR DEMPSEY: Don't you think that qualification should be included in this order?

MR. SANDERSON: Yes sir.

MR. ATWOOD: I understood Mr. Sanderson to say, Governor, when you asked him if this should be permanent - I understood him to say permanent until changed by the Commission.

GOVERNOR DEMPSEY: Yes.

MR. ATWOOD: The situation has arisen now that was not when the original program was set up. Now we have conditions which call for the method and basis of allocation conditions, and in the future will call for another change. There is no order that cannot be set aside or modified by the Commission at a future date.

GOVERNOR DEMPSEY: I think [illegible] more time on that, and include it in the [illegible] not cause any misunderstanding. I do not [illegible]

[illegible] just referred to the fact that we have allowables a higher allowable than our [illegible] is that due to normal production?

MR. SANDERSON: No, I do not think so, these pools are getting very old.

MR. ATWOOD: In the future, if in our new reserves or discoveries when this is reclaimed by reason of old age - would be still have allowable to meet the allowable as at the present time.

MR. SANDERSON: That is correct.

MR. ATWOOD: Where, in your opinion, lies the best chance for developing large or deeper reserves, or shallow or deeper drilling?

MR. SANDERSON: Deeper drilling is the best opportunity right now.

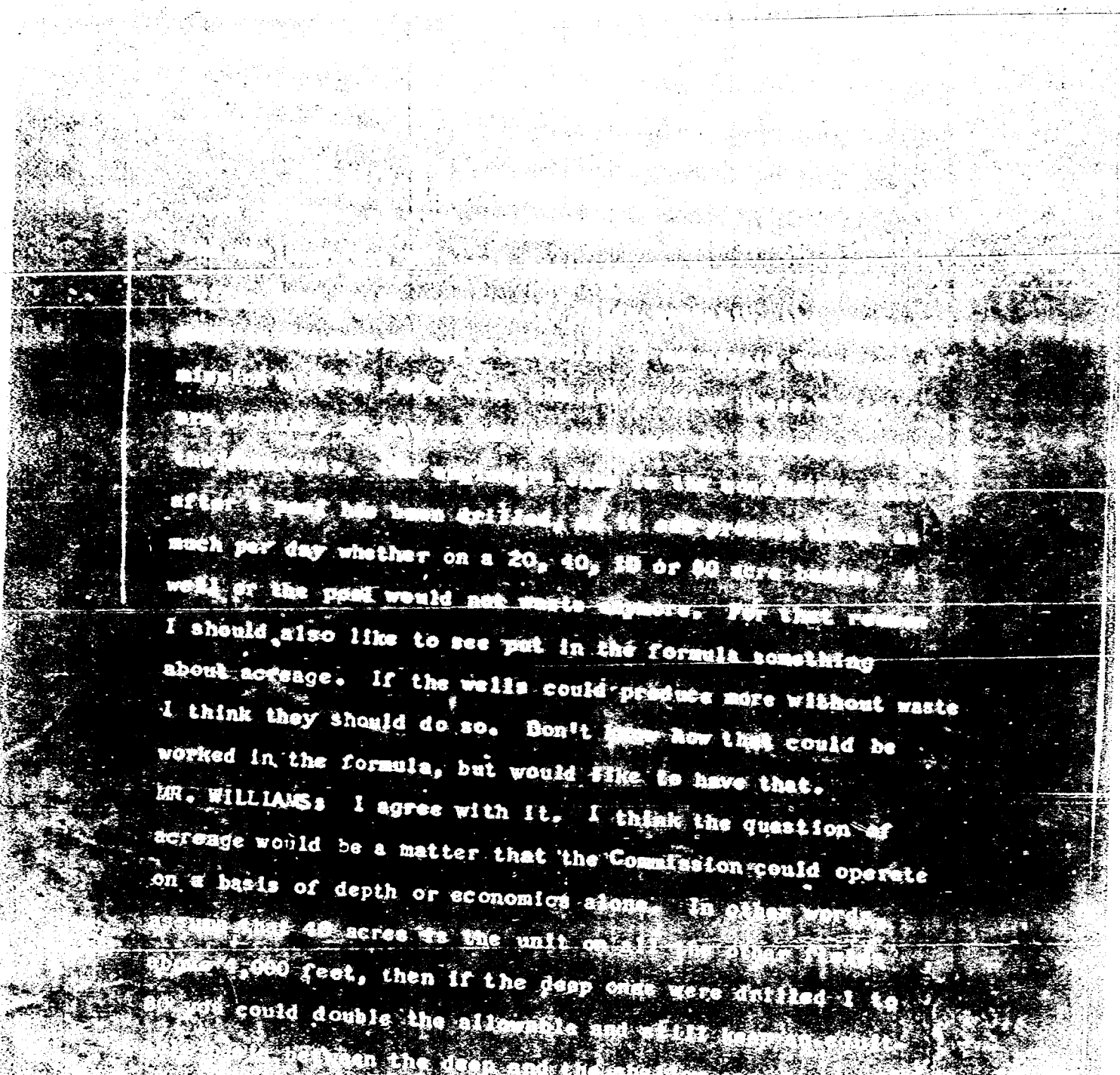
MR. ATWOOD: You are going right back into the areas that have been contoured and [illegible]

MR. SANDERSON: [illegible]

[redacted] to offer any suggestions they have. This order [redacted] only to Eddy and Lea Counties. The petition [redacted] to counties. The rest, I am unsure about.

MR. [redacted]: The Gulf asked for was revision of state wide proration order 465, with the depth factor of the proration order only proration in Lea and Eddy Counties, so nothing was advertised as to changing the proration status in the other counties.

MR. ATWOOD: At present that problem is not in other counties. The Commission can make the order to apply to any other county in which [redacted] applied.



after [illegible] has been drilled [illegible]
much per day whether on a 20, 40, 80 or 80 acre [illegible]
well, or the pool would not waste [illegible]. For that reason
I should also like to see put in the formula something
about acreage. If the wells could produce more without waste
I think they should do so. Don't know how that could be
worked in the formula, but would like to have that.

MR. WILLIAMS: I agree with it. I think the question of
acreage would be a matter that the Commission could operate
on a basis of depth or economics alone. In other words,
[illegible] 40 acres as the unit on [illegible]
[illegible] feet, then if the deep ones were drilled I to
[illegible] could double the allowable and still [illegible]
[illegible] on the deep and [illegible]

IN THE MATTER OF THE [illegible] OF THE GULF OIL CORPORATION FOR REVISION OF STATEWIDE PRORATION ORDER NO. 511 TO PROVIDE FOR [illegible] OIL ALLOWABLES PROGRESSIVELY ACCORDING TO DEPTH FOR POOLS PRODUCING BELOW [illegible] FEET.

"The Texas Company respectfully requests [illegible] this statement in its behalf in connection with the hearing called to consider the subject matter.

"On August 3, 1943, a hearing was held on the application of the New Mexico Oil Conservation Commission upon its own motion on this same matter. At that hearing considerable testimony and evidence were introduced which are pertinent to a further consideration of this matter. We respectfully request that the record of that hearing be made a part of and considered by the Commission in addition to the testimony to be offerred on May 14.

"Experience has shown that the cost of drilling and operation of wells varies in some proportion with the depth. Experience, however, has shown that this variation is not pre-determined and varies considerably from one area to another as shown by the testimony in the hearing of August 3, 1943. It is generally known that the deeper the well the higher drilling and operating costs will be. We are in accord with recommendations made heretofore that some recognition in the form of higher allowables be accorded wells drilled to deeper depths. We feel, however, that the measure of such consideration should be carefully determined by the Commission in accord with the authority vested in it by the New Mexico Conservation Statutes. We refer to and quote for your ready reference Paragraph 2 of Section 12 of the Session Laws of New Mexico, 1935, Chapter 72.

"No owner of a property in a pool should be required by the Commission, directly or indirectly, to drill more wells than are reasonably necessary to secure his proportionate part of the production. To avoid the drilling of unnecessary wells, a proration unit for each pool may be fixed and such being the area which may be efficiently and economically drained and developed by one well. The drilling [illegible] creates fire and other hazards conducive to waste, [illegible] increases the cost of products to the ultimate consumer.

"Much constructive work has been done on the [illegible] and since as far back as [illegible] drilling which is generally recognized [illegible] industry. The following is a [illegible] an I.P.A.A. Sub-Committee of [illegible] ing which appeared in the Oil

[illegible] would be considered in determining the allowable of wells drilled in that particular field. Whereupon, from such hearings the Commission may determine, under the requirements of Section 11 quoted above, the proper spacing and proration units and, further, under Section 11 of the same [illegible] to distribute the allowable production among the fields of this State.....on a reasonable basis..... Thus, an Operator in undertaking the drilling of a deep well would have the assurance, prior to the commencement of the well, that the costs peculiar to and encountered in the drilling and operation of his well would be given due consideration in fixing the allowable for such well.

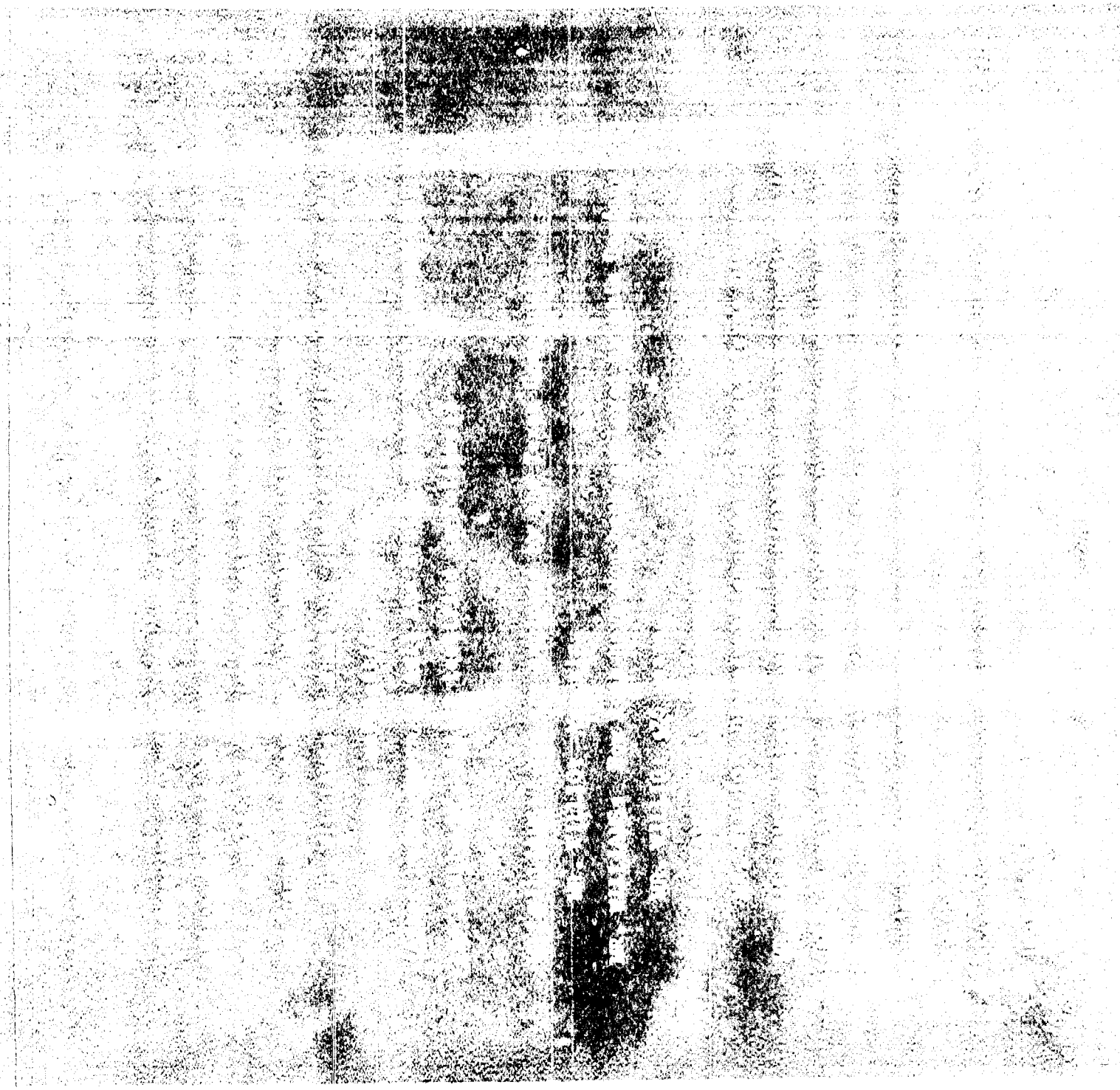
"It is recognized that, before the pertinent physical characteristics of the reservoir may be determined, it is desirable to have available the data from a number of wells in a new reservoir. During the interim from the drilling of the discovery well and the further wells required for the reasonable determination of the reservoir's characteristics, we recommend the application of a modified form of the present 'Bonus Discovery Allowable' Order No. 573 of the New Mexico Oil Conservation Commission adopted September 6, 1944. Modifications of this Order should include:

"1. Reasonable daily top allowable rates based on various depth brackets for the discovery well.

"2. The application of such top daily allowables to the next subsequent four wells completed in the same reservoir within the eighteen months or two year period next following the completion of the discovery well.

"3. Prior to the expiration of the period adopted for bonus discovery allowables, the Commission will call a hearing to determine the proper spacing, proration unit, and regular top allowables to be assigned to all wells in such field. The regular top allowable so determined may thereafter be maintained in an amount in the same proportion theretofore assigned to other fields.

"We further respectfully submit that the pre-determined allowables for deeper wells submitted by the producers in said cases are arbitrary and, as pointed out before, do not [illegible] the pertinent data necessary and available [illegible]



that degree of certitude.

MR. WILLIAMS: Then you are in accord with the proposal that a higher allowable than the allowable at the present time be assigned to wells found in Lea County be temporarily assigned to those deeper wells do your not.

MR. WILLIG: Yes, I think it would help the development of deeper fields.

MR. WILLIAMS: As the composition of several wells in a pool, it is your recommendation that the factors then known regarding that pool be considered [illegible]

GOVERNOR MILES: [illegible]

allowable [illegible]

order.

might be

in the order as

before

MR. T. J. DORSEY -

The Atlantic Refining Company also agrees with the Gulf order in principal.

MR. HARVE H. MAYFIELD - Magnolia Petroleum Company.

The Magnolia Petroleum Company also agrees with the Gulf's order in principal.

MR. GEORGE M. SELLINGER - Shelly Oil Company agrees in principal with the Gulf Oil Corporation, we favor the allocation of of wells based on a scale as to depth, I don't know what the other operators have in mind with reference to principal, but I imagine they feel like we do. The question of waste or proper spacing, that the Commission should call a hearing to determine that. The Commission itself can call the hearing, or the operator of any single well in the field or any interested wells, and if there is waste being made by the drilling of unnecessary wells (or a small spacing) in that matter, can be presented at that time. The well spacing and the allocation of allowable can likewise be brought up. I think all operators are agreeable - these particular matters are not known until enough wells in the field. I think the Commission should

a schedule

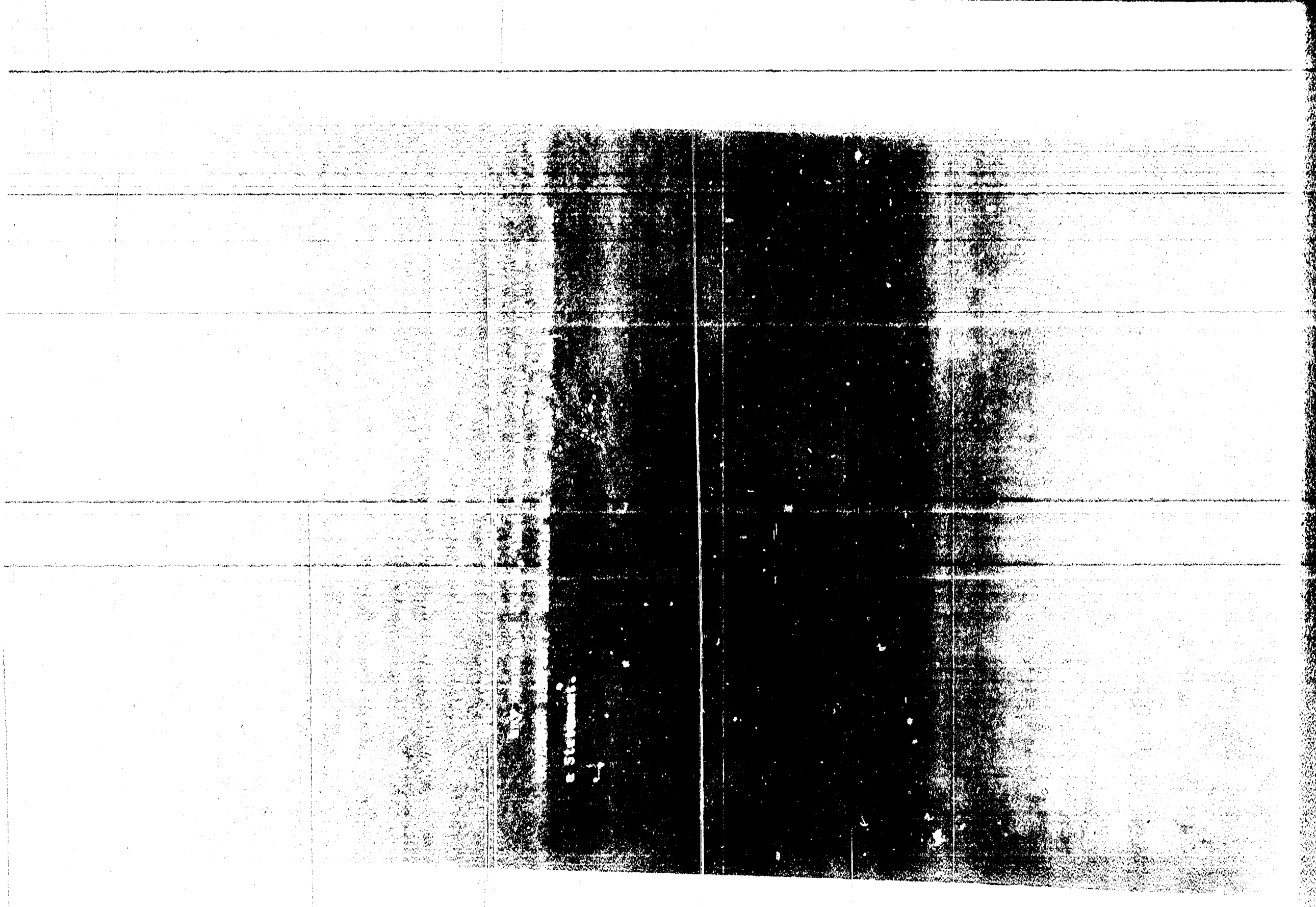
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GOVERNOR



and ... of the New Mexico Examiner, a number of general circulation ... Santa Fe, County of Santa Fe, and the State of New Mexico, printed daily in the City of Santa Fe, that the attached is a true copy of ...

as it appeared in the New Mexico Examiner, issues of ...

... in a full and complete edition of the same.

This ... within the meaning of Sec. 2, Chapter 167, Laws of 1937.

Signed ...

STATE OF NEW MEXICO
COUNTY OF SANTA FE } ss.
CITY OF SANTA FE

... appeared before me this 26 day of June, 1939, known to me to be the person above making affidavit, and after being duly sworn, deposes and says that the statements above made are true and accurate to the best of his knowledge.

... Draper
Notary Public in and for Santa Fe County, State of New Mexico

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION
COMMISSION

Pursuant to Chapter 72, Sess. Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 21st day of July, 1939, at 9:00 A. M., for the purpose of considering the following:

Case No. 15

a) The adoption of rules, regulations and orders as may be necessary to make effective the prohibitions contained in Section 13, Chapter 72, Laws of New Mexico 1935 and for the issuance of certificates of clearance or tenders in some other method, so that no person may have an opportunity to determine whether any contemplated transaction of sale or purchase or acquisition, or of transportation, refining, processing, or handling in any other way, involves illegal oil or illegal oil product.

b) The adoption of rules, regulations and orders relating to the making up of shortage or back allowable. Any person having an interest in the subject of this said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on this 19th day of June, 1939.

OIL CONSERVATION COMMISSION

By s/s HUNK WORDEN
Commissioner of Public Lands

By Sgd. A. ANDREAS
State Geologist

SEAL

Pub. in Artesia Independent-Journal issue of June 30th, 1939

PROOF OF PUBLICATION

Geo. B. Bowra

Editor

Public Hearing

One

30 June 39

30 June 39

Geo B Bowra

30 June 39

Mary V. Daylor

Notary Public

Oct. 31, 1939

My Commission Expires

4.48

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I, Thomas B. Summers

Publisher

Of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once ~~a week~~ in the regular and entire issue of said paper, and not in a supplement thereof for a period of

One issue

~~beginning~~ with the issue dated

June 27, 1939

~~and ending with the issue dated~~

, 193

Thomas B. Summers
Publisher.

Sworn and subscribed to before me

this 27 day of

June, 1939

Ella Waye Montgomery
Notary Public.

My commission expires February

5, 1942

(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 [illegible]

(June 27, 1939)

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION
COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by virtue of the Oil Conservation Commission of New Mexico, I have issued my proclamation to said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act. Notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 21st day of July, 1939, at 9:00 A. M., for the purpose of considering the following:

Case No. 15.

(a) The adoption of rules, regulations and orders as may be necessary to make effective the prohibitions contained in Section 13, Chapter 72, Laws of New Mexico 1935, and for the issuance of certificates of clearance or tenders, or some other method, so that any person may have an opportunity to determine whether any contemplated transaction of sale or purchase or acquisition, or of transportation, refining, processing, or handling in any other way, involves illegal oil or illegal oil product.

(b) The adoption of rules, regulations and orders relating to the making up of shortage or back allowable.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on June 22, 1939.

OIL CONSERVATION COMMISSION

By (Sgd.) Frank Worden
Commissioner of Public Lands

(SEAL)

By (Sgd.) A. Andreas
State Geologist.

[illegible] PUBLICATION
[illegible] OF NEW MEXICO
[illegible] CONSERVATION COMMISSION

[illegible] Chapter 72, Session Laws of 1935, State of New [illegible] the Oil Conservation Commission of New Mexico [illegible] creating said Commission with the jurisdiction and [illegible] matters relating to the conservation of oil and [illegible] State and of the enforcement of all provisions of said [illegible] notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 21st day of July, 1939, at 9:00 A. M., for the purpose of considering the following:

Case No. 15.

(a) The adoption of rules, regulations and orders as may be necessary to make effective the prohibitions contained in Section 13, Chapter 72, Laws of New Mexico 1935, and for the issuance of certificates of clearance or tenders, or some other method, so that any person may have an opportunity to determine whether any contemplated transaction of sale or purchase or acquisition, or of transportation, refining, processing, or handling in any other way, involves illegal oil or illegal oil product.

(b) The adoption of rules, regulations and orders relating to the making up of shortage or back allowable.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on June 22, 1939.

OIL CONSERVATION COMMISSION

By _____
Commissioner of Public Lands

By _____
State Geologist

United States Department of Justice

UNITED STATES ATTORNEY
DISTRICT OF NEW MEXICO
Albuquerque
July 30, 1951

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
RECEIVED
JUL 31 1951

New Mexico Oil Conservation Commission
Capitol Building
Santa Fe, New Mexico

Attention: Mr. Graham, Attorney
for the Commission

Re: Humble Oil & Refining Co.
et al. (2 cases) Criminal
No. 16,499 & 16,500.

Dear Mr. Graham:

Forwarded to you herewith are the documents you requested in your long distance telephone conversation to me this afternoon, namely:

Defendants Motion to Dismiss in
No. 16,499

Defendants Motion to Dismiss in
No. 16,500

Defendants Motion to Supress Certain
Rules, Regulations and Orders of the
New Mexico Oil Conservation Commission,
No.16,500

The motion to suppress in No. 16,499 is substantially identical with the corresponding motion in Criminal No. 16,500 and for that reason is not included with the documents forwarded.

An opinion by the Attorney General is also respectively requested as to questions collateral to the constitutionality of the Oil Conservation Act. In the event the opinion of the Attorney General should hold that the members of the Commission were improperly designated by the legislature in violation of Section 16 of Article IV of the State Constitution, are the members of the Commission at least de facto officers? If the members are

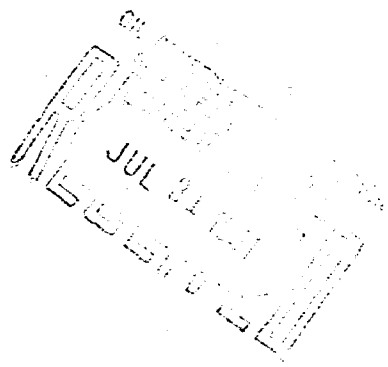
at least de facto officers, are the orders and regulations promulgated by them subject to collateral attack by the public and third parties having an interest therein?

This office is indebted to the Attorney General and to you for your courtesy in this matter.

Sincerely yours,
EVERETT M. GRANTHAM
United States Attorney

MAURICE SANCHEZ
Assistant U. S. Attorney

JRL:t
Encls.



I[illegible] THE DISTRICT [illegible] THE UNITED STATES

[illegible] DISTRICT OF NEW MEXICO

[illegible],

Plaintiff,

vs.

[illegible],

[illegible],

Defendants.

No. 16,449 - Criminal
Vio: Sec. 371; [illegible],
Conspiracy to defraud the
United States
Sec. 715(b), [illegible],
Violation of the Mineral Leasing.

[illegible] CERTAIN RULES,
REGULATIONS [illegible] THE NEW
MEXICO OIL [illegible] COMMISSION.

COME NOW the defendants, Paul S. Brunn, H. W. Brown and Walter J. Robertson, and enter their Motion to [illegible] certain certified copies of the rules, regulations and orders of the New Mexico Oil Conservation Commission which would necessarily have to be introduced by the government in this case, in order to prove that contraband oil was produced in the State of New Mexico during the years 1945 to June, 1950, both dates included, and defendants would show to the Court:

1. That pursuant to an order heretofore entered by the Court in this case these defendants have timely filed herein a Motion for the government to furnish them a more definite statement and bill of particulars, but which said Motion as of the filing hereof, has not been heard by the Court, and in order that this Motion to Suppress evidence may be timely filed, these defendants are compelled in anticipation of [illegible]

[illegible] evidence by the [illegible]

[illegible]

such orders, rules and regulations, but believe such will include the following orders allocating the monthly production of oil in New Mexico in barrels, to-wit:

1948 Month	N. M. Oil Conservation Commission Order Number
	398
	637
	[illegible]
January	[illegible]
[illegible]	748
March	753
April	[illegible]
May	762
June	771
July	774
August	782
September	7[illegible]
October	7[illegible]
November	7[illegible]
December	797
1949	
January	804
February	811
March	812
April	813
May	820
June	822
July	827
August	833
September	834
October	837
November	841
December	845
1950	
January	852
February	A-2
March	A-3
April	A-4
May	A-5
June	A-6

2. The foregoing orders and each of them, and any [illegible] the New Mexico Oil Conservation Commission which the [illegible] oil was produced in the State of New Mexico [illegible]

3117

the entering or promulgation or date of any of said orders, the New Mexico Oil Conservation Commission prescribed no time and place for, and provided no hearing with regard thereto before entering same and gave no notice of any such hearing with respect thereto, and held no state-wide hearing whatsoever for the purpose of considering and promulgating any of said orders, or for the purpose of fixing monthly oil production allowables, state-wide or otherwise, all of which was in direct violation of mandatory provisions of the Statutes of the State of New Mexico in such cases made and provided, to-wit: Chapter 72 Session Laws 1935 and Amendments thereof, and particularly Sec. 15; Sec. 69-221 New Mexico Statutes 1941 Annotated; Secs. 5 and 7 Chapter 168 New Mexico Session Laws 1949, (b) In fixing state-wide oil production allowables for the period stated herein and in fixing or establishing oil production allowables among the various oil fields and oil pools in the State of New Mexico, and among the various oil wells in the State of New Mexico, the New Mexico Oil Conservation Commission simply guessed at the market demand in barrels and arrived at a figure which the oil fields, pools and oil wells of the state should produce for the following month and allocated same according to a formula established in Orders of the Commission numbers 398, 637, 798, A-2, A-3, A-4, A-5, and A-6, and merely prorated oil to be produced in the state to market demand alone.

3. That if it be disclosed that certified copies of other orders of the New Mexico Oil Conservation Commission are to be introduced in evidence by the government in this case,

[illegible]

9173

(a) That under the Constitution and laws of New Mexico the appointive power for commissions such as the Oil Conservation Commission created by the Acts above cited is vested in the Chief executive of New Mexico. That said acts so far as they purport or attempt to appoint the members of said Oil Conservation Commission violate the Constitution and laws of New Mexico, and particularly Article 5 of the Constitution of New Mexico, and [illegible] such power at no time material [illegible] been a member of the commission in the State of New Mexico, and the purported acts in [illegible] such commission are void and unenforceable;

(b) That the acts of the Legislature of New Mexico with reference to the creation and establishment of the Oil Conservation Commission in said state delegate to said commission legislative and judicial powers and not executive powers. That said portion of said conservation acts which attempt to delegate to the Commission therein attempted to be created the power [illegible] determine [illegible] to be necessary in order to prevent waste delegate to such commission composed of members of the executive branch of the government of New Mexico legislative powers in violation of and contrary to the provisions of Article 3 of the Constitution of the State of New Mexico. That the determination by the Oil Conservation Commission and the issuance of orders by said commission restricting the production of oil within the State of New Mexico, and allocating the same, are legislative acts that cannot be performed by the members of the Oil Conservation Commission of New Mexico, nor by said commission because of its composition of members of the executive branch of the state government of said state, and such acts and orders and purported acts and orders are void;

(c) That the conservation act of New Mexico, in attempting to delegate the power to make rules and regulations to prevent the waste of crude oil delegates to said commission, composed of members of the executive branch of the government of New Mexico, legislative powers in violation of Article 3 of the Constitution of New Mexico, and is in such particular void, and the rules and regulations issued pursuant thereto are void. That there is [illegible]

[illegible]

attempting to delegate to the [illegible]

[illegible]

[illegible] the Constitution of the State of New Mexico;

(c) That the Oil Conservation Act of New Mexico in attempting to delegate to the Oil Conservation Commission of New Mexico as constituted by said act the power [illegible] in the amount of crude oil that could be produced in the State of New Mexico, in the pools mentioned in the State of New Mexico, and from all pools in the State of New Mexico, is in contravention of [illegible] not set forth [illegible] under the [illegible] power to [illegible] basis in [illegible] of the powers delegated to the Conservation Commission. [illegible] by which the rules, [illegible] were required to be established;

(f) That that portion of the Oil Conservation Act of New Mexico attempting to delegate to the Oil Conservation [illegible] limit the total [illegible] state is vague, indefinite and uncertain in its failure [illegible] standards for the issuance of such rules, regulations and orders that said act is unconstitutional and void, and constitutes and is an unconstitutional delegation of the legislative power of said state to such Oil Conservation Commission;

(g) That the delegation to the Oil Conservation Commission of New Mexico of the power to make rules, regulations and orders limiting the production of crude oil in the State of New Mexico and the power attempted to be delegated to said commission to determine when waste exists that requires the issuance of orders limiting the production of oil is not clearly expressed in the title to said act and for such reasons violates the provisions of Article 4, Section 16 of the Constitution of the State of New Mexico, and is unconstitutional and void.

6. That none of the orders, rules or regulations of the Oil Conservation Commission of New Mexico at any time material hereto have been filed with the librarian of the Supreme Court of New Mexico as required by [illegible] the year 1947 and Chapter 154 of the Session Laws of New Mexico for the year 1941 as amended, and for such reasons any

of this case; and further, to enter an order suppressing the introduction in evidence of certified copies of proof of any of the orders of the New Mexico Oil Conservation Commission, which the government may attempt to introduce as evidence in this case, which are found by the Court to have been promulgated by the New Mexico Oil Conservation Commission in non-compliance of the provisions of the Statutes of the State of New Mexico with respect thereto, and to suppress all orders, rules or regulations of said commission by reason of the unconstitutionality thereof, as herein alleged, and to suppress all orders, rules or regulations of said Oil Conservation Commission not filed with the Librarian of the State Supreme Court Library in Santa Fe, New Mexico.

/s/ C. M. Neal
C. M. Neal

/s/ W. D. Girand, Jr.
W. D. Girand, Jr.

Attorneys for Defendants,
Paul C. Brown, W. W. Brown,
and Walter J. Robertson.

(Hobbs, New Mexico)

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OIL CONSERVATION COMMISSION
JUL 31 1951

IN THE DISTRICT COURT OF THE UNITED STATES

FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA, PLAINTIFF,	)	
V.	)	NO. 16,500 Criminal
HUMBLE OIL & REFINING COMPANY, HUMBLE PIPE LINE COMPANY, JACK S. LITTLE, ROY MOSELEY, WALTER J. ROBERTSON, DEFENDANTS.	)	

MOTION TO SUPPRESS CERTAIN RULES, REGULATIONS AND ORDERS OF THE NEW MEXICO OIL CONSERVATION COMMISSION

COMES NOW, Humble Oil & Refining Company and Humble Pipe Line Company, and enter this Motion to suppress certain certified copies of the rules, regulations and orders of the New Mexico Oil Conservation Commission which would necessarily have to be introduced by the Government in this case, in order to prove that contraband oil was produced in the State of New Mexico during the years 1948, 1949 and up to June 2, 1950, both dates included, and Defendants would show to the Court:

I.

That, pursuant to an order heretofore entered by the Court in this case these Defendants have timely filed herein a Motion for the Government to furnish them a more definite statement and bill of particulars, but which said Motion as of the filing hereof, has not been heard by the Court and in order that this Motion to suppress evidence may be timely filed, these Defendants are compelled to anticipate in advance that certain orders and perhaps rules and regulations of the New Mexico Oil Conservation Commission will be upon the trial hereof, offered in evidence by the Government in an attempt to prove that contraband oil

was produced in New Mexico during the period from January 1, 1948, to June 2, 1950, both dates inclusive, using certified copies of such instruments.

At this time these Defendants are not advised with particularity of the identity by numbers, or otherwise, of any such orders, rules and regulations, but believe such will include the following orders allocating the monthly production of oil in New Mexico in barrels, to-wit:

1948 Month	N. M. Oil Conservation Commission Order Number
	398 637 798
January	738
February	749
March	753
April	757
May	762
June	771
July	773
August	782
September	783
October	789
November	790
December	797
1949	
January	804
February	811
March	812
April	813

Month	N. M. Oil Conservation Commission Order Number
1949--Continued	
May	820
June	822
July	827
August	833
September	834
October	837
November	841
December	845
1950	
January	852
February	A-2
March	A-3
April	A-4
May	A-5
June	A-6

II.

The foregoing orders and each of them, and any order of the New Mexico Oil Conservation Commission which the Government may seek to prove upon the trial of this case for the purpose of establishing and proving that contraband oil was produced in the State of New Mexico for the period stated, are and were void at the time of the entering thereof by the New Mexico Oil Conservation Commission and at the time of the attempted promulgation thereof and at all times thereafter, for the following reasons:

1. In the promulgation of such orders, the New Mexico Oil Conservation Commission failed to comply with the statutory procedure prescribed therefor, in that (a) all said orders were made, promulgated and entered by the New Mexico Oil Conservation Commission without the notice and hearing prescribed by Statute of New Mexico, (Sec. 15, Chapt. 72, and amendments thereto; Sec. 16-221, New Mexico Statutes 1941 Ann.; Secs. 5 and 7, Chapt. 168, New Mexico Session Laws, 1949); (b) that if said orders were in other respects valid (and it is contended by these defendants that they were not) the New Mexico Oil Conservation Commission acted arbitrarily in fixing the statewide allowable production of oil, and in so fixing said allowable took into consideration only market demand, and failed to consider waste in any respect; and (c) that the aforementioned orders of the New Mexico Oil Conservation Commission, at all times material hereto, were not filed with the Librarian of the Supreme Court Library of the State of New Mexico, as required by Chapt. 139 of the 1947 Session Laws of New Mexico, (Sec. 3-713 to 3-720, inc., 1949 Pocket Part), and at all times material hereto the same were void, unenforceable and of no force and effect.

III.

That if it be disclosed that certified copies of other orders of the New Mexico Oil Conservation Commission are to be introduced in evidence by the Government in this case, these defendants desire an opportunity to amend their Motion to Suppress, to include such.

IV.

That all said orders, and each of them, and all schedules showing allowable production pursuant thereto are, therefore, void and of no force and effect, all of which these defendants are, by proper evidence, ready to verify.

WHEREFORE, these defendants acting within the order of the Court permitting them to file this Motion after pleading to the indictment, pray the Court to hear evidence upon the tendered issues and as such evidence warrants to enter an order suppressing the introduction in evidence of the orders of the New Mexico Oil Conservation Commission listed herein and such orders, rules and regulations of the New Mexico Oil Conservation Commission as they may be later advised the Government might offer to introduce in evidence upon the trial of this case; and further, to enter an order suppressing the introduction inevidence of certified copies or proof of any of the orders of the New Mexico Oil Conservation Commission, which the Government may attempt to introduce as evidence in this case, which are found by the Court to have been promulgated by the New Mexico Oil Conservation Commission in non-compliance of the provisions of the Statutes of the State of New Mexico with respect thereto.

(S) [signature]
Roswell, New Mexico

(S) [signature]
P. O. Box 2180, Houston 1, Tex.

ATTORNEYS FOR DEFENDANTS,
HUMBLE OIL & REFINING COMPANY
AND HUMBLE PIPE LINE COMPANY.

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
JUL 31 1951
RECEIVED

IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA, Plaintiff,	
V.	No. 16,499, Criminal.
HUMBLE OIL & REFINING COMPANY, HUMBLE PIPE LINE COMPANY, JACK S. LITTLE, ROY MOSELEY, WALTER J. ROBERTSON, Defendants.	

MOTION TO DISMISS

Come now the defendants Humble Oil & Refining Company and Humble Pipe Line Company, in the above entitled and numbered cause and move the Court to dismiss Count 1 of the indictment herein as to them, for the following reasons:

1. That it appears from the face of the indictment that the conspiracy alleged to have been entered into by these defendants and others was so entered into prior to April 1948; that at the time it was so entered into, it was the intent of the conspirators "in violation of Sec. 371 Title 18 USCA 1948 Edition" to "commit divers and sundry offenses against the laws of the United States, to-wit:

> "(a) To knowingly violate Section 715b of Title 15, USCA, being a part of the Act sometimes known as the Connally 'Hot Oil' Act (49 Stat. 30), as amended.
>
> "(b) To knowingly violate Section 715d of the aforesaid Act and Section 302.6 of the regulations duly prescribed thereunder (30CFR, Sec. 302.6 as amended).
>
> "(c) To knowingly violate Section 715d of the aforesaid Act and Section 302.9 of the regulations duly prescribed thereunder (30 CFR, Sec. 302.9, as amended."

That said indictment does not set out facts sufficient to show a conspiracy punishable under Sec. 371 of Title 18 USCA 1948 Edition, in that said Section 371 was not enacted until long after the alleged offense occurred, and these defendants could not have had the intention at the time alleged to violate said statute; nor could they have violated it.

2. That said Section 371 was a consolidation of Secs. 88 and 294, Title 18 USCA 1940 Edition. Section 88 was as follows:

> "If two or more persons conspire either to commit any offense against the United States, or to defraud the United States in any manner or for any purpose, and one or more of such parties do any act to effect the object of the conspiracy, each of the parties to such conspiracy shall be fined not more than $10,000 or imprisoned not more than two years, or both."

Section 294 had reference to conspiracies to violate counterfeiting laws, and is not material here.

That said Sections 88 and 294 were specifically repealed by an act approved June 25, 1948, which provided that "the sections or parts thereof of revised statutes or statutes at large enumerated in the following schedule are hereby repealed. Any rights or liabilities now existing under such section or parts thereof shall not be affected by this repeal."

Sections 88 and 294 are included in the sections enumerated as repealed. These sections were consolidated, but with changes, particularly in that more severe punishment was provided for violating Sec. 371 than was provided by the repealed act in force prior to June 25, 1948. Said Sec. 371 is as follows:

> "Sec. 371. CONSPIRACY TO COMMIT OFFENSE OR TO DEFRAUD UNITED STATES.
> "If two or more persons conspire either to commit any offense against the United States, or to defraud the United States, or any agency thereof in any manner or for any purpose, and one or more of such persons do any act to effect the object of the conspiracy, each shall be fined not more than $10,000 or imprisoned not more than five years, or both.
> "If, however, the offense, the commission of which is the object of the conspiracy, is a misdemeanor only, the punishment for such conspiracy shall not exceed the maximum punishment provided for such misdemeanor."

These defendants say that at the time the alleged crime was committed, if ever, the law under which they are being prosecuted had not been enacted, and if applied to the crime charged it is ex post facto in effect and offends Sec. 9(3) of Art. 1 of the Constitution of the United States.

3. The facts charged as an offense by the indictment state the violation of repealed Section 88 of Title 18 USCA and not Section 371, in that it is provided by the act repealing Section 88

and other sections of the United States statutes (Act of June 25, 1948) that "the sections or parts thereof of revised statutes or statutes at large enumerated in the following schedule are hereby repealed. Any rights or liabilities now existing under such section or parts thereof shall not be affected by this repeal."

It is charged in the indictment that the conspiracy was entered into and certain overt acts were performed before June 25, 1948, and these defendants were then subject to prosecution for the complete crime of conspiracy under Sec. 88.

For the reasons stated these defendants move for a dismissal of the indictment.

(S) [signature]
Roswell, N. M.

(S) Nelson Jones
P.O. Box 2180, Houston 1, Texas

Attorneys for Defendants
Humble Oil & Refining Company and
Humble Pipe Line Company.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 162
ORDER NO. 799

IN THE MATTER OF THE APPLICATION OF THE NEW MEXICO OIL CONSERVATION COMMISSION UPON ITS MOTION AT THE SUGGESTION OF THE LEA COUNTY OPERATORS COMMITTEE THAT PARAGRAPH "C" OF SECTION 2 OF COMMISSION ORDER 637 KNOWN AS THE STATE WIDE PRORATION ORDER BE AMENDED.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at ten o'clock A.M., October 28, 1948, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this 19th day of November, 1948, the Commission having before it for consideration the testimony adduced at the hearing of said case and being fully advised in the premises;

IT IS THEREFORE ORDERED that:

The order herein shall be known as:

THE STATE-WIDE PRORATION ORDER
(with deep-pool adaptation)

1. (a) i. The unit of proration shall consist of 40 acres or lot in accordance with the legal sub-divisions of the United States Public Lands Surveys, on which is at least one producing well. 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.

(a) ii. Where, however, a given proration unit appears to be underlain by more than one pool, each a separate common reservoir, and it is sought to produce from more than one such pool, no well shall be drilled and completed in the same pool closer to the unit boundary line than 330 feet nor less than 660 feet from any other well completed in the same pool. In these cases, within the discretion of the Commission, wells may have a surface proximity closer to each other than 660 feet to permit twinning, trippling, and so on in accordance with the number of such pools lying above or below the other. In any case in this paragraph mentioned, in addition to the information now required in Form C-101, Notice of Intention to Drill, there must also be shown in said notice the distance of the proposed location from any other well nearer on the surface than 660 feet.

(b) A marginal unit is a unit that will not produce the top unit allowable for the pool.

(c) A non-marginal unit is a unit that will produce the top unit allowable for the pool.

(d) The top unit allowables in accordance with various depth ranges to be used for the purpose of making allocations to the respective pools and for the purpose of distributing or prorating the pool allocations to the units within the pool, except for those pools having proration plans of their own, shall be as defined in the computation for making allocations to pools as set forth in Section 2 hereinbelow.

(e) The normal unit allowable to be used for the purpose of computing the top unit allowables for each of several ranges of depth shall be as defined in Section 2(c) hereinbelow.

(f) The proration month shall be the calendar month which shall begin at 7 A.M. on the first day of such month.

2. (a) The total allowable for pools in Lea, Eddy and Chaves Counties shall be in terms of total barrels daily for each calendar month and shall be allocated to the respective pools by the following computation:

(b) From the total allowable shall be deducted the sum of the allowables for all marginal units. The remainder shall be divided among the non-marginal units in a proportion as set forth in Section 2(c).

(c) Top unit allowables shall be calculated for each of several ranges of depth in the following proportions:

Pool Depth Range	Proportional Factor
From 0 to 5000'	1.00
Below 5000 to 6000'	1.33
Below 6000 to 7000'	1.77
Below 7000 to 8000'	2.33
Below 8000 to 9000'	3.00
Below 9000 to 10,000'	3.77
Below 10,000 to 11,000'	4.67
Below 11,000 to 12,000'	5.67

(Figures subject to change as in Section 5)

The calculation of the respective top unit allowables for each pool depth range shall be made in the following manner: Multiply the number of non-marginal units within each depth range by the above corresponding proportional factors (subject to Section 4). Add all of the products so obtained. Divide this total of the products into the total allocation for all non-marginal units. The quotient thus obtained shall be the normal unit allowable. Top unit allowables for each range of depth shall then be determined by multiplying the normal unit allowable for the proportional factor for each depth range as set out in the table hereinabove: any fraction of a barrel shall be regarded as a full barrel for both normal and top unit allowables.

(d) The top unit allowables so determined in Section 2(c) shall be assigned to the respective pools in accordance with each pool's depth range. The sum of all marginal units plus the sum of the top unit allowables for all non-marginal units in each pool shall constitute the allocation for each pool. In the event that the normal unit allowable as calculated in Section 2(c) is found to be less than 30 barrels per day for any month, the top allowable for the depth range from 0 to 5000 feet shall be set at 30 barrels per day and a corrected top allowable shall be computed for all other depth ranges below 5,000 feet by the following formulae:

(1) Corrected top allowable = top allowable times correction factor.

(2) Correction factor = $$\frac{(B-30U)}{(30-B)U+(B-30U)}$$

Where:

B = Total allocation to Lea, Eddy and Chaves Counties, non-marginal units.

N = Normal unit allowable as calculated in Section 2(c)
U = Number of non-marginal units within the depth range of 0 to 5,000 feet.

The allocation for each pool shall then be computed as described hereinabove, using the corrected top allowables in the place of the top allowables.

(The figure 30 as used in this section is subject to change as in Section 5)

(e) The depth classification for each pool shall be determined from the depth of the first well measured to the top of the producing formation. In the event the casing is set into or through the producing formation, the depth to the casing shoe or the top perforation in the casing, whichever is the highest, shall be the assumed top of the formation for purposes of determining the depth. When such depth classification for a pool has been established, all non-marginal units in that pool shall have the same top unit allowable.

(f) Thereupon the allocation to each pool shall in turn be prorated or distributed to the respective units in each pool in accordance with the proration plan of the particular pool where any such plan exists. Where no proration plan for any pool exists, then the pool allocation shall be distributed or prorated to the respective marginal and non-marginal units therein as determined hereinabove.

(g) At the beginning of each calendar month, the distribution or proration to the respective units in each pool shall be changed in order to take into account all new wells which have been completed and were not in the proration schedule during the previous calendar month. Where any well is completed between the first and last day of the calendar month, the unit shall be assigned an allowable in accordance with whether such unit is marginal or non-marginal, beginning at 7 A.M., on the date of completion and for the remainder of that calendar month.

3. For convenience, pools with depth range from 0 to 5000 feet may be referred to as "ordinary pools" and the allowables computed for proration units therein, as "ordinary pool" allowables; and pools with depth range below 5000 feet may be referred to as "deep pools" and the allowables computed for proration units there, as "deep pool" allowables - notwithstanding the fact that the allowable for any proration unit may be marginal or non-marginal for the particular pool in accordance with pool depth range.

4. No proration unit in any pool with pool depth range below 5000 feet shall have both a deep pool allowable and a bonus discovery allowable, by reason of Order 573, at the same time. At the operator's option the operator may either waive such bonus allowable so as to permit the deep pool allowable; or the operator may first make full use of any such bonus allowable to which he may be entitled before receiving a deep pool allowable. In case of the latter alternative, the deep pool allowable shall be calculated as for an ordinary pool allowable pending the making use of such bonus allowable.

5. Any of the figures in Section 2(c) and Section 2(d) is subject to revision to prevent waste, to meet changed conditions, and to preclude inequities, upon petition and hearing as provided by law; however, the Commission retains jurisdiction of this case for the purpose of providing in executive session an equitable proportional factor in Section 2(c) applicable to any pool that may be discovered at any depth range below 12,000'.

* 6. Pools in counties other than Lea, Eddy and Chaves, shall be permitted to produce their market demand as long as such can be done without waste, until production in such other counties is deemed sufficient to warrant proration determinable by hearing as provided by law.

7. The Order herein replaces Order No. 538, State-Wide Proration Order, and Order No. 413, Eddy County Fields Proration Order. Order No. 235, the Proration Schedule Order, is retained as supplemental to the order herein.

This order shall become effective on November 19, 1948.

Done at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

THOMAS J. MABRY, CHAIRMAN

GUY SHEPARD, MEMBER

R. R. Spurrier

R. R. SPURRIER, SECRETARY

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 62
ORDER NO. 637

THE PETITION OF THE GULF OIL CORPORATION FOR REVISION OF STATEWIDE PRORATION ORDER NO. 538 TO PROVIDE FOR INCREASING THE OIL ALLOWABLE PROGRESSIVELY ACCORDING TO DEPTH FOR POOLS PRODUCING BELOW 5000 FEET.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at ten o'clock A.M., May 14, 1945, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission".

NOW, on this 7th day of February, 1946, the Commission having before it for consideration the testimony adduced at the hearing of said case and being fully advised in the premises;

IT IS THEREFORE ORDERED that:

The order herein shall be known as:

THE STATE-WIDE PRORATION ORDER
(with deep-pool adaptation)

1. (a) 1. The unit of proration shall consist of 40 acres or lot in accordance with the legal sub-divisions of the United States Public Lands Surveys, on which is at least one producing well. No well shall be drilled closer to any unit boundary 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.

(a) ii. Where, however, a given proration unit appears to be underlain by more than one pool, each a separate common reservoir, and it is sought to produce from more than one such pool, no well shall be drilled and completed in the same pool closer to the unit boundary line than 330 feet nor less than 660 feet from any other well completed in the same pool. In these cases, within the discretion of the Commission, wells may have a surface proximity closer to each other than 660 feet to permit twinning, trippling, and so on in accordance with the number of such pools lying above or below the other. In any case in this paragraph mentioned, in addition to the information now required in Form C-101, Notice of Intention to Drill, there must also be shown in said notice the distance of the proposed location from any other well nearer on the surface than 660 feet.

(b) A marginal unit is a unit that will not produce the top unit allowable for the pool.

(c) A non-marginal unit is a unit that will produce the top unit allowable for the pool.

(d) The top unit allowables in accordance with various depth ranges to be used for the purpose of making allocations to the respective pools and for the purpose of distributing or prorating the pool allocations to the units within the pool, except for those pools having proration plans of their own, shall be as defined in the computation for making allocations to pools as set forth in Section 2 hereinbelow.

(e) The normal unit allowable to be used for the purpose of computing the top unit allowables for each of several ranges of depth shall be as defined in Section 2(c) hereinbelow.

(f) The proration month shall be the calendar month which shall begin at 7 A.M., on the first day of such month.

2. (a) The total allowable for pools in Lea, Eddy and Chaves Counties shall be in terms of total barrels daily for each calendar month and shall be allocated to the respective pools by the following computation:

(b) From the total allowable shall be deducted the sum of the allowables for all marginal units. The remainder shall be divided among the non-marginal units in a proportion as set forth in Section 2(c).

(c) Top unit allowables shall be calculated for each of several ranges of depth in the following proportions:

Pool Depth Range	Proportional Factor
From 0 to 5000'	1.00
Below 5000 to 6000'	1.33
Below 6000 to 7000'	1.77
Below 7000 to 8000'	2.33
Below 8000 to 9000'	3.00
Below 9000 to 10,000'	3.77
Below 10,000 to 11,000'	4.67
Below 11,000 to 12,000'	5.67

(Figures subject to change as in Section 5)

The calculation of the respective top unit allowables for each pool depth range shall be made in the following manner: Multiply the number of non-marginal units within each depth range by the above corresponding proportional factors (subject to Section 4). Add all of the products so obtained. Divide this total of the products into the total allocation for all non-marginal units. The quotient thus obtained shall be the normal unit allowable. Top unit allowables for each range of depth shall then be determined by multiplying the normal unit allowable for the proportional factor for each depth range as set out in the table hereinabove: any fraction of a barrel shall be regarded as a full barrel for both normal and top unit allowables.

(d) The top unit allowables so determined in Section 2(c) shall be assigned to the respective pools in accordance with each pool's depth range. The sum of all marginal units plus the sum of the top unit allowables for all non-marginal units in each pool shall constitute the allocation for each pool. In the event that the normal unit allowable as calculated in Section 2(c) is found to be less than 30 barrels per day for any month, the top allowable for the depth range from 0 to 5000 feet shall be set at 30 barrels per day and a corrected top allowable shall be computed for all other depth ranges below 5,000 feet by the following formulae:

(1) Corrected top allowable = top allowable times correction factor.

(2) Correction factor = $$\frac{(B-30U)}{(30-N)U+(B-30U)}$$

Where:

B = Total allocation to Lea, Eddy and Chaves Counties, non-marginal units.

N = Normal unit allowable as calculated in Section 2(c)
U = Number of non-marginal units within the depth range of 0 to 5,000 feet.

The allocation for each pool shall then be computed as described hereinabove, using the corrected top allowables in the place of the top allowables.

(The figure 30 as used in this section is subject to change as in Section 5)

(e) The depth classification for each pool shall be determined from the depth of the first well measured to the top of the producing formation. In the event the casing is set into or through the producing formation, the depth to the casing shoe or the top perforation in the casing, whichever is the highest, shall be the assumed top of the formation for purposes of determining the depth. When such depth classification for a pool has been established, all non-marginal units in that pool shall have the same top unit allowable.

(f) Thereupon the allocation to each pool shall in turn be prorated or distributed to the respective units in each pool in accordance with the proration plan of the particular pool where any such plan exists. Where no proration plan for any pool exists, then the pool allocation shall be distributed or prorated to the respective marginal and non-marginal units therein as determined hereinabove.

(g) At the beginning of each calendar month, the distribution or proration to the respective units in each pool shall be changed in order to take into account all new wells which have been completed and were not in the proration schedule during the previous calendar month. Where any well is completed between the first and sixteenth day of the calendar month, its unit shall be assigned an allowable in accordance with whether such unit is marginal or non-marginal, beginning at 7 A.M., on the sixteenth and for the remainder of that calendar month.

3. For convenience, pools with depth range from 0 to 5000 feet may be referred to as "ordinary pools" and the allowables computed for proration units therein, as "ordinary pool" allowables; and pools with depth range below 5000 feet may be referred to as "deep pools" and the allowables computed for proration units there, as "deep pool" allowables - notwithstanding the fact that the allowable for any preration unit may be marginal or non-marginal for the particular pool in accordance with pool depth range.

4. No proration unit in any pool with pool depth range below 5000 ft. shall have both a deep pool allowable and a bonus discovery allowable, by reason of Order 573, at the same time. At the operator's option the operator may either waive such bonus allowable so as to permit the deep pool allowable; or the operator may first make full use of any such bonus allowable to which he may be entitled before receiving a deep pool allowable. In case of the latter alternative, the deep pool allowable shall be calculated as for an ordinary pool allowable pending the making use of such bonus allowable.

5. Any of the figures in Section 2(c) and Section 2(d) is subject to revision to prevent waste, to meet changed conditions, and to preclude inequities, upon petition and hearing as provided by law; however, the Commission retains jurisdiction of this case for the purpose of providing in executive session an equitable proportional factor in Section 2(c) applicable to any pool that may be discovered at any depth range below 12,000'.

* 6. Pools in counties other than Lea, Eddy and Chaves, shall be permitted to produce their market demand as long as such can be done without waste, until production in such other counties is deemed sufficient to warrant proration determinable by hearing as provided by law.

7. The Order herein replaces Order No. 538, State-Wide Proration Order, and Order No. 413, Eddy County Fields Proration Order. Order No. 235, the Proration Schedule Order, is retained as supplemental to the order herein.

This order shall become effective on March 1, 1946.

Done at Santa Fe, New Mexico, on the day and year hereinabove designated.

OIL CONSERVATION COMMISSION

/s/ John J. Dempsey
JOHN J. DEMPSEY, CHAIRMAN

/s/ John E. Miles
JOHN E. MILES, MEMBER

/s/ E. S. Spurrier
E. S. SPURRIER, SECRETARY

BEFORE THE OIL CONSERVATION
COMMISSION OF THE STATE
OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 15

ORDER NO. 235

(a) THE ADOPTION OF RULES, REGULATIONS AND ORDERS AS MAY BE NECESSARY TO MAKE EFFECTIVE THE PROHIBITIONS CONTAINED IN SECTION 13, CHAPTER 72, LAWS OF NEW MEXICO 1935, AND FOR THE ISSUANCE OF CERTIFICATES OF CLEARANCE OR TENDERS, OR SOME OTHER METHOD, SO THAT ANY PERSON MAY HAVE AN OPPORTUNITY TO DETERMINE WHETHER ANY CONTEMPLATED TRANSACTION OF SALE OR PURCHASE OR ACQUISITION, OR OF TRANSPORTATION, REFINING, PROCESSING, OR HANDLING IN ANY OTHER WAY, INVOLVES ILLEGAL OIL OR ILLEGAL OIL PRODUCT.
(b) THE ADOPTION OF RULES, REGULATIONS AND ORDERS RELATING TO THE MAKING UP OR SHORTAGE OR BACK ALLOWABLE.

ORDER OF THE COMMISSION PROMULGATING RULES AND REGULATIONS GOVERNING THE ISSUANCE OF THE MONTHLY PRORATION SCHEDULE AND SUPPLEMENT THERETO, THE CERTIFICATE OF THE COMMISSION AUTHORIZING THE PRODUCTION, PURCHASE AND TRANSPORTATION OF OIL PRODUCED UNDER SUCH SCHEDULES AND THE MAKING UP OF CERTAIN SHORTAGES.

BY THE COMMISSION:

This cause came on for hearing at nine o'clock A. M. on the 21st day of July, 1939, at Santa Fe, New Mexico.

NOW, on this 13th day of January, 1940, the Commission having before it for consideration the evidence adduced at the hearing in said case and being fully advised in the premises, the Commission adopted the order promulgating rules and regulations governing the issuance of the monthly proration schedule and supplement thereto, the certificate of the Commission authorizing the production, purchase and transportation of oil produced under such schedules and the making up of certain shortages, as follows:

1. The New Mexico Oil Conservation Commission will meet monthly, as soon as practicable after the announcement of the Bureau of Mines of the market demand for New Mexico, and at such meeting will consider the announcement of the Bureau of Mines and other evidence of market demand, and will determine the amount of oil to be produced from all pools in the State of New Mexico during the following calendar month. The amount so determined will be allocated among the various pools in the State in accordance with existing regulations and among the various units in each

pool, in accordance with the regulations governing each pool. The Commission will thereupon issue a proration schedule which will specify the amount of oil each unit in the State may produce each day during the following calendar month, including shortages which may be made up and lawful overages. Allowables for wells completed between the first and sixteenth of each month shall be included in a supplementary proration schedule to the current monthly proration schedule. This supplement shall be issued on the sixteenth of each month. Such monthly proration schedule and such supplementary proration schedule shall each constitute the certificate of the Commission authorizing thereunder:

(1.) The production of oil from the various units in accordance with such respective schedules;

(2.) The purchase of oil so produced by the purchasing companies; and,

(3.) The transportation of oil so produced by the various pipe line companies.

2. The monthly schedule provided for in paragraph "1" hereinabove shall show accrued shortages for two succeeding months and such shortages shall be made up within the same period of time; or if overage occurs, which is unavoidable and lawful, then such overage should be compensated by reduced allowable within a like period of time. After two succeeding months, shortages shall be eliminated from the schedule unless the operator furnishes a written statement to show that he could not sell, or the pipe line would not run the allowable, or that remedial work for the purpose of conserving reservoir energy had caused the shortage.

3. Shortage incurred prior to October 1, 1939, due to lack of pipe line connection or the inability to sell the allowable, shall be cumulative and allowed. Such shortages shall be shown in the cumulative column on the proration schedule and the amount of cumulative shortage authorized to be run shall be added to the current allowable and total shown as net allowable.

4. In no event should shortages when authorized, be produced in such manner or in such daily amounts as to constitute waste.

For the purpose of taking under further advisement, the Commission reserves herein for a supplemental order the matters in this case in so far as they relate to the transportation of oil and the products thereof by means other than by pipe line.

DONE at Santa Fe, New Mexico, this 13th day of January, 1940.

NEW MEXICO OIL CONSERVATION COMMISSION

By (SGD) Frank Worden
Commissioner of Public Lands

By (SGD) A. Andreas
State Geologist.

M E M O R A N D U M

RE HOT OIL CASE SUBPOENA ON MR. SPURRIER: Data and Information He Will Need at Trial

1. Order No. 1. Issued June 29, 1935; effective July 1, 1935. See Circular No. 5, page 41. This was a general statewide proration order. He should have with him:

   (a) Proof that notice was given and a hearing was had.
   (b) A transcript of giving book and page showing adoption of the order.
   (c) A copy of the Hobbs agreement if he has it.

2. Order No. 45. Amended Order No. 1 -
See Circular No. 5, page 42 - dated 11/12/36

   (a) Transcribe minutes, get book, page, and date of meeting

   (b) Copy of Notice - or Proof of Publication (or note lack of notice and hearing -

   (c) Record of hearing, if any -

   (d) Get full text of order, if not given in full in Circular 5, page 42

3. Order No. 48. Hobbs proration order

(a) Transcribe minutes - Get date, book, page. No. 48 is not set forth in any of the circulars that I can find.

(b) Proof of Publication, or Notice - if any

(c) Record of hearing

(d) Get full text of Order No. 48 - Cannot be found in circulars

(e) If there was a new agreement, better have that

4. Order No. 52. Adopted 12-30-36; effective 2-1-37. Get the following:

(a) Minutes showing adoption; date, book, and page. Notice of hearing.

(b) Full text of Order No. 52

(Look up this order and see if it has any application -)

Order No. 52 not found in any of the circulars

5. Order No. 235. Proration schedule order. Full text Page 46, Circular 5

(a) Transcribe minutes showing adoption of Order 235 - date, book, page

(b) Record of hearing, if any -

(c) Proof that notice was given - Copy of notice

6. Order No. 329. (In none of the circulars) Promulgated 12-31-40.

Hobbs proration order revising Order No. 48.

(a) Transcribe minutes - giving date, book and page

(b) Record of hearings, if any -

(c) Notice - Proof of Publication

(d) Agreement, if any

All Carbons to Case

7. Order No. 398. Case #14. Adopted 9-12-41; effective 10-1-41

Note: Retained in new rules (1950) Sec. 1. Amended Order #329.

Circular #5, page 44 - full text - (Also Compact Bulletin - p. 74)

(a) Transcribe that portion of Commission minutes in meeting of 6-25-41 wherein Commission annoucned its intention to clarify Order No. 329 (Get book, page of minutes)

(b) Transcribe minutes of 9-12-41 showing adoption of Order No. 398

(c) Copy of Notice and Proof of Publication for hearing.

(d) Record of hearing, if any.

8. Order No. 538. Not in any of the circulars - statewide proration.

(a) Copy full text of order - Get schedule for order...find out when it was in force.

(b) Transcribe minutes showing adoption.

(c) Notice of hearing - proof of publication.

(d) Record of hearing, if any.

9. Order No. 637. Effective 3-1-46. See Circular 6, page 31 - Text in full

(a) Transcribe mimutes showing adoption, date, book and page

(b) Record of hearing, if any - (or lack of record).

(c) Notice of hearing, if any - Proof of publication - or lack of notice.

10. Order No. 798. Statewide proration order with deep pool adaptation - Issued Nov. 19, 1948. Case No. 162 - full text.

(Note: See full text Compact Commission Bulletin - p. 69 - 72

(a) Transcribe minutes showing adoption - date, book and page

(b) Record of hearing - October 28, 1948

(c) Notice - Proof of publication

11. Collect all the records concerning the allowable orders set forth in the subpoena for 1948, 1949 and 1950; this begins with Order No. 738. What I want with reference to these orders is a notation in the minutes of the Commission wherever same was made in the matter of setting the allowable production for the following month. Where the minutes do not mention or set the allowable for any of these months, I want a note to that effect - that nothing was mentioned in the minutes concerning the allowable, a note of the lack of minutes to show it.

Wherever you transcribe minutes or refer to minutes, refer to the date, book and page.

Spurrier will be asked whether or not there was a hearing had when the allowable was fixed for all months during 1948, 1949 and 1950, and as to the notices of any scheduled hearings.

JOE L. MARTINEZ
ATTORNEY GENERAL

State of New Mexico
Department of Justice
Office of the Attorney General

WALTER R. KEGEL
PHILIP H. DUNLEAVY
HILARIO RUBIO
PETER N. CHUMBRIS
ASSISTANT ATTORNEYS GENERAL

att. Gen. opinion

Santa Fe
August 9, 1951

No. 5397

Mr. R. R. Spurrier, State Geologist
Secretary and Director
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Spurrier:

Recently you requested an opinion from this office as to the constitutionality of the New Mexico Oil Conservation Act of 1935, as amended, being Chapter 69, 203 et seq., N.M.S.A. In that request you asked that we consider objections as to its constitutionality stemming from the contention that the act constitutes an unlawful encroachment upon the appointive power of the Governor and unlawfully delegates legislative and judicial power to the executive branch of the Government, namely the Oil Conservation Commission itself, in violation of Article 3 of the Constitution of the State of New Mexico providing for the separation of the three branches of government. You also requested that we consider the contention that certain provisions of the act are void for the reason that they are not clearly expressed in the title of the Act as required by Section 16 of Article IV of the Constitution of the State of New Mexico.

It appears from this request that these are the precise points of inquiry made of you by the United States District Attorney and that the reason for his inquiry is the fact that these questions have arisen in

a matter pending in the United States District Court for the District of New Mexico in which the validity of the Oil Conservation Act of New Mexico and the rules and regulations issued thereunder are being considered.

It appears further that a contention has been made that general orders made by the Commission and monthly proration orders as to allowable oil production are void for the reason that no public hearing was had, as required by statute, and pursuant to notice. It is further contended that the Oil Conservation Act of New Mexico and all rules, regulations and orders are unconstitutional upon the grounds as hereinbefore set forth. A further reason advanced in support of the contention that these orders are void is the alleged failure of the Commission to comply with provisions of the Statute requiring filing of such orders, etc., with the librarian of the State Supreme Court.

In order to enable this office to consider the various problems presented, you have requested us to provide you with an opinion as to the constitutionality of both the act itself and the orders issued by the Commission.

I will endeavor to discuss the several contentions made as to the asserted unconstitutionality of the Oil Act and the alleged invalidity of the rules, regulations, and orders issued by the Commission to the extent possible as inquired into by the U. S. District Attorney.

In general, where two constructions of the statute are possible, and the determination of the question of constitutionality is necessary, the court is bound to construe the statute so as to avoid the conclusion of unconstitutionality. In Gamble v. Velarde, 36 N.M. 262, the court said, quoting in part from 31 N.M. 254:

> "The Legislature is a coordinate branch of our state government. Its prerogative in the matter of legislation is to be construed solely from the standpoint of our federal or state constitutional limits *** The Legislature possessing the sole power of making law, it will not be presumed that the people have intended to limit its power or practice by unreasonable or arbitrary restrictions. *** A reasonable construction of a constitutional limitation on legislative power or practice requires the court to keep in mind the sound purpose of the provision and the existing or anticipated evil to be overcome or avoided."

In my opinion, there is no merit to the contention that the act is unconstitutional on the grounds that since the Legislature has named the members who constitute the Commission, there has been an invasion of the executive power of appointment in violation of Art. III. Art. III reads as follows:

> "The powers of the government of this state are divided into three distinct departments, the Legislative, Executive and Judicial, and no person or collection of persons charged with the exercise of powers properly belonging to one of these departments, shall exercise any powers properly belonging to either of the others, except as in this constitution otherwise expressly directed or permitted."

It has long been recognized that separation of powers does not mean an entire and complete separation of powers. The true meaning of the principle seems to be that the whole power of one department should not be exercised by the same hands which possess the whole power of either of the other departments. See 42 Am. Jur. 320. But aside from this, what is the nature of the power of appointment? Although the power of appointment is not essentially a legislative function, neither is it inherent in, nor does it belong to, the executive or the judicial. The power of appointment to public office belongs where the people have chosen to place it by their Constitution or laws. See 42 Am. Jur. 950. In respect to offices which are created by the Legislature, the Legislature can select the persons to be appointed unless restricted by the Constitution. 42 Am. Jur. 952.

Is there any such restriction in the New Mexico Constitution which would prevent the Legislature from designating appointees to an office or commission which it has created? Art. V. §5 provides, in part:

> "The Governor shall nominate and, by and with the consent of the Senate, appoint all officers whose appointment or election is not otherwise provided for, ****."

In my opinion, the appointments contemplated in the Act we are considering are appointments "otherwise provided for", as those words are used in Art. V, §5. Therefore, the act does not invade the Governor's power of appointment. In this connection it is important to note that the corresponding sections of many other state Constitutions carry the language "not otherwise provided for in this constitution." This, in my opinion, is most persuasive to the view that the language of our §5 can only mean "not otherwise provided for in this Constitution, or by statute." In 36 N.M. 362 the court said:

> "It will be well to remember that our Constitution is one of the newest. It will be judged not only by what it says, but by what it omits to say -- what it might have adopted from other Constitutions and did not."

Although the point has not been specifically raised by defendant in his motion, it is possible that the validity of the Oil Conservation Act may be attacked on the ground that it seeks to confer, or impose, upon the Governor, State Geologist, and Commissioner of Public Lands duties in addition to, and perhaps inconsistent with, those which they are required by the Constitution and the Statutes to perform. In 23 So. 2d 855 the Supreme Court of Florida was presented with a similar question and said:

> "The Legislature may impose additional powers and duties on both constitutional and statutory officers so long as such duties are not inconsistent with their duties imposed by the Constitution. This court has accordingly approved the rule that the legislature may make an existing officer the member of another and different board by enlarging his duties."

Similarly, in Taylor v. Davis, 102 So. 433, 48 A.L.R. 1052, the Supreme Court of Alabama was considering a statute which required the governor to secure the introduction into the legislature of budget bills presented by the budget commission, and cause amendments to be presented, if desirable, during the passage of the bill. The validity of the statute was attacked on the ground that it sought to confer power on the governor and budget commission to dictate the introduction of bills in the legialture and amendments thereto while pending. The court said, in upholding the validity of the statute:

> "The direction to the Governor to secure the introduction of such bills is entirely compatible with the constitutional duty of the Governor to recommend for the consideration of the legislature such measures as he may deem expedient, and the duty of the Governor, auditor and attorney general to prepare a general revenue bill to be presented to the House of Representatives by the governor."

In New Mexico, Art 5. §4 of the Constitution states that the governor "shall take care that the laws are faithfully executed." The Commissioner of Public Lands is charged in N.M.S.A., §8-103, with making "rules and regulations for the control, management, disposition, lease and sale of state lands and perform such other duties as may be prescribed by law." Under N.M.S.A., §69-201 the State Geologist shall "collect and compile information relative to oil and gas development and production within the state which may affect state lands, ***."

In my opinion, therefore, it is indisputable that whereas the Oil Conservation Act may well enlarge the duties of these executive officers, none of the functions outlined therein for the members of the Commission to perform are inconsistent with their already-existing duties. Any attack on the validity of the Act on the above mentioned grounds must, therefore, fail.

The act is also attacked as unconstitutional because it delegates to the executive department powers which are essentially legislative, i.e., powers to restrict production of oil when the commission determines this necessary to prevent waste, and the power to make rules and regulations to prevent waste.

Are these powers essentially legislative, or are they in reality administrative? It is my opinion and contention that they are the latter. It is clear that a state legislature may not delegate to administrative offices the legislative powers vested in itself. But while the legislature cannot abdicate its general law-making powers, it may authorize others to do things which it might properly do, but which it cannot conveniently or efficiently perform. The distinction between the legislative and the administrative function is fundamental. The authority to make rules and regulations to carry out a policy declared by the lawmaker is administrative and may be delegated. See 42 Am. Jur. 330. In the Oil Conservation Act, this policy, or purpose, is clearly set out in §1:

> "The production or handling of crude petroleum oil or natural gas of any type or in any form, or the handling of products thereof, in such manner or under such conditions or in such amounts as to constitute or result in waste is each hereby prohibited."

In further distinguishing between the delegation of legislative and administrative powers, 40 Am. Jur. 336 says:

> "In considering the true test as to whether a power is strictly legislative or whether it is administrative and merely relates to the execution of the law, the true distinction is between the delegation of power to make the law, which necessarily involves a discretion as to what it shall be, and the conferring of authority or discretion as to its execution, to be exercised under and in pursuance of the law. The first cannot be done; to the latter no valid objection can be made."

In the act we are considering, there is no delegation to the Commission of the power to make the law or determine what it shall be. The law is, in effect, a prohbition against waste, and it is the duty and power of the Commission to prevent the waste prohibited by the act. See §9 of the Act.

The contention is also made that the Act is unconstitutional in that it delegates to the Commission judicial powers.

In answer to this argument it is only necessary to state that it is axiomatic in administrative law that it is not only convenient, but necessary, for administrative and executive officers to be vested with some judicial power. See 125 A.L.R. 736.

The doctrine of separation of the powers of government does operate to restrict the exercise of judicial powers by administrative authorities. But it is my opinion that such powers delegated to the Oil Conservation Commission are, at most, of a quasi-judicial nature. The power of the Commission in this regard is limited to the hearing and consideration of evidence and to the ascertainment of certain facts in the performance of its statutory duties. In 42 Am. Jur. 370, we read:

> "Administrative officers may hear and determine, or ascertain facts and decide by the application of rules of law to the ascertained facts, and the power exercised by them is administrative, or quasi-judicial, and not judicial, at least in the sense of a violation of the principle of separation of powers."

This brings us to the contention that the act is unconstitutional because it does not establish a comprehensive standard defining and prescribing the conditions and circumstances under which the Commission can exercise the delegated powers. It is my opinion that adequate standards are contained in the Act. It is true that as a general rule, to avoid an unlawful delegation of power, the legislature must declare the policy and purpose of the law and fix the legal principles which are to control by setting up standards or guides to indicate the extent of the discretion which may be exercised under the statute. As I have indicated previously, the purpose and policy of this Act are clearly set out. It is likewise my opiniont that the extent of the Commission's discretionary power is defined and the standards by which it is to act are clearly delineated. Sec. 9 of the act reads as follows:

> "The Commission is hereby empowered, and it is its duty, to prevent the waste prohibited by this Act and to protect correlative rights, as in this Act provided. To that end, the Commission is empowered to make and enforce rules, regulations and orders, and to do whatever may be reasonably necessary to carry out the purposes of this Act, whether or not indicated or specified in any section hereof."

It is inescapable, from a reading of this section, that the Commission has been granted no summary power to regulate oil and gas production but is empowered only "to prevent waste prohibited by this act and to protect correlative rights." Moreover, "waste" is defined explicitly in §2 of the Act. In this connection, I have learned that the concept of "waste" is set out with much more particularity in §2 of our Act than it is in corresponding sections of the statutes of other oil producing states.

Sections 11 and 12 of the act further limit the power granted the Commission in §9, by requiring that any allocation, distribution, or proration made by the Commission must be done on a reasonable basis. In some cases, courts have even inferred that a standard of reasonableness is to be applied where it can take its meaning from the expressed policy of the statute. See 42 Am. Jur. 345. In our Oil Conservation Act the standard of reasonableness is explicitly required.

It is indisputable, in my opinion, that sections 9, 11 and 12 of the act clearly limit the power of the Commission and set up a comprehensive standard for the exercise of that power. The objection will undoubtedly be made that the standards of this act are so broad and vague as to be ineffective. I do not agree that the standards are of this character, but even if this contention be conceded for the purpose of argument, on this precise point I find the following language in 42 Am. Jur. 346:

> "The policy of the law-making body and the standards to guide the administrative agency may be laid down in very broad and general terms, which get precision from the technical knowledge or sense and experience of men and thereby become reasonably certain."

It is my opinion that the Oil Conservation Commission of New Mexico is of such a nature as to impart this "technical knowledge or sense."

In considering the constitutionality of the act itself, we come finally to the point of inquiry made by the U.S. District Attorney under (e), as follows: "The Act is unconstitutional as violative of Article 4, Section 16 of the New Mexico Constitution, because the delegated power, by issuance of orders, to limit production of oil in the state when it determines this to be necessary to prevent waste is not clearly expressed in the title of the Act."

There is no merit to this contention. The original title to the Act, passed as Chapter 72, Laws of 1935, provides as follows: "An Act to prevent waste of crude petroleum oil, natural gas, and products thereof, as defined in this Act and in furtherance thereof, creating an Oil Conservation Commission; defining the powers and duties of such commission; authorizing it to prescribe rules, regulations and orders; providing penalties for the violation of the provisions of this Act, and of the Rules, Regulations and Orders of the Commission; levying a tax on the proceeds of oil and gas to pay the cost of the administration and enforcement of this Act; and repealing Sections 97-201 to 97-204, inclusive, of the New Mexico Statutes, Annotated, Compilation of 1929, and Sections 97-601 and 97-602 of the New Mexico Statutes, Annotated, Compilation of 1929, and Sections 97-102 to 97-109, inclusive, of the New Mexico Statutes, annotated, Compilation of 1929."

This is a rather broad, inclusive title. The Act was amended by Chapter 193 of the Laws of 1937. The title to the amendment concerned itself principally with Dioxide Gas but declared it to be amendatory of Chapter 72 of the Laws of 1935. The act was further amended by Chapter 166, Laws of 1941. The title to that amendment indicated that the amendments concerned themselves with additions to the original and amended Act, and clearly referred to the original and amended Act. The act was further amended by Chapter 168, Laws of 1949. The title to that act indicated that it was amendatory of the original Act as amended.

In determining whether any act meets the test of constitutionality requiring that the subject matter of the act be clearly expressed in the title, one is not permitted to single out the titles to amendments alone to determine if the title provisions have been complied with. There

must be a reference to the original act itself when the title of amending acts clearly indicate that they are amendatory of such original act. If the title to the original act is sufficiently descriptive of the subject matter of the act, the test has been met. It is safe to say that titles to amendments would be sufficient if they included nothing more than language indicating that the amendments modified the particular act. Of course, this is not true if a title indicates an act is being amended only in certain respects but additional amendments are included. That is not the case with this particular Act.

In determining whether there has been sufficient compliance with the constitutional requirements as to title of acts, the Supreme Court of the State of New Mexico in the recent case of State v. Aragon Et Al., No. 5278, Supreme Court (opinion published but not appearing in Reporter system as yet) stated: "In our opinion, the true test of the validity of a statute under this constitutional provision is: Does the title fairly give such reasonable notice of the subject matter of the statute itself as to prevent the mischief intended to be guarded against? If so, the act should be sustained. The reason of the rule not applying to such cases the rule itself does not apply (quoting from State v. Ingalls, 18 N.M. 211, 135 P. 1177)."

In a subsequent case, State ex rel Salazar v. Humble Oil & Refining Company, et al., No. 5383 (opinion published but not appearing in Reporter system as yet) the Supreme Court, in discussing the constitutional provision that the title of an act must embrace the subject matter of the act, stated:

> "The title of the act plays a very important part therein for without some title there can be no valid legislation. The scope of the title is within the discretion of the legislature; it may be made broad and comprehensive, and in this case the legislation under such title may be equally broad; or, the legislature, if it so desires, may make the title narrow and restricted in its nature, and in such case the body of the act must likewise be narrow and restricted. ***** ."

A reference to the title of the original act indicates that it is broad and comprehensive so far as it relates to the powers and duties to be performed by the Oil Conservation Commission. While the act was amended, it appears that the title to every amendment complied with the constitutional requirement so far as the matters embraced within the amendment are concerned. In State v. Sifford, 51 N.M. 430, the Supreme Court of the State of New Mexico stated, in disposing of a challenge to the constitutionality of an act arising out of an alleged title defect in the act: "This being an amendment, we must look to the original Act to determine whether there is a compliance with constitutional provisions."

The next point of inquiry concerns itself with the validity of the rules, regulations and orders adopted by the Commission. The point is made that all rules, regulations and orders adopted by the Commission under the Act are invalid for the reason that the Act itself is unconstitutional upon the grounds set forth hereinbefore. I feel that what has been said hereinbefore as to the constitutionality of the act against the challenges made against it under the various headings is a sufficient answer to this contention. There is no merit to the contention that the rules, regulations and orders of the Commission adopted under the Act are invalid because the act itself is unconstitutional.

A further point of inquiry asserts the contention that the orders of the Commission setting monthly allowables are invalid for the reason that no hearing was had in connection with the adoption of such rules, regulations or orders, pursuant to statutory notice.

Section 17 of the Act provides that before any rule, regulation or order, including revocation, change, renewal or extension thereof shall be made under the provisions of this act, a public hearing shall be held at such time, place and manner as may be prescribed by the Commission. The Commission is required to give reasonable notice of such hearing (not less than 10 days) except in case of emergency.

Section 5 of the Act provides for the manner of giving notice. In brief, it provides that notice may be served personally or by publication in a newspaper of general circulation published at Santa Fe and in a newspaper of general circulation in the county, or counties, in which oil or gas or other property affected may be situate.

In connection with this it is necessary to allude to the historical development of the rules and orders of the Commission. From what I have been able to ascertain it appears that Original Order No. 1 was adopted on or about June 28, 1935. This order provided the original formula for determining the amount of total monthly allowable oil production and allocating monthly production to oil wells. It appears that this order was adopted after compliance with the statutory directive as to hearing pursuant to notice.

Order No. 235 was adopted on January 13, 1940, pursuant to compliance with the statutory directive as to hearing pursuant to notice, setting the original hearing on July 21, 1939, at Santa Fe. The pertinent features of that order are as follows: "1. The New Mexico Oil Conservation Commission will meet monthly, as soon as practicable after the announcement of the Bureau of Mines of the latest market demand for New Mexico, and at such meeting will consider the announcement of the Bureau of Mines and other evidence of market demand, and will determine the amount of oil to be produced from all pools in the State of New Mexico during the following calendar month. The amount so determined will be allocated among the various pools in the State in accordance with existing regulations and among the various units in each pool, in accordance with the regulations governing each pool. The Commission will thereupon issue a proration schedule which will specify the amount of oil each unit in the State may produce each day during the following calendar month, including shortages which may be made up and lawful overages. Allowables for wells completed between the first and sixteenth of each month shall be included in a supplementary proration schedule to the current monthly proration schedule. This supplement shall be issued on the sixteenth of each month. Such monthly proration schedule and such supplementary proration schedule shall each constitute the certificate of the Commission authorizing thereunder:

(1) the production of oil from the various units in accordance with such respective schedules.

(2) the purchase of oil so produced by the purchasing companies; and

(3) the transportation of oil so produced by the various pipe line companies. "

The order was signed by two members of the Commission.

The general order provides a means for monthly ascertainment by the Commission of monthly market demand and state allowables. It provided further that the Commission would then prorate by schedule allowable production as to pools and as to wells. The ministerial task of preparing the schedule was done by a deputy of the Commission, acting under its direction, in the field, whose salary, except for $1.00 per year, was paid by the producers under their proration agreements. This schedule was forwarded to each producer each month.

I am told that each and every monthly schedule of state allowable production and pool and well allowable production, up to January 1, 1950, was prepared according to the provisions of Order No. 235 and that each monthly schedule of proration referred directly to Order No. 235, with an appropriate sub-heading for the particular monthly proration schedule, which latter, for the sake of convenience in identification, was designated Proration Order No. 738, No. 739, etc. as appropriate.

This general order was superseded in 1950 by General Order No. 850, adopted pursuant to statutory notice of hearing. I am informed that the 1949 amendment to the Act provided for allocating monthly allowables based upon corelative rights and that this, together with the fact that the industry had grown, persuaded the Commission to adopt Order 850 which provides that the Commission will determine the monthly prorations through its staff at Santa Fe. I am told that the change was made for these reasons only and not because there was any feeling upon the part of the Commission that there had been anything defective about the manner of determining monthly allowables prior to that time.

I am informed that since January 1, 1950, every monthly schedule of state allowable production and pool and well allowable production, has been prepared according to the provisions of this order. Each monthly proration schedule carried a reference to this Order No. 850, with an appropriate sub-reference for the particular monthly proration schedule, which latter for the sake of identification is designated Proration Order No. 1-A, 1-B, etc.

It is not necessary to discuss all orders of the Commission. Order No. 329 was adopted, according to the information available, on or about October 1, 1941. It was adopted for the Hobbs pool and set up specifications and methods for ascertaining pool and well allotments for the Hobbs field. It was adopted after notice and hearing pursuant to Statute.

Order No. 398, I am informed, was a modification of the previous order concerning allotments for the Hobbs field. It was adopted after notice and hearing pursuant to statute. Order No. 538 was adopted on or about July 1, 1943, I am told. It was a general statewide proration order, adopted after notice and hearing pursuant to statute. Order No. 637 was adopted on or about March 1, 1946, I am told. It modified Order No. 538 and adopted the deep pool theory of production. It was adopted after notice and hearing pursuant to statute. Order No. 798 was adopted on or about November 19, 1948, I am told. It modified Order No. 637 and provided for gas and oil ratios. It was adopted pursuant to notice and hearing according to statute.

It appears therefore that all monthly schedules or state wide allowables and pool and well allowables since 1940 have been set under the provisions of either Order No. 235 or Order No. 850, modified in each case by the provisions of the other orders herein referred to.

The principal bone of contention is apparently that the monthly allowable schedules are orders and the objection may be raised that being orders, these orders were not adopted pursuant to notice and hearing, each month, as required by statute. At least this objection might be raised as to such schedules, if they be in truth orders, adopted prior to Order No. 850. I am told that all monthly schedules for production since January, 1950, have been adopted pursuant to hearing and notice and that notice of such meetings has been given setting out the dates of each monthly meeting.

It is my opinion that the monthly proration schedule, even though it may be termed a monthly proration order, is not an order of the Commission. An order presupposes that one is thereby compelled to perform some act or to desist from performing some act. General Order No. 235, adopted by the Commission, compelled the Commission to act according to a certain fixed standard in determining the monthly

state wide allowable. It was binding upon the Commission. But it could not bind the State of New Mexico to produce one barrel of oil. Neither could it prohibit the State of New Mexico from producing oil in excess of the monthly state wide allowable production because the State of New Mexico is not engaged in oil production. Order No. 850 falls into the same category.

Can it be said that the monthly proration schedules compelled any pool or well to produce a given amount of oil? The answer is obviously no. Does the monthly proration schedule prohibit any pool or well from producing oil in excess of the schedule? The act of alloting monthly allowable production to wells and pools is a strictly ministerial task. Perhaps the word is more correctly, a mere mechanical, mathematical task. Sections 11 and 12 of the Act provide that when the Commission limits the total amount of oil or gas to be produced, it shall allocate or distribute the allowable productions accordingly. These sections appear to be mandatory, compelling the Commission to prepare schedules. The schedules and their compilation are an integral part of the statute, involve nothing more than the application of precise mathematical formulae to the determination the Commission has made in setting the monthly statewide allowable.

But it may be argued that the allocation by schedule of allowable production to a pool or well makes production in excess thereof illegal. The schedule has no such effect whatsoever. Section 15 of the Act provides that the sale or purchase or acquisition (which includes production) or the transportation, refining, processing, or handling in any other way, of crude petroleum oil or natural gas in whole or in part produced in excess of the amount allowed by any statute of this state, or by any provision of this act, or by any rule, regulation or order of the Commission made thereunder, is hereby prohibited, and such oil or commodity is hereby referred to as "illegal oil" or "illegal gas," as the case may be. Sections 11 and 12 compel the Commission to set schedules for pool and well production. Production in excess thereof in excess of the amount allowed by schedule is made illegal by the very provisions of the Act itself, not by the schedules themselves.

There is a further argument to be advanced in favor of the contention that these monthly schedules are not orders.

It is found in 42 Am. Jur., at page 503, under the topic, "Public Administrative Law." In discussing the nature, operation and effect of public administrative law, this statement appears:

> "There are many administrative determinations which can be broadly covered by no other designation. They are not coercive or directory and do not constitute orders."

The monthly determination by the Commission of the state wide allowable production is definitely not coercive upon anyone engaged in any phase of the oil industry. After the Commission has made this determination, it is compelled to prepare pool and well allowables, not by virtue of its determination, but by virtue of the Act itself.

In my opinion, no matter what the Commission may call these monthly allowable schedules, the matter of nomenclature is unimportant. The schedules are determinations, nothing more. It is the substance of what is contained in what may be called an order which determines whether it is in fact an order or not.

There may be a possible further objection to the validity of such orders based upon the contention that the Commission in determining monthly statewide allowable production may not have followed the rules it has laid upon itself to make such determination. The Commission is an administrative body. The general rule in administrative bodies is that unless required by statute to do otherwise, the Commission is free at any time to disregard any factors it might consider in making determinations, or to reject evidence completely, in arriving at such determinations. The rules the Commission laid upon itself are for its guidance only. With propriety the Commission could establish a monthly schedule allowing no state wide production or well or unit production, if, in its opinion, it deemed it necessary to prevent waste of oil or gas. Any aggrieved party would have the right to appeal from the decision of the Commission.

In this connection may it be noted that the Legislature itself must be presumed to have intended that the determinations of the Commission, with respect to certain phases of the Act, including, it must be presumed, the setting of state wide monthly allowables, was not to be deemed an order. Justification therefor is found in Section 19 of the Act providing for judicial review of any order or decision of the Commission.

While I am convinced that the foregoing is sufficient to establish that the monthly determination of state-wide allowable oil production by the Commission and the determination of monthly allowable production for pools and wells are not orders, it may not be amiss to mention one additional consideration.

"An order" essentially imputes deliberation of some matters by some tribunal or agency, the exercise of discretion and the issuance of the command. If the Commission has determined the state-wide monthly allowable oil production, there is nothing left for it to deliberate upon or upon which it can exercise any discretion whatsoever as to monthly allowable oil production for pools and wells. The fact that the Commission may deliberate or exercise its discretion in making its determination of the monthly state-wide allowable oil production does not make its determination an order, for again the question must be asked: Who is bound by the order other than the Commission itself?

In determining the state-wide allowable oil production the Commission is engaged in regulating the production of oil and gas in New Mexico, not in producing it. Orders that it enters are primarily intended to affect those engaged in the industry itself.

Lastly, objection may be made to the fact that the orders of the Commission are of no force and effect by virtue of the provisions of Chapter 154, Laws of 1931, making it the duty of the office head of every state office, commission, etc., to file three copies of any official report, pamphlet or publication relating to the affairs of the office with the Librarian of the State Supreme Court. There is no merit to this contention. An order is neither an official report, a pamphlet or a publication relating to the affairs of the office.

This is demonstrated further by the amendment to that law, being Chapter 139, Laws of 1947. This amendment required the filing of three copies of any official report, pamphlet, publication, etc., and in addition, copies of any regulation, rule, code of fair competition notice, proclamation, order or similar instrument issued by any state office or commission. The amendment clearly implies that up to 1947, copies of orders of commissions were not intended to be filed.

The amendment provided that by August 1, 1947, the head of any commission, etc., should file all rules, orders and regulations of the Commission, etc., of which he is the head, which, in his opinion, have general legal applicability and legal effect. Orders in effect at that time, not so filed, are made void until filed.

I am told that the head of the Oil Conservation Commission felt that all orders, in his opinion, had no general applicability and were of interest only to those engaged in producing oil and gas or buying or transporting the same. Therefore the failure to file any such orders, etc., would be of no effect as to orders of the Commission issued prior to August 1, 1947. If ineffective as to orders, the statute is no less ineffectual as to the schedules. As a matter of fact, I am told, that the Commission did file general Circular No. 6, although not required so to do, which contained general information upon the industry and operations under the Act.

Section 4 of the amendment provides that orders of Commissions, etc., not filed as required, shall be invalid except as to persons having actual knowledge of the order. It is inescapable that anyone engaged in oil production or in any activity covered by the Act had actual notice of all orders and all monthly schedules.

Actually I am told that Order No. 850, adopted in January, 1950, has been filed as required by Statute.

I realize this opinion has been lengthy. It has been impossible to treat the matters you raise in any other fashion. In conclusion and to summarize what has been said previously, may I state:

It is my opinion that the Oil Conservation Act of New Mexico is constitutional and does not invade the executive power of appointment and does not delegate to the executive department powers essentially legislative or judicial, in violation of Article 3 of the Constitution. It is my further opinion that the Act establishes a comprehensive standard for the Commission to follow; that its provisions authorizing the Commission to make rules, regulations and orders for the prevention of waste are definite and certain and establish a reasonable standard governing the exercise of the powers delegated to the Commission. It is my opinion that the Act does not violate Section 16 of Article IV of the Constitution.

It is my further opinion that the orders adopted by the Commission have been validly adopted and are in full force and effect and that the monthly determination of state-wide allowable oil and gas production and monthly determination of pool and well allowable production are not orders but are determinations only and that in making such determination no hearing or statutory notice is required except as may be required by the rule or order of the Commission itself, which rule or order is binding upon the Commission until it may be modified or changed appropriately.

Very truly yours,

Joe L. Martinez

JOE L. MARTINEZ
Attorney General

[redacted]

[redacted] Planning of

[redacted] Proposed

[redacted]

[redacted]

[redacted]

NEW MEXICO
OIL CONSERVATION COMMISSION

GOVERNOR THOMAS J. MABRY
CHAIRMAN
LAND COMMISSIONER JOHN E. MILES
MEMBER
STATE GEOLOGIST R. R. SPURRIER
SECRETARY AND DIRECTOR

OIL CONSERVATION COMMISSION
RECEIVED
SEP 15 1948

Santa Fe, New Mexico

12 August 1948

Mr. Bill Vaughn
Lea County Operators Committee
Drawer Eye
Hobbs, New Mexico

Dear Bill:

Enclosed please find description of all the orders which you requested to be listed in June. I am not sure whether we should attempt to compile all these orders and issue them or not. I should like to have yours and Glenn's opinion in the matter and we will try to work something out if you think it would be convenient for you and the operators to have copies of these or certain other orders.

Very truly yours,

Dick

RRS:bsp

Order No.	REFERENCE
1	General State Proration Order
4	General Rules & Regulations Governing The Conservation Of Oil And Gas In New Mexico.
7	Special Rules & Regulations for Hobbs, Jal, Cooper, Eunice and Monument fields.
22	Proration Plan For Monument Field, Lea County
27	Proration Plan For The Artesia-Grayburg-Jackson-Maljamar Area, Eddy And Lea Counties.
45	Revision of Order No. 1 of the Commission, "General State Proration Order".
48	Proration Agreement of Operators For The Hobbs Field, Lea County, New Mexico, Or Other Plan of Proration For This Field.
52	Case No. 4 (Special Rules and Regulations for the Lea County Fields, New Mexico.
66	Emergency Order on Carbon Dioxide.
67	Case No. 7 (The Devising and the Adoption of General Rules and Regulations for Carbon Dioxide ($C.O._2$) Gas for the Entire Area of New Mexico.
71	Adopted this order for pay of E. L. Medler for services rendered concerning Carbon Dioxide Gas operations.
82	Emergency Order, In the matter of the Temporary Proration For the Artesia-Grayburg-Jackson-Maljamar Area, Eddy & Lea Counties.
83	Case No. 9 (The application of Two States Oil Co. to have a closer spacing than at present provided by the rules of the Commission, etc.
105	The application of J. P. Cusack to have a closer spacing than is at present provided by the rules of the Commission, etc. (case No. 10)
116	The application of R. A. Nipper & David Finkelstein to have declared the hereinafter described wells as abandoned wells and the application of the same said parties to pull casing from the same said wells, etc.(Case 11)
122	Allowable ltr. dtd. May 6, 1938
124	The Application of R. A. Nipper & David (Case 11) Finkelstein To Have Declared The Hereinafter Described Wells As Abandoned Wells And Application Of The Same Said Parties To Pull Casing From The Said Wells, Which Said Wells Are Described As Follows: H. L. Williams Well No. 3, located on Section 29, Tnp. 18N, Rge 8 West, N.M.P.M.; H. L. Williams Well No. 4, located Sec. 19, Tnp. 18N, Rge 8 West, N.M.P.M.
128	Order to continue hearing on above case.
132A	The Application Of A. C. Kittell, Trustee,(Case 12) For The Determination As Abandoned, Well Known As Spalter No. 1, LOCATED on the NESE of Sec. 32, Tnp. 31 North, Range 11 West, Aztec Field, San Juan County, and to pull casing and plug same said well.
133	Final Order on Case 11 (above)
181	The Application of the Operators of San Juan County To Have A closer spacing and a smaller unit of production etc.

182 That shortage in a meritorious case, such as for mechanical difficulties, lack of market or pipe line facilities in the discretion of the Commission may be authorized and such authorization may be evidenced to the purchaser, pipe line company or other party in interest by a letter from the Commission, signed by the Commission, or an authorized agent.

183 The Revising, Modifying And Amending The Existing Proration Plan For Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, Designated As Order No. 33 Of the Commission.

206 The Application of Shell Oil Co., Inc., Formerly Shell Petroleum Corporation, For a Special Spacing "To Drill A Well For The Production Of Oil And Gas, To Be Known As Endura "A" No. 3, AT A Location 330 Feet From The South Line And 125 Feet From The West Line of the $SW\frac{1}{4}NE\frac{1}{4}$ Of Said Section 12, Township 21 South, Range 35 East: That Said Location Is Sought, For The Reason That This Applicant Desires To Attempt To Secure Production From A Narrow Belt Along The Flank Of The Eunice Structure, And A Proposed Location At The Normal Distance - That Is To Say 330 Feet East From The Unit Line - Would Be Outside Of This Zone Of Production", Said Location Being In Lea County.

207 The Petition Of Iverson Tool Company To Have Determined The Status Of The Well "Generally Known As The Cabra Springs Oil & Gas Co. North American Investment Company No. 1", Located Upon The $NE\frac{1}{4}NE\frac{1}{4}$ of Section 22, Township 12 North, Range 22 East (San Miguel Co.) As Abandoned : To Withdraw Casing Therefrom And Plug Said Well In Accordance With The Requirements Of The New Mexico Oil Conservation Commission.

242 Final Order to Case No. 17 (above)

243 The Revising, Modifying And Amending The Existing Proration Plan For Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission. (Case 14)

248A Emergency Order modifying Order No. 248 to Case No. 19 - The Adoption of Regulations Governing Oil-Gas Ratios in the various producing fields in New Mexico.

257 The petition of National Surety Corporation to have determined the status of the well known as the Winston Marks well, located upon the $SE\frac{1}{4}NW\frac{1}{4}$, Section 5, twp. 25 North, Range 24 East, (Colfax County), as abandoned; to withdraw casing therefrom and plug said well in accordance with the requirements of the New Mexico Oil Conservation Commission.

322 The petition of R. W. Fair, Bert Aston, Charles A. Scheurich, Carl A. Hatch, J. R. Cole, Sidney Johnson & Anna Franklin, for a location for a well for oil and gas in the Northwest corner of the $NE\frac{1}{4}SW\frac{1}{4}$, Section 32, T. 17 S., R. 30E., (Loco Hills), for structural reasons, at a point closer to the boundary line of said 40-acre tract than is permitted by present rules of the Commission.

ORDER NO.	REFERENCE
323	Petition of Frank B. Hadlock for unorthodox location of well in W½NE¼NE¼ Sec. 16-20S-32E (Halfway Pool) Case 25
329	The application of M. R. Antweil and Conchas Development Co., Inc., for an order determining as abandoned the southwestern drilling company, Inc., Well No. 1, on or in the proximity of the N½NE Section 34, township 17N, Range 21 E, N.M.P.M., San Miguel County, New Mexico: and further for an order authorizing the pulling of casing from said well and the plugging of said well in accordance with the laws, rules and regulations of the Oil Conservation Commission of the state of New Mexico.
330	In the matter of the petition of the Barnsdall Oil Co. for a hearing to modify "Order for the Monument Field, Lea County, New Mexico, made effective May 1, 1936, which said order was promulgated by the Oil Conservation Commission, pursuant to a recessed hearing held on the 25th day of February, 1936 for the purpose of considering a plan of proration for said field. (Case 2) Final Order.
389	Given to allowable set for last half of August 1941, for the continuance of Emergency Order No. 258, in the matter of temporary proration for the Artesia-Grayburg-Jackson-Maljamar Area.
390	Given to allowable set for last half of Aug. 1941, for the continuance of Emer. O 259 in matter of application for gas-oil ratio adjustment.
393	Given to allowable set for firsthalf of Sept. 1941, for the continuance of Emergency Order No. 258, in matter of Artesia-Grayburg-Jackson-Maljamar Area.
394	Given to allowable set for first half of Sept. 1941 for continuance of Emergency Order No. 259, in the matter of application for gas-oil ratio adjustment.
396	Given to allowable set for last half of Sept. 1941, for continuance of E. Order 258, in matter of temporary proration for the Artesia-Grayburg-Jackson-Maljamar Area, Eddy & Lea Counties.
397	Given to allowable set for last half of Sept. 1941, for continuance of E. Order 259, in matter of application for gas-oil ratio adjustment.
398	(Case No. 14) The devising, Modifying and Amending the Existing proration plan for Hobbs Field, Lea County, designated as Order No. 48, of the Commission.
402	Given to allowable set for first half of October, 1941, for continuance of E. O. 258, in matter of Artesia-Grayburg-Jackson-Maljamar Area.
403	Given to allowable set for first half of October, 1941, for continuanc of E. O. No. 259, in matter of application for gas-oil ratio adjustment.
404	Given to allowable set for last half of October, 1941, for continuance of E. O. 258, in matter of Artesia-Grayburg-Jackson-Maljamar Area.
405	Given to allowable set for last half of October, 1941 for continuance of E. O. 259, in matter of application for gas-oil ratio adjustment.
406	Given to allowable set for first half of November, 1941, for continuance of E. O. 258, in matter of Artesia-Grayburg-Jackson Maljamar Area.

ORDER NO.	REFERENCE
409	Given to allowable set for first half of November, 1941, for continuance of E. O. 259, in matter of application for gas-oil ratio adjustment.
411	Given to allowable set for last half of November, 1941, for continuance of E. O. 258, in matter of Artesia-Grayburg-Jackson-Maljamar Area.
412	Given to allowable set for last half of November, 1941, for continuance of E. O. 259, in matter of application for gas-oil ratio adjustment.
416	Given to allowable set for first half of December, 1941, for continuance of E. O. 258, in matter of Artesia-Grayburg-Jackson-Maljamar Area.
417	Given to allowable set for first half of December, 1941, for continuance of E. O. 259, in matter of gas-oil ratio adjustment.
418	Given to allowable set for last half of December, 1941, for continuance of E. O. 259, in matter of application for gas-oil ratio adjustment.
419	Given to allowable set for last half of December, 1941, for continuance of E. O. 258, in matter of Artesia-Grayburg-Jackson-Maljamar Area.
420	Given to allowable set for for January 1942. (first period)
421	Given to allowable set for second proration period of Jan. 1942
422	Given to allowable set for first half of January, 1942, in matter of gas-oil ratio adjustment.
423	Given to allowable set for last half of January, 1942, for continuance of E. O. 259, in matter of application for gas-oil ratio adjustment.
424	Given to allowable set for first period of February, 1942.
425	Given to allowable set for second period of February, 1942.
426	Given to allowable set for first half of February, 1942, for continuance of E. O. 259, in matter of application of gas-oil ratio adjustment.
427	Given to allowable set for last half of February, 1942, for continuance of E. O. 259, in matter of application of gas-oil ratio.
430	Given to allowable set for first half March, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
431	Given to allowable set for last half of March, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
434	Given to allowable set for first half of April, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
435	Given to allowable set for last half of April, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
439	Given to allowable set for first half of May, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
441	Given to allowable set for last half of May, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
442	Given to allowable set for last half of May, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
445	E. O. for first half of June, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.

ORDER NO.	REFERENCE
446	E. O. for first half of June, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
448	E. O. to endure for last half of June, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
449	E. O. to endure for last half of June, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
452	Given to allowable set for first half of July, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
453	E. O. to endure for first half of July, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
454	Given to allowable set for last half of July, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
455	Given to allowable set for last half of July, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
459	E. O. to endure for first half of August, 1942, for continuance of E. O. 259, in matter of application for gas-oil ratio.
460	E. O. to endure for first half of August, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
461	E. O. to endure for last half of August, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
462	E. O. to endure for last half of August, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
465	E. O. to endure for first half of Sept. 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
466	E. O. to endure for first half of Sept. 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
468	E. O. to endure for last half of September, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
469	E. O. to endure for last half of Sept. 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
472	Given to allowable set for first half of Oct. 1942, for continuance of E. O. 259, in matter of gas-oil ratio.
473	Given to allowable set for first half of October, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
474	E. O. to endure for last half of October, 1942, for continuance of E. O. 259, in matter of gas-oil ratio.

ORDER NO.	REFERENCE
475	E. O. to endure for last half of October, 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
478	Given to allowable set for first period of Nov. 1942.
479	Given to allowable set for second period of Nov. 1942.
480	Given to allowable set for first half of Nov. 1942.
481	Given to allowable set for first half of Nov. 1942, for continuance of E. O. 440, in matter of authorizing & directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
482	Given to allowable set for last half of Nov. 1942, for continuance of E. O. 259, in matter of application for gas-oil ratio.
483	Given to allowable set for last half of Nov. 1942, for continuance of E. O. 440, in matter of authorizing & directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
488	Given to allowable set for first half of Dec. 1942, for continuance of E. O. 259, in matter of application for gas-oil ratio.
489	Given to allowable set for first half of Dec. 1942, for continuance of E. O. 440, in the matter of authorizing and directing purchasers to take or purchase one hundred percent from wells which produce only ten barrels or less daily.
490	Given to allowable set for last half of Dec. 1942, for continuance of E. O. 259, in matter of application for gas-oil ratio.
491	Given to allowable set for last half of Dec. 1942, for continuance of E. O. 440, in matter of authorizing and directing purchasers to take or purchase 100% from wells which produce only 10 barrels or less daily.
494	Given to allowable set for first half of Jan. 1943, for continuance of E. O. 259, in matter of application for gas-oil ratio.
495	E. O. adopted to endure for first half of Jan. 1943, to continue E. O. 440, in matter of authorizing & directing purchasers to take or purchase 100% from wells which produce only ten barrels or less daily.
496	Given to allowable set for last half of Jan. 1943, to continue E. O. 259, in matter of application of gas-oil ratio.
497	Given to allowable set for last half of Jan. 1943, to continue E. O. 440, in matter of authorizing & directing purchasers to take or purchase etc.
501	Given to allowable set for first half of Feb. 1943, to continue E. O. 259, in matter of application of gas-oil ratio.
502	Given to allowable set for first half of Feb. 1943, to continue E. O. 440, in matter of authorizing & directing purchasers to take or purchase 100% etc.
503	E. O. adopted for first half of Feb. 1943, to continue E. O. 498, in matter of authorizing an exception to O. 399, the Loco Hills Pressure Maintenance Order.

ORDER NO.	REFERENCE
504	E. O. adopted for the last half of Feb. 1943, to continue E. O. 259, in matter of application of gas-oil ratio.
505	E. O. adopted for last half of Feb. 1943, to continue E. O. 440, in matter of authorizing & directing purchasers to take or purchase one hundred percent from wells which produce only 10 barrels or less daily.
506	E. O. adopted for last half of Feb. 1943, to continue E. O. 498, in matter of authorizing an exception to O 339, Loco Hills Pressure Maintenance Order.
536	E. O. adopted to continue for last half of June 1943, to continue E. O. 259, in matter of application of gas-oil ratio.
537	E. O. adopted to continue for first half of July, 1943, in matter of application of O. 259 gas-oil ratio.
547	E. O. adopted to continue for last half of July, 1943, E. O. 259, in matter of application of gas-oil ratio.
561	(Case 48) The application of M. R. Antwell and Conchas Development Co., Inc., for an order determining as abandoned the Southwestern Drilling Co., Inc., Well No. 1, on or in the proximity of the NWNE Sec. 34, Tnp. 17N, R. 21E, N.M.P.M., San Miguel County, New Mexico: and further for an order authorizing the pulling of casing from said well and the plugging of said well in accordance with the laws, rules and regulations of the Oil Conservation Commission of the State of New Mexico.
566	Order adopted allocating 110,000 barrels per day for month of June, 1944, & ratified the action of the Commission's Director, John M. Kelly, on June 7, 1944, in allocating the same amount for the same period & under the same order number by reason of the Commission's inability to meet.
568	Given to allowable set for month of August, 1944.
569	Case 50, The application of Al Greer, Aztec, New Mexico, for an order determining as abandoned the following wells: H. L. Williams--Santa Fe Pacific Railraod Co. Well No. 3, SWSW 29-18N-8W, and H. L. Willisma-Santa Fe Pacific Railroad Co., Well No. 4, NESW 19-18N-8W, McKinley Co., New Mexico: and further for an order to plug said wells.
575	Given to allowable set for November, 1944.
577	E. O. adopted to continue for last half of Nov. 1944, E. O. 576, changing limiting gas-oil ratio in Loco Hills.
578	E. O. Adopted to continue E. O. 576, for first half of Dec. 1944, changing the limiting gas-oil ratio in Loco Hills Field.
581	E. O. adopted to continue E. O. 576 for last half of Dec. 1944.
582	E. O. adopted to continue E. O. 576, for first half of Jan. 1945.
583	(Case 57) The application of Stanolind Oil & Gas Co. for approval of the Southeast Vacuum Unit Agreement dated Oct. 1944, subscribed by the applicant and the Pure Oil Co, pertaining to lands within Sections 8,9,16 & 17, tnp. 18S, R. 36E, N.M.P.M., in the SE Vacuum Area, Lea County.

ORDER NO.	REFERENCE
585	E. O. adopted to continue E. O. 576 for last half of January, 1945.
586	E. O. adopted to continue E. O. 576 for first half of February, 1945.
587	(Case 53) The application of J. L. Head and W. A. Miller for an order determining as abandoned the carbon dioxide well sometimes known as the J. L. Head & W. A. Miller carbon dioxide well, NENE, (sometimes described as NENW) 31-20N-31E, Harding County, New Mexico, and to grant leave to plug said well in accordance with the laws, rules and regulations of the Commission.
593	Given to allowable set for last half of Feb. 1945, to continue E. O. 576.
594	Given to allowable set for first half of March, 1945, to continue E. O. 576.
597	Given to allowable set for last half of March, 1945, to continue E. O. 576.
598	Given to allowable set for first half of April, 1945, to continue E. O. 576.
600	Given to allowable set for last half of April, 1945, to continue E. O. 576.
601	Given to allowable set for first half of May, 1945, to continue E. O. 576.
605	Given to allowable set for month of June, 1945.
606	Given to allowable set for last half of May, 1945 to continue E. O. 576.
607	Given to allowable set for first half of June, 1945, to continue E. O. 576.
609	Given to allowable set for last half of June, 1945, to continue E. O. 576 (gas-oil ratio for Loco Hills 3000).
610	Given to allowable set for first half of July, 1945, to continue E. O. 576.
612	Given to allowable set for last half of July, 1945, to continue E. O. 576.
613	Given to allowable set for first half of August, 1945, to continue E. O. 576.
615	Given to allowable set for last half of August, 1945, to continue E. O. 576.
616	Given to allowable set for first half of Sept. 1945, to continue E. O. 576.
617	E. O. to Case 53, In the matter of the application of J. L. Head and W. A. Miller for an order determining as abandoned the carbon dioxide well sometimes known as the J. L. Head and W. A. Miller carbon dioxide well, NENE (sometimes described as NENW) 31-20N-31E, Harding County, New Mexico, and to grant leave to plug said well in accordance with the laws, rules and regulations of the Commission.
619	Given to allowable set for last half of Sept., 1945, to continue E. O. 576.
620	Given to allowable set for first half of October, 1945, to continue E. O. 576.
621	Case 53, in matter of the motion of Colo-Mex Gas Co. to vacate and set aside order No. 587 and the permit issued thereunder to J. L. Head and W. A. Miller to plug the carbon dioxide well upon Sec. 31, Twp. 20N, R. 31E, to accept the plugging bond submitted by Colo-Mex Gas Co. to cover said well; and to cancel the plugging bond of J. L. Head & W. A. Miller.

ORDER NO.	REFERENCE
623	Given to allowable set for last half of October, 1945, to continue E. O. 576.
624	Given to allowable set for first half of Nov. 1945, to continue E. O. 576.
626	Given to allowable set for last half of Nov. 1945, to continue E. O. 576.
627	Given to allowable set for first half of Dec. 1945, to continue E. O. 576.
631	Given to allowable set for last half of Dec. 1945, to continue E. O. 576.
632	Given to allowable set for first half of Jan. 1946, to continue E. O. 576.
635	Given to allowable set for last half of Jan. 1946, to continue E. O. 576.
636	Given to allowable set for first half of Feb. 1946, to continue E. O. 576.
639	Given to allowable set for last half of Feb. 1946, to continue E. O. 576.
640	Given to allowable set for first half of March, 1946, to continue E. O. 576.
642	Given to allowable set for last half of March, 1946, to continue E. O. 576.
643	Given to allowable set for first half of April, 1946, to continue E. O. 576.
645	Given to allowable set for last half of April, 1946, to continue E. O. 576.
646	Given to allowable set for first half of May, 1946, to continue E. O. 576.
653	Given to allowable set for last half of May, 1946, to continue E. O. 576.
654	Given to allowable set for first half of June, 1946, to continue E. O. 576.
662	Given to allowable set for last half of June, 1946, to continue E. O. 576.
663	Given to allowable set for first half of July, 1946, to continue E. O. 576.
665	Given to allowable set for last half of July, 1946, to continue E. O. 576.
666	Given to allowable set for first half of August, 1946, to continue E. O. 576.
668	Given to allowable set for last half of August, 1946, to continue E. O. 576.
669	Given to allowable set for first half of Sept. 1946, to continue E. O. 576.
671	Given to allowable set for last half of Sept. 1946, to continue E. O. 576.
672	Given to allowable set for first half of Oct. 1946, to continue E. O. 576.
679	Given to allowable set for last half of Oct. 1946, to continue E. O. 576.
680	Given to allowable set for first half of Nov. 1946, to continue E. O. 576.
682	Given to allowable set for last half of Nov. 1946, to continue E. O. 576.
683	Given to allowable set for first half of Dec. 1946, to continue E. O. 576.

ORDER NO.	REFERENCE
684	Case 68, The application of Byrd-Frost, Inc., for an order of approval of the unit agreement for the development and operation of the Angel Peak Unit Area, within tnps. 27,28 and 29N, Ranges 10 & 11W, N.M.P.M., containing 29,802.17 acres more or less, San Juan County, New Mexico.
685	Case 89, The application of American Employers Insurance Co., surety upon the plugging bond for the hereinafter described well, requiring the interested parties to show cause why Orville Lee - C. N. Milbourn Well No. 1, center SW¼, Sec. 36, Tnp. 7N, Rge 7E, N.M.P.M., Torrance County, should not be declared abandoned and ordered plugged in accorance with the regulations of the New Mexico Oil Conservation Commission and the provisions of said bond.
687	Given to allowable set for last half of Dec. 1946, to continue E. O. 576.
688	Given to allowable set for first half of Jan. 1947, to continue E. O. 576.
690	Given to allowable set for last half of Jan. 1947, to continue E. O. 576.
691	Given to allowable set for first half of Feb. 1947, to continue E. O. 576.
693	Given to allowable set for last half of Feb. 1947, to continue E. O. 576.
694	Given to allowable set for first half of March, 1947, to continue E. O. 576.
696	Given to allowable set for last half of March, 1947, to continue E. O. 576.
697	Given to allowable set for first half of April 1947, to continue E. O. 576.
700	Given to allowable set for month of May, 1947, to continue E. O. 576.
701	Given to allowable set for month of (last half) April 1947, to continue E. O. 576.
702	Given to allowable set for first half of May, 1947, to continue E. O. 576.
704	Given to allowable set for last half of May, 1947, to continue E. O. 576.
705	Given to allowable set for first half of June, 1947, to continue E. O. 576.
715	Given to allowable set for last half of June, 1947, to continue E. O. 576.
716	Given to allowable set for first half of July, 1947, to continue E. O. 576.
721	Given to allowable set for last half of July, 1947, to continue E. O. 576.
722	Given to allowable set for first half of August, 1947, to continue E. O. 576.
761	Case 131, In the matter of the application of Malco Refineries, Inc., Dale Resler d/b/a Resler Oil Co. and Martin Yates, Jr. for approval of the deepening of an unorthodox location 2390 feet from the north line and 2390 feet from the east line of Section 23 in tnp. 18 South, Range 28 East, N.M.P.M. in the Artesia Pool, Eddy County, New Mexico.

New Mexico Oil Conservation Commission Orders
Relating to Unorthodox Locations.

February 1, 1950

Case	ORDER			ORDER
3	30	Msg		818
- 9	83	Msg ✓		819*
- 10	105	Msg ✓	- 185	821* Msg ✓
- 16	206	Msg ✓		828
- 24	322	Msg ✓		832
- 25	323	Msg ✓ dismissal		844*
	387			847*
	395			848*
	399			849*
	590			
	591			* R-9
	604			
78	657	Msg ✓		
- 82	660	Msg ✓		
95	707*			
- 96	708*			
107	727*	[redacted]		
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	803			
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* Indicates 5-spot cases.

Msg - Missing from O.C.C. files

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Case No.

14

File #2

Application, Transcript,
Small Exhibits, Etc.

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(2)

LEGAL NOTICE

(June 27, 1939)

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION
COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 21st day of July, 1939, at 9:00 A. M., for the purpose of considering the following:

Case No. 15.

(a) The adoption of rules, regulations and orders as may be necessary to make effective the prohibitions contained in Section 13, Chapter 72, Laws of New Mexico 1935, and for the issuance of certificates of clearance or tenders, or some other method, so that any person may have an opportunity to determine whether any contemplated transaction of sale or purchase or acquisition, or of transportation, refining, processing, or handling in any other way, involves illegal oil or illegal oil product.

(b) The adoption of rules, regulations and orders relating to the making up of shortage or back allowable.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on this [illegible]

OIL CONSERVATION COMMISSION

By [illegible]

[illegible]

SEAL

By [illegible]

State [illegible]

379

ORIGINAL

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FOR PURCHASES AND SERVICES OTHER THAN PERSONAL

STATE OF NEW MEXICO, OIL CONSERVATION COMMISSION, DR.

June 26, 1939

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I, or We, certify that the above articles were received in good condition after due inspection thereof, or the services rendered as stated; that they were necessary and proper and that the amounts claimed are just and reasonable and that no part thereof has been paid.

APPROVED OIL CONSERVATION COMMISSION

Title Secretary

Title

DISBURSING OFFICE

, 19

STATE AUDITOR'S OFFICE
J. O. GARCIA,
Auditor.

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OIL CONSERVATION COMMISSION

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June 27, 1939

Mr. W. E. Hubbard
Humble Oil & Refining Co.
Houston, Texas

Re: Authorization for the running of shortages

Dear Mr. Hubbard:

Regarding the running of shortage in a meritorious case such as mechanical trouble and the like, enclosed please find a suggested form letter for authorization of running of such shortage. I shall be profoundly grateful to you for any suggestions you may have.

In order to remove doubt as to the legality of running such shortage, the Commission held a meeting on the afternoon of June 22 and promulgated Emergency Order No. 182 authorizing the running of shortage within the discretion of the Commission in certain meritorious cases, to endure f for the first bimonthly period of July, with the intention of renewing said emergency order until formal hearing for the purpose of adopting a permanent order. By law, emergency orders can only endure fifteen days at a time.

At the same said meeting, the Commission ordered a hearing upon Case 15 for the purpose of adopting rules and regulations regarding the running of shortage and for the further purpose of providing for certificates of clearance in order to carry out the provisions of Sections 13 and 14, Chapter 72, Laws of 1935, our Conservation Law. A copy of notice of hearing is enclosed for your information.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Encls.

3719

May 3, 1940

Mr. Lloyd L. Gray
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 14 - In the Matter of Revising Hobbs Proration Order No. 48.

Dear Mr. Gray:

This will acknowledge receipt of your letter of May 1, requesting that additional time be allowed for the preparation of the Gulf Oil Corporation's statement in the Hobbs proration case.

You are herewith granted an additional fifteen-day period for the preparation of this statement. Your previous time was to May 10. It is now enlarged by fifteen days to May 25, 1940.

Very truly yours,

Frank Worden
Secretary

FW:ik

PETROLEUM AND IT'S PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

May 1, 1940

Mr. Carl Livingston, Attorney
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Dear Sir:

Confirming our recent conversation, I request that a little additional time be allowed for the preparation of our statement in the Hobbs proration case. As I previously stated, the fault is mine in that Judge Lowe requested that I give him a report over a month ago but due to several necessary trips out of the state and a recent illness I have been unable to give him the report. It is, of course, possible that the report could be made and Judge Lowe's statement prepared before May 10th. However, if at all possible I should appreciate a little more time so that the subject may be a little better and thoroughly covered.

Yours very truly,

Lloyd L. Gray

LLG:RC

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

April 17th, 1940

Mr. Carl B. Livingston, Attorney,
Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Livingston:

Case No. 14 - In the Matter of Revising
Hobbs Proration Order No. 48

This acknowledges with thanks your letter of the 15th advising time to file statement on behalf of Gulf Oil Corporation has been enlarged to May 10th.

Yours truly,

RGL.W

Russell Lowe

April 15, 1960

Honorable Russell C. Lowe
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 11 - In the Matter of Revising Rules Prescribed Order No. 26.

My dear Judge Lowe:

Reference is made to your letter of April 11, wherein you request an enlargement of time by a period of twenty days for the filing of the statement on behalf of the Gulf Oil Corporation.

Today I took up the matter of your request with Mr. Worden, member and secretary of the Commission, and I am authorized to state that the enlargement by twenty days is granted. Your previous time was to April 20. It is now enlarged by twenty days to May 10.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

SETH AND MONTGOMERY
ATTORNEYS AND COUNSELORS AT LAW
111 SAN FRANCISCO ST.
SANTA FE, NEW MEXICO

J. O. SETH
A. K. MONTGOMERY

March 30, 1940.

MAR 3[illegible] [illegible] '40
[illegible], N. M.

Oil Conservation Commission,
c/o Honorable Frank Worden,
Commissioner of Public Lands,
Santa Fe, New Mexico.

Gentlemen:

Enclosed please find two copies of statement of Stanolind Oil & Gas Company in support of its position with respect to revising, modifying and amending the existing proration of the Hobbs Field Order No. 48, Hobbs Pool, Lea County.

We have sent copy to Judge Lowe of the Gulf.

Very truly yours,

JOS:IG
Encl.

OIL CONSERVATION COMMISSION

April 15, 1940

COPY

Honorable Russell G. Lowe
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 14 - In the Matter of Revising Hobbs Proration Order No. 48.

My dear Judge Lowe:

Reference is made to your letter of April 11, wherein you request an enlargement of time by a period of twenty days for the filing of the statement on behalf of the Gulf Oil Corporation.

Today I took up the matter of your request with Mr. Worden, member and secretary of the Commission, and I am authorized to state that the enlargement by twenty days is granted. Your previous time was to April 20. It is now enlarged by twenty days to May 10.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

April 11th, 1940

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
APR 13 1940

Oil Conservation Commission,
Santa Fe, New Mexico.

Gentlemen:

Re: Case No. 14 - In the Matter of Revising
Hobbs Proration Order No. 48

It would be appreciated if you would enlarge the time in which statement on behalf of Gulf Oil Corporation is to be filed for a period of 20 days.

We have been very busy since the brief of the Stanolind was filed and considerable research is necessary.

Thanking you, I am,

Yours very truly,

RGL.W

Russell G. Lowe

OIL CONSERVATION COMMISSION

March 30, 1940

COPY

Russell G. Lowe, Esq.
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 14, in the matter of revising the Hobbs Proration Order No. 48.

My dear Mudge Lowe:

The Stanolind Oil & Gas Company has today filed its statement in chief in connection with the above captioned matter.

You accordingly have twenty days in which to file your answer statement. If you desire a longer time, please advise the Commission.

Yours very truly,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

OIL CONSERVATION COMMISSION

March 30, 1940

COPY

Honorable J. O. Seth
Attorney at Law
Santa Fe, New Mexico

Re: Case No. 14, in the matter of revising the Hobbs Proration Order No. 48.

My dear Judge Seth:

This is to acknowledge receipt of two copies of your statement in chief for the Stanolind Oil & Gas Company in connection with the above captioned matter.

Honorable Russell G. Lowe, Attorney for the Gulf Oil Corporation, is being notified that he has twenty days' time in which to file an answer statement.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

BEFORE THE CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF STANOLIND OIL AND GAS COMPANY FOR A REVISION, MODIFICATION AND AMENDMENT TO EXISTING PRORATION ORDERS APPLICABLE TO THE HOBBS FIELD.	)))))	RE: ORDER NO. 48 HOBBS POOL, LEA COUNTY, NEW MEXICO

STATEMENT OF STANOLIND OIL AND GAS COMPANY IN SUPPORT OF ITS POSITION WITH RESPECT TO REVISING, MODIFYING AND AMENDING THE EXISTING PRORATION PLAN OF THE HOBBS FIELD

Section 12 of the existing Conservation Law of the State of New Mexico, approved February 23, 1935, provides, in part, as follows:

> "Section 12. Whenever, to prevent waste, the total allowable production for any field or pool in the state is fixed by the Commission in an amount less than that which the field or pool could produce if no restriction were imposed, the Commission shall prorate or distribute the allowable production among the producers in the field or pool. Such proration or distribution shall be made on a reasonable basis. The rules, regulations or orders of the Commission shall, so far as it is practicable to do so, afford to the owner of each property in a pool the opportunity to produce his just and equitable share of the oil and gas in the pool, being an amount, so far as can be practicably determined, and so far as such can be practicably obtained without waste, substantially in the proportion that the quantity of the recoverable oil and gas under such property bears to the total recoverable oil and gas in the pool, and for this purpose to use his just and equitable share of the reservoir energy."

STANOLIND'S POSITION

(a) That the proration formula now in effect in the Hobbs Field, allocating 60 per cent of the production to acreage and 40 per cent to average unit potential, modified by shut-in bottom hole pressure adjustments, has failed to operate, and does not now operate in such manner as to afford Stanolind Oil and Gas Company an opportunity to produce its just and equitable share of the oil from said pool, which it can produce without waste, and which would be in proportion that the quantity of recoverable oil under its properties bears to the total recoverable oil in the pool, such being the opportunity to which

Stanolind is entitled under Section 12 of the Conservation Law of 1935 just cited.

(b) But, on the contrary, said proration formula denies to Stanolind an opportunity to produce its just and equitable share of the oil in said pool, which can be produced without waste in the proportion that the quantity of recoverable oil under Stanolind's properties bears to the total recoverable oil in the pool, and denies to Stanolind Oil and Gas Company the right to use its just and equitable share of the reservoir energy.

(c) That the conditions now existing in the Hobbs pool, with respect to the physical characteristics of the said reservoir are such that, if the proration plan for the Hobbs Pool is changed and modified, so that each 40 acre unit within said pool is permitted to produce the allowable oil which each unit can produce without waste, in the ratio or proportion that the acreage in each unit bears to the acreage of the entire pool, such modification will result, at least prospectively, in all producers being afforded an opportunity to produce their just and equitable share of the oil and gas in the pool, being an amount so far as can be practicably determined, and so far as can be practicably obtained without waste, substantially in the proportion that the quantity of recoverable oil under each owner's property bears to the total recoverable oil in the pool, and will afford each owner an opportunity to use his just and equitable share of the reservoir energy.

EVIDENCE

Formational Characteristics of Reservoir

The undisputed evidence by all interested parties was to the effect that the Hobbs Pool, located in the northeastern part of Lea County, New Mexico, covering some 9000 acres, is producing from a series of porous zones in the Permian White Lime, of which at least three have been definitely recognized. The testimony further indicates it to be an accepted fact that these

pay zones have varying degrees of permeability and porosity ranging from very tight pay sections to highly cavernous conditions. The first, or upper pay section is found at an approximate depth of 4050 feet. The second pay section is found at an approximate depth of 4100 feet, and the third recognized producing horizon is found at an approximate depth of 4150 feet. The upper, or first pay is recognized as the most extensive and prolific of the three pays. The second pay was originally considered a part of the first or upper pay, but from additional development it is now considered definitely to be a separate producing horizon and, although not as extensive or as prolific as the upper horizon, it has much the same producing characteristics. The third pay, or what is known as the Capps Lime, is generally less cavernous than the upper pay, and, although originally considered to contain less reserves, after acidizing has been found, as a result of recent study, to be much more prolific than at first thought, and to indicate a per acre recovery on a par with the first and second horizons.

Nature of Water Drive

There is clear evidence of water encroachment completely encircling the field, with the exception of a small part in the northeast flank. Difference in permeability varies greatly within each zone, as well as between zones (Card 14, 15 and 16). The upper, or first zone, had very high permeability across the southwest flank, which was evident when water entered the southwest area on a wide front, displacing oil ahead of it from the leases on which it was originally in place, to be produced by leases farther up structure. This oil was taken away from these southwest leases, many of which were owned by Stanolind, for three reasons (Exhibits B, C and D): First, large quantities of free gas and oil were withdrawn from the apex of the structure, leaving room for replacement from the outer edges; second, there was abundance of water energy available at the outer edges; third, the most permeable areas of the entire field in the first zone

lie along the southwest flank, allowing ready access for the water to drive oil from the upper zone of the southwest flank leases. Other evidence of water encroachment to some extent is shown on exhibits in the northwest end of the field, and to a lesser extent in the southeast portion. Leases suffering the greatest damage from the water movement across the southwest flank were those belonging to Stanolind, in Sections 4 and 5, in Township 19 South, Range 38 East.

Stanolind's Oil Losses on Southwest Flank Leases Resulted in Gains to Leases Up Structure, but Benefited Field Recovery as a Whole

Stanolind's wells in this southwest area had more than average potentials, as is evidenced by the early schedules which have been made a part of this record. Had not space voidance by heavy withdrawals of oil and gas up structure taken place, there would have been no broad water movement across Stanolind's southwest flank leases. When water began to make its appearance in this upper zone in Stanolind's leases, Stanolind had a choice of two things: It could disregard the rights of others to their proportionate share of the reservoir energy, and produce the water in large quantities, such as is being done by the Gulf and others in the northwest portion of the field at this time (Card, Pages 18 and 19, where Gulf was shown to be producing 82% water; Cities Service and others were shown to be producing 73%, 93%, 95%, and other large quantities of water along with the oil). Stanolind's producing costs, according to the testimony, might have been higher had water packers not been set, but by producing large quantities of water, not only would it have prevented this water from displacing oil from its properties, but it would have created opposite drainage by bringing oil from up-structure back down upon Stanolind properties. Card further testified that had Stanolind followed this procedure "many of these wells up here (up structure) would be pumping today, if packers had not been set in our wells, but they would not have as much oil as they have with the packers."

In the second place, Stanolind could practice true conservation, by setting packers, shutting off the upper pay from the lower pays, which would result in Stanolind abandoning forever all the oil to which it was entitled to recover, under the law, from the upper zone. In the first case, Stanolind could have operated at slightly higher lifting costs, and recovered hundreds and thousands of barrels of oil which it lost to up structure leases, and in so doing utilized more than its share of the reservoir energy, such as is now being done in the northwest portion of the field. Or, in the second case, which it followed, it could practice true conservation by setting water packers, thereby avoiding the production of huge quantities of water, and the consequent huge waste of reservoir energy, and obtained temporarily a slightly lower lifting cost.

Stanolind Oil Losses from Southwest Leases Were Not Denied But Actually Admitted

Mr. Card shows that after Stanolind set more water packers than any other company in the field, the loss of its oil by displacement in the upper zone by water was in excess of 1,550,000 barrels, which oil was produced from properties higher up structure. 518,000 barrels of this amount Mr. Card showed (Page 21) had been pushed off Stanolind's properties by the broad water movement since the effective date of the present Conservation Law, June 1, 1935. No witnesses disputed the fact that Stanolind lost this oil off its leases in the southwest flank. There was no attempt to refute or deny the testimony of Mr. Card regarding the loss of this oil in any manner. Lloyd Gray, witness for the Gulf, testified (Page 83) "The water encroached most rapidly progressively up structure in the areas adjacent to Stanolind's State No. 11, in the southwest of Section 5, and apparently followed the lines of least resistance, which was areas having high permeability and porosity."

Mr. Card (Page 21) testified that his estimate of Stanolind's losses of more than a million and a half barrels, was not based on acreage, but on Stanolind's proportion of acre-feet swept by water, as compared to the total acre-feet in the reservoir.

Other methods of calculation would have shown the loss to be greater.

Mr. Card's testimony as to drainage away from Stanolind, on its southwest flank properties, can be summarized by the statement that Stanolind lost more than one and a half millions of barrels of oil to other operators of the pool, which fact was not only uncontradicted, but was supported by Gulf testimony.

Stanolind Led All Operators in Setting Water Packers and Suffered Most Thereby, All For the Benefit of the Field as a Whole

Thus, it was shown that purely as a conservation measure, at the expense of Stanolind's own production, and for the benefit of the reservoir as a whole, and at the recommendation and insistence of the Hobbs Engineering Committee, Stanolind set 13 water packers on its properties. A total of 34 water packers have been set in the field (page 17). It will be noted that approximately 38% of all the water packers were set on Stanolind's properties, although Stanolind is the owner of but 22% of the acreage of the field. When Stanolind set these water packers, shutting off the oil from its first and second zones, its future recovery was limited to the third and lowest zone, known to be very low in permeability, and requiring much acidation to facilitate production therefrom.

Saturated Pay Now of Uniform Thickness Making Acreage Factor Alone Applicable

Card testified that due to the cavernous condition of the lime, porosity over the whole area of a unit was not determinable. That "Potential is a measure of the permeability, the pay thickness, and the bottom hole pressure of a particular well." That "permeability has no bearing at all on the oil in place. It is merely the measure of the ease with which a fluid flows out from the reservoir." That the original pay thickness could be roughly determined, but that "due to the development of a gas cap throughout the top of the structure, it has leveled off so that at present the oil saturated section is more or less uniform." In answer to the question "The gas cap and the water drive have

more or less made the remaining oil and gas in place uniform throughout the field -- sort of pancaked it and flattened it out?" he answered: "That's true"; and to the question "For that reason would an acreage basis probably more fairly represent the recoverable oil than it would perhaps in the beginning of production?" he answered: "At the present time, yes". And to the question "As to what is left there?" he also answered "Yes".

Potential Is Not a Measurement of Oil in Place in Lime Fields

He further testified, in support of his statement that potential cannot be used in calculating oil in place, that fields producing under wide open flow conditions proved his point. He cited the Hendrick Field "immediately south of the state line in Texas, on the same trend of the lime fields in New Mexico". He explained, using Exhibit A (page 13), that the Hendrick Field has produced under wide open flow conditions up to the present time, when it is practically depleted; that producing wide open, each well drained the oil from underneath its property within its local drainage area. When the oil underneath the property was produced, the high potential wells went to water, usually before the lower potential wells. He showed that of two wells of the same initial potential of 2200 barrels per day, one had recovered 10,000 to 11,000 barrels per acre, and the other 25,000 to 26,000 barrels per acre. He showed that there were four or five other leases having an average initial potential of twice 2200 barrels per day, with an average recovery of less than 5000 barrels per acre. His testimony further showed that if the Hendrick Field had been prorated, as has Hobbs been prorated, the high potential wells would not have gone to water, because the restriction to a low daily allowable would have prevented water coning. However, he testified when, under proration, as in the Hobbs Field, the high potential wells did not go to water, but drew oil from surrounding properties when their allowable, under a potential proration system permitted them to produce greater quantities than the neighboring wells. He testified that this potential was not due to the oil in place underneath the properties, but

to an open and permeable condition around the bore hole of the well, which allowed more oil to come to the well at no difference in pressure. Thus, he said, "The wells with high potential producing large volumes of oil, will drain oil from neighboring wells. Wells on the upper parts of the structure produce oil and have that oil replaced from edge wells, which are subjected to a water drive such as on the southwest flank of the structure". In this case he referred to the southwest flank of the Hobbs Field, where Stanolind's leases suffered more than a million and a half barrels of drainage under the present proration plan. Pointing to that particular area on the Hobbs map, he testified "Water encroached across the section (southwest -- upper pay) of the field at a very rapid rate, displacing oil from the upper pay, pushing the oil on up structure and replacing the oil produced from the up structure wells".

Acidation Results Are Proof that Potential Is Not a Measure of Oil in Place

R. S. Dewey, Petroleum Engineer for the Humble Oil and Refining Company, testified that 260 of the wells of the field were acidized, changing the permeability around the bore hole and increasing the potentials, and consequently the allowable withdrawal from the common reservoir of each well treated. 70 wells, he said, were not treated because either they were packer wells, or because acid treatment might result in dissipating the reservoir energy through increasing by acidation the gas-oil ratio or the water production. These 70 wells, he said, did not obtain an increase in potential through acidation, and therefore lost their right to more allowable from the common source of supply, and consequently have lost materially in their share of oil produced. He also showed that, due to the use of excessive amounts of acid in the treatment of wells, abnormally large allowables were obtained. Potential on 11 wells in particular was increased approximately 400%, which, of course, was directly reflected in giving these wells more oil from the common source of supply by the application of a large potential factor in the proration formula. Some wells, after having 12,000 gallons of acid dumped into them, showed an

increase in potential of 6-1/2 times, and an enormous increase in allowable from the common source of supply of reservoir oil. It was Dewey's opinion that various operators had used excessive amounts of acid to take advantage of the potential proration plan, and that the potentials as a whole should be revised to a reasonable basis, so that the inequities caused, not by an increase in recoverable oil in place, but an increase in the amount of acid used to treat a well, would not continue in the future. Dewey testified: "Under the current statute governing New Mexico oil in place, my conception of potential is merely a very poor co-factor which might be applied with other factors to estimate roughly the oil in place". He testified that it was his belief that potentials obtained by acid treating did not represent natural permeabilities, and that such potentials should be adjusted. Dewey further testified (page 7) "potential indicates the permeability immediately around the bore hole and does not indicate necessarily oil in place". He condemned the use of the method used in Plan 2-A of corrected potentials.

In answer to the question, "Isn't it a fact that if any changes in bottom hole pressure come into existence in a pool, the result is a migration of oil which takes place from the high pressure area to the low pressure?", he said: "I have been unable to apply bottom hole pressure adjustments to potentials in the Hobbs Pool -- I should say in my own mind" (Pages 13 and 14).

Stanolind's Leases in the Southeast End of Field Did Not Benefit By Drainage from Leases of Other Operators

The shut-in bottom hole pressures as reflected by the Hobbs Engineering Committee Report were used in the various exhibits introduced by Witness Knappen. These covered the entire field as taken on December, 1931; October, 1933; August, 1936; September, 1939 (Gulf Exhibits Nos. 6, 7, 8 and 9). Attention is called to the fact, however, that these exhibits do not reflect the formation in which such pressures were taken, nor do they reflect, as a matter of fact, that such pressures were taken in different formations, at different periods, and in many cases comparative pressures for offset wells may have been for entirely

different formations. On cross examination Witness Knappen testified for the benefit of the Commission regarding the pressures in certain wells along the township line between Townships 18 and 19, as reflected by the 1935 survey of the Hobbs Engineering Committee. The testimony showed that Stanolind's properties are located generally south of the township line between Townships 18 and 19, while the properties of the Gulf Oil Corporation, Ohio Oil Company, Continental Oil Company, and others, lie immediately north of the line. Witness Knappen's testimony showed conclusively that, as a matter of fact, during the period represented by this pressure survey, the pressures in the wells to the south of said township line located upon Stanolind's properties were as high, and in many cases higher than in the wells to the north, on the properties of the Gulf, Ohio, Continental, Repollo, and others. For example, the Continental State No. 3-B well, in Section 33, Township 18, showed a pressure of 1210; while the Stanolind State No. 26, located in the northeast of Section 4, Township 19, lying to the south of the Continental well, showed a pressure of 1220 pounds; and Stanolind's Byers No. 8, in the northeast quarter of Section 4, Township 19, had the same pressure as the Continental well located to the north. When Witness Knappen was asked how, under his theory, the oil could drain from the low pressure wells to the high pressure wells of Stanolind's properties, he was forced to the absurd conclusion that it drained around the edge of the structure, or through those parts of the 40-acre units in which no wells were located (pages 175 to 179). Knappen's theory of oil draining around the edge of the structure, draining completely around high pressure wells, to get to a low pressure area on the other side of a high pressure, is just as logical as would be the statement that a lake on the western side of the Sierras, in California, for instance, would drain down the west coast ~~of~~ to the Isthmus of Panama, across the Panama Isthmus, back up the east side of the Sierras into the Great Salt Lake, if the lake on the west side of the Sierras be higher than the Great Salt Lake in Utah.

When Witness Knappen was asked why he had not prepared an exhibit of the pressures as shown in 1935, his answer was as follows: "We were afraid more would tire the Commission". Although Witness Knappen did not use the pressures as shown by the survey in 1935, such were made a part of the record, and the Commission will find, upon inspection of the pressures shown in the area in which Gulf claims drainage occurred to Stanolind, that drainage of oil away from Stanolind leases in the opposite direction will be shown on the basis of Witness Knappen's theory.

The purported drainage to Stanolind leases in the southeast part of the field is not apparent if all of the available data is considered. Pressure surveys of November 16 and December 11, 1931, show irregular pressures across the boundary line of Stanolind's leases along the south line of Twp. 18 S., and the section line between 33 and 34, Twp. 18 S., R. 38 E. Full data for Gulf's Exhibits 6 and 7 will be found opposite page 104 of the first "Hobbs Pool General Report", made part of the record. Comparing Stanolind's with offset leases shows Stanolind having an average pressure higher than that of offset leases. If drainage does exist in this area of low permeability, it would be off of, rather than on to Stanolind leases. The comparison follows:

Offset Leases			Stanolind Leases		
Gulf - W.Grimes No.5	Pressure	1470	McKinley No.6	Press.	1453
Continental State No. 33, Avg.of No.2-No.3	Pressure	1422	State A-4 No.8	Press.	1445
Gulf - E.Grimes No.1	Pressure	1460	Turner 29-M	Press.	1458
Average Pressure		1449			1456

Gulf Exhibit No. 7, showing the results of pressure survey No. 9, of October 17, 1933, does not show sufficient information to make the same comparison of pressures along the boundary line mentioned in the foregoing paragraph. If, however, only the packed off upper zone be considered, definite cross sections can be used. The first one is south to north, through the center of Section 32-18-38 and 5-19-38, as follows:

Gulf - West Grimes	No. 6	Press. 1383	This shows a continually
	No. 3	Press. 1360	lower pressure due to
	No. 2	Press. 1355	migration from south
	No. 7	Press. 1340	to north.

(The data on packers will be found on pages 290, 291 of the above report). Another south to north cross section through the center of Sections 33-18-38 and 4-19-38 shows a similar relationship as follows:

Stanolind - State-4 No. 3-K Pressure 1365
No.26-E Pressure 1360
No.11-C Pressure 1355

Continental-State-33 No. 6 Pressure 1345

Here again a continuous decrease in pressure from south to north, and away from Stanolind leases is indicated. Taken as a whole, the complete data for Gulf Exhibits 6 and 7, the only possible conclusion is that oil is moving away from Stanolind leases and not to them.

<u>If Gulf Drainage Theory Hold True Stanolind Leases Would Drain to Stanolind Leases</u>

Exhibit 12 of Gulf Oil Corporation is a contour map of the Hobbs Field showing a line drawn from the northeast to the southwest, through Stanolind's Capps No. 26 Well, in the SW¼ of Section 3, Township 19; Stanolind's State No. 8, in the NW¼ of Section 10, Township 19; and Stanolind's State No. 26, in the NE¼ of Section 9, Township 19, The exhibit also shows a series of wells in which pressures were taken at different times since the beginning of development, and on the basis of these pressures, theoretical calculations have been made to estimate the amount of oil which the witnesses alleged drained across this imaginary line as a result of the difference in pressure. In connection with this exhibit, it will be noted that Stanolind is the large owner of the properties lying on both sides of this line, and even though the witness's conclusion is conceded to be correct, the drainage shown to Stanolind's properties, therefore, comes in the main from other Stanolind properties. It will also be noted from an examination of this exhibit, and other maps introduced into evidence, that the imaginary line referred to by the witness is in excess of a mile south of the north line of Stanolind's properties.

Gulf Theory Based Upon Assumption Not Applicable to Hobbs

The testimony of the witness regarding the foregoing alleged drainage, on cross examination, developed the fact that the calculations referred to have been adjusted on the basis of laboratory tests. In adapting a formula which was developed for the flow of liquids only, it is necessary to estimate, or guess what the corrective factor in such formula would be if applied to the conditions in the southeast end of the Hobbs Field, where gas freely intermingled with the oil in the reservoir. The guess made as to the corrective factor to be used was 33%, which, it was assumed, would cover the element of error introduced into the calculations by using a formula developed for liquid flow, for a flow of a mixture of oil and gas bubbles. Attention is called also to the fact that the radial formula used to calculate the permeability across the whole zone in which drainage to Stanolind leases is alleged to have taken place would be applicable as used only in the case of absolutely uniform permeability throughout the entire area; a condition which all witnesses testified, or admitted d[illegible] not exist. This is true because the use of a radial formula to determine the permeability of flow across a given plane must assume a uniformity of cavernous conditions in all directions from a well, which, according to all testimony, is not true.

Knappen Testimony Introducing Published Statements of Stanolind Engineers Misleading?

On direct examination, Witness Knappen, for the Gulf Oil Corporation, maintained the position that originally the top part of the structure contained the thickest producing sections and the greatest amount of oil in place. In support of this testimony the witness read from page 77 of an article by Ronald K. DeFord and Edwin A. Wahlstrom, published in January, 1932, bulletin of the American Association of Petroleum Geologists. The paragraph read on direct examination is as follows:

> "The top productive member of the 'White Lime' is cavernous on the crest of the structure, fairly porous on the flanks, and off structure is in places only very slightly porous, in other places somewhat porous." (Transcript page 102).

On cross examination (Transcript page 198) the witness was asked

to read the last sentence of this paragraph, which reads as follows:

> "On the flanks the lower porous member, particularly the Capps pay (all relatively unimportant on the crest), generally yield much more oil than the top member."

When asked why the witness had not read the last sentence of the paragraph in his direct testimony, his answer was:

> "I had no thought of misleading the Commission; if I did, I am sorry." (Transcript pages 198 and 199).

Witness Knappen Testifies Permeability Is Not a Measure of Oil in Place

Further discussing the cross examination of Witness Knappen, attention is called to Transcript pages 189, 190 and 191, where it will be found that the testimony developed the fact that, prior to acidizing the wells located in the southeast flank of the field, they had a much lower potential than the wells on the crest of the structure, but that after acidizing, the wells were increased in potential comparable with the wells higher up on the structure. The testimony showed that the wells in the southeast flank were located in very tight or slightly permeable sections. However, the percentage of increase after acidizing was much greater than the percentage of increase experienced by the wells higher upon the structure located in the more cavernous or high permeable sections. The witness admitted that thisshowed that the low permeable sections contained the oil which was secured by acidation and that it was a mere question of getting it out of the producing section. The witness also admitted that when acid was used it increased the permeability and also admitted that potential is a measure of permeability; and when asked "When you prorate the field on potentials, you are prorating it on permeability?", the answer was "Surely." and again when asked "And permeability is no measure of the oil in place?". the answer was "No". (Transcript page 190).

Court Room Demonstration that Potential Is no Measure of Oil in Place, and that Tight or Low Permeability Areas Require More Reservoir Energy per Barrel to Produce

R. W. Tesch, Petroleum Engineer for Stanolind Oil and Gas Company, showed by visual experiment that permeability has no

relationship to recoverable oil in place. In so doing he took two tubes of equal size, one of which was filled with a coarse sand, the other with a fine sand. He made a visual demonstration that it took approximately the same amount of water to fill each tube, but that the tube of low permeability took about 2-1/2 times as long under the same pressure to produce its water. In other words, the tube containing the tight fine sand, or the one of low permeability, required about 2-1/2 times the energy to recover the same amount of liquid in the same length of time, as the tube having a high permeability. By the use of Dr. Muskat's formula, which the Gulf witnesses, including Dr. Muskat himself, maintained was applicable to Hobbs Field, Tesch demonstrated that the energy necessary to bring oil to the hole varied with the permeability, the energy requirements being in inverse ratio to the permeability of the formation. In other words, a well in a formation of low permeability might contain the same amount of recoverable oil as a well drilled into a formation of high permeability. If the permeability relationship was in the ratio of 10 to 1, that well whose permeability was 10 times greater, would require but 1/10th of the energy in order to produce its oil from the formation (pages 63 to 70). In filling the tubes, Witness Tesch demonstrated that the difference in permeability caused nothing more than a difference in potential, and that potential is no measurement of oil in place (page 67). Tesch said:

> "Getting back to the experiment again, everything is constant here except permeability. Both tubes hold the same amount of water, yet one you get twice as fast as the other.
>
> Q What does that mean in respect to potentials?
>
> A Well, it simply means this to me: The potential is no measure of oil in place.
>
> Q In other words, this more permeable tube produces its oil in place more than twice as rapidly as the other?
>
> A Yes, sir.
>
> Q So that rate of flow represents potential?
>
> A That is right.
>
> Q This well, by having higher potential, would have gotten rid of its oil in less than half the time the other one would have?

A That is correct.

Q If it continued to produce oil, this well would have to get its oil from some other place?

A That is the only way it could.

Q It takes more pressure to get oil out of the less permeable well?

A It takes more pressure to get it out at the same rate.

Q If you produce the oil in the same elapsed time, it would take --

A Twice as much differential in pressure.

Q For this well to produce its oil in the same time, it would require a pressure drop of twice what this well of low permeability requires?

A Approximately.

Q Do you have anything further from Mr. Muscat's book?

A No, I think that is enough.

Q You can see this has gone down almost twice as fast (referring to the experiment).

A This tube of low permeability is still laboring along -- it takes a while longer.

BY GOVERNOR MILES: This diagram (formula Exhibit F) you speak of, has that been considered at all in the production on this field?

A No. In other words, it has always been taken in the past that potential is the measure of oil in place, which, to my way of thinking, under the conditions you have in the Hobbs Pool, is entirely wrong. If you will notice, this formula (Exhibit F) is taken from this book (Hands the Governor the book the witness has been using).

This tube has already recovered twice the amount of oil in place. This tube has only recovered slightly less than 80%. I would like to add this for the record: In a field like Hobbs, where you have such variances in permeability, that what I have shown here is more true than ever -- even more reason why you should not use potential as a measure of oil in place."

Not Only Have Companies Who Set Water Packers Been Penalized by Surrendering All Claims to the Horizon Packed Off, but They Have Also Been Further Penalized by the Method of Applying Proration to Packer Wells

Dewey testified "These packer units have lost about 36% of their potentials" (page 2-2).

Card testified (page 17) when asked:

"Why weren't more packers set in the north end of the field?

A It would appear that due to the proration formula that has been in effect, that is, the correction of potentials by bottom hole pressure, and the assigning of the field

average pressure to packer wells, these wells would be assigned lower pressures after packers were set than they had before, or would have if packers were not set, and therefore their potentials and allowables would be reduced."

And again (page 23) he was asked:

Q By assigning the field average pressure to packer wells instead of declining their potentials by the field average decline in potential in other wells, have Stanolind wells been penalized?

A Yes.

Q How much greater would the present potential now be if they had been declined according to the field average decline instead of by assigning the field average pressure?

A The potential of Stanolind packer wells would now be 57,260 barrels greater than it is at the present time.

Q In other words, Stanolind has suffered a considerable loss in allowable by setting packers due to adjustment of potential on packer wells, and has also given up large quantities of oil to up structure leases?

A Yes, sir.

Q Which company at Hobbs has benefited the most due to bottom hole pressure adjustment?

A The Gulf.

Q How much has their allowable been increased by bottom hole pressure over and above what their allowable would have been if the potential had not been adjusted?

A Up to September 1, 1939, about 198,000 barrels, and at the present time it would no doubt be in excess of 200,000 barrels.

Q That is the increase in potentials of the Gulf wells?

A That is the increase in allowable.

Q In allowable.

A Yes.

Q Has that been in real oil produced during the period?

A Yes.

Q They have been given that many barrels by reason of this bottom hole pressure formula?

A Yes, bottom hole pressure formula.

Card further testified (page 21), that when Stanolind set their packers, the packer wells were in high pressure areas, and if the packers had not been set in these high pressure areas, "the potentials and therefore our allowables would have been increased on each pressure adjustment period". Card also testified

(page 18), that the Gulf wells in the north end of the field, producing large quantities of water, some as much as 82%, are high pressure wells in which packers have not been set.

Card was asked as to the manner of making a bottom hole pressure correction in the proration formula, the answer was:

> "The bottom hole pressure correction formula is the new well potential equals the old well potential times a fraction whose numerator is the new well pressure minus two thirds the present field average pressure, and the denominator is the previous field average pressure minus two thirds of the present field average pressure".

He explained that pressure adjustments were made every six months; that under this method, the potential of a well would be increased even though its pressure might be declined. He said:

> "Yes, the way this bottom hole pressure formula works, as long as the well's pressure during any particular survey is above the field average pressure, no matter if the pressure on that well increased or decreased from the previous survey, the potential on the well will be increased; and, on the other hand, if a well's pressure is below the field average, whether or not its pressure is increased or decreased, its potential will be declined. For example, if a well had a pressure of 925 pounds and increased from one survey to the next to 950 pounds, its potential would be declined, because its pressure is below the field average, which is now about 1180 pounds."

He stated that wells whose bottom hole pressures remain above the average of the field will continue to get an increase in potential, and therefore an increase in allowable every six months. He explained, by the operation of such a formula, wells capable of making "greatly in excess of their allowable" have been reduced to zero potential, and such wells are prohibited from participating in any manner in that part of the field's allowable given to potential of wells.

Card testified further that five wells of the field, due to the bottom hole pressure correction to potentials, had potentials allocated to them in excess of 26,000 barrels, which was the highest potential ever recorded any well in the field under actual potential test. Card believed that such a method was "certainly" inequitable. "The erroneous potentials which it has created is alone sufficient to condemn it".

ARGUMENT AND CONCLUSION

The analysis of the foregoing testimony conclusively shows:

That the formational characteristics of the Hobbs reservoir are so irregular, insofar as porosity and permeability are concerned, so composed of various pays separated by impermeable strata, that even though some consideration of bottom hole pressures and potentials may be desirable in other fields of uniform production sections, and of uniformity of permeability and porosity, it could not be applied in Hobbs without creating gross inequities.

That the nature of the water drive is such that Stanolind has lost more than a million and a half barrels of oil because the upper pays on Stanolind's southwest flank leases were of high potentials and high permeabilities, giving easier access to the water drive than any other portion of the field.

That the oil losses incurred by Stanolind in its southwest flank leases were converted into gains by more fortunately situated leases farther up structure; and that, because Stanolind practiced conservation, by avoiding producing large quantities of water such as is now done by the Gulf and others in the northern portion of the pool, the water energy was made available to be utilized in more efficiently recovering the oil from the reservoir as a whole. This has proved that not only did other than Stanolind leases gain more than a million and a half barrels in recovery, but the efficiency of recovery from the reservoir as a whole was increased through pressure maintenance brought about by the practice by Stanolind of conservation methods.

That the losses which Stanolind proved that it had incurred, and which Stanolind estimated, on a most conservative basis, to be a million and a half barrels, was not only not denied but corroborated by Gulf witnesses.

That Stanolind led all operators in setting water packers for the benefit of the pool as a whole, and in so doing suffered the greatest loss of oil thereby. The evidence conclusively showed that Stanolind did not set these packers to decrease its lifting costs. The evidence showed that had Stanolind not set these packers,

it could have produced large quantities of oil along with large quantities of water, and cut off the water energy from leases farther on up structure. Stanolind could have produced at such rates that oil could have been brought down structure. Gulf witnesses testified that in the conditions which are similar in the northern part of the structure, it is best for the operator to produce large quantities of water to obtain the oil before it passes on in the regional drainage movement of the field. It is readily apparent, on reading the testimony, that the Gulf proposes to defy conservation efforts, and produce large quantities of water in order to get the oil of others.

That the saturated pay remaining between the water table below and the gas cap above has reached a uniform thickness, which makes a straight acreage basis of proration the most equitable. It was submitted by Stanolind, and admitted by Gulf, that this uniform thickness actually exists. It was also proven by evidence on both sides that it is impossible to estimate with any degree of accuracy the actual amount of oil in place in each acre-foot within the reservoir; that permeability and potential are not a measurement of oil in place, consequently, in the absence of the ability to measure accurately the recoverable oil in place, the only thing left to do is to use straight acreage as the basis of proration, as is used in all other fields in Lea County except one.

That potential is not a measure of oil in place in lime fields. This is demonstrated by the actual record of a similar lime field which was produced wide open, so that interference was set up between wells to such an extent that the recovery of each well was approximately the oil in place beneath the leases. In the case of this field, it was shown that the higher potential wells did not recover the most oil per acre. On the contrary, some of the highest potential wells produced their oil, and went to water before low potential wells. This demonstrates that, under wide open flow, high potential wells will cone water before they drain extensively from their neighbors, but that when such wells are restricted, the differential in weight between the water and

oil is sufficient to hold the water in a horizontal plane, and allow the oil to come in from neighboring properties, wherever undue allowables or allowables out of all proportion to the relative recoverable oil in place are practiced.

That the acidation of wells resulted in further proof that potential is not a measure of oil in place. The evidence was produced to show that acidation raised the potential of wells 400% and more, but that it is a physical impossibility to increase the recoverable amount of oil in place by this proportion. Evidence further showed that the potential of the field as a whole was enormously increased, yet the engineers did not add at all to their estimate of the field's total recoverable oil in place. The testimony showed that acidation of wells, particularly the use of huge quantities of acid, had resulted in allowables which had no relationship to the recoverable oil in place underneath the property, and which had no reason to exist under the present proration law, even though such fictitious potentials had been created before the law was passed.

That Stanolind's leases in the southeast end of the field did not benefit by drainage from leases of other operators. It was shown and admitted by Gulf witnesses that, in order for Stanolind leases to benefit by drainage from leases lying to the northward, the oil would have to traverse a circuitous route, going down to the water edge of the field and returning around high pressure areas, in order to land on Stanolind leases to which it was alleged to have drained. The Gulf witness added to the absurdity of this theory by explaining that the oil alleged to have drained to Stanolind leases could have traversed through the gas cap, which, for the most part, had been separated from the remaining oil pay by gas and water packers. The flimsiness of the Gulf's drainage theory in this area of low permeability was evidenced in the flights of imagination used to explain it. After admitting that Stanolind's southeast leases were of the lowest permeability of the field, and partly surrounded by water, and after admitting that water flows more readily than oil (Witness Knappen stated, p. 188 "It (water) will not come through much faster"), Gulf

witnesses still contended that these leases of low permeability were receiving oil from a great distance in preference to water under high pressure immediately at hand.

That the Gulf drainage theory, if true, would indicate oil would drain away from Stanolind leases rather than toward them. This was shown by the fact that Gulf's own exhibit showed high pressure areas on Stanolind's own leases which would furnish oil for the purported drainage rather than leases of other companies lying at a greater distance in lower pressure areas.

That the Gulf theory is based upon assumptions which are not applicable to the Hobbs Field. In order to apply a formula developed for the flow of liquids, Gulf made assumptions of error for applying this same formula to a flow of mixtures of oil and gas. Whether or not the error factor of 33%, which they admitted having used, results in a correct formula for application in the Hobbs Field is indeterminable. The method of calculating the permeability of flow through the section towards Stanolind leases, also being based on assumptions which are not true for the Hobbs Field, makes the calculations further in error.

That the statement by Gulf witness that they would not mislead the Commission, should be taken for its true worth, after it was shown on cross examination that Witness Knappen failed to read that part of the published paper of Stanolind Engineer Wahlstrom which qualified Wahlstrom's conclusion.

That, although Gulf asked for increase in the potential factor in the proration formula, the witness admitted that permeability and potential are not a measure of the oil in place.

That the experimental demonstration showed visually that areas of low permeability may contain the same amount of recoverable oil in place as areas of high permeability, and that areas of low permeability require more energy per barrel to produce their oil, and thus necessarily require a higher differential, which will be reflected in a lower bottom hole pressure. That if the bottom hole pressure be equalized between areas of high and low permeability, the area of low permeability cannot recover its proportion of the oil.

That the method of correcting potentials, by use of the present bottom hole pressure corrective factor, is erroneous, inequitable and unjust, and has given hundreds of thousands of barrels to operators from the common source of supply, which cannot be justified under the law which provides that each operator shall be given the opportunity to produce his recoverable oil in place.

The only company vigorously protesting an acreage allocation plan for the Hobbs Field was the Gulf Oil Corporation. That corporation not only resisted the change to acreage allocation, but actually proposed that the allocation be made on the basis of 75% potential and 25% acreage. Not only did the Gulf insist on an increased potential factor, and in retaining to themselves abnormally high fictitious potentials which the bottom hole pressure formula had already given them, but they insisted that these fictitious potentials continue to be further increased by further periodic application of the erroneous bottom hole pressure correction factor as now used. So enthusiastic did Witness Knappen, of the Gulf, become in support of this erroneous method of correcting potentials by means of bottom hole pressure, that he alleged it to be the same formula to be used in many fields other than Hobbs, including Kettleman Hills and Yates. When questioned further as to the manner of applying bottom hole pressure corrections in Kettleman Hills and Yates, he was forced to admit he did not know what proration formulas were used in these two fields (Transcript page 206).

After reading and analyzing the testimony of the witness appearing for the Gulf Oil Corporation, and the cross examination of such witness, it appears even to one not familiar with the technicalities of oil proration, that the proposal of the Gulf was a camouflage, and a mere attempt to maintain and continue to enjoy an unfair, unjust, and inequitable advantage that they have enjoyed for years at the expense of the other operators in the field.

We earnestly submit that an order allocating the

production allowed from the Hobbs Pool should be placed on a straight acreage basis immediately, in line with other fields in Lea County, New Mexico, so that the Stanolind Oil and Gas Company, and other companies, will not be forced to suffer longer the inequities accumulating over the past years, and that they may have an opportunity to recover their equitable share of the remaining reserves in the Hobbs Pool.

Guy H. Woodward

J. Dixon

Attorneys for Stanolind Oil and Gas Company.

Orders:

First Proration order: Dated 6-29-35

Case — Order No 1. "General State Proration Order"

Beginning at 7 A.M. July 1, 1935 = and until Changed by order of The Commission - (56,800 of oil Daily.) PS - Mem'g (See Transcript) - Mr. K.E. Handwerker (author of 72 Laws) sat as friend of Commission + guided it's meeting, in adoption of Procedure rules and No 4 General rules; as approved 7-23. as were as entertained without Developing on General State Proration order. - and the fixing of allowable thereunder. (Trans - 7-8-9-10) Hearing held after notice - order issued upon recognition of existence and imminence of waste of oil, and the powers thereof authorized by Ch 72. Laws 1935. (Affirmed

Second Proration Order: Dated:

Case 5 — Order # 15: Revision of Order No 1

Provided only that "market demand" as determined by the Commission be considered of less than allocation under 15 day periods.

Exh. No. M

IN THE MATTER OF THE OIL CONSERVATION COMMISSION OF
THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING AND ADOPTING A PLAN FOR ALLOCATING GAS, SAN JUAN, RIO ARRIBA, SANDOVAL AND MCKINLEY COUNTIES, NEW MEXICO, DESIGNATED AS ORDER NO. 33 OF THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO.

I N D E X

TO TRANSCRIPT OF HEARING ON MARCH 1, 1940

Name of Witness	Direct Cross	Redirect Recross
R. D. Curtis	3 16 - Mr.Kraus 17 - Mr. Seth 17 - Mr.Dewey 17 - Mr.Seth 18 - Mr. Hays	20 27 - Mr.Seth 26 29 - Mr.Selinger 36 32 - Mr.Seth 36 32 - Mr. Nash
	Ramsdell Oil Co. Rests - 35	
R.O.Schuchle	37 52 - Mr.Fleetwood 62 - Mr.Christie 62 - Mr. Fleetwood	
Geo.H.Card	64 68 - Mr.Fleetwood	
	Stanolind Oil Co. Rests - 70	
A.P. Loukeng	71	
E.A.Markley	72 74 - Mr. Seth	76

CASE NO. 14

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE [illegible] CONSIDERING THE REVISING, READOPTING AND READJUSTMENT OF THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, NEW MEXICO, CONTAINED IN ORDER NO. 33 OF THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO.

TRANSCRIPT OF PROCEEDINGS AT HEARING
STATE CAPITOL BUILDING
SANTA FE, NEW MEXICO
MARCH 7, 1940

Pursuant to Order of the Commission No. 845, duly made and entered, setting March 7, 1940, at ten o'clock A. M., for resumption of hearing in the above entitled matter, said hearing was convened at ten o'clock, A. M., of March 7, 1940, in the hall of the House of Representatives, Capitol Building, Santa Fe, New Mexico, the Commission sitting as follows:

HON. MARK WORDEN, Commissioner of Public Lands, Secretary
HON. A. ARCHULETA, State Geologist, Member
HON. CARL B. LIVINGSTON, Attorney for Commission.

APPEARANCES:

NAME	COMPANY	ADDRESS
J. S. Holand	Barnsdall Oil Co.	Tulsa, Okla.
W.W.Fleetwood, Jr.	" " "	" "
E. D. Curtis	" " "	" "
S. A. Markley	" " "	" "
A. P. Lookamp	" " "	Midland, Texas
E. S. Christie	Amerada Petroleum Corp.	Ft. Worth, Texas
C. H. Card	Stanolind O. & G. Co.	Ft. Worth, Texas
R. E. Teach	" " "	" " "
Rex E. Nader	" " "	Hobbs, N. M.
H. V. Dewey	Humble Oil & Rfg. Co.	Midland, Texas
Roy Yarbrough	Oil Conservation Com.	Hobbs, N. M.
Glenn Staley	Proration Office	Hobbs, N. M.
H. J. Penny	Reppolo Oil Co.	Midland, Texas
J. E. Kennedy	" " "	" "
H. . Marsh	" " "	" "
. P. Hamilfin	Magnolia Pet. Co.	Seawell, N. M.
Ed. Fleming	" " "	Merkel, Texas
J. C. Seth	Stanolind Oil & Gas Co.	Santa Fe, N. M.
A. H. McCorkle	" " " "	Ft. Worth, Texas
Lloyd . Gray	Gulf Oil Corp.	Tulsa, Okla.
J. L. Paine	Tide Water Associated Oil Co.	Houston, Texas
. . Childers	" " " " "	Midland, Texas
. . Crosbill	The Ohio Oil Co.	Hobbs, N. M.
J. . Sessler	" " " "	Houston, Texas
. . Sanderson	Gulf Oil Corp.	Tulsa, Okla.
Russell . Lowe	" " "	" "
. Albertson	Shell Oil Co., Inc.	Houston, Texas
George .Holinger	Kelly Oil Co.	Tulsa, Okla.
Edgar Penna	Atlantic Rfg. Co.	Carlsbad, N. M.

Frank Gray	Anderson-Prichard	Hobbs, N. M.
Weston Payne	" "	Oklahoma City, Okla.
James G. Murray	Ho-Tex	Hobbs, N. M.
Howard P. Nolson	Two States Oil Co.	Dallas, Texas
Delmar H. Quinn	Cities Service Oil Co.	Hobbs, N. M.
E. P. Escolor	Continental Oil Co.	Hobbs, N. M.
H. D. Hurley	" " "	Ft. Worth, Texas
Harry Leonard	Leonard Oil Co.	Roswell, N. M.
A. J. Holland	The Texas Co.	Hobbs, N. M.
Glenn Dish	Ohio Oil Co.	Hobbs, N. M.
D. D. Dodie	Cities Service Oil Co.	Hobbs, N. M.
D. C. McKeithan	Phillips Pet. Co.	Bartlesville, Okla.
P. T. Knowlton	" " "	" "
Paul N. Collinton	" " "	Midland, Texas
H. J. Kemler	Shell Oil Co.	Midland, Texas
E. O. Schuehle	" " "	" "
A. R. Willig	The Texas Co.	Ft. Worth, Texas

The meeting was called to order by Mr. Frank Worden, who announced that Governor Miles would join the Commission in a short time. Mr. Worden then called upon Mr. Livingston to read the notice of hearing.

BY MR. LIVINGSTON: This notice of hearing will consist in the reading of Order No. 243 of the Commission, which was published as notice of this hearing, and the reading of the order will explain itself -- skipping the heading of the order: (Reading)

"WHEREAS, the hearing called by the Oil Conservation Commission of the State of New Mexico for the purpose of considering the revising, modifying and amending the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission, heretofore recessed to February 5, 1940, could not be heard on said date by reason of conflict with the hearing on the Cole Bill before the Sub-committee of Interstate and Foreign Commerce held in Washington, D. C., and

WHEREAS, a written notice, so advising and unofficially designating March 7, 1940, at ten o'clock A. M. for the resumption of said hearing, was sent by first-class mail to each of the parties who had made appearance in the case herein,

IT IS [illegible] by the Commission that said unofficial notice is confirmed and March 7, 1940, at ten o'clock A. M., Santa Fe, New Mexico, is set for the resumption of said hearing.

IT IS [illegible] that this order be published as

notice of said hearing as prescribed by law.

DONE at Santa Fe, New Mexico, this 20th day of February, 1940."

And the publication was made as provided by law, and the purpose of this order was to retain jurisdiction of this case by setting a new date, the new publication and setting of new date by order of the Commission.

BY MR. WARREN: Gentlemen, the Commission is ready to proceed with the recessed hearing.

BY MR. LAWRENCE: Gentlemen, for your information, the testimony ended, at the hearing on December 9th, with Mr. H. D. Curtis being interrogated.

BY MR. SETH: There is some question as to whether that testimony is part of this new hearing. I suggest the testimony already taken be made a part of this hearing.

BY MR. FLEETWOOD: We would also like, in the interest of expediency, to ask that all other hearings before this Commission, in engineering matters, that the minutes be considered as part of this hearing, with the understanding that if there is any omissions in the other hearings, Barnsdall will be glad to fill those omissions, taking them up one at a time. If there is no objection, we would like that to be so considered.

BY MR. WARREN: There are no objections.

H. D. Curtis,

being called as a witness and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Mr. Curtis, you are the same H. D. Curtis who was testifying in this matter on December 9, 1939, when the hearing recessed here until today, were you not?

A. I am.

Q. To connect up that testimony, I will ask you if you didn't, in a general way, testify that you were a petroleum engineer in the proration department of the Barnsdall Oil Company, and

that your duties consisted in keeping in touch with Lea County pools, particularly Monument, New Mexico, and that you have access to all their records on proration affecting that field?

A I did.

Q You were preceded by the first witness, Mr. Card, of Stanolind. Without going into the testimony he presented, I will ask you if the summation I gave is not what you, generally, testified to?

A It is.

Q Your testimony ended with the request that you outline the present proration plan now in force in the Monument Pool in Lea County?

A Yes, sir.

Q Will you now outline that plan?

A The present plan of proration in the Monument Pool provides for the allocation of the pool on the basis of 80% acreage and 20% bottom hole factor.

Q Does that mean that four out of five barrels allocated to the pool are distributed on the unit or acreage basis, and that one out of five is distributed under the formula to bottom hole pressure?

A Yes, sir.

Q Mr. Curtis, as engineer, have you had under your direct supervision and authority the preparation of five bottom hole pressure maps which we have with us today, and which we will use as exhibits?

A I have.

Q Did you obtain that information reflected on those maps from the official records of the Conservation Commission of the State of New Mexico office?

A Yes, sir.

Q Mr. Curtis, I show you what has been marked "Stanolind's Exhibit No. 1", and ask you to identify that.

A Exhibit No. 1 is a bottom hole pressure survey map of the Monument Field, Lea County, New Mexico, as of April, 1940.

MR. [illegible]: We offer this in evidence, if the Commission please.

(The exhibit is placed on my stand)

Q Mr. Curtis, will you not go there at the board and first explain to the Commission more in detail what that exhibit is, what it shows, and what your conclusions are from that exhibit?

A Exhibit No. 1 is a bottom hole pressure survey map of Monument field as of April, 1936. The Monument Pool is located in Townships 19 and 20 South, Ranges 36 and 37 East. This is a map of the first official bottom hole pressure survey made in the field, and made under the direction of Mr. Stanley's office. At this time there were 89 wells within the field, 77 of which were included in the first pressure survey.

The highest bottom hole pressure reported was 1508 pounds; the lowest pressure reported 1122 pounds, or a difference between the highest and the lowest of 386 pounds. The average pressure of all wells surveyed was 1430 pounds.

On this map the bottom hole pressures as recorded in this survey of 1936 are entered under each well. The color legend is this: All wells appearing in the red areas have pressures of 1300 pounds or less. All in the green areas cover a range from 1300 to 1349 pounds. The purple areas cover a range from 1350 to 1399 pounds. The next area, the yellow, from 1400 to 1449. The next higher, the blue, covers a range from 1450 to 1499. And the orange range covers those pressures above 1500 pounds.

The Monument Pool was opened by the Amerada Petroleum Corporation on March 5, 1935, when they drilled the No. 1 State B, located on the SW¼ of Sec. 1, T. 20 S., R. 36 E. From the date of the discovery until the date of this survey, or approximately one year, there were 89 more wells completed in the pool. During this same period many wells in the pool received a flat top, or 160 to acreage allowable. In the early part of 1936 the Marshall Oil Company felt that a proration plan based on 160 acreage was not equitable within the pool, and petitioned the Commission to change the method of allocation. As a result of that hearing, held in February,

1936, order No. 33 was issued. This order changed the method of allocation within the field from 100% in the field based on acreage, to 80% acreage and 20% to bottom hole pressure factor. This survey which, as I mentioned before, was the first or initial survey made in that pool under Order No. 28 -- pardon me -- this survey was made for the purpose of administering Order No. 28.

Prior to discovery of this field, we feel that the entire reservoir was in equilibrium, that is, throughout the reservoir on a common plane or level the same pressure existed. We see that a year later, under a proration plan of 100% on acreage, we have in the pool great differences in pressure, and when we have those differences in pressure we have drainage existing from the high pressure to low pressure areas. In other words, one man's oil is being drained by another man. Barnsdall felt that Order No. 28 did not give enough to the pressure factor, and petitioned the Comission for a re-hearing. This re-hearing was held in June, 1936, and as a result Order No. 33 was issued by the Comission. This modified Order No. 28 but slightly, the percentage on acreage still being 80% and the percentage to the pressure factor still being 20%.

Q Mr. Curtis, did I understand that prior to the discovery of the field by the Amerada it was generally thought that on the same plane, in the ground, in the reservoir, all pressures were the same?

A That is right.

Q And oil was not migrating?

A No, it was not. The gas was above the oil, then the oil and the water below that.

Q You say on that map I am there, about a year later, wells having been drilled and produced under a flat top allocation, those pressure differences set up?

A That is correct.

Q And you say that all of the wells in the blue area had within the same range of pressure?

A I did.

Q What is that?

A 1450 to 1490 pounds.

Q Does that mean that between that range there is no drainage between wells in that area?

A No. That color is used for pressures from 1450 to 1490 pounds, so that there will be pressures within the blue range that may vary as much as 40 pounds of each other.

Q Do you have any knowledge of the potential ability to produce at that time?

A Yes, sir. At that time, April, 1936, there were wells in the pool which were tested. Incidentally, most operators make an initial potential test of some sort. There were wells in the pool capable of producing at the rate of 30,000 barrels a day. Other wells, less than 100 barrels per day. Incidentally, the Lea County flat top allowable given Monument was somewhat over a hundred barrels per day, so we have a situation of some wells being allowed to produce to capacity, and other wells, with a high potential range, being severely restricted.

Q A 100 barrel well was allowed to produce up to its capacity, wide open, and a twenty or thirty thousand barrel well was shut down to that point?

A Yes, sir.

Q And is it your opinion that drainage existed?

A Yes, pressure differentials set up and caused drainage from one property to another.

Q Could that have been rectified prior to April, 1936?

A Yes, I believe it could have been.

Q How?

A If an allocation formula had been used that kept the pressure as near equal as possible throughout the field.

Q Mr. Curtis, will you identify what the reporter has marked Exhibit No. 2? Tell what it is?

A Exhibit No. 2 is a bottom hole pressure survey map as of April, 1937 of the crescent field.

Mr. [illegible]: We would like to offer that in evidence, if the

correlation please.

Q Will you explain to the Commission what Exhibit No. 2 shows, and what your conclusions are from that exhibit?

A Exhibit No. 2 is a map showing the results of the bottom hole pressure survey made by the Hobbs Proration Office in April, 1937. Incidentally there were surveys made in July, 1936, October of 1936, and January of 1937. Those were all official surveys. We, however, did not make maps of them. This shows the yearly period starting with April, 1936.

At this time there were 369 wells in the Townsend Pool, or an increase over April, 1936, of 270 wells. Included in the survey of April, 1937, were 310 wells, with the highest recorded pressure being 1435 pounds per square inch, and the lowest recorded being 705 pounds per square inch, or a difference between the highest and the lowest of 730 pounds. The same color legend was used on this map as on Exhibit No. 1, and was used throughout on our exhibits.

This map shows the results of one year's operation under a proration formula based on 80% acreage and 20% bottom hole pressure factor. Inspection of the map shows there were still great differentials in pressure within the pool. The application of this formula may have done some good, but it is apparent that if the bottom hole pressure factor in the formula had been greater, we probably would not have had the great bottom hole pressure differentials existing in the pool. We still felt at this time there was drainage from one property to another. Was that drainage still the result of differences in pressure?

A It is.

Q Where does that drainage occur?

A Between the high pressure areas and the low pressure areas. It will drain from a high pressure area to a low pressure area.

Q Does that mean there was drainage between wells in the same color area, as well as the different colors?

A Yes, it may be possible, within an area, that [illegible] by as much as 40 pounds to the square inch.

Q This exhibit (indicating another map on map stand) has been marked "Exhibit No. 3", and I will ask you to identify that so that it may be admitted in evidence.

A Exhibit No. 3 is a bottom hole pressure survey map of the Monument field as of April, 1938.

Mr. Williams: We ask that it be admitted in evidence.

Q Will you again explain what that map shows and what your conclusions are?

A This is another bottom hole pressure survey map of the Monument field made from the official survey by the Conservation office, made in April, 1938. There was a survey made in September, 1937, but, as I mentioned before, we took the yearly interval beginning April, 1936. At this time 360 wells had been drilled in the Monument field, or an increase, since April of 1937 of 100 wells. In the survey of April, 1938, 425 wells were included.

The maximum pressure recorded was 1453 pounds per square inch, and the minimum 685 pounds per square inch, or a difference between the highest and lowest pressure of 771 pounds per square inch. The average of the 425 wells included in the bottom hole pressure survey was 1041 pounds. This survey was made one year after the survey shown on Exhibit No. 2, and still shows great differentials in pressure existed within the pool, with resulting drainage from one property to another.

Mr. Williams: Will you give, from Exhibit No. 3, the average bottom hole pressure?

A 1043 pounds.

Mr. Williams:

Q Once again will you identify what has been marked " [illegible] No. 4, so that it may be admitted in evidence?

A Exhibit No. 4 is a bottom hole pressure survey map of the Monument field of April, 1939.

Mr. Williams: We ask that it be admitted.

Will you explain [illegible] No. 4 to us?

A Exhibit No. 4 is a similar map, made in a similar manner as the other survey maps made, and shows the bottom hole pressure survey made by the Hobbs Proration Office in April, 1939.

At this time there were 406 wells in the field, or an increase over April of 1938 of 16 wells. In other words, during the year between April, 1938 and April, 1939, there were only 16 wells completed in the pool.

In this survey there were 435 wells, that is, in the bottom hole pressure survey, with a maximum bottom hole pressure of 1451 pounds, and a minimum of 824 pounds, or a difference between the two of 627 pounds. The average of the 435 wells included in the survey was 1320 pounds per square inch.

At this time we find but little difference in the pool, in that there are still great differences in pressures, with resulting drainage from one property to another.

Q Mr. Curtis, here is Exhibit No. 5. Will you identify that one for us?

A Exhibit No. 5 is a bottom hole pressure survey in the Monument field as of November and December, 1939.

BY MR. MACNAUGHT: We ask that it be admitted in evidence, if you please, sir.

Q Will you explain that to us, Mr. Curtis?

A This is a map showing the latest bottom hole pressure survey by the Hobbs Proration Office, and was just completed in the early part of January. We have shown it as November and December because the bulk of the work was done then.

There were 438 wells in the field, only nine more wells than are shown in April, 1939. In other words, the field is, for all practical purposes, fully developed.

The maximum pressure recorded in this survey is 1347 pounds per square inch; the minimum pressure recorded is 720 pounds per square inch, or a difference between the highest and lowest pressures recorded of 627 pounds per square inch. The average for the 445 wells which were included in this survey was 1060 pounds per square inch.

In this map, as will be seen by the yellow, we have still most

differences in pressure in the reservoir. Since April, 1956, the allocation to the field has been based on the 60% acreage and 20% bottom hole pressure formula, and today, as shown back on the earlier maps, we still have great differences in pressure, with resultant drainage from one property to another.

Q Mr. Curtis, as I understand Exhibit No. 1, it is the result of a bottom hole pressure survey made prior to Order No. 22 or 53, and shows the result of 100% acreage, is that right?

A Yes, sir.

Q Exhibit No. 2 shows the bottom hole pressures as under Order No. 22 for about three months, and under order No. 53 the rest of the period?

A Yes, sir.

Q The next exhibits, Nos. 3, 4 and 5, as I understand, are the results of the application of Order No. 657

A That is right.

Q That has never been changed from that year on?

A Yes, sir.

Q And that is the 60% acreage, 20% bottom hole pressure?

A It is.

Q That red area shows wells which have bottom hole pressure of 1300 pounds or less?

A Yes, sir.

Q What is the lowest pressure area shown?

A That is the lowest we have used.

Q Will you explain why the relative amount of wells shown in the red area increases all the way across from Exhibit No. 1 to Exhibit No. 5?

A The red area should increase because it includes all pressures below 1300 pounds per square inch, and as withdrawals are made from the field, the whole field average is going down, so naturally there would be more wells in the red area.

Q Is it your opinion the wells in the red area have, or have not, drained oil from other wells?

A Yes, because there have been differentials in pressure. Those in the red area have lower pressures than [illegible]; I can in

purple area have higher than the green.

Q What has been the practice as to bottom hole pressures? How often are they taken?

A Bottom hole pressures have been taken by the Noble Proration office, and are static bottom hole pressures after a 24 or 36-hour shut-in period, at a sub-sea datum of 250 feet, or a point 250 feet below sea level.

Q Is it possible there are wells on some proportion that are less permeable and would require a longer time to show the highest bottom hole pressure? Would it be necessary, perhaps, to shut some wells in longer than others to get the maximum pressure in them?

A It might be necessary in some cases. There may be some wells which, after being shut in, would not reach the maximum build-up pressure within 24 or 36 hours.

Q As an engineer, would you say any such operator should be given a longer time, or should the pressure be taken the same as the other wells?

A No, he should be given an opportunity to reach the maximum pressure.

Q I notice across here (indicating) the field stops abruptly at this south boundary, as shown by the heavy black line. That line is shown on exhibits Nos. 3, 4 and 5, and it is called the Monument-Eunice dividing line. A hearing was had before the Commission, I believe in May of 1937, and as a result of this hearing an order was made by the Commission setting this boundary line, effective August 1, 1937, as the boundary line between what is known as the Eunice pool and the Monument pool. Prior to that an engineering committee had set the boundary at a point three-quarters of a mile south of the line later set by the Commission's order.

You don't mean, by carrying the maps in that way, that line is the place where the field stops?

A No, sir.

Q It is simply an official designation, and if you are here saying?

A No, the area north of the line -- the wells south of the line

are included in the [illegible] field proration schedule.

Q I noticed when you told the number of wells in the field, you then told the number of wells in which the bottom hole press ure were recorded. As I recall, the number of wells that recorded pressures was less than the number of wells in the field. Is there any explanation of that?

A Yes. There may have been a few new wells in there which were completed shortly after the survey was made. Also, in low pressure areas there is always a good number of wells in which no pressure was taken because such wells had low bottom hole pressure and would receive only that portion of the allowable allotted to acreage, or an 80% flat top.

Q What did you say that now the average field bottom hole pressure is?

A 1300 pounds.

Q The average?

A An average of the wells included in the survey, or 445.

Q Under Order No. 35 do all wells with a pressure under 1300 pounds get the same allowable, if they can make it?

A No.

Q Explain why?

A Under Order No. 35, the average of the three lowest pressures in the field, or 80% of the highest recorded pressure, whichever of those two happens to be the highest, is used. The wording of the order has been such that 80% of the highest pressure has always been used. In February, or June, the maximum pressure recorded was 1397 pounds. 80% of that was 1118 pounds. In the operation of the formula, every well with a pressure of 1118 pounds per square inch or less is allowed an 80% flat top allowable, or 47 barrels -- or a barrel, [illegible] of which [illegible], the [illegible] is allowed what it will make.

Q Does that any well that can make 35 barrels is allowed to make that?

A Yes.

Q But in the 47 barrels any well can make

A 52 barrels.

Q It ranged from 52 barrels down to 5% or less?

A down to 5% or less. There may be some wells that make considerably less.

Q As an engineer can you tell whether even with a one-pound difference in bottom hole pressure, that will cause oil to migrate from an area of greater pressure to an area of lesser?

A You would have a pressure differential which would be very slight.

Q Suppose you have a difference of 378 pounds, as your map shows, between the highest and the lowest pressures. Would there be migration from the high to the low in a case like that?

A Yes, there will be migration from the high pressure area to the low pressure area.

Q With that great difference, would the migration of oil be extensive?

A Yes, you would look for it to be.

Q Is it your opinion as an engineer that on all five of these exhibits there is shown drainage of oil from one man's property to another that has been going on from the beginning of the field and is going on today?

A That is my opinion.

Q What is the remedy you propose for that?

A The remedy is the use of a bottom hole pressure factor of greater than 20%. In other words, a proration schedule which would give less to acreage and a greater percentage to the bottom hole pressure factor.

Q Would you suggest to the Commission just exactly how that be done?

A As I recall, we suggested before, back in 1949, a formula giving 80% to acreage and 20% to bottom hole pressure factor. That would give you, over a period of time, uniform pressure throughout the pool.

Q Do you make that recommendation now?

A Yes.

Q Do you think it is practical now, or how it was in 1949?

A ...to have been added all along. Probably more now than then, since the pool is now fully developed.

Q ...would the enactment of such a formula be considered by engineers as a practical solution?

A No, it might not be a practical solution. In other words, engineers recommend that the most practical plan would be a plan of 100% bottom hole pressure.

Q Is it possible that in giving 75% to bottom hole pressure, some wells might decline very rapidly, or too rapidly?

A They would decline less than under the present formula.

Q Would it be difficult to adjust any differences that might crop up on a 85%-75% basis?

A No. The plan would work so that a high pressure well which, for some reason, was given too much allowable, would be lowered perhaps during the following survey period, and between that period and the next would have less allowable, so that the over-all during the year would average.

Q Can you tell whether it is possible to accurately determine the amount of oil in place under each tract in the Hawkins pool?

A I believe we could roughly determine it, but I don't believe an accurate enough estimate could be arrived at for allowable within the pool. Fortunately we do have two factors capable of accurate measurement, and that is the acreage of each well and its stable bottom hole pressure. In the absence of other factors for the proper distribution of reservoir, we have these two factors just could not which, if applied to the proration formula, should keep uniform pressure throughout the pool with but little drainage between tracts.

Q Do I understand you correctly that your theory is in this accumulation that since we cannot ascertain accurately the amount of oil under our property, that application of bottom hole pressure formula would stop drainage, and thereby every man's oil would stay beneath his own property?

A Yes, I believe that is true.

Q Are you calculating that the maximum allowable on the 75-25 basis would be?

A In February it would have been 85 of 47 barrels, or an increase of twelve barrels a day.

Q In your opinion will twelve barrels a day repay lifting costs in the Monument Pool?

A I believe on an average it will pay a reasonable lifting cost.

Q Would that minimum be a constant minimum, or would there be a chance to get a greater one?

A No, in some cases it would be on a temporary basis. I can might get the twelve barrels on one survey, and on the next pressure period the next man might get it.

Q In conclusion, Mr. Curtis, you recommend that the Commission's Order No. 33 be modified so that the formula will be 25% on acreage and 75% bottom hole pressure factor?

A I do.

BY MR. FLETWOOD: That is all.

CROSS EXAMINATION By Mr. Kraus:

Q Will you tell how many barrels of oil have been withdrawn from the Monument field between the dates of the first survey and the dates of the last survey?

A The figures I have show that as of December 1, 1939 -- this is a rough figure, was 31,05[illegible],000 barrels from discovery, and as of January 1, 1930 -- the earliest day I have is April, 1930, the map there, was 56,000 barrels.

Q So about 30,000,000 barrels have been produced between these two dates?

A Yes, sir.

Q With that amount of production, do you, as an engineer, believe a drop in bottom hole pressure, average for the field, of 130 pounds is an indication, in a general way, of good operation or poor operation?

A I think, in a general way, it shows good operation through the field. A pressure drop that has amounted to -- what did you say?

Q 130 pounds?

A Merely an eight pound pressure drop for one million barrels of oil produced.

Q In a general way, you do not feel there had been much waste?

A Not a tremendous amount of waste, no.

CROSS EXAMINATION by Mr. Seth:

Q Would you mind pointing out on the map the location of the Barnsdall leases? I understand they are all in one body?

A Yes, sir. The Barnsdall Cooper lease is located on the N½ N½ of Sec. 12, T. 20 S., R. 36 E., and the W½ W½ of Sec. 7, T. 20 S., R. 37 E., and consists of 320 acres.

Q Eight wells?

A Yes, sir.

CROSS EXAMINATION by Mr. Dewey:

Q You indicated in your formula you would reduce the formula on some of the lower units to a possible 12 barrels per day?

A That is what it would do; in a flat top allowance of 47 barrels, which was made in February, 1940 -- I say 12 -- it is a little over eleven, but the Proration Office always carries whole figures, so I called it twelve.

Q I wonder if you have calculated the allowance Barnsdall would have under the same condition?

A No, I have not made the calculation; I could make it.

Q It would be rather interesting to know what they would have.

CROSS EXAMINATION BY Mr. Seth:

Q Those maps indicate the low pressure areas are particularly along the south line, the line between Monument and Cooper?

A That shows a low pressure area, yes, sir.

Q Can you explain that?

A My explanation of that is that those wells probably have had, under the present proration formula, a larger allowable than they should have had.

Q Isn't that a very tight area?

A I understand it is.

Q You are not familiar with conditions there?

A Not personally familiar. However, I have always understood that some wells were very difficult to complete in that area.

Q A tight area, or one of low permeability rather than large

Cross-examination by Mr. Hayes:

Q Would you have the formation pressure adjustment so that all pressures would be uniform? So that all permeation would become uniform?

A So that they would be more nearly uniform.

Q If they were completely uniform you think there would be no drainage?

A I think if the pressures were completely uniform there would be no drainage.

Q Is there quite a variation in permeability in the field?

A Yes, I think so.

Q Would you think a man that had a barrel of oil in a highly permeable area would be entitled to the same pressure as a low permeable area?

A I think every man is entitled to produce the oil under his land.

Q Do you know the relationship of permeability and energy requirements for bringing the oil to the bore hole?

A There will be more energy required in an area of low permeability.

Q You were present here when Mr. Muscat produced his formula which shows the energy requirements are directly in proportion to t e permeability of a well?

MR. PLAYWOOD: I don't want to be highly technical, and we want that record to be part of this hearing --

Q Do you know that to be a fact? He has testified as a petroleum engineer.

MR. PLAYWOOD: All I want is an agreement by all that the Hobbs record be made a part of this record. We want it in -- we would prefer to have it a part of this record.

MR. HAYES: Wasn't the Hobbs hearing the previous hearing?

MR. PLAYWOOD: It was, and we would be glad to have it made a part of this record.

Q I will ask if you can answer that question?

A I will take more of an engineer than I am to tell that.

Q Isn't it directly in proportion?

A I believe it is in the formula -- I am not certain.

Q If a man had a barrel of oil in a tight area the relationship

would be ten to one -- it would require ten times as much energy?

A It would take more.

Q It would take ten times as much, based on this formula?

A Yes.

Where would he get that energy?

A In the gas dissolved within the oil; possibly with the occlude gas; possibly some free gas.

Q If he used more energy would he have a drop in bottom hole pressure?

A No, I don't believe that necessary.

Q Why would he need more bottom hole pressure if -- I would like to know why you would like an equalization of bottom hole pressures if they have nothing to do with reservoir energy?

A There is a great deal of reservoir energy, probably more than will ever be needed to move the oil there.

Q Will you explain to the Commission why, if a man has a barrel of oil in a tight area, it requires ten times as much energy to get it out?

A He may not have as much oil under his property.

Q I did not say that. How will he produce his barrel of oil and use ten times as much energy without a drop in bottom hole pressure? If you equalize bottom hole pressure you will keep that man from producing his oil.

A No, if you equalize it, he will get more oil.

Q How can you equalize -- if you restrain him from using that, you reduce the out-go.

A If he reduces the pressure in the well, on stable pressure tests, and is given enough time to get the maximum build up around the well, he may not have as much oil under his property. Certainly there is much energy in the reservoir, certainly more than enough to move the oil to the well and up to the surface.

You want to say he can use ten times as much energy, and still have the same bottom hole pressure?

Q He may use more energy --

(Interrupting) And still have the same bottom hole pressure?

A In lifting it?

Q Ten times as much energy to get his oil.

A Not getting his oil, he may have less to get.

Q That is not the question. How can he use ten times as much energy to get one barrel of oil as is needed to get a barrel of oil in some other well, and not have a drop in bottom hole pressure?

A Nevertheless I still think the pressures should be maintained as near equal throughout the pool as possible.

RE-DIRECT EXAMINATION By Mr. Hatch:

Q Mr. Curtis, do you find you are alone in believing in these engineering principles you have advocated here this morning?

A No, sir, I have known and heard of a number of other engineers who have advocated the same principles.

Q Mr. Curtis, the Honorable Miram M. Dow, of this state, advised by Judge J. O. Seth and Carl Livingston, wrote a paper which was published by the Mineral Law Section of the American Bar Association, and in that paper he states, "The taking of bottom hole pressure measurements permits a more accurate control of the reservoir energy" --

BY MR. SPURRIER: Mr. Dow is not an engineer.

BY MR. HATCH: He is a very eminent New Mexican whose opinion I value very highly.

Q Do you, as an engineer, agree with Mr. Dow, Judge Seth and Mr. Livingston?

A Yes, sir, I think their conclusions are self-evident.

Q In that same volume published by the American Bar Association, Mr. Robert E. Hardwicke, an attorney and engineer of Fort Worth, Texas, who has frequently appeared here in this state, stated "the creation of low pressure areas causes dissipation of reservoir energy and also causes damaging encroachment of salt water thereby bringing about underground waste, which is another way of saying that the ultimate recovery from the pool will be less than it would have been if efficient production practices had been used." And he also says, in the same paper, "the property of one operator must not, in effect, be given to another by a discriminatory method of allocation [illegible]

drainage". Do you agree with engineer and lawyer our rules in that respect?

A Yes, sir, I agree with him.

In July 10th and 20th, 1930, here in Santa Fe, the Interstate Oil Compact Commission held a meeting, at which time Governor Sow stated, "There are three ways of measuring waste in an oil field: the rate of drop in bottom hole pressure, gas-oil ratios, and irregularity of water encroachment". At the same meeting Colonel Ernest Thompson, of the Texas Railroad Commission, stated: "We have found that certainly there is a direct relationship between the flow and bottom hole pressure reaction". Also the Advisory Committee on Economics to that Commission, a committee composed of Dr. deGolyer, Dr. Jacks and Mr. Pogue, reported that one of the two principles which embody the fundamentals of conservation are "equityable adjustment of competing interests be done by operating wells in such manner that cross drainage is minimized, the several properties in a single pool shall be so produced that the development of pressure differentials within the reservoir is minimized." Also another gentleman, not an engineer, Senator Clint Small, of the State of Texas, stated: "It seems funny to look back and to think that we ever had an idea to allow a poor well to produce as much as a good one. We cannot say that because each of you has holes in the ground you are entitled to produce the same account of oil."

Mr. Curtis, I have read a lot of excerpts here, and I will not ask you to comment on each of them. Do any of the quotations differ, or interfere with the principles of conservation you have been advocating, or are they in agreement with those principles, in general practice?

A I believe they are in agreement. These gentlemen have stated in a much better fashion than I have, the same principles. According to the minutes of a meeting of the Coke Engineering Committee, held in Santa Fe on June 11, 1936, a report was made to Mr. Glenn Staley by a special committee composed of Mr.

[illegible] Stablstrom, of the Standlind, Mr. [illegible] Christie, of the Nevada, Mr. Lloyd Gray, of the Gulf, Mr. [illegible] Heath, of the Sun Oil Company, and Mr. Melvin Rae, of the Shelly. In this report these gentlemen, after stating their reasons for not recommending to them the use of potential factors, flowing pressure, build-up pressures, and thickness of pay formations as elements in a proration formula applicable to the Monument Field, stated that acreage should be considered, and that static bottom hole pressure, defined as 24-hour shut-in bottom hole pressure "is the best known factor to prevent drainage across property lines. It is also an index as to the proper functioning of the producing reservoir, thus serving to promote conservation." Do you believe these gentlemen, Mr. Stablstrom, Mr. Christie, Mr. Gray, Mr. Heath and Mr. Rae, were correct in that report?

A Yes, I believe they were correct in that report, and they also expressed the opinion of a large number of engineers.

Q Do you know who Mr. J. E. Wooten is?

A Yes, sir.

Q Will you tell the Commission who Mr. Wooten is?

A He was, in June, 1956, employed by the Standlind Oil Company as division engineer, out of the Fort Worth office.

Q On June 12, 1956, Mr. Wooten testified at a hearing before this Commission with reference to Order No. 22, covering the Monument Field, as follows: "Any method employing bottom hole pressure would have to be in operation for some length of time to determine how pressures range, going up or down or equaling. As long as bottom hole pressures are included the plan can be perfected from time to time as conditions." Then, "the lowest bottom hole pressure in the most favorable plan", and "to select the plan at the start of a field, I would select the high bottom hole pressure. I think bottom hole pressure would obtain results that are desired in the plan, that is, to prevent physical waste." Mr. Wooten was asked "why do you think high bottom hole pressure better than Order No. 22?" and Mr. Wooten answered, "It would

prevent waste over a long period of time." Mr. Hooten was also asked, "You answered your questions that it was true the nearer we approach 100% bottom hole pressure, the more we would have to offset hole pressure, just that much nearer we would come to the point of eliminating to the smallest degree drainage across property lines?" And Mr. Hooten answered, "That is true." Mr. Bellinger, of the Shelly Oil Company, asked: "What was your statement in regard to the effect of placing the consent field statewide on a 100% bottom hole pressure?" Mr. Hooten responded: "100% bottom hole pressure would tend to equalize pressures, and I think fundamentally 100% bottom hole pressure is correct."

Mr. Curtis, do you find yourself in agreement with Mr. Hooten's statements?

A I think Mr. Hooten is absolutely correct in his testimony. On February 25th and 26th, 1938, here in Santa Fe, at a hearing before this Commission, Mr. Jack Rankin, of Hobbs, testified it was correct to say "A unit allowable plus some sort of allocation on bottom hole pressure would be desirable, provided you give enough weight to minimum allowable." Mr. Rankin also testified: "In order to be scientific, to be secure from the tendency of drainage, we should have a plan to equalize bottom hole pressures," and "As far as the method is concerned, I rather favor the static bottom hole pressure," which was advocated as a plan. He also stated that he believed that a beginning plan, these lines should be made by assigning a small value to bottom hole pressure and increase their values as rapidly as conditions justified. Do you agree with Mr. Rankin's basic idea?

A Yes, sir. The only objection I had at that time, at the time of the hearing, and ever since, is that we have just been creating rules. I believe a plan giving some bottom hole pressure factor should have been made earlier in the life of the field. As an engineer, very definitely I want you to answer one final question. I want to read to you from the opinion of a recent Federal court, dated January 20, 1941, in the matter

and Texas Pacific cases in Texas, and I want you to tell what [illegible] of this statement of the federal court: "As evidence here, however, is that even without pumping well, production can be profitably continued on five to ten bar ols per day. e can think of no good reason why a higher allowable should be fixed for non-marginal wells w on to do so would take three-fourths of the distributable oil on a basis which is neither according to the productive capacity of the well nor according to the amount of oil on the leases. To distribute three-fourths of the allowable on a flat basis per well without regard to oil reserves of the leases, of the productive capacities of the wells, which constituton the value of the property, is unreasonable, and therefore in violation of the Constitution and the statutes." What do you think about that? Not being a lawyer, I cannot say that the procedure is unconstitutional. However, as an engineer, I certainly agree with the court that to distribute three-fourths of the field allowable on a flat basis per well or unit, without regard to the oil in place, certainly is contrary to engineering principles, and is unreasonable, in my opinion. Here in the Monument field we actually distribute more than 75%, or 80%, on a flat acreage basis.

At the Seventh midyear meeting of the American Petroleum Institute, on June 2, 1937, Dr. Lyndon L. Foley stated "Some fields have been prorated on the basis of acreage [illegible] for example, Jonesville field in New Mexico, has 10% of the allowed production based on acreage and 20% according to productive pressure. The allocation according to acreage [illegible] that we accept it as good as another, we fail to not change the case.

[illegible] you also [illegible] with Mr. Colpitt

[illegible].

Q Mr. Curtis, do you know who Mr. C. V. Millikan is?

A Yes, sir.

Q Mr. Millikan is Chief Production Engineer of the Amerada Petroleum Corporation in Chile, is he not?

A Yes, sir.

Q What interest has the Amerada Petroleum Corporation in the Lomitas Field?

A The Amerada has 103 production units out of the 400 in the field, or approximately 20% of the units in the field.

Q Mr. Curtis, I ask you to examine this exhibit (handing witness a printed pamphlet which has been marked "Barnsdall Exhibit No. 6). Will you examine Exhibit No. 6 and identify it?

A Exhibit No. 6 is a reprint from the transactions of the American Institute of Mining Engineers, 1933, 103 of Petroleum Development and Technology, and is entitled "Reservoir and Bottom-hole Producing Pressures as a Basis for Proration". This paper was written by C. V. Millikan.

Q Of the Amerada?

A Yes, sir.

Q Turning to page 3 of that paper, will you read what is marked there?

A (Reading) "Maintenance of uniform reservoir pressures is the most equitable method of prorating. If the reservoir pressure in a field is maintained uniform at all stages of depletion, there will be no migration of oil and gas from the drainage area of one well to that of another. At any stage in the life of the field each well will have withdrawn the same proportion of its recoverable reserves as any other well.

"When allowed production is allocated on the basis of decline of reservoir pressure, some tentative distribution must be made. A method which considers the rate of production seems most logical. The tentative allocation, however, need not be established with the accuracy that is necessary when the proration is based on the capacity of the wells to produce. The allowable could be adjusted when the most of closed-in pressures is taken, all wells having a greater decline in

-3/-

reservoir pressure than the average of the field will have their allowed production correspondingly increased while the allowed production of those in which the reservoir pressure has declined less than the average will be proportionately increased. Those periodic adjustments will equalize the reservoir pressures of the various wells to the end that a uniform decline of the reservoir pressure in the field will be maintained, when the field is exhausted each well will have produced the same proportion of the original oil and gas content in the reservoir within the drainage area of the well as the total recovery of the field is to the total original oil and gas content of the field."

Q Now, Mr. Curtis, as an engineer, would you say that the application of those principles advocated by Mr. Millikan is similar to the advocation of the principles you have been advancing here this morning?

A They are.

Q Would you, as an engineer, say that the law of the State of New Mexico, which reads: "The rules, regulations or orders of the Commission shall, so far as it is practicable to do so, afford to the owner of each property in a pool the opportunity to produce his just and equitable share of the oil and gas in the pool, being an amount, so far as can be practically determined and so far as such can be practicably obtained without waste, substantially in the proportion that the quantity of the recoverable oil and the gas under such property bears to the total recoverable oil and gas in the pool, and for this purpose, to use his just and equitable share of the reservoir energy." You believe the application of Mr. Millikan's principles, or the principles advocated by Mr. Millikan would obtain this result, giving every operator an opportunity to produce his proportionate share of the oil and gas and use his share of the reservoir energy?

A Yes, sir, I believe it would come very near to obtaining this result.

Cross-examination by Mr. Robb:

Q You intend to tell the Commission that in that unit and when it ends over 7%, will a allowable was allocated on a well basis?

A Yes, on an acreage basis, as I understand.

Q You know well that the courts condemned use on a well basis on a per well basis?

A They mentioned units in their argument.

Q You know that the court condemned was giving 7%, on the same proportion to a well on one-tenth of an acre as to one on ten acres?

A That may be so. I am not certain.

Q You are not certain of that?

A I don't know whether they used a unit or well.

Q Are there any units in east Texas?

A Acreage is taken into consideration.

Q The court condemns the 7% on a per well basis, didn't they?

A Yes, sir.

Q In that 7% one well, even on an area where there were seven wells to a half acre, each well would get as much as a well on ten acres?

A Yes, sir, it will, but the number of acres is taken into consideration under any formula.

Q 25% of it?

A I believe it is.

Q What the court condemns is not the taking of acreage into consideration, but the 7% on the per well basis?

A It may have been.

Q You testified, on the last round, but you said in addition to the amount of oil to be taken in the way of acreage, [illegible] you could not [illegible] any [illegible] on the acreage basis, but you would be entitled to [illegible] on a basis of, it would be entitled to [illegible] and if the [illegible] on units would be entitled to [illegible]

You know it would, don't you?

A Yes, sir.

Q ...t you know it cannot be determined with any degree of accuracy?

A That was my statement.

Q The acreage is the only definite factor, except bottom hole pressure, that might be used as a corrective factor?

A As I recall, I said you have two factors which can be accurately determined, one being acreage and the other being bottom hole pressure.

Q You wouldn't content that bottom hole pressure is a measure of oil in place?

A Not necessarily.

Q That will leave acreage as the only factor that could be accurately determined as bearing on the oil in place?

A With unit spacing, if you had differentials in pressure you would have drainage from one man's property to another.

Q But pressure does not indicate the oil in place?

A Not necessarily.

Q The only definite factor in the field is the acreage as indicating the oil in place?

A Acreage is used as one of the factors in determining oil in place.

Q I asked, isn't that the only definite factor you have?

A Yes, sir.

RE-DIRECT EXAMINATION by Mr. Fleetwood:

Q You don't mean that each 40-acre tract has the same amount of oil in place as every other 40-acre tract?

A No, sir.

Q Then it is not in the size of the tracts that the differences exist, because they are all the same?

A Yes, in the ordinary field we have one well on each forty acres. Each and every unit is the same size. Regardless what kind it is used, in acreage each and every unit is alike.

Q Is anything given acreage as a factor is the same in a maximum allowable?

Yes, sir.

Q Is your testimony that just as soon as you have [illegible]

exist, the oil will drain from one man's property to another?

A Yes, sir.

(Cross-examination of Mr. Ballinger:)

Q What position do you hold with the Barnsdall Oil Company?

A Operation engineer.

Q As such, are you familiar with the holdings of the Barnsdall Oil Company in all states where they have production?

A With most of the prorated wells. Some wells in what is called the outpost areas I am not familiar with.

Q As I understand your testimony, the only two factors on which you have accurate information are acreage and bottom hole pressure?

A I believe that is what I said.

Q Those two factors are considered under the present order by the Commission?

A They are.

Q You are familiar with the weight given each of the two factors?

A Yes.

Q On your suggestion of 25% to acreage and 75% bottom hole pressure, you told the Commission it would approach a minimum allowable of twelve barrels, is that right?

A I said that is the case for the month of February, 1940.

Q In other words, on that acreage factor, a small well on the edge would participate in the acreage allowable originated at approximately twelve barrels?

A Yes, sir.

Q If the allocation on the new well allowable formula, that minimum allowable is liable to decrease?

A That is true.

Q If this is the minimum allowable would not as low as eight or ten barrels?

A It is not impossible.

Q Is that particular case in mind?

A I would if might be a like.

Q You recommend to this Commission that minimum allowable [illegible]

A ...per unit.

Q ...in this state a unit is how many acres?

A ...forty.

Q ...ave you recommended a margin allowable in other states where the Bermudall Oil Company has holdings?

MR. ...: We object to that as incompetent, irrelevant and immaterial. This question is in regard to fields in other states.

MR. ...: If I can't tie it in I will agree to have it deleted.

MR. ...: I think you should confine your question to the Monument area.

MR. ...: Practically all the papers quoted from has to do with the East Texas field where they are allowed to drill seven wells to an acre.

MR. ...: No objection was made. If anyone had objected we would have agreed to have that evidence stricken.

MR. ...: We move that all the evidence read as to some other pool be stricken.

MR. ...: We agree that anything we have offered that has reference to other pools be stricken.

BY MR. ...: My question, the quotation I had in mind has a bearing on the Monument pool.

MR. ...: Since we have agreed we are going to strike the evidence as to other fields, we will confine ...

...

...

...

...

BY M[illegible]: That is my understanding, that all the testimony offered in regard to other pools than the Monument Pool will be disregarded.

BY [illegible]: The Commission's ruling is the testimony Mr. Curtis gave with reference to questions referring to pools other than the Monument Pool will be stricken, but that the questions referring to the Monument Pool directly will not be stricken?

BY MR. [illegible]: Anything directly pertaining to the Monument Pool, that has any bearing directly on that pool will not be stricken.

BY [illegible]:

Q You say you were and in this connection that the minimum allowable in the Monument Pool be placed at twelve barrels per unit?

A I would have been in February under the recommended plan.

Q It would have been in your mind, 1/40?

A Yes, sir.

Q What would the per unit allowable for March be?

A I don't know what it is. If you can tell me what the allowable is, I can take that and figure it.

Q In February the minimum allowable was twelve barrels per forty acre unit?

A Yes.

Q Would that have the effect of having a lower minimum allowable in the Monument Pool than in other pools?

BY MR. [illegible]: [illegible] objection, if he refers to pools outside of the state, or in other states that [illegible].

Q In comparison with other pools in the state of [illegible].

[illegible]

Q [illegible] in the Monument Pool, [illegible] in the Monument Pool, [illegible] in the Monument Pool.

That is not the question. The question is, would it have the effect of having a lower minimum allowable in the state.

A ther pools in the ste a ure operated on other plans.

ould the effect be that o minimum allowable under your plan would be lower?

A The minimum allowable would be lower.

y Mr. Rich:

, Buddie, are you going to [illegible] several packers set in the [illegible] pool to operate over?

A Yes, sir, I do.

Q In your opinion, does that reflect, after setting a packer you take the bottom hole pressure, does that bottom hole pressure reflect through the pressure in the reservoir?

A Not necessarily so. At the previous hearing held in December I believe there was a committee recommendation made at that time by Mr. Kraus for the taking of pressures in packer wells. In your opinion as an engineer, should there be an adjustment made for packer wells at Monument?

A Yes, sir, operators should not be penalized because he has set a packer.

Re-d y Mr. Rich:

Q Will you come over to your [illegible] for a number of [illegible] the Barnsdall Arco 1-A Hobbs or Lea. Is that what you obtain?

A Yes, sir, the 1/2 B of Seven and the 1/2 B of 32.

Q For what flow the bottom hole pressures at the last survey, I believe it to be over last December, 1952?

A Yes, sir.

Q Are your No. 3, 4 and 5 the northernmost well on the eastern [illegible] had to be artificial pressure?

A 1500 pounds.

Q At the bottom hole pressure of the offset well, the [illegible] was not, was it fully built?

A 1500 pounds.

Q Before we [illegible] you [illegible] to your well?

A Yes, sir.

Q Are you the [illegible] Smith, are you, sir?

A [illegible] Yes, sir.

Q And the offset well, the Anderson-Prichard No. 1?

A 1360 pounds.

Q Then the offset well is five pounds higher. Take your No. 7, what is that pressure?

A 1352 pounds.

Q And the offset well to the east?

A 1359 pounds.

Q Seven pounds differential. Take your No. 6.

A 1362.

Q And the No. 6 Anderson-Prichard immediately east?

A 1369 pounds.

Q In all four of those wells, your east offset had higher pressures?

A Yes, sir.

Q You contend Barnsdall is draining oil from the wells to the east?

A Yes, sir, wherever there is a difference in pressure there will be drainage.

Q Take the offset to the south, Continental No. 1, what is the pressure?

A 1367 pounds.

Q And your well to the north of that?

A 1352.

Q Your pressure is 15 pounds lower than the offset well. Come over here to your No. 6 in Sec. 12, what is that pressure?

A 1360.

Q And the one immediately south, the Amerada No. 1?

A 1365 pounds.

Q And the one immediately west, the Amerada No. 6?

A 1366 pounds.

Q The Amerada well is 15 pounds higher than your No. 5?

A Yes, sir.

Q Come up here to the next one, Amerada No. 3?

A 1360 pounds.

Q And what is the pressure of your well immediately east of that?

A 1356 pounds.

Q And to next one, the Amerada No. 2?

A 1500 pounds.

Q And yours immediately east?

A 1367.

Q And the Andrade No. 1?

A 1350 pounds.

Q And your well?

A 1356.

Q And the Skelly State, what is that?

A 1362 pounds.

Q Except in a few instances your wells had some five to 10 pounds lower pressures than the offset wells?

A Yes, sir.

Q And you think you are draining a lot of oil from your neighbors?

A We may have for a period. However, we will have less allowable because we have less pressure than our neighbors.

Q When will that happen?

A The new press re survey was placed in effect on the proration schedule in February, 1940.

Q This difference in pressure, your wells being lower than the offset wells, will that continue for some time?

A Here they are higher than the offset (indicating).

Q But to the west on this map, they average ten pounds difference. You were draining from your west offsets?

A Yes, there was a pressure differential across there.

Q And if you increased the bottom hole pressure formula to twenty pounds difference, or to some higher figure, it would increase the drainage?

A No, sir, you would give the wells with the higher pressure more allowable.

Q It wouldn't increase the drainage?

A No, those with the lower pressure would get less allowable. You are way above the scale that would take the minimum in the application of your formula, that was eleven hundred something?

A 1111 pounds.

Q You are above that?

A Yes, sir.

Q You would get a higher allowable for that proration?

A We would get a somewhat higher allowable. Those offsets with higher pressures would get more than we would.

Q Your drainage would continue if you got a higher allowable?

A No, it would tend to equalize it.

RE-DIRECT EXAMINATION By Mr. Fleetwood:

Q On the question of the offset wells, is it your opinion as an engineer that we are entitled to drain any oil from our neighbors?

A Not unless the offsets, by counter drainage, were making it up.

Q You don't contend that Barnsdall is entitled to drain from anyone else?

A No, sir. If we are in a low pressure area, we would drain from the high pressure area. We are not asking for anything we consider out of line.

Witness dismissed.

BY MR. FLEETWOOD: We do not have any further testimony or questions at this time.

BY MR. GORDON: We will recess until 1:30 o'clock this afternoon.

Pursuant to recess taken, the hearing was resumed at 1:30 o'clock, P. M. The hearing was called to order by Mr. Gordon, and the following proceedings were had:

MR. [illegible]: This firm has some questions we would like to ask Mr. Curtin, if you permission.

MR. GORDON: Proceed.

H. P. [illegible]

recalled by Barnsdall for further re-direct examination:

E [illegible]:

Q Mr. Curtis, we may have created the impression this morning that our sole interest in this proposed formula was the result simply of a mat or of principle, and I think that may be an important interest. I want to ask you if some difficulties and inequities which Barnsdall has suffered will be corrected or benefitted by the application of this formula, and if so, just what would be the nature of that benefit?

A Yes, I have figured what the allowable would be, and Barnsdall would gain six or seven barrels per well, or about, approximately 58 to 60 barrels per lease.

Q Judge Seth asked you as to the offset properties, some of which had slightly higher bottom hole pressures, ranging from five to thirteen pounds, and you testified there would doubtless be some drainage from those leases to our leases?

A Yes.

Q Is that the important thing in this picture, and if not, what is the important thing?

A The important thing is the equalization of pressures, where you wouldn't have the present great differentials. We have pressures ranging from 1300 -- nearly 1400 pounds on down to 500 pounds, and maybe less on some wells which are not included in this survey.

Q In evening up the spread from 500 to 1400 pounds the vital thing, evening up the present great differentials in pressure?

A That is right. We would like to see the next survey show a more even distribution of pressures throughout the pool.

Witness dismissed.

R. C. SCHUCHLE,

being called as a witness, and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Seth, and testified as follows:

DIRECT EXAMINATION

Q Please state your name?

A R. C. Schuchle.

Q What is your profession, Mr. Schuchle?

A Petroleum engineer and geologist.

Q By whom are you employed?

A Shell Oil Company.

Q Will you state briefly your training and experience as a petroleum engineer and geologist?

MR. [illegible]: Unless you want to go into that, I will be glad to admit his qualifications.

Q Your training has included geology as well as engineering?

A That is right. I have had advanced work in geology.

Q Are you acquainted with the Monument Pool in Lea County?

A Yes, I am.

Q Were you present when the discovery well was brought in?

A Yes, I was present when the discovery well was brought in.

Q When was that?

A May, 1935.

Q Have you been familiar with that pool ever since?

A I have been directly in charge of engineering and geology work in the field since the beginning.

Q And you are familiar with all of the wells and all development in this pool?

A Yes, I am.

Q Will you give an account of the stratigraphy of the field, if that is the right term?

A Yes, I will do that.

Q Have you a map of that?

A I have a cross section I would like to use.

(Cross section placed on map stand and marked "Shell Exhibit No. 1")

Mr. Schaible, this diagram, Shell Exhibit No. 1, was that prepared by you or under your direction?

A Yes, sir.

Will you explain to the audience just what that means? I am using part of that -- several parts or zones on that cross section to illustrate the strata of the field. Oil, gas and water are accumulated in the Permian Lime formation, and that is the most important formation which is present in the field, and I will spend most of the time discussing it rather than the limestone formation.

The top, indicated by the uppermost green band, and that is overlain with anhydrite, and as you penetrate the limestone formation, you first find it composed of a series of crystalline and sandy limestone zones. The uppermost zone penetrated in the limestone section is persistent throughout the field, a horizon of sandy, dense limestone indicated on this cross section by these green bands. The green means sandy limestone. I wish to explain that the entire section, from here down to here (indicating on cross section) is sandy limestone.

That means between the two uppermost green lines?

A That is right.

The next segment, between the next two green bands, is pure crystalline lime --

Between the second and third bands going down?

A That is right. It contains a certain amount of sandy limestone greatly improved. The oval has been designated the sandy phase and encompasses this area (indicating). You will notice it is a zone in which we have angular green lines, indicating the present lenticular formation underlying this. See the manner we will explain that. The brown color in the section, underlying the lowermost green phase is a pure crystalline limestone body.

To get that definitely, above the uppermost green line is anhydrite?

A That is true.

Between the first and second green line, results from the big

to bottom, is mostly lime

That is right.

Between the second and third green lines is white crystalline limestone?

A That is right.

Q And between the third and fourth green lines is a body of sandy lime with lenticular formations in it?

A It represents a formation or horizon of crystalline lime with some minor amounts in the second, and the lower is pure.

Q While it may not be right in point here, on Exhibit No. 1, the line at the bottom represents the water, is that true?

A That is right.

Q And the heavy brown line that runs through the third and fourth green lines, what does that represent?

A That represents the uppermost limits of the oil accumulation.

Q Is it the contact between the oil and gas

A That is right.

Q Would you state in what direction that cross section runs?

A It is an east-west cross section, through the middle of the field, approximately.

Q Will you take up the structure of the pool?

A At the present known informations shows we have an east-west dip over the limits of the field. On this particular section, this (indicating) is the extreme eastern well, and this is the extreme west well. That is as far as we have control at the present time. From this cluster we have a dip from both flanks.

MR. GRAY: We offer in evidence Shell Exhibit No. 1.

Q Will you get the other maps you want?

(Witness places a map on the map stand. Marked Shell Exhibit No. 2.)

Q Does Shell Exhibit No. 2 represent

A A north-south cross section through the long length of the accumulated field. A well is present and also the same conditions are present throughout the field, on a north-south line, as I have shown on Exhibit No. 1. You will notice also a certain degree of dip to the south and a rise to the east of

dip due north.

Do those green lines mean the same thing as on Exhibit No. 1?

A Yes, the color and lines are identical.

Q Will you state, those various lines up and down the exhibit, what do they represent, please?

A Each line represents a well.

Q On the wells, in places there are small dots. Do they mean?

A We have triangles here, and one triangle means the casing point.

Q It means that below that point the well is not cased?

A That is right. There are other smaller lines, and when all such data as presented on the section is compiled, we have the structure outline of the zone by contours on this map.

Q On Exhibit No. 3?

A On Exhibit No. 3, they are the black waving lines.

Q What is the contour interval?

A 20 feet on this map.

Q Does the contour represent the top of the formation as you have shown it?

A The contour of this so-called upper sandy phase.

Q Do you want to discuss the contour of the structure?

A That would be correctly termed nutational.

Q With some minor closures?

A The contour shows two minor closures, one in 19 S., 36 E. -- R. 37 E., instead; and another closure located -- the predominate or main closure in T. 20 S., ranges 36 and 37 E.

Q Anything further you want to state?

A I do know it is quite obvious.

Q Porosity -- what do you know with respect to porosity

A Porosity in the Grayburg pool is extremely variable, as we all know. It has been found to occur predominantly in the more crystalline lime phases. This porosity does not have a certain degree of porosity & permeability, but it has been found, by tests and cores in various wells, as to the producing life of the well is concerned, effected more by the formation rock in the more crystalline phases. Where I see con-

divisions, we find in the Mansard pool three zones in which effective porosity is present, indicated as zone 1, extending between the second and third green lines, and the second zone which occurs between the third and fourth, and the third zone underlying the lowest green zone.

Q That is, between the green and the water?

A Between the green and as far down as the water.

Q Is there at the present time, in your opinion, any intercommunication between the three "pays", as you might call them?

A Other than through bore holes, there isn't any communication between the so-called zones.

Q In a natural state, before wells were drilled, the bore holes making no connection, you believe they were not connected for any practical purpose?

A As far as the life of the field goes, that is right.

Q Has your detailed work shown you anything as to permeability?

A Yes, in addition, permeability is very erratic. One measure of permeability, and solely permeability, we have found on examining the way, the potential range is very erratic. Just picking any particular well, I find a well here has a potential of 744 barrels a day, whereas over in this area (indicating) a mile away, the potential is 5804. There are extreme variations in permeability. There is another point we found in studying porosity in the field, that porosity apparently is more effective laterally.

Q Do you mean porosity or permeability?

Permeability -- pardon me -- is more effective parallel to the bedding planes than it is vertical.

That means oil will flow more easily laterally than it will up and down?

That is right. I might also point out that very little movement of fluid takes place vertically. Practically all of the movement is laterally.

Q What oil or the price of gasoline? If it is, take up the consideration of oil.

A Well, covered porosity in our bore holes, we have found a few certain cases -- which are economic, especially

detailed work, that oil has accumulated when porosity reaches as high as 175 feet above sea level, and no more. I wish to state that was the original top oil accumulation, and the original water accumulation occurred immediately below, 340 feet below sea level. In other words, you have a horizontal oil column found wherever porosity would permit the oil to be accumulated. Now, gas is found immediately overlying the oil.

To go back to structure for a minute, I mentioned we had an anticlinal fold. Oil, gas and water are accumulated in the lenticular formation, accumulated there in a trap formed by deformation, and sealed by the overlying anhydrite, and the limits of the oil accumulation, the ultimate limit of the oil accumulation was when the anhydrite intercepted the oil column. However, as I stated, within the oil column, or within the limestone formation -- porous ne -- the structure has not compelled the accumulation of oil. That is indicated in this manner: we have this green formation, (indicating on map) meaning a sandy limestone, dense and impervious. The brown is oil accumulation, the upper line indicating the upper limit. We have further found evidence of some oil, of a non-producible quantity, the oil showing around the bore hole down at the same point in the highest permeability section. That is indicated, the impervious structure, by this line across the green. We have, therefore, keeping in mind this coning effect and the fact that lateral permeability greatly exceeds vertical permeability, we have been able to set up definite rules, and during the exploitation of a well these can be followed. We have been able to outline these zones and locate a well so that we may intercept the productive zone within the oil column. If you should be fortunate enough to get a well, and are unfortunate enough to miss this on the structural contour because your impervious, very porous light and granite, fine grained zone in the crystalline lime which you find throughout this interval, you would be very unfortunate to have a dry hole or a very small well. Therefore, since we have the answer to the facts, and we have been successful in locating this zone,

point out this well on the extreme north end --

Q (Interrupting) Exhibit No. 8 you are referring to?

A That is Exhibit No. 2. I think it would be premature to use No. 1 at the present moment. You will observe the same picture continues through the field, making the extreme -- this is the east-west cross section (Exhibit No. 1) -- coming on the extreme west well, I believe, Shell Foster No. 2. You will observe it encountered oil accumulated entirely within the so-called first zone. The same thing happened in the next three wells -- all of the production from within the first zone. Then go to the center part of the field and select, for example, a well, here, I believe Gulf Graham - State 4? encountered oil accumulation only within the lower horizon, this zone, which carries oil in place in the so-called second zone being above the gas-oil contact; thus, keeping in mind we have an absolute barrier in this green phase and this green phase (indicating on map) -- that is, little production in this zone (indicating). This zone (ndicating on map) is also oil bearing in places, it has prolific wells, is also separated from the other two by a dense, impervious barrier. We have three separate reservoirs within the Monument Pool between which no intercommunication exists other than through the bore holes. To show conditions --

Q (Interrupting) Let me take this first -- I don't know that the Commission exactly understands. This area between the two upper green lines marked "Main Sandy Phase", is not all bearing? It is not.

Between the second and third, marked "First Zone", between the second green line and the third green line, this is oil and gas bearing?

That is right.

This heavy brown line would run across this cross section, marked "Original Gas- Oil Contact", that represents the top of the oil originally.

In this zone marked "Oil Zone", between the [illegible]

green lines, all above the green line is gas?

A That is right.

Q And this zone has oil only where it extends below the brown line?

A That is right.

Q At the north, the middle, and again at the extreme south?

A That is right.

Q Come down between the third and fourth green lines, the "Second Zone", that is also oil bearing?

A That is also oil bearing.

Q Where the projects above the brown line, it is gas bearing only?

A That is correct.

Q Below the lowest green line it is again oil bearing?

A That is correct.

Q The "Third Zone"?

A That is right.

Q And beneath that is the water?

A That is right.

Q When you speak of wells penetrating the zones, you mean this (indicating first zone), or this (indicating second zone) or this (indicating third zone)?

A That is correct. Since we have three zones, and you have probably noticed the zones overlap, in which wells may produce from one, two or as many as three zones colored on this map --

Q (interrupting) That is Exhibit No. 3?

A Yes. I wish to make a statement at the present time. Although I stated a well has penetrated the first, second and third zones, I am stating that all three zones produce at one and the same time in the same well, the porosity variations may be such that only one zone produces in a well. However, it is possible that should the porosity be developed, then the well will produce all zones. On this map, Exhibit No. 3, the colors show the groups of wells producing from the various zones.

The blue shade, shown on the extreme flank, are wells that have penetrated only the first zone within the oil rim,

or this area right here (indicating on map).

The yellow are wells that have penetrated the first and second zones within the oil column. We will use as an example the Texas-American Petroleum Company No. 1 well. It penetrated the first and second zones within the oil column.

The orange color, this small area here (indicating) and another area here (indicating) are wells so located that they have been able to penetrate all three producing zones within the oil column. We might make an example of Shell-Lane B No. 1. You see the illustration of this particular well (indicating on Exhibit No. 2).

So not only are there three separate reservoirs open in the field, each having its own variations of porosity and permeability, but you have overlaps, or six types of wells to make a further complication, making it rather impossible to determine what reservoir characteristics apply, and if so, of what value they are.

To make it a little more clear, and to show the exact relationship between this map and the cross section, I have another exhibit I would like to present.

(Structure contour map marked "Shell Exhibit No. 4).

Q Will you please explain Shell Exhibit No. 4.

A Yes. That is a three dimensional presentation of the north half of the Monument structure. This entire exhibit presents the field from the so-called range line --

Q (Interrupting) You mean the range line as on Exhibit No. 3?

A The range line shown on Exhibit No. 3, yes. I have here by colors having the same meaning as on the cross section, a generalized section through the field. Here is the first unit base --

Q (Interrupting) When you speak of "here" that here put into the record. You are referring to this map?

A The uppermost cross section represents the unit shell, please. The next section, that will be portions here (indicating) marking the zone, is the first zone. The well penetrates --

-4-

called lower sandy phase. And then this (indicating) represents the lenticular or second producing zone. We have three wide so-called beds through there. The third zone is from here (indicating) on down.

We have here on this line an oil well, the Amerada Manley No. 1, located on this map in the yellow, on the zone map, and it has penetrated and produced in the first and second zones, the oil accumulation within the first zone and able to penetrate the second. This particular well, the Amerada Manley No. 1 is producing from two horizons, the first and second.

Then, showing a different degree, we have another well located, the Ohio Barber No. 3. That well is producing from the second and third zones.

Near the middle of the exhibit is the Repollo Phillips No. A2, producing only from the third zone.

Q The upper part of the exhibit, above here (indicating), what is that?

A The blank contours on here represent contours on the north, they have been distorted somewhat due to perspective, the blue here being shown on this particular well, Shell Foster No. 1, located over here in the blue area, seen here in the blue area, produces solely from the first zone. The same color value meaning the same zoning.

Q On this map, Exhibit No. 4, you have immediately below the top lower sandy phase, or representing the second zone, you have drawn substantially parallel lines. Does that mean the same thing as that represented by these lines (indicating)?

A Yes, sir.

You don't mean the sandy line and the line are laid down parallel?

A No, that is merely an idealized representation and is drawn parallel, and are continuous throughout the zone as a rule.

This heavy brown line or mark, is that gas?

Above that is gas.

And the line along the bottom of the picture?

Brine water.

The only area that produces oil is between the brown line

and the water?

A That is right.

Q Below this area (indicating) is a gas cap?

A That is right.

Q Turning to Exhibit No. 2, across this area marked "Lower Sandy Phase" are well bores, are some brown lines. What does that mean?

A Because this lower zone shows some effect --

Q (Interrupting) You don't mean the lower zone do you?

A No, the second zone shows some effect of lenticularity, this color, brown, through the well bore indicates a good oil showing, a good oil bearing porous sand. That particular well. We have not attempted to evaluate the oil accumulation between the wells, and have shown it only in this particular well.

Q In this so-called second zone, the lenticular zone, is oil sometimes found in substantial quantities?

A Yes, some very prolific wells have been completed in that zone.

Q Do wells producing from the same zone always function alike?

A No, definitely not. Previously I have mentioned you have variations of permeability within zones, between layers. In other words, the porosity, I would say from this first zone, indicated by the second and third lines in this cross section, does have the same porosity value, not permeability. Though there there are little layers varying within themselves.

Q The same is true of the other zones?

A The same is true of the other zones.

Q And vary between zones?

A Apparently also there is considerable variation between zones.

Q The effect in the fluid coming between zones is the fact that there is more permeability laterally than vertically, does that have an effect in the operation of a well?

A Definitely. Now, as I said before, the movement of fluids have been laterally, coming in this manner, the vertical porosity is small -- relatively small, and since there is the zoning effect, the movements of fluid have all been parallel to

bedding planes, which would be apparently parallel to this green line in this zone. The result has been the water movement has been very erratic at the present time, and the gas movement is erratic, varies. The gas-oil content at the present time in the oil columns a very disturbed.

Q Have you a water map which shows that?

A Yes, I have. (Witness produces map which is marked "Shell Exhibit No. 5).

MR. SETH: We offer in evidence Shell Exhibits Nos. 2, 3 and 4.

Q Will you please explain Shell Exhibit No. 5, Mr. Schuchle?

A Each colored unit represents a unit at the present time producing water. The various colors means different percentages. The blue, zero to 5% water; yellow is 5% to 15%; the orange -- an example is the Skelly well, State No. 1 -- runs 15% to 30%; the purple, over 30%.

As you will observe, there is no uniformity of water encroachment, and there is not any uniformity of time of encroachment; it is scattered heterogeneously across the field. That is due primarily to lateral movement. If you have a lateral movement, if this well is securing production in the upper area, in here --

Q To what well are you referring?

A Gulf No. 3 -- I don't recall whether it is a water well -- I am using it as an example. This well, when it is producing, the oil moves in this manner --

Q Parallel?

A Parallel with the bedding planes, the water drive will function up to 100 feet either side, and the movement, also parallel, of the gas does the same thing. If disturbed, it moves downward along the bedding planes, which accounts for the extreme difficulty we have had in setting packers.

Q That appearance of water is very erratic?

A Extremely erratic, yes. And exactly what you would expect in a reservoir of this kind.

Q What is the energy in that Tonkawa Pool that produces the oil?

A The energy is both gas and water.

Q ...this gas cap, would you say an area north of [illegible] line and between it and the second [illegible] line, was gas?

A That is right.

Q About how thick is this, roughly?

A It is possible to find gas over an area of as much as -- assuming a small amount of gas found immediately at the top -- you would say the ultimate limit, in the vicinity of 500 feet.

Q That gas lies in the portion of the second zone which extends above the gas oil contact?

A That is right.

Q You say the field is operated under both water and gas drive?

A Yes, it does. Some layers can be identified definitely as gas drive, at least, in parts, and others water drive, in parts.

Q The pool varies?

A Yes, sir.

Q Would you say some were almost entirely gas drive?

A Some are almost entirely gas drive, and some very nearly water drive.

Q Which is the more efficient? Are you able to compare them? Which produces the most energy?

A That would depend entirely on the porosity and permeability.

Q And which force would equalize quicker under shut-in conditions, gas or water?

A Gas equalizes more rapidly.

Q You have stated, Mr. Schuchle, that in your opinion the field was originally divided into three zones in which gas and oil were found?

A That is quite right.

Q I mean, that is as far as your investigation [illegible]?

A That is right.

Q There might be fractures causing intercommunication?

A There may possibly be some fractures.

Q Have you seen any evidence of it?

A I have seen no evidence of it.

Q [illegible] you are connected through the well bores, I believe you stated?

A ...to right.

Q By that you mean a well, whose casing point is above the contact between the oil and gas, the bore hole going down permits gas --

A (Interrupting) It could exert pressure on another zone.

Q How many wells in the pool or field are there through which that pressure might be exerted, roughly?

A Roughly, it would be through all wells within the yellow, purple and orange, about 250 to 300.

Q There are now 250 to 300 openings through which there may be intercommunication between zones?

A That is quite so.

Q Does that permit the gas in the large gas cap in the first zone to exert its pressure on the oil in the other zones?

A That is quite possible, yes.

Q Now, Mr. Schuehle, when a well is shut in and builds up bottom hole pressure, may that indicate that it has more ready access to the gas cap?

A It may indicate that.

Q It does not necessarily indicate a water drive is coming in and building up the pressure?

A In some areas it would probably be water drive. It depends entirely on the well and the zone you are considering.

Q And you could not fix any uniform rule throughout the pool, could you?

A No, you couldn't.

Q Would that build-up of bottom hole pressure when a well is shut in have any relationship to the recoverable oil in place?

A None whatever.

Q It is stated that gas pressure equalizes much more readily than water?

A That is right.

Q Gas travels through openings in lime much more quickly than water?

A That is quite right.

Q If a well builds up quickly, it might mean it had direct

connected with the gas cap?

A That is right.

Q And had no relationship whatever to the oil in place?

A None whatever.

Q An increase in the present bottom hole factor at Monument might give a well an advantage that merely had direct connection with the gas cap?

A That is quite right.

Q You could not lay down any rule generally applicable that would apply to bottom hole pressure?

A None whatever. We have a complexity of reservoirs at Monument, none of which function like the others.

Q And the bottom hole pressure does not mean anything?

A Bottom hole pressure does not mean anything in reservoirs of this character.

Q Is the bottom hole pressure, is there any evidence of water coming in from the sides?

A Oh, yes. I might cite a particular well, Shell Foster No. 2. That well is producing from the first zone only. I believe you will find that well on this cross ~~x~~ section, Exhibit No. 1, if I am not mistaken, it is this particular well (indicating). The original water level is immediately below -340 feet. That particular well found oil at -320 feet, and is producing in excess of 30% water. That well, completed approximately 12 months ago, found the horizon at that time was water bearing above the original oil-water contact, whereas the next well immediately east, Shell-Foster No. 1, produced in the same horizon, the same total depth, which is somewhat higher on the structure, probably in the same zones open at the same total depth, that well is water free. Water coning up structure has reached this point, climbing progressively in this manner, and will ultimately reach Shell-Foster No. 1. At the present time we can expect to state the horizon or layer in which the water might appear.

And you stated a while ago that the oil, water and gas moves more easily laterally, following the bedding planes of the

structure?

A That is right.

Q A well of high pressure may be draining oil locally from neighboring leases?

A That is it, oil going from one to the next, moving laterally.

Q Mr. Schuehle, is there any definite factor in the treatment tool which, in your judgment, can be used for proration other than acreage?

A None whatever. It is the only one that can be determined.

Q Porosity cannot be determined?

A No, sir. Bottom hole pressure means absolutely nothing, because of the different types, the extreme complexity in the structure.

Q And the same well may have three different phases?

A That is right.

Q Mr. Schuehle, would you recommend any increase in the percentage now allowed for bottom hole pressure?

A Definitely not.

Q Your recommendation would be that there be no increase?

A That is quite right.

Q What do you feel about continuing the present formula?

A Since there is a faint possibility there may be a slight degree of intercommunication and at the present time have some intercommunication, both in honesty and in fairness, I think you may be able to use a small bottom hole factor, but certainly it should not be increased.

CROSS EXAMINATION by Mr. Hartwood:

Q Mr. Schuehle, you do say there is drainage between the various zones?

A No, I didn't say there is drainage between zones. I said there don't between wells, as far as we know.

Q Why is it you want to give 25% to bottom hole pressure?

A I did not say 25; I said 20%.

Q You want to give 20?

A That is right.

Q Why do you want to give that much?

A In case, because we cannot see between the bore holes, there may be some small degree of fracture and a very small tendency to equalize pressure.

Q There may be drainage?

A Very slight, if any.

Q I believe you advised the Commission in your best judgment acreage is the only factor we could properly consider in a proration formula at Monument?

A That is right.

Q If every acre has the same amount of oil beneath it, is that a good system?

A Yes, sir.

Q And if every acre does not have the same amount, it is not good?

A If we knew that every acre does not have, it would not be, but we do not know.

Q It is your opinion that at Monument every acre does have the same amount of oil as every other acre?

A I am not in position to state.

Q You have an opinion?

A Information is so controversial, there are so many factors present, such a complexity, that an answer to that now could not justifiably be made.

Q You don't want to tell your opinion?

A I am glad to tell it.

Q And that is?

A I have studied this reservoir in such detail, over a period of time that I find I am not able to judge.

Q You have not formed an opinion?

A My opinion is that it is a question of such complexity that it is just impossible to answer that question.

Q Mr. Chandler, I understood, from this complex test map, that you stated there were at least three separate and distinct zones, one almost entirely separate from the other two?

A That is right.

Q Is the basis of that

A I know that to be the case from very detailed, careful study of numerous wells. In are able to find these dense, non-productive layers throughout these layers, when the well is drilled to depths sufficient to encounter such zones, it is present.

Q At various depths?

A At various depths, depending on the structural position.

Q How is it you know the third and fourth green lines is wholly impervious and furnish a sealed space or barrier between the zones? How do you know that?

A A detailed study of these cross sections show a relatively few number of wells -- more or less present in all wells. On examining them further, you will find sandy zones at relatively uniform depths in every well placed where logically you would expect to find them.

Q You used a word in your testimony that I am not familiar with, that is, lenticular. The best I understood that was that there were streaks of porosity?

A That interrupts non-continuous areas, areas that may not be continuous.

Q Various types and degrees of porosity?

A That is right.

Q And I believe you said that exists between the third and fourth green lines?

A I said those green lines represent lenticular bodies of sand. I was discussing the presence of sandy limestone that has porosity varying through it.

Q Is there varying porosity and permeability in the third and fourth green beds?

A Within the sand itself?

Q Yes, this one here (indicating on map) Are the porosity and permeability both varying, or are both of these reasonably porous or permeable?

A It depends on how you use the terms. Over geologic time there has been a certain degree of porosity, interconnected, or having probability that the fluid that passed through it was effective.

Q You say that the oil can have down on that horizontal plane?

A No.

Q You say it is not?

A It is now. It is accumulated.

Q I will say accumulated, in that horizontal band?

A Originally.

Q In order to do that it had to go through non-permeable structure?

A Certainly.

Q But it took a long time to get through?

A That is true.

Q We are not going to be so long taking the oil out, so we disregard that?

A We can disregard that because it is ineffective.

Q From what zone is the most oil produced?

A All three zones are open in the field.

Q I was curious to know which zone produces the most oil. Roughly, just in a general way. I will not hold you to the number of barrels.

A That is pretty well divided, as shown by the zone map there.

Q Now, Mr. Schuchle, in any one of the three zones, looking back over on this Exhibit No. 3 cross section -- the north and south cross section -- Exhibit No. 2. Suppose for the moment that in any one of those zones there are differences of bottom hole pressure, would there be drainage from well to well, or property to property, within that zone?

A If they were connected.

Q In the same zone?

A I stated that within the zones there were layers.

Q Not so right.

A If two particular wells were open to the same layer, in identical layer, with different bottom hole pressure, that would cause migration.

Q From the high to the low?

A From the high to the low.

Q You think the majority of wells within any one zone are intercommunicating within that zone?

A [illegible]

A Not necessarily.

Q I concede it would not be necessary, but what is your judgment?

A Frankly, there are so many possible variations and so many layers upon -- if you want to refine the point to where it would group wells producing in the same zone and the same layer, it becomes ridiculous -- you get to the point where you have two wells here, and two wells here --

Q (Interrupting) In the same zone?

A This proposition presented here can be refined to an almost ridiculous point.

Q Mr. Schuchle, maybe you can enlighten us further: ordinarily speaking, in one production zone or reservoir, disregarding the known theories relative to Monument, within any ordinary zone or horizon where there are differences in bottom hole pressure, does drainage exist between two wells?

A When there are proper conditions of permeability and porosity, there will be movement of fluid from high to low.

Q Those conditions do usually exist?

A In Monument?

Q Yes, those conditions do usually exist?

A Not in limestone.

Q So in limestone fields it does not necessarily follow there is drainage from high to low?

A That is right, because of the barriers.

Q An impervious, or nonbible rock?

A That is right.

Q That is very frequently the case?

A Ohio oil.

Q [illegible] of very low porosity [illegible] limestone?

A [illegible] I would not care to say.

Q [illegible] where there is little drainage?

A Yes, any limestone produces the same effect.

Q There will be no drainage between zones?

A [illegible]

Q [illegible]

A I said --

Q Primarily do they contribute, or not?

A You would have to cite specific examples, and I could answer you.

Q Will you tell what would be the adverse effect of giving more weight to bottom hole pressure factor in a formula?

A In the first place, assuming to provide uniform reservoirs, under varying conditions, there are gas drives of all degrees and water drive, you can't make a bottom hole pressure factor that would work because you cannot determine the facts.

Q What we should do is divide this field up into three or four or half a dozen areas, and prorate each separately?

A Suppose you difide it up into three areas, it would not work, because I said you could refine that point to a ridiculous degree, you would not know where to stop, you might have to prorate each one on a different basis.

Q You say there are three reservoirs. Wouldn't it be proper to prorate them separately?

A No.

Q What pressure, in general, do the most recently drilled wells have? Is it higher or lower that the early wells?

A Naturally lower.

Q Why?

A Some degree of depletion has taken place.

Q On all three zones?

A Naturally.

Q Is that not because of intercommunication?

A No, certainly not. There is no intercommunication between zones.

Q Now, Mr. Schuchle, you said, and I think properly, that bottom hole pressure is no indication of oil in place?

A Quite right.

Q You stated that a well which obtains pressure as a result of the presence of gas, or the gas cap, builds up pressure more rapidly than water drive?

A I admit that statement.

Q You see any objection to giving wells which rely on water pressure a longer time in which to build up?

A Yes, I do, because you do not know, and you will not be able to find out until too late, whether you have water coning or an

drive.

Q I thought we know, in certain wells no had water drive?

A I showed water drive, but I did not say it was the main source of energy.

Q That water drive on Exhibit No. 1, is that the area of higher or lower bottom hole pressures than the field average?

A That usually, as I recall, is lower than the average.

Q Around the edges the bottom hole pressures are generally lower?

A No.

Q Generally speaking, that is not true?

A You can't generalize here.

Q I am asking if it is not more apt to be the case?

A That may be due to many causes.

Q In that end of the field (indicating) you have low and you have high. Most of the low pressures are around the edge of the field isn't it?

A I would not want to make that generalization.

Q You would not say that is not true?

A I am not prepared to go into that.

Q You think there is any drainage between properties going on in this field?

A When you have lateral movement it is rather hard to prevent drainage.

Q So what is your conclusion? There is migration of oil?

A There is some.

Q There is some?

A That is right. It may be compensated, it may be moving from a property that is getting it from some other property.

Q The ideal thing would be for every man to keep his oil under his own track?

A Naturally.

Q That is not occurring at present?

A I don't know.

Q Didn't you just say there was some migration?

A I said it might be compensated.

Q There might be compensation for the drainage?

A ...ertainly.

Q ...ould you say some of the wells are producing from two or three zones at one time?

A Yes, some do.

Q That connects those zones?

A Through the bore holes there is some connection.

Q After all, wells in the field are holes in the ground through which there is some connection?

A You are interpreting my statement.

Q I don't want to interpret.

A I said wells have penetrated as many as three zones within the oil column. I immediately went on to say further that did not mean that every individual well produced in all three zones.

Q I jotted down a note that you said there were 250 to 300 wells the bores of which permitted intercommunication. Did I misunderstand you?

A No, that is right.

Q So wouldn't those 250 to 300 wells, with an average of a 7-inch opening --

A (Interrupting) Six to seven inch.

Q Would they permit intercommunication between zones?

A Yes, some degree.

Q And there may be some fracturing, although you did not see any evidence of it?

A That is right.

Q Is the permeability and porosity of the three zones greatly varying?

A Extremely varying.

Q Except in this top one but streak that is not true?

A Your degree may be extreme, but the entire reservoir is very small, and therefore you can eliminate it.

Do you know why some wells, which you refer to, were drilled so as to take in only one or two zones and others to take in the entire oil column?

Q You mean all three zones?

A In all three zones?

A Naturally the point is, I would say, a number of wells were drilled before this setup was recognized to the most competent extent.

Q When did engineers and geologists recognize this to exist?

A That has been gradually increasing since the beginning of the field.

Q If you had -- let us suppose a client of yours had leases, and you, as an engineer and geologist, told him they were located in Zone No. 1, and all around wells were drilled, and you told them they were drilled in No. 2 and No. 3, and that Zone 2 and 3 did not correspond with No. 1, would you give them the advice that they could sit idly by and they need not drill offsets on their lands; that there was no danger of their lands being drained?

A I don't suppose I would give such advice, but I would not give it from an engineering standpoint. I would probably say it would be better to go ahead and drill.

Q Why keep on drilling if there is no danger of drainage?

A The legal profession does not know when conditions exist, so they presuppose that there would be drainage. That condition does exist but the courts do not know it.

Q If you know that all these wells were drilled right up to your property line, you would not hesitate to advise your client that he need not drill here because he would not be harmed?

A If I was working here and found that would be the proper, I would say, from the engineering and geological point that drilling was unnecessary because you have no drainage, but there are other reasons that keep you drilling.

You could not tell him he could not be drained?

A It depends entirely on the time factor.

Q I believe that, Mr. Chairman, in order to answer an inquiry to this effect, I am going to ask that we go off, and never touch it, until we produce all of the oil from Zones 1 and 2, and when the record shows above Zone 2, that the oil in Zone 3 will not migrate into Zone 1 and 2, and the pressure will never be lowered as a result of

producing the oil from Zones 1 and 2?

A Do you mean if we had been able to foresee this early, understand the setup before any wells were drilled, and had been able to drill down and stop the wells above Zone 3, and never enter it?

Q That is right.

A Then you have a barrier other than as I mentioned the possibility of fracture.

Q But if you knew you did not have that. Outside of that?

A Then you could.

Q Would you be pretty certain that no oil would migrate from that zone?

A That is right.

Q And you would be equally certain the reservoir pressure would never be decreased in Zones 1 and 2?

A State that again.

Q Decreased in Zone 321, if you are certain it would not be?

A Not of any importance.

Q None at all. It is impervious?

A Effectively so.

Q And you would be equally certain the reservoir pressure in Zone 3 would not be decreased?

A Yes, I think you can say so if it were never opened, if you permitted it to remain in a natural state, then you could exhaust the upper zones.

Q And it not be disturbed?

A Yes.

Q Does not water encroach in all zones?

A It is encroaching all over the field.

You don't mean it is coming through this impervious zone?

A I think not.

Then it is encroaching on all zones?

A Water is tending to replace all the oil that has been withdrawn from the reservoir or reservoirs.

CROSS-EXAMINATION By Mr. Christie:

Q Mr. Schuehle, what is the geological formation, the so-called formation here?

A Permian limestone.

Q What geological name does it have?

A We are calling it Permian limestone.

Q What is the geological formation of your No. 2 zone?

A The whole section technically is a formation, and that is refined to horizons, those formations, or layers, so the entire limestone section is a formation.

Q All three zones are producing from the same geologic formation?

A That is right.

RE-CROSS-EXAMINATION By Mr. Fleetwood:

Q One more question. The official records of the Proration Office of the State of New Mexico, quotes Mr. Edgar Kraus, as follows: "One reservoir in Cooper, Sunico and Monument are present and that although several porous zones may exist, that the gas, oil and water accumulation cuts across such stratigraphic zones, and that therefore the gas-oil contact and the oil-water contact are essentially horizontal planes, irregularities being due to differences in porosity near such contact. With such a picture of the reservoir it must be plain that there is communication between zones, and therefore there must be drainage between zones. Whether such drainage is rapid or slow depends upon local conditions." That is dated June, 1956. Do you disagree with Mr. Kraus?

A In some parts he is quite right. In one part, however, I do not agree. I agree with the zones, that is the same theory presented here. He is quite right about having intercommunication during geologic time, I am sure he is correct there. The quotation quotes "is" communication there.

I don't agree with the present drainage.

Mr. Allstron, of the Humble Oil & Gas Company, testified here before the Proration Commission on January 20, 1956, stating: "I agree with Mr. Kraus' statement, under one of these fields you have these porous horizons. However, they are connected vertically and in communication, and as the gas,

oil and water contacts are found, they have points of depth which would practically convince you there is this connection or you would not have found oil, gas and water in that relation. I am assuming here that there are not any particular zone or strata pays, they are all intercommunicating. We have several specific examples in each one of these fields that show definite intercommunication in wells 1320 feet apart." Would you say Mr. Wehlstrom also was mistaken?

A Of course, you must realize those statements were made early in the life of the field. Little development had taken place. They had not been able to get the zoning effect. It had not been evaluated to the degree we can evaluate it now.

Q You think later developments --

A (Interrupting) They had a very good start on the right track. Further development have shown the error of their ways, in some respects?

Q Their statements, so far as active intercommunication at the present time is concerned, I do not agree with them.

And similarly, Mr. Schuehle, the procurement of additional information in the future may alter your opinion?

A That field at the present time is so nearly completely developed, we might say we have so much knowledge and information at the present time, that any changes would be in minor details.

Q In other words, this is the latest, and perhaps the best and last engineering and geological theory that will be advanced?

A That is quite right.

Witness dismissed.

GEORGE H. CARD,

being called as a witness, and being first duly sworn, was examined by Mr. Seth, and testified as follows:

DIRECT EXAMINATION

Q State your name please.

A George H. Card.

Q Are you the same Mr. and who heretofore testified as a witness for Barnsdall?

A I testified back at the Monument hearing in December.

Q What is your profession?

A Petroleum engineer.

Q How long have you been engaged in that profession?

MR. MARSHALL: We will admit his qualifications.

Q Mr. Card, we have had a lot of talk here about the movement of fluids. Do you agree with the theory advanced that oil moves from a high pressure to a low pressure area?

A Yes, under certain conditions.

Q What are those conditions?

A In a reservoir having uniform permeability.

Q Are there any limestone fields with which you are familiar that have uniform permeability?

A No.

Q What is the situation at Monument? Is it a limestone field?

A It is a limestone field, yes, sir.

Q Does it have uniform permeability?

A No, it does not. It varies widely.

Q In a limestone field of varying permeability, what is the effect of equalizing the bottom hole pressure at the well bore?

A With two adjacent wells, one well having a permeability much higher than the permeability of the other unit, the pressure gradient of the well having low permeability would be much steeper than the well having higher permeability, therefore the drainage area of the well having the high permeability would move into the unit having low permeability, and would drain the oil from the unit having low permeability.

Q Could you illustrate that with a sketch or some kind

(Witness draws a sketch, marked Shell Exhibit No. 6).

A You take the dividing line between the units, the vertical line, the wells being an equal distance from the dividing line. This would be the shut-in pressure at the bore hole of the two wells being equal.

Q Will you indicate the high permeability well with an "H"?

A This one would have low permeability; this would have high.

Q You have indicated that by the words "Low" and "High"?

A Yes. We would assume production, or recovery, so as to equalize the bottom hole pressure at the bore hole of the wells as this line here (indicating). Then the pressure gradient away from the bore hole of the low permeability well would be rather steep, whereas the pressure gradient of the well having high permeability would be much less, and would intersect this well over here (indicating);on this unit the slope, this drainage, would of course be greater because over here in this area is low permeability, so that the drainage area of this well is moving over into the unit of low permeability and draining part of its oil.

Q The slanting lines, under the word "Low" and under the word "High" represent the pressure gradient?

A Yes, pressure.

Q Somewhat in the nature of a curve, rather than a straight line?

A When the wells are flowing it is more of a curve.

Q Roughly, in a straight line?

A This represents the shut-in pressure.

Q The slanting line from the well under "Low" that represents the pressure gradient of the low pressure well?

A Low permeability. We assume the pressure is equal at the two wells.

Q The low pressure well, i.e. pressure gradient is more steep. Is that due to the fact -- was that due to the fact that the low permeability takes more pressure to get the oil out?

A That is right.

Q In the high permeability well it takes less energy to get the oil out?

A That is true.

in the high permeability well it reaches farther away from the bore hole than in the low permeability?

A Not necessarily. It does until it intersects the drainage area of the other well.

It moves much more easily through the ground -- in other words, in the high permeability well gets this drainage, it may reach over into the unit on which there is low permeability, or on which the low permeability well is located?

A That is true.

Q And take oil from that unit?

A That is true.

Q And the oil it won from that unit is not moving against pressure, but the high pressure is bringing it to the well?

A Yes, the higher pressure here.

Q And forces it to the well?

A Yes, sir.

Q And might rob its neighbor of low permeability?

A Yes, sir.

Q Now, Mr. Card, referring back to another matter: If we assume intercommunication between the different producing zones, due to interconnection of the zones by the wells, or by any fracturing that may possibly exist, is there any assurance that such movement of oil and gas can be prevented by means of bottom hole pressure?

A No assurance.

Q Makes it impossible to adjust production capacity satisfactorily by bottom hole pressure?

A I should say so, yes.

Cross-examination by Mr. Westwood:

Q Mr. Card, did you say you had to have uniform permeability before oil would drain from a high pressure area to a low pressure area?

A Yes, uniform permeability with very slight variations.

Q I believe you followed that statement by saying in no lime-stone reservoir you know of does oil migrate from high bottom hole pressure areas to low bottom hole pressure areas?

A No, I did not say that. I said I did not know of any lime-stone fields of uniform permeability.

Q So you do not know of any limestone fields where there is migration of oil from a high bottom hole pressure area to a low bottom hole pressure area?

A If you have uniform permeability between those wells, and had differences in pressure, it is expected you would have migration.

Q So that if you lack uniformity in permeability in lime production fields, you do not know of any limestone field where oil migrates from high to low pressure areas?

A In most limestone fields permeability varies so widely you would assume it would be impossible to show migration.

Q You don't know of any limestone field where there is migration from high to low pressure areas?

A I don't know of any.

Q You state that generally, weighting the bottom hole pressure factor in a field would cause migration of oil from low bottom hole pressure areas to high?

A I don't understand what you mean by "weighting".

Q Giving 20%, as you recommend, as against 75%, you do not believe oil will migrate, or come from the low to the high?

A I said between two wells, if you have uniform permeability, there is a possibility of drainage.

Q What is your judgment as to drainage going on in the Conwest field?

A It is very hard to say.

Q What is your judgment -- I will strike that question. Assume it is going on and is draining from the high to the low -- or from the low to the high pressure areas?

A You are talking about the shut-in pressure at the well bore, or the pressure when the well is flowing?

Q Whichever you best feel to.

A I don't know what the pressure line is between wells.

Q Suppose there is a well with 1500 pounds bottom hole pressure here, and suppose that across the line is a well with 1000 pounds bottom hole pressure; is there supposed to be drainage

going on, and if all these things are true, which way would the drainage be, from low to high, or high to low?

A You would have to know where the drainage areas intersect.

Q You are not sure it always goes on from low to high?

A Oil will migrate from high to low where you have uniform permeability.

Q Referring to your sketch --

MR. SMITH: May I interrupt, and have that marked Exhibit No. 6, and introduce it in evidence?

Q Referring to Exhibit No. 6, as I understand that is a drawing of a well log and beneath the word "High" that means the well is in a fairly high permeability area?

A Yes, sir.

Q In other words, oil moves through the formation with considerable ease?

A Yes.

Q And the well beneath the word "Low" is in a low permeability area, "tight", as they call it, and the oil does not flow with much ease?

A That is right.

Q Did I understand that if both wells had equal static bottom hole pressure, and were allowed the same production per day --

A (Interrupting) No, I said they were produced so as to give them the same bottom hole pressure. I did not say the same production.

Q They have been produced so as to give them the same bottom hole pressure?

A That is right.

Q I will begin about equalization: Adjust the proration so as to give the same allowable, so we get two wells with the same bottom hole pressure, two wells with the same allowable, one in a high permeability area and one in a low. Under such conditions, is it your opinion oil will migrate from the low to the high?

A Yes, if the pressure were scaled back so that it would be less in the high permeability well.

It would go from the low permeability section to the high, so

matter whether the bottom hole pressure was even or not?

A What do you mean, "even"?

Q Just as you take it at Monument?

A Shut-in, at the bore hole?

Q Is that the way it is taken at Monument?

A Yes, sir.

Q How would oil migrate under those conditions?

A I do not understand.

Q We will start all over again. You have two wells, one in a low, and one in a high permeability section.

A Yes.

Q Both have the same static bottom hole pressure; both have the same allowable per day. Is it your opinion there would be drainage from one property to the other?

A Let me see what you said -- you adjust the allowable on these wells so you have brought the bottom hole pressure equal, then you are going to give the same allowable for the next period?

Q Start the period with the same bottom hole pressure and the same allowable, will there be drainage from one property to the other?

A Under conditions as exists there, it shows the high permeability well would take it from the low permeability well.

Q We will start all over again. I will pencil in this very lightly so that you can take it off. I have written in that each of those wells have 1,000 pounds static bottom hole pressure, and I have written that each of the wells have an allowable of 50 barrels per day; if they are produced under that assumption, will there be drainage between the wells from one to the other?

A The next time you take the bottom hole pressure --

Q (Interrupting) Get this out of the way first so I can follow you: Will there be drainage from one to the other?

A Here is the thing: take the next pressure survey, and your high permeability well will probably have a higher pressure than the low.

Q Will there be drainage from one to the other, with the same pressure?

A the drainage reaches back farther into the area in one than the other.

BY MR. JOHN: You mean to say they have the same permeability?

BY MR. PLUNKETT: No, sir. We have the two wells Mr. [illegible] has been testifying about. I will start the routine once more.

Q We have a well in a low permeability section, and one in a high permeability section. Both have the same bottom hole pressure and the same allowable. Will there be drainage from one property to the other?

A Under those conditions as I have written them up, I would think there would be drainage.

Q I want to know, under the conditions I am stating, whether there would be drainage?

A The drainage area of the high permeability well would reach back into the low.

Q Would oil from that property migrate to the other property?

A I should think so.

Q Is that right?

A Yes, under the conditions I illustrated there.

Q Under the conditions I have stated?

A You mean will the oil move from the low to the high permeability area?

Q I don't know.

A I should think it would.

Q It would move from the low to the high if they have the same bottom hole pressure?

A Your high permeability well would be producing longer.

Q Would there be migration of oil from one to the other?

A You would have to know how much the allowable was, how far back it goes, how far the oil moves to the bore hole.

(Witness dismissed.)

MR. JOHN: That is our case.

A. P. LOHKAMP

being called as a witness, who being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Q State your name.

A A. P. Lohkamp.

Q You are a geologist with the Ramsdall?

A Yes, sir.

Q Stationed at Midland, Texas?

A Yes, sir.

Q And do New Mexico fields in which Ramsdall have interests come under your immediate supervision?

A They do.

Q How long have you been in touch with the Monument Field?

A Ever since the discovery.

Q Have you had access to the data, facts and field records accumulated by Ramsdall?

A I do.

Q Have you studied them to the best of your ability?

A Yes.

Q Were you educated as a geologist?

A I was.

Q Tell where.

A At Syracuse and Stanford.

Q How long have you been practicing the profession of geology?

A About 17 years.

Q How long have you been stationed at Midland?

A 13 years.

Q How long have you been in touch with the Monument field as geologist for the Ramsdall Oil Company?

A Ever since its discovery.

Q Did you hear the testimony presented this afternoon by Mr. Schuchle, of the Shell Oil Company?

A Yes, sir.

Q Are you in general accord with the opinions of Mr. Schuchle expressed on the witness stand?

A With some of them, they are contrary to my ideas of reservoir conditions.

Q Point out to the Commission what particular point, or points, you hold a different professional opinion than those advanced by Mr. Schuchle.

A It seems quite probable there are zones of production, porous zones. They are awful hard to trace, especially from well samples, the information is very poor. It is quite likely there are three, or more, zones, but it has been my opinion, and still is, that these zones have vertical movements between zones, and that the reservoir, for all practical purposes, should be considered as one reservoir.

Q I understand you to mean it is your opinion that they are interconnected, and are not separate and sealed off one from the other?

A I believe there is connection between zones, if the zones are present.

Q Would it follow, or would it not follow, if there is a high bottom hole pressure area, and a low bottom hole pressure area in another place, that there would be a tendency for the oil to migrate from the high bottom hole pressure area to the low?

A I am not qualified as an engineer. However, that is my idea of the migration of oil, from the high to the low areas, and that they had a certain migration over the reservoir.

BY MR. PLENTWOOD: You may cross examine.

BY MR. SMITH: No cross.

Witness dismissed.

E. A. HARTLEY,

being called as a witness, and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Plentwood, and testified as follows:

DIRECT EXAMINATION

Q Mr. Hartley, you are Chief Geologist for the Carmudi Oil Company?

Yes, sir.

Q How long have you held that position?

A Two years.

Q Prior to that time were you a geologist with that company?

A Yes, sir.

Q For how long?

A 16 years.

Q Where did you receive your education?

A The University of Kansas and California.

Q And you have been practicing geology how many years altogether?

A About 18 years.

Q As Chief Geologist, with Barnsdall, does your duty include supervision of geology looking to the accumulation of data and information in the various fields in the states in which the company is active?

A Yes, sir.

Q Have you had contact with the Monument field in Lea County, New Mexico?

A Yes, sir.

Q Has that been of a general supervisory nature?

A That is right.

Q And have you had access to the data so accumulated?

A Yes, sir.

Q And have you attempted to study the data to the best of your ability?

A I have.

Q You heard Mr. Pechuchle, of the Shell Oil Company, testify as to the zonal pressure which he thinks exists in the Monument field?

A I did.

Q I would like to have you tell the Commission what your opinion is, in a general way, as to those matters.

A My opinion is that there are differences in degree of porosity. Those differences are recognized. Those harder, more dense, less porous streaks are known to exist in the field, but it is a matter of degree. I do not believe those supervious zones, or non-porous zones would prevent the migration of oil from one zone to another.

Q You think if the zones exist, they are interconnected and communicating?

A I wouldn't think that could be proven.

Q What is your judgment? In other words, do you believe there are three, or more, zones, and that each one is sealed off and separate?

A I believe zones are there -- we recognize three zones as being zones in which porosity is less than it is in a sandy zone and the pay section,- that portion which is occupied by the oil production.

Q Do you think the zones are connected?

A Yes, sir.

Q Would it necessarily follow that with high pressure areas and low pressure areas, would that result in migration of oil from high pressure areas to low?

A I think it would.

Q I may have misunderstood Mr. Schuckle, but according to him, the zones laid down were about as if a concrete wall had been laid down horizontally between the zones. Is that your opinion?

A No, sir. That is, the samples, the showings of the logs was that there was porosity present, in those particular logs.

Q You think they are intercommunicating?

A I think they are intercommunicating. I think the evidence shows the fact that there is intercommunication between the separate zones. Certainly there is no evidence that would prove, in my opinion, that there is not fracturing possible within the so-called zones.

CROSS EXAMINATION by Mr. Roth:

Q How many the zones are connected and as valid, how close the various "pays" are associated by the term sand

A That is true. That is brought out by Mr. Schuckle's testimony, that there are some 200 more holes connected the zones.

Q Can you give some opinion on that as the basis of your opinion?

A No, sir, not my area of expertise is based on development in our own wells, where we found a generally porous condition as existing,

and we are firmly of the opinion that migration of oil not only is possible, but does take place between wells in sections as porous as the one mentioned.

Q Have you made any study of the field as a whole in an effort to determine whether the zones are separated by an impenetrable wall?

A No, sir, we never have made that study.

Q You have never made a study outside of your own wells relative to the zonal pattern of that field?

A No, sir, we have never made a detailed study.

Q Your opinion is based on data which your company has in their office?

A Based on the nature of the reservoir, with the common water level which originally existed, a sub-sea datum of -350 feet,- I believe the testimony was it was -340 feet. We all agree within those limitations originally pressures were equalized throughout the reservoir. We find, as indicated on this map, that the so-called impervious zones, which are supposed to separate the oil in each zone, do have a degree of porosity and saturation.

Q In the second zone?

A In this zone supposed to prevent the migration of oil in the reservoir from this zone.

Q Did you do the field work yourself?

A I have been in the Monument field.

Q Once?

A One time, on one of our wells, only once.

Q All of your testimony is based on what has been reported to you?

A That is right, but it came under my direction.

Q You have not examined outcrops of the sand personally?

A No, personally.

Q Not throughout the field?

A No, sir.

Q Your opinion is just an assumption?

A It is an opinion that has been encurred in up until recently I think by the majority of geologists familiar with this area.

Q How many years was that oil leveling off in there, how many, many years has it taken that oil and water to level off?

A I am not that good a mathematician.

Q Couldn't it level off in this unlimited period of geologic time just through one small opening?

A You mean this horizontal zone of production which cuts across the stratigraphy? Couldn't it level off through one small opening?

Q One small opening?

A Not knowing how long it has taken, I don't think that question could be answered.

Q You know it has been long enough that one small opening could have leveled the whole thing off?

A In my opinion, sir, no.

RE-DIRECT EXAMINATION By Mr. Lockwood:

Q Mr. Schuehle stated there are some 250 to 300 wells known which, at least in his opinion, connected the three zones he spoke of vertically?

A Yes, sir.

Q You recall one of the first Carmadall wells could have made 25,000 or 30,000 barrels a day?

A 23,000 barrels.

Q Through one six or seven inch hole?

A That is right.

Q You think it is unimportant that 250 to 300 such holes interconnect these zones?

A I think that is very important.

Witness dismissed.

BY MR. [illegible]: No rest.

BY MR. [illegible]: No rest.

[illegible]: Those who wish to submit briefs or statements [illegible] may do so by the 22nd of March.

Thereupon the hearing adjourned.

---000---

C E R T I F I C A T E

I hereby certify that the foregoing and attached seventy-six pages of typewritten matter, numbered one to seventy-six, both inclusive, are a true, correct and complete transcript of the shorthand notes taken by me at the hearing in the above entitled case on the 7th day of March, 1940, and by me extended into typewriting.

Witness my hand this 12th day of March, 1940.

(Signed) Esther Barton

Statements — Ca
on Hobbs Prorati

Case No.

14

File #1

Application, Transcript,
Small Exhibits, Etc.

OIL CONSERVATION COMMISSION

H. R. /xxxxxxxx Rodgers,

January 3, 1941

AIRMAIL
SPECIAL DELIVERY

Honorable Russell G. Lowe
P. O. Box 661
Tulsa, Oklahoma

Re: Case No. 14, Hobbs Division.

My dear Judge Lowe:

In accordance with your request by Long Distance, enclosed please find a copy of the Commission's order modifying Hobbs Proration Order No. 48.

With best good wishes,

Very truly yours,

Carl B. Livingston
Attorney

CBL:ik
Enc.

C O P Y

December 19, 1940

Honorable E. L. Medler
c/o Hotel McCoy
El Paso, Texas

Re: Case No. 14, Hobbs and Monument Proration Matters.

COPY

My dear Judge:

Immediately upon receipt of your telephone call, the files of the respective matters were prepared and Mr. Bayne is immediately delivering the package containing the files to the Express Office in the hope that the package will be in time to catch the express, which I doubt. But, at any rate, we acted promptly and immediately.

In the package you will note there are two files. I separated them into separate containers for your convenience. The one pertains to the Hobbs proration matter, and the other to the Monument proration matter - both in Case No. 14, but heard separately. The Hobbs division was heard first. You will note in the transcript of the hearing held December 6, 1939, page 3, the procedure was the hearing upon the Hobbs division first. If you will keep all the files separated into the Hobbs division and into the Monument division, you will have little difficulty in keeping the two matters straight.

There was no formal petition in either of these matters. The Commission, under the provisions of Section 5, Chapter 72, Laws of New Mexico 1935, may institute a hearing upon its own motion.

The exhibits in these two matters, in the nature of engineering maps, are exceedingly voluminous. I mentioned to Mr. Worden over the telephone whether these exhibits were desired by you. He did not think you desired these. Therefore, they were not enclosed.

Enclosed in this letter is Proration Order #48, the existing Hobbs order sought to be changed in Case No. 14. Also enclosed herewith is Proration Order No. 33, the existing Monument

proration order sought to be changed in Case No. 14. As I recall, neither of these orders were introduced in the record of Case No. 14.

With kindest personal regards, and wishing you a Merry Christmas and hoping above all you escape the flu, I am,

Cordially,

Your friend,

Carl B. Livingston

CBL:ik
Encls.

COPY

SETH AND MONTGOMERY
ATTORNEYS AND COUNSELORS AT LAW
111 SAN FRANCISCO ST.
SANTA FE, NEW MEXICO

J. O. SETH
A. K. MONTGOMERY

January 17, 1940.

Honorable Frank Worden,
Commissioner of Public Lands,
Santa Fe, New Mexico.

Dear Mr. Worden:

Enclosed is a clipping from the Fort Worth Star-Telegram of January 14th. Reference is made to the article entitled "Plan to End Potentials Is Approved." You may have seen this, but I know you will be interested in the proposed change in Texas.

Very truly yours,

JOS:IG
Encl.

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NEWS AND
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FORT WORTH STAR-TELEGRAM

A Fort Worth Owned Newspaper

OIL NEWS A
CLASSIFIED A

FORT WORTH, TEXAS • • • Where the West Begins • • • SUNDAY, JANUARY 14, 1940

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Lacey Walker, Secretary of API, Visits Fort Worth to Make Plans for Convention

Facilities of Three Hotels Will Be Used as Headquarters and to House Committee Meetings of the Convention

Lacey Walker, secretary of the American Petroleum Institute which holds its midyear meeting in Fort Worth from May 27 to 31, inclusive, while in Fort Worth last week to make plans for the convention announced it would be necessary to use the Blackstone, Texas and Worth Hotels in order to accommodate the institute's sessions.

It previously had been announced that headquarters would be set up only in the Blackstone and Texas Hotels.

Between 1,500 and 2,000 oil men and company officials are expected to attend the convention. During the five-day convention, committee meetings and open sessions will be held on every phase of the oil industry, similar to the annual meeting of the institute.

Although the meeting still is more than four months away, attention to much preliminary detail is necessary to assure the smooth functioning of the institute's sessions with little lost motion.

Close attention particularly is necessary inasmuch as the convention's sessions will be divided among three hotels rather than concentrated in one hotel as is the annual meeting which always is held in Chicago, Lacey pointed out.

At the annual meeting of the institute last November for the first time since its organization, a new board of directors was elected which included 19 Texans.

In addition to Texas representation on the board, the State also has three members on the executive committee.



LACEY WALKER.

Charles F. Roeser of Fort Worth, immediate past president of the Independent Petroleum Association of America, is a member of the executive committee as is J. C. Hunter of Abilene, former president of the West Central Texas Oil and Gas Association. J. L. Hamon of Dallas, past president of the Texas division, Mid-Continent Oil and Gas Association, is the third Texan on the committee.

Etex Wildcat Interest in Smith Area

Shell Test in Chapel Hill Coring for Porosity in Travis Peak of Trinity

Special to The Star-Telegram.

MARSHALL, Jan. 13.—Probable starters in Shelby and Panola Counties coupled with drilling progress at two Smith County Trinity series operations drew attention Saturday of operators in the East Texas district.

The Smith tests were being watched closely as one was coring for porosity in the Travis Peak zone of the basal Trinity and the other was looking for top of the Paluxy section.

Two miles northeast of the Hunt Oil Company No. 1 Bradley, wet gas discovery at Chapel Hill, eastern Smith County, Shell Oil Company, Inc., No. 1 Campbell, in the Lively survey, was cutting a core below 8,355 feet as the week closed and was credited with picking up some porosity with slight oil stain and gas odor at 8,337-55 feet. Heretofore the sand has been silty and tight, with no show except one place, around 8,280 feet, and this lacked porosity.

Coring for Paluxy.

One and one-half miles south of the Hunt discovery, the Sun Oil Company No. 1 Huddle, in the Dickerson survey, was coring below 5,514 feet for top of the Paluxy zone. It was at this level the Shell test indicated a wet gasser at 5,760 feet on drill stem test. On basis of Georgetown, while [illegible] specifically

New Officers of Local Geological Society



RALPH S. POWELL.



LOUIS H. FREEDMAN.



VERNON LIPSCOMB.

Members of the Fort Worth Geological Society elected officers for 1940 at the first meeting of the new year last Monday. Ralph S. Powell, the Texas Company, left, was named president. Louis H. Freedman, Snowden & McSweeney, Inc., center, was named vice president, and Vernon Lipscomb, the Pure Oil Company, right, was re-elected secretary-treasurer. Retiring officers are J. Earle Brown, consulting geologist, president; Joseph H. Markley, the Texas Company, vice president.

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BY JOHN W. NA
Oil Editor.

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Snow Blankets All Panhandle

Special to The Star-Telegram.

PAMPA, Jan. 13.—Heavy snow and ice played havoc with drilling in the Panhandle oil field this week. An eight-inch snow fell early in the week to top a five-inch snow of the previous week. Melting of the snow began late in the week to continue making roads through the field almost impassable.

All wildcats in the field were shut down because of the bad weather or for other reasons. In Lipscomb County the Phil O'Neil No. 1 Jacob Koch, in section 539, H&TC survey,

Four Operations in Walnut Bend Indicate Wells

Special to The Star-Telegram.

GAINESVILLE, Jan. 13.—Four operations in the Walnut Bend pool of northeast Cooke County are in various stages of completion, all indicating producers. Two on the southeast side are of especial interest because of tests of shows in upper Strawn sands.

Only completion from the upper Strawn is the Magnolia Petroleum Company No. 1 G. L. Ramsey, Conrad Furnash survey, abstract 369, given potential rating of 675 barrels from sands at 4,8[illegible]6-42 feet, total

Crude Storage Continues Gain

Stocks of foreign and domestic crude oil in the United States continued to gain for the first week of the new year ended Jan. 6, with a net increase of 839,000 barrels, the Bureau of Mines reported Saturday. The increase compares with a gain of 1,704,000 barrels during the previous week. Stocks at the end of the week totaled 238,581,000 barrels against 237,742,000 barrels at the end of the previous week.

The net increase in stocks was at the rate of 119,860 barrels daily. Stocks of domestic crude oil gained 1,063,000 barrels during the week

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PAGE 2, COLUMN 7)

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o The Star-Telegram.

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No. 2 G. E. Winn test in Isaac White survey, abstract 895.

Southeast of Jermyn one and a half miles, Harper-Kappenberger & Gillispie No. 1 Oliver Loving, in southeast part of section 2753, TE&L survey, a wildcat, is coring for the sand at 3,156 feet. This test is approximately three miles northwest of the deep production in the Winn pool, and its outcome is of vital importance to this particular section of the field.

North of Jacksboro 10 miles, W. L. Forbes and associates No. 1 N. W. Davis, in BBB&C survey, abstract 94, a wildcat, is drilling at 1,500 feet in shale.

Henlon-Buchanan, Inc., No. 1 A. T. Smith, two miles southwest of the Forbes test, and in the A. T. Smith survey, abstract 2175, block 2, is drilling at 2,370 feet in a shale and lime.

Steed & Cooper No. 1 W. J. Mathis, a 3,200-foot test, section 2, BS&F survey, abstract 1562, southwest of Jacksboro four miles, spudded in.

Ill Beddo Pool

Special to The Star-Telegram.

SAN ANGELO, Jan. 13.—Further exploration of the Sarratt sand possibilities, discovered last Fall, in the Beddo pool in Runnels County six miles northeast of Ballinger was assured this week as Art Tucker No. 1 J. L. King gauged 187.66 barrels of high gravity oil on a 24-hour railroad commission potential test.

The production from the new well compares with 33.1 barrels of 45 gravity oil gauged for Homer Price No. 2 J. C. Beddo, Sarratt sand discovery, on its potential test last September. Tucker No. 1 King is 425 feet northwest of Price No. 2 Beddo and is in subdivision 51, Domingo Diaz survey 532. It drilled oil bearing Sarratt sand from 2,329 to 2,355 feet. The gauge was on net oil separated from approximately 200 barrels of water.

Floyd C. Dodson No. 1 Robert Wilson, scheduled Ordovician wildcat in southwestern Concho County, was drilling at 1,500 feet in the upper Pennsylvanian lime after setting 13-inch casing at 1,490 feet. The test is in Thomas F. Green survey 1.

Shut down for repairs after breaking the bull wheel and losing tools in the hole, Dan Short and associates No. 1 J. G. Davidson, scheduled 3,500-foot wildcat three miles southeast of San Angelo and in Lovie P. Moore survey, had drilled to 2,935 feet in lime after passing through a slight showing of oil at 2,893-95 feet in lime.

Southwest outpost to the Page pool in central eastern Schleicher County, Cooper Gas Company No. 1-41 Bert Page was drilling at 2,515 feet in shale. It had underreamed to 2,346 feet to shut off water. The test is in section 41, block L, GH&SA.

Voth Pool

Special to The Star-Telegram.

MUENSTER, Jan. 13.—A saturated lime new to the area was topped Saturday at 1,554 feet and drilled eight feet in a north side test in the Barney Voth pool just south of Muenster to give rise to speculation over a third producing horizon. The test is the Whitfield, Pearson & Grimes No. 1 Henry Sicking, S. Hinkle survey, abstract 494, a north offset to their No. 10 Barney Voth, Z. D. Fulton survey, abstract 1250, a completion from a sand topped at 1,665 feet.

The lime in the Whitfield test was declared not to be in the Ellenberger and operators were planning to drill and set pipe on the 1,600-foot sand. Most of the wells in the pool are producing from the 1,700-foot Ellenberger lime, lower Ordovician.

Southwest of the Voth pool, the Joe Mixon and others No. 1 Peter Strong, SP survey, abstract 975, was drilling in broken lime at 1,749 feet after passing through a broken sand at 1,649-65 feet showing some saturation. The test is projected to the Ellenberger to test the Voth pool formations.

A little further west, the Staley & Cranfill No. 1 Peery estate, BBB&C survey, abstract 145, has been delayed by a breakdown and by the weather, total depth 1,235 toward 2,500-foot contract.

About 10 miles south of Muenster and three miles north of Rosston, the G. E. Sykes No. 1 Hill Christian, J. P. Bailey survey, abstract 70, was preparing to start drilling on 3,000-foot test, this in an area having shows in several wildcats in the past few years.

Adjoining the Voth pool on the southeast side, the T. C. U. area has another well on the sand. This is the Dickson Oil Company No. 2 Sarah Alice Linn, J. D. Linn survey, abstract 1347, which topped the sand at 1,099 feet, drilled two feet and set pipe. Spudder was being rigged up to drill in. Its No. 1 Linn, one location west, was given a potential of 163 barrels from the same sand.

The Shaw Oil Company No. 2 T. C. U. (H. W. Stark land), W. A. Linn survey, abstract 1572, had trouble with casing recemented on top of the sand at 1,128 feet and was running a new string of five and three inside the seven inch, to set with packer, to complete. Location has been made for No. 3 T. C. U., 150 feet out of the southeast corner of the W. A. Linn survey.

About a mile south, the Charles C. Lynch No. 1 Buddy Hellman, Thomas Toby survey, abstract 1060, was drilling at 835 feet in broken lime.

North of Muenster the J. G. Richards & Son No. 1 Trew, Henry Whiteside survey, abstract 1083, is a starter, projected to 1,400 feet.

Pool Gets Six Sites

M'ALLEN, Jan. 13.—Six new locations were staked in the Starr County portion of the Kelsey pool by Humble, following the oil show in the No. 43 J. C. McGill, which almost straddles the Brooks-Starr line in La Blanca grant.

It will be 80 feet lower on the top of the Georgetown.

Latest leasing in the area, other than Magnolia Petroleum Company taking 980 acres near Friendship, saw Delta Drilling Company purchase 58 acres for $7.50 in the Samuel Epps survey. Also in this district, Sun has taken the Luther Ford 50-acre tract in the Epps survey at $5 per acres for 10 years with $1 rental.

Panola Wildcat.

The Panola prospect is credited to Continental Oil Company, which has been planning for some time an 8,000-foot test northeast of Carthage on Marshall Lumber Company lands in the John F. Hendricks and Shears surveys. Reports now say activity is planned for the early part of February.

The Shelby prospect is reported planned along the Pickering Lumber Company right-of-way, where several Glenrose wet gassers have been finaled. Pewitt et al are said to be planning the well.

Another new sector coming in for attention is north of the Talco field in Titus County. R. L. Peveto of Tyler is said to be taking all available acreage north and east of Talco, largely in the B. Jones, J. Nugent, Delgado and other surveys. Sources state the activity is believed prompted for account of some major which is said to be considering drilling a big lime test.

In Gregg County Gulf Oil Corporation has been renewing leases south of Longview four miles, paying $5 to $10 per acre for five-year leases. The acreage is in and around

(TURN TO PAGE 2, COLUMN 2.)

Drilling Permits Total 261 in Texas for Week of Jan. 12

By International News Service.

AUSTIN, Jan. 13.—Permits for drilling 261 new tests in Texas were issued by the Texas Railroad Commission for the week ended Jan. 12, reported R. W. Byram, oil statistician for the Texas State House Reporter.

This was 221 more than the number issued during the previous week when the total was cut down by the aftermath of the year-end holiday slack.

Nine new tests were issued for East Texas where all drilling must be by special exception to the regular spacing rule.

For the fourth time in five weeks, the North Texas district held first place in the State, listing 82 permits, of which 24 were in Archer County and 21 in Wichita.

Panhandle operators were given permits to drill 17 new wells. Ten locations were in Gray County.

In Southwest Texas 51 locations were widely scattered, while the Gulf Coast listed 43 locations, no county numbering as many as ten.

In West Texas, operators planned 33 new wells, Yoakum County leading the district with 13. West Central Texas operators were issued 21 permits.

East Central Texas total was five.

Haskell County Pool Indicated in Palo Pinto

Special to The Star-Telegram.

ABILENE, Jan. 13.—Opening of a new southern Haskell County oil pool was indicated this week, although operator Saturday planned to plug off sulphur water in the bottom foot of a streak of saturation in the K. B. Nowels of Abilene No. 1 Marie S. Pardue.

The wildcat, about three and a half miles northeast of Stamford and half a mile north of the Jones-Haskell County line, drilled from 3,399 feet to 3,425 feet in oil saturated Palo Pinto lime before drilling into the bottomhole water.

Free oil was bailed from the hole during the drilling of the hard section, and with acid treatment it was believed the test could be made a commercial producer. If not, it will be carried to the contract depth of 3,700 feet. Ungren & Frazier, Abilene contractors, are drilling it with cable tools. Six-inch casing is set to 3,225 feet.

Besides Ungren & Frazier, offset acreage is held by Danciger Oil and Refineries, Inc., Iron Mountain Oil Company, J. G. Hammond, Inc., J. E. Farrell and Dean Brothers of Fort Worth, Carl B. King Drilling Company of Dallas, Fain-McGaha

(TURN TO PAGE 2, COLUMN 7.)

No. 1 Pavlara, section 101, block 2, AB&M survey, was fishing at 915 feet. In Sherman County the Hagy, Harrington & Marsh gas test on the Freeman lease, in section 46, block 42, GH&H, was plugged back to 2,909 feet and shut down awaiting orders. In the same county the Indian Territory Illuminating Oil Company No. 1 Bryant, in section 369, block 1-T, T&NO survey, was fishing for tools at 2,511 feet.

Twelve applications to drill were filed at the local office of the Texas Railroad Commission, six in Gray County and three each in Carson and Hutchinson Counties. The Texas Company staked three locations, two in Carson and one in Hutchinson County.

Completions by counties follow:

Gray County.

Stanolind Oil and Gas Company No. 7 Saunders, section 40, block 3, I&GN survey, gauged 371 barrels with lime pay between 2,998 and 3,100 feet.

Ryan Consolidated Oil Company No. 3 Barrett, section 113, block 3, I&GN survey, was given a potential of 453 barrels. Pay was from 3,103 to 3,295 feet in lime.

Magnolia Petroleum Company No. 15 J. Haggard, section 112, block 3, I&GN survey, gauged 222 barrels with pay from 3,250 to 3,280 feet in lime.

King Oil Company No. 6 Simpson, section 140, block 3, I&GN survey, tested 411 barrels. Pay was in lime between 3,195 and 3,302 feet.

Skelly Oil Company No. 16 Derrick, section 53, block 24, H&GN survey, Wheeler County, gauged 213 barrels. Granite wash formation was from 2,460 to 2,525 feet.

Sinclair Prairie Oil Company was running electrical survey of a series of Strawn sands running from 4,739 feet to 4,944 feet in the No. 6 McGeorge (Fred Snuggs fee), C. L. Ross survey, abstract 1276, in preparation for a drillstem test. Odor showed in sand topped at 4,739 feet and core at 4,829-48 feet brought recovery of five feet of saturated sand. Several sands and broken shale followed and the Best sand was topped at 4,913 feet.

West 660 feet from Magnolia No. 1 Ramsey, Cox & Hamon were preparing to drill plug in the No. 11 William H. Neu, BBB&C survey, abstract 180, which had broken sands showing oil from 4,876 to 4,926 feet. Magnolia No. 2 Ramsey, a north offset to No. 1 Ramsey, is yet to start below conductor pipe because of the weather. Repairs were being made to slush pits and drilling is due shortly.

The Sun Oil Company first operation, the No. 1 Fred Snuggs, block 58, Fannin County school lands survey, was drilling at 3,505 feet in shale. This is one location south of Magnolia's No. 1 Ramsey and one east of Sinclair Prairie No. 6 McGeorge.

Interest also will follow the most southern well in the pool, the Sinclair Prairie No. 5 McGeorge, Ross survey but abstract 1434, which was drilling in shale at 1,417 feet after resuming below surface pipe set at around 1,000 feet. Location is on the west side of the lease.

On the west side of the pool, Sinclair Prairie has two completions due from the Best sand. The No. 16 Best, Thomas Toby survey, abstract 1054, was waiting on cement after setting casing at 4,946 on sand running to 4,949 feet, total depth. The first show appeared in sand topped at 4,195 feet and cored to 4,850 feet. Drillstem test with packer set at 4,801 feet showed some oil.

Two locations south, the No. 17 Best drilled plug at 4,979 feet and was bailing, total depth of the hole 4,994 feet, still in the sand. Core at 4,986-94 feet brought full recovery of saturated sand. These two wells on the Best lease are separated by No. 15 Best, a producer from the 4,900-foot Best sand.

Cox & Hamon's other operation, on the south side of the pool, is still shut down for orders, after running surface pipe to 1,060 feet about three weeks ago. This is the No. 7 Old (W. H. Neu fee), J. O. Henderson survey, abstract 1261.

Southeast of Gainesville, Big Indian Oil and Development Company was preparing to attempt production from an upper sand in the No. 1 M. P. Morton, ET survey, abstract 365. Sand at 2,509-20 feet showing black oil failed to make a commercial producer and plans are to plug back and perforate casing at the 2,035-45-foot sand. Location is south of the Anderson-Kerr field and east of the old Wheelock pool.

Natural Gas Rates Cut

M'ALLEN, Jan. 13.—Rates for natural gas for domestic use were reduced by city ordinance in Harlingen from 94 cents to 70 cents, representing a cut of 24 cents. It is expected the Rio Grande Valley Gas Company, which supplies Harlingen, will protest to the State Railroad Commission. Valley Winter climate is so mild that a peak load for a family of five persons is seldom over $5 per month, gas officials say.

barrels. Stocks of foreign crude oil declined 224,000 barrels for the week, or a daily average drop of 32,000 barrels.

Stocks of crude oil continued to accumulate in Texas although the increase was approximately one-third of the amount of oil added during the preceding week. Crude stocks in the State showed a net addition of 476,000 barrels against a net addition of 1,465,000 barrels the previous week. East Texas showed the largest gain of 475,000 barrels while unclassified Texas areas showed a decline of 254,000 barrels for the week.

The only major decline in stocks in the Nation was in Louisiana where storage dropped 199,000 barrels for the week, and in Oklahoma where stocks were down 159,000 barrels during the period covered by the report.

Outside of Texas the largest increase was reported in California where stocks were up 355,000 barrels. Illinois and Southwest Indiana storage climbed 136,000 barrels during the week.

Stocks of crude petroleum and change from previous week (in thousands of barrels):

Grade—	Jan. 6.	Change from Dec. 30.
Penn	4,651	- 57
Other Appalachian	1,455	+ 19
Lima-Michigan	1,519	+ 83
Illinois-Indiana	16,728	+ 136
Arkansas	2,759	+ 76
Kansas	7,089	+ 275
Northern Louisiana	3,674	- 127
Gulf Coast Louisiana	7,289	- 72
New Mexico	5,892	- 47
Oklahoma	60,218	- 159
East Texas	16,216	+ 475
West Texas	15,506	+ 200
Gulf Coast Texas	18,133	+ 55
Other Texas	21,232	- 254
Rocky Mountain	17,794	+ 125
California	35,675	+ 355
Domestic	235,810	+1,063
Foreign	2,771	- 224
Total U. S. Refinable	238,581	+ 839
Heavy in California	13,366	+ 44

Wildcat to Spud

M'ALLEN, Jan. 13.—Great States Oil Company No. 3 F. G. Trevino, survey 38, in the Colorado pool of Jim Hogg County, was scheduled to be spudded next week. Henshaw Brothers of San Antonio have the drilling contract.

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Effect of Seasonal T Felt by Refined Mark

Seasonal trends became more pronounced last week in the refined oil markets of the Midcontinent and central refining areas. A general rise of ⅛ of a cent a gallon in heating oils reflected the heavy demand due to subnormal temperatures which gripped all of the Middle West. Against this condition was the usual response of subnormal consumption of gasoline, which forced further weakness in quotations of the light ends.

Another buying surge, however, developed in lubricants and wax. The further rise of 1 cent a gallon this year in lubricants and the maintenance of high quotations for paraffine and petrolatums counteracted the disastrous financial effects of low gasoline quotations and, as a result, the setback of the completely integrated plants has not suffered as heavily as would be indicated by the drop in prices of 50 per cent of the volume production.

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B H P - agreed 11-11-26

measured.

First map. 89 wells
77 wells surveyed

1520 high
1122 low
1430 average

agreed 1937
Exhibit #2

3.17.37

359 wells
average 1385

310 surveyed
1483 high
753 low
730

Exhibit C #3
RHP agreed 1938

458 wells 425 surveyed
1433 high
862 low. Av. 1341
571

B.H.P. Apr. 8 1931

Monument

First map 84 wells
77 different

1526 high
1130 low

1430 average

Exhibit #4
April 1931

484 wells 434 producing

1451
424
627 av. 1320

Exhibit #2

B.H.P.

359 wells
average 1355

316 producing

1493 high
753 low
740

Exhibit #5

B.H.P. Nov. Dec 1931

492 445 surveyed

1391
525
872 av. ~~1411~~ 1360

proposed change
25% acreage
75% B H P

Exhibit C #3

B.H.P. April 1931

468 425 producing

1433 high
862 low av 1341
571

12

Total pool 30,000,000
130 prod. ds

Case # 14

For the Considering of the Revising of Existing Proration Plans for Hobbs and Monument Fields, Lea County.

Name	Company	Address
E.E. Rowley	Cities Service Oil Co	Hobbs
J.D. Attwood	" " "	Roswell
Lloyd E. Gray	Gulf Oil Corp	Tulsa Okla
P.H. Bellart	Gulf Oil Corp.	Tulsa Ok
[illegible]		" "
R.H. Arnaffen	Gulf Oil Corp	Tulsa
D. Lumsden		
R.D. Curtis	Barnsdall Oil Co.	
J.S. Roland	Barnsdall Oil Co.	Tulsa
W.M. Fleetwood	J. Barnsdall Oil Co.	Tulsa
E.R. Keeler	Continental Oil Co.	Hobbs
R.S. Dewey	Humble Oil & Ref Co	Midland Texas
W.K. Hubbard	do	Houston Texas
L.A. Fenig	Shell Oil Co	Hobbs, N.M.
Glenn Pickett	The Ohio Oil Co	Hobbs
[illegible]	Continental Oil Co.	Hobbs,
H.B. Hurley		Ft Worth
D.R. McKeithan	Phillips Pet. Co.	Bartlesville Okla.
R.E. Willig	The Texas Co	Ft Worth, Texas
Lee Denning	Gulf Oil Corp	Hobbs N.M.
Ross M. Shutt Jr		Tulsa, Okla
S.P. Hannifin	Magnolia Pet. Co.	Roswell, N.M.
Edward L. Quinn	Stic Service Oil Co	Hobbs, N.M.
Mike B. Hyson		
D.A. Powell	Carbon & Exploration Co	Hobbs
Jack N. Rankin	Ryscello Oil Co	Midland
W.B. Lovell	Ryscello Oil Co	Midland
H.J. Lummus	Ryscello Oil Co	Midland
Geo. E. Bell		
Dalton Payne	Do	Do

H J Kenler	Shell Oil Co.	Midland, Tex
C. D. Cates	" " "	Houston "
W. T. Smith	" " "	Midland Tex
Hibbert Sun Oil Co		Dallas "
Harvey Hendrix	Std Oil Co of Tex	Houston "
Rowan C. Wilson	Wilson Drilling Co	Houston Tex
Weldon Bregance	Rowan Drilling Co	Fort Worth
R. S. Christie	Amerada Petr corp	Ft. Worth
E. S. Campbell	Texas Pacific Coal & Oil Co	Midland
O. J. Hendrick	Texas Pacific coal & oil	
B. Sibley	Skelly Oil & Getty Oil	Tulsa Okla
Colin Chase	Skelly Oil Co	" "
M. Albertson	Shell Oil Co Inc.	Houston Texas
R. G. Schuehle	Shell Oil Co	Midland Tex
J. M. Childers	Tide Water Assoc. Oil Co.	Midland, Tex.
Edgar Kraus	Atlantic Ref. Co	Carlsbad N.M.
[illegible]	[illegible]	[illegible]
C. O. Cusack	[illegible]	[illegible]
A. M. McConkle	Stanolind Oil & Gas Co.	Fort Worth Tex
J. H. Cash	Stanolind Oil & Gas Co	Ft. Worth Tex
Howard P. Holmes	Two States Oil Co.	Dallas, Tex
Roy Yarbrough	Getty oil Corporation	Hobbs N. M.
R. L. Rader	Stanolind Oil & Gas Co.	Hobbs N. M.
R. W. Teeple	" "	Ft. Worth
Guy Woodward	" "	Tulsa, Okla
L. S. Bayz	" "	" "
J. O. Seth	" "	Seattle, Wash

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DOMESTIC		CABLE	
TELEGRAM	X	FULL RATE	
DAY LETTER		DEFERRED	
NIGHT MESSAGE		NIGHT LETTER	
NIGHT LETTER		SHIP RADIOGRAM	

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WESTERN UNION

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

1217-A

CHECK
ACCT'G INFMN.
TIME FILED

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

SANTA FE, NEW MEXICO
JANUARY 10, 1940

MR J S NOLAND
BARNSDALL OIL COMPANY
TULSA OKLAHOMA

REPORTER ESTHER BARTON COMPLETING TODAY HOBBS SECTION OF TRANSCRIPT.

CARL B LIVINGSTON, ATTORNEY
OIL CONSERVATION COMMISSION

(Send Collect)

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

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
Ship Radiogram

(15)..

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-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

VE111 30 DL=TULSA OKLA 9 400P

CARL LIVINGSTON=

BD JUN 9 PM 4 18

WILL YOU BE SO KIND AS TO INQUIRE OF THE REPORTER AND ADVISE ME BY WIRE COLLECT WHEN WE MAY EXPECT TRANSCRIPT OF THE RECENT HEARING ON THE HOBBS POOL=.

J S NOLAND.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a full-rate Telegram or Cable-gram unless its de-ferred character is in-dicated by a suitable symbol above or pre-ceding the address.

WESTERN UNION

1220

SYM
DL=Day
NL=Night
LC=Def
NLT=Cab
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R. B. WHITE, PRESIDENT — NEWCOMB CARLTON, CHAIRMAN OF THE BOARD — J. C. WILLEVER, FIRST VICE-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 de

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CARL LIVINGSTN=

STATE LAND OFFICE

RETEL LEA OPERATORS MEETING. PERIOD COMMISSION ALSO DESIROUS OF HOBBS SETTLEMENT AND HEREWITH POSTPONES HEARING TO NOVEMBER DATE TO BE SET LATER PERIOD PLEASE ADVISE PARTIES INTERESTED OF POSTPONEMENT. PERIOD COMMISSION GLAD TO KNOW OF UNANIMOUS AGREEMENT FOR MONUMENT. PERIOD SUGGEST EXTENSION OF HEARING WILL PERMIT FURTHER AND CONTINUED STUDY OF HOBBS WILL RESULT IN A COMPROMISE AND UNANIMOUS DECISION PERIOD PLEASE SEND COPY OF THIS TELEGRAM TO ALL INTERESTED=

WORDEN ANDREWAS.

WORDEN ANDREWAS.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE DESIRED			
DOMESTIC		CABLE	
TELEGRAM		FULL RATE	
DAY LETTER		DEFERRED	
NIGHT MESSAGE		NIGHT LETTER	
NIGHT LETTER		SHIP RADIOGRAM	

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

COPY OF
WESTERN UNION TELEGRAM

Santa Fe, New Mexico
October 16, 1939

Telegram

HONORABLE FRANK WORDEN
MAYFLOWER HOTEL
WASHINGTON, D. C.

GULF SKELLY BARNSDALL AND ANDERSON PRICHARD HAVE REQUESTED FURTHER CONTINUANCE HOBBS MONUMENT PRORATION MATTERS STOP IF CONTINUANCE IS GRANTED POSSIBLY YOU WOULD WISH TO CONTINUE IVERSON TOOL COMPANY MATTER TOO STOP PLEASE ADVISE SO CAN GET WORD OUT

CARL B. LIVINGSTON

(Charge to
State Land Office)

OIL CONSERVATION COMMISSION

November 7, 1939

Hobbs Daily News-Sun
Sun Publishing Corporation
Hobbs, New Mexico

C

O

P

Y

Re: Notice for Publication, Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

ATTENTION: Mr. Thomas G. Summers.

Gentlemen:

Enclosed please find the publisher's affidavit in the above captioned matter and compare the last two lines with the copy supplied you. Those two last lines read, "Frank Worden, State Geologist." They should have read, "A. Andreas, State Geologist." In case you have destroyed the notice sent you, enclosed please find another copy.

The notice must be published again, one time.

Your statement and purchase voucher in duplicate are returned, accompanied by new purchase voucher blanks in duplicate, in order that you may re-submit your statement and voucher upon the re-publication.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Encls.

CLASS OF SERVICE DESIRED			
DOMESTIC		CABLE	
TELEGRAM		FULL RATE	
DAY LETTER		DEFERRED	
NIGHT MESSAGE		NIGHT LETTER	
NIGHT LETTER		SHIP RADIOGRAM	

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

COPY OF WESTERN UNION TELEGRAM

SANTA FE, NEW MEXICO
OCTOBER 27, 1939

MR. J. S. NOLAND
BARNSDALL OIL COMPANY
TULSA, OKLAHOMA

HEARING DATE CANNOT BE SET UNTIL WORDEN ANDREAS RETURN SOON

CARL B. LIVINGSTON, ATTORNEY
OIL CONSERVATION COMMISSION

(Send Collect)

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.

(23) WESTERN UNION 1201

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

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

Received at

VE10 10=TULSA OKLA 27 1000A OCT 27 AM 31

FRANK WORDEN=

OIL CONSERVATION COMMISSION

WHAT DATE HAS HOBBS MONUMENT HEARING BEEN POSTPONED WIRE ANSWER=

J S NOLAND.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

November 1, 1939

Hobbs Daily News-Sun
Hobbs, New Mexico

Gentlemen:

There is enclosed herewith a Notice for Publication, which you are kindly requested to publish once immediately. You are also requested to furnish this Commission with a copy containing this publication.

Immediately upon completion of the publication be sure to transmit to the Oil Conservation Commission your affidavit of publication.

Upon sending to the Commission your affidavit of publication, please send your statement in duplicate and enclosed purchase voucher, also in duplicate.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

November 1, 1939

New Mexico Examiner
Santa Fe, New Mexico

Gentlemen:

There is enclosed herewith a Notice for Publication, which you are kindly requested to publish once immediately. You are also requested to furnish this Commission with a copy containing this publication.

Immediately upon completion of the publication be sure to transmit to the Oil Conservation Commission your affidavit of publication.

Upon sending to the Commission your affidavit of publication, please send your statement in duplicate and enclosed purchase voucher, also in duplicate.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

November 1, 1939

Honorable J. O. Seth
Attorney at Law
Santa Fe, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Judge Seth:

Enclosed please find Notice of Hearing in the above captioned matter.

This is a re-advertising of the same case heretofore set and continued to a date to be announced by the Commission, which date is now announced in the advertisement.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

November 1, 1939

Honorable H. M. Dow
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Hi:

Enclosed please find copy of Notice of Hearing in the above captioned matter.

This is a re-advertising of the same case heretofore set and continued to a date to be announced by the Commission, which date is now announced in the advertisement.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

November 1, 1939

Honorable Harry Leonard
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Leonard:

Enclosed please find copy of Notice of Hearing in the above captioned matter.

This is a re-advertising of the same case heretofore set and continued to a date to be announced by the Commission, which date is now announced in the advertisement.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

November 1, 1939

Honorable C. J. Dexter
c/o C. J. Dexter Company
Artesia, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Dexter:

Enclosed please find copy of Notice of Hearing in the above captioned matter.

This is a re-advertising of the same case heretofore set and continued to a date to be announced by the Commission, which date is now announced in the advertisement.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

November 1, 1939

Honorable James M. Murray
Lieutenant Governor
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Jim:

Enclosed please find copy of Notice of Hearing in the above captioned matter.

This is a re-advertising of the same case heretofore set and continued to a date to be announced by the Commission, which date is now announced in the advertisement.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

November 1, 1939

Honorable Roy Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Yarbrough:

Enclosed please find copy of Notice of Hearing in the above captioned matter.

This is a re-advertising of the same case heretofore set and continued to a date to be announced by the Commission, which date is now announced in the advertisement.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

November 1, 1939

Honorable Glenn Staley
Proration Umpire
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Glenn:

Enclosed please find copy of Notice of Hearing in the above captioned matter.

This is a re-advertising of the same case heretofore set and continued to a date to be announced by the Commission, which date is now announced in the advertisement.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

October 18th, 1939

Mr. Carl B. Livingston, Attorney,
Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Livingston:

Re: Case No. 14 - Revision of Proration Plans -
Hobbs and Monument Fields,
Lea County, New Mexico.

Thanks for yours of the 17th to which is attached copy of telegram from Commissioners Morden and Andreas advising the hearing set for Monday, October 23rd, has been postponed.

Yours truly,

Russell Lowe

RGL.W

October 11, 1939

Honorable J. O. Seth
Attorney at Law
Santa Fe, New Mexico

My dear Mr. Seth: Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Your letter of October 10 regarding the recessed hearing in the above captioned matter will be called to the attention of Mr. Andreas and Mr. Worden as soon as they arrive.

It is specifically noted that Mr. McCorkle has called a meeting of the Lea County Operators at Fort Worth on October 16 and that it is requested that the Commission make no definite decision concerning the postponement of the October 23 hearing until after the meeting of the operators in Fort Worth on the 16th.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

/

J. O. SETH
A. K. MONTGOMERY

SETH AND MONTGOMERY
ATTORNEYS AND COUNSELORS AT LAW
111 SAN FRANCISCO ST.
SANTA FE, NEW MEXICO

October 10, 1939.

Honorable Carl Livingston,
c/o Commissioner of Public Lands,
Santa Fe, New Mexico.

Dear Mr. Livingston:

Please refer to the hearing on Hobbs and Monument proration and the possible postponement of this hearing to a date subsequent to October 23rd, for which it is now set.

I have just talked to Mr. McCorkle of the Stanolind, over the phone, and he advises that he is calling a meeting of the Lea County operators for Fort Worth on October 16th, at which time the committee of engineers appointed to consider the Hobbs proration will make its report. It is possible that this may give the various companies who have requested a postponement, sufficient time to take whatever action they may decide on before October 23rd. In any event, we request that there be no decision reached concerning a postponement of the October 23rd hearing until after the meeting of the operators in Fort Worth on the 16th.

I would appreciate your bringing this matter to the attention of Mr. Worden and Mr. Andreas when they return.

Very truly yours,

JOS:IG

OIL CONSERVATION COMMISSION
RECEIVED
OCT 11 1939

October 11, 1939

Mr. A.H. McCorkle
Stanolind Oil & Gas Co.
Box 1410
Ft. Worth, Texas

Dear Mr. McCorkle:

Mr. Glenn Bish, Superintendent of the Ohio Oil Company, has called my attention to the loss in pressure that has occurred in their Barber Nos. 2, 3 and 8, Section 5, Township 20 South, 37 East, Monument Pool.

This is a matter that should be kept in mind in considering a continuation or postponement of the recess hearing scheduled for October 23. Mr. Bish feels that this delay is jeopardizing his company's interests in that field.

Yours very truly,

GS:H

Glenn Staley

cc: Oil Conservation Commission

Glenn Bish-Ohio

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

October 7, 1939

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
OCT 9 1939

Mr. A. M. McCorkle, Chairman
Lea County Operators Committee
P.O. Box 1410
Ft. Worth, Texas

Dear Sir:

I have your notice of October 2 addressed to all operators - Hobbs and Monument Fields, in which you advise that a meeting of the operators will be held at the LaFonda Hotel, Santa Fe, at 10:00 a.m., October 21, 1939, unless you hear from a majority of the operators to the contrary.

Since receiving your letter we have talked to several of the operators about this meeting and find that they feel that the operators should have some time to consider the report of the engineering committee before the hearing is held. This is particularly true of some of the companies which were not represented on the engineering committee. After thinking the matter over, we, too, feel that the operators, and particularly those that are not represented on the engineering committee, should have a reasonable length of time, say at least two or three weeks, to consider the engineering committee report, contact their management, and reach a decision regarding this important matter. Therefore, we feel that the hearing should be deferred for a period of 30 days and that a meeting of the operators should be held as soon as possible at a convenient place.

Very truly yours,

ORIGINAL SIGNED
S. G. SANDERSON

General Superintendent

SGS:AL

CC - New Mexico Conservation Commission
Santa Fe, New Mexico

Mr. Edgar Kraus, Chairman, Engineers' Committee
Atlantic Refining Company
Carlsbad, New Mexico

October 9, 1939

Airmail

Mr. S. O. Sanderson
General Superintendent
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Sanderson:

The several requests by letter, telegram and long distance for further continuance of the hearing in the above captioned matter, which is set for eleven o'clock A. M., October 23 at Santa Fe, will be brought to the attention of the Commission as soon as is possible. However, at this writing both Mr. Andreas and Mr. Forden are attending a national timber meeting in the East and the Governor is expected to return to Santa Fe sometime today.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
cc - Mr. A. M. McCorkle, Chairman
Lea County Operators Committee
Fort Worth, Texas
cc - Oil Conservation Commission
Hobbs, New Mexico
cc - Mr. Edgar Kraus, Chairman, Engineers' Committee
Atlantic Refining Company
Carlsbad, New Mexico
cc - Mr. Harry Leonard
Roswell, New Mexico

SKELLY OIL COMPANY

TULSA, OKLAHOMA

PRODUCTION DEPARTMENT
H. M. STALCUP, VICE PRESIDENT
J. S. FREEMAN, ASSISTANT

October 6, 1939

NEW MEXICO
OIL CONSERVATION COMMISSION
OCT 9

Mr. Frank Worden, Secretary
Oil Conservation Commission
Santa Fe, New Mexico

Dear Sir:

The hearing on changes in allocation for the Hobbs and Monument pools is set for 10:00 a.m. October 23, at La Fonda Hotel, in Santa Fe. A number of the representatives of operators in both Hobbs and Monument pools will have to be in Texas during the week in which the Commission contemplate holding this hearing, making it virtually impossible for them to attend the proposed hearing on October 23 in Santa Fe. In view of the fact that these same representatives are those who are familiar with the history of the Hobbs and Monument pools, I believe that should be sufficient reason to postpone the hearing for at least thirty days.

I am also in receipt of a notice from the Chairman of the Lea County Operators' Committee of an operators' meeting on October 21, and it would give operators insufficient time to work out the matter before the proposed hearing on Monday, October 23, and, consequently, we feel that if the hearing is postponed for at least thirty days it would give the operators ample time to digest the engineering committee's report at the meeting on the 21st.

We also understand that several of the other Companies are of the same opinion and are requesting a continuance, and we wish to take this opportunity of joining with them in requesting such continuance.

Yours very truly,

George W. Selinger.

GWS/mb

George W. Selinger

October 9, 1939

Airmail

Mr. George W. Selinger
Skelly Oil Company
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Selinger:

The several requests by letter, telegram and long distance for further continuance of the hearing in the above captioned matter, which is set for eleven o'clock A. M., October 23, at Santa Fe, will be brought to the attention of the Commission as soon as is possible. However, at this writing both Mr. Andreas and Mr. Worden are attending a national timber meeting in the East and the Governor is expected to return to Santa Fe sometime today.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

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.

(18)

WESTERN UNION

1201

SYMBOLS

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

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-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

Received at

1935 OCT 6 PM 1 20

VE75 22 SER=RT OKLAHOMACITY OKLA 6 150P

OIL & GAS CONSERVATION COMMISSION=

GENTLEMEN, WILL BE UNABLE TO ATTEND MONUMENT AND HOBBS HEARING SET FOR OCTOBER TWENTY THIRD. WILL GREATLY APPRECIATE A CONTINUANCE OF CASE=

ANDERSON PRICHARD OIL CORP J STEVE ANDERSON VICE PRESIDENT.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

October 9, 1939

Airmail

Mr. J. Steve Anderson, Vice-President
Anderson-Prichard Oil Corporation
Oklahoma City, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Anderson:

The several requests by letter, telegram and long distance for further continuance of the hearing in the above captioned matter, which is set for eleven o'clock A. M., October 23, at Santa Fe, will be brought to the attention of the Commission as soon as is possible. However, at this writing both Mr. Andreas and Mr. Worden are attending a national timber meeting in the East and the Governor is expected to return to Santa Fe sometime today.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 9, 1939

Airmail

Mr. J. S. Noland
Box 2039
Barnsdall Oil Company
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Jim:

The several requests by letter, telegram and long distance for further continuance of the hearing in the above captioned matter, which is set for eleven o'clock A. M., October 23, at Santa Fe, will be brought to the attention of the Commission as soon as is possible. However, at this writing both Mr. Andreas and Mr. Worden are attending a national timber meeting in the East and the Governor is expected to return to Santa Fe sometime today.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

Charge to the account of $

CLASS OF SERVICE DESIRED			
DOMESTIC		CABLE	
TELEGRAM	X	ORDINARY	
DAY LETTER		URGENT RATE	
SERIAL		DEFERRED	
NIGHT LETTER		NIGHT LETTER	
SPECIAL SERVICE		SHIP RADIOGRAM	

Persons should check class of service desired, otherwise the message will be transmitted as a telegram or ordinary cablegram.

WESTERN UNION

1206-B

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

CHECK

ACCOUNTING INFORMATION

TIME FILED

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

c
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p
y

Santa Fe, New Mexico,
October 16, 1939.

Honorable Frank Worden,
Mayflower Hotel,
Washington, D. C.

MEETING LEA COUNTY OPERATORS HELD FORT WORTH THIS MORNING. APPARENTLY UNANIMOUS AGREEMENT ON MONUMENT. MAJORITY THOSE PRESENT FAVOR EIGHTY TWENTY HOBBS BUT AGREEMENT NOT UNANIMOUS AND NOW LOOKS AS IF MATTER WOULD HAVE TO BE SETTLED BY HEARING. THOSE PRESENT ASSUMED HEARING WOULD BE RESUMED NEXT MONDAY. STANOLIND WOULD LIKE TO HAVE MATTER SETTLED BUT IF MATTERS IN WASHINGTON WILL PREVENT YOUR RETURNING NO OBJECTION ON STANOLINDS PART TO FURTHER POSTPONEMENT OF HEARING TO SOME DATE IN NOVEMBER AFTER MEETING AMERICAN PETROLEUM INSTITUTE. HOPE YOU ARE HAVING A GOOD TIME AND THAT THE TRIP HAS DONE YOU GOOD.

Send Paid
Charge Seth & Montgomery.

J. O. Seth

CLASS OF SERVICE DESIRED			
DOMESTIC		CABLE	
TELEGRAM	X	FULL RATE	
DAY LETTER		DEFERRED	
NIGHT MESSAGE		NIGHT LETTER	
NIGHT LETTER		SHIP RADIOGRAM	

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

WESTERN UNION

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

1217-A

CHECK

ACCT'G INFMN.

TIME FILED

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

Day Letter

SANTA FE, NEW MEXICO
OCTOBER 17, 1939

MR. C. E. BUCHNER, EXECUTIVE MANAGER
INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA
BLACKSTONE HOTEL, FORT WORTH, TEXAS

PLEASE ANNOUNCE TO YOUR MEETING TELEGRAM WHICH JUST CAME FROM WASHINGTON FROM WORDEN AND ANDREAS POSTPONING MEETING AT SANTA FE OCTOBER TWENTY-THIRD QUOTE RETEL LEA OPERATORS MEETING. COMMISSION ALSO DESIROUS OF HOBBS SETTLEMENT AND HEREWITH POSTPONES HEARING TO NOVEMBER DATE TO BE SET LATER. PLEASE ADVISE PARTIES INTERESTED OF POSTPONEMENT. COMMISSION GLAD TO KNOW OF UNANIMOUS AGREEMENT FOR MONUMENT. SUGGEST EXTENSION OF HEARING WILL PERMIT FURTHER AND CONTINUED STUDY OF HOBBS WILL RESULT IN A COMPROMISE AND UNANIMOUS DECISION. PLEASE SEND COPY OF THIS TELEGRAM TO ALL INTERESTED UNQUOTE

CARL B. LIVINGSTON, ATTORNEY
STATE CORPORATION COMMISSION
OIL CONSERVATION COMMISSION

(Charge to State
Oil Conservation Commission)

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

CLASS OF SERVICE DESIRED			
DOMESTIC		CABLE	
TELEGRAM		FULL RATE	
DAY LETTER	X	DEFERRED	
NIGHT MESSAGE		NIGHT LETTER	
NIGHT LETTER		SHIP RADIOGRAM	

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

WESTERN UNION

1217-A

CHECK
ACCT'G INFMN.
TIME FILED

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

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

SANTA FE, NEW MEXICO
OCTOBER 17, 1939

Day Letter

MR. A. M. McCORKLE, CHAIRMAN
LEA COUNTY OPERATORS COMMITTEE
c/o STANOLIND OIL & GAS COMPANY
FORT WORTH, TEXAS

JUST RECEIVED FOLLOWING TELEGRAM FROM WORDEN AND ANDREAS IN WASHINGTON POSTPONING MEETING AT SANTA FE ON OCTOBER TWENTY-THIRD QUOTE RETEL LEA OPERATORS MEETING. COMMISSION ALSO DESIROUS OF HOBBS SETTLEMENT AND HEREWITH POSTPONES HEARING TO NOVEMBER DATE TO BE SET LATER. PLEASE ADVISE PARTIES INTERESTED OF POSTPONEMENT. COMMISSION GLAD TO KNOW OF UNANIMOUS AGREEMENT FOR MONUMENT. SUGGEST EXTENSION OF HEARING WILL PERMIT FURTHER AND CONTINUED STUDY OF HOBBS WILL RESULT IN A COMPROMISE AND UNANIMOUS DECISION. PLEASE SEND COPY OF THIS TELEGRAM TO ALL INTERESTED UNQUOTE

CARL B. LIVINGSTON, ATTORNEY
OIL CONSERVATION COMMISSION

(Charge to State
Oil Conservation Commission)

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

CLASS OF SERVICE DESIRED			
DOMESTIC		CABLE	
TELEGRAM		FULL RATE	
DAY LETTER		DEFERRED	
NIGHT MESSAGE		NIGHT LETTER	
NIGHT LETTER		SHIP RADIOGRAM	

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

COPY OF
WESTERN UNION TELEGRAM

WH169 71 NT WASHINGTON D C 16 1939 OCT 16 PM 11 24

CARL LIVINGSTON
STATE LAND OFFICE

REFER LEA OPERATORS MEETING. PERIOD COMMISSION ALSO DESIROUS OF HOLDING SETTLEMENT AND READY ITS POSITIONS RELATING TO NOVEMBER DATE TO BE SET LATER PERIOD PLEASE ADVISE PARTIES INTERESTED OF POSTPONEMENT. PERIOD COMMISSION GLAD TO KNOW OF UNANIMOUS AGREEMENT FOR SHORT PERIOD SUGGEST EXTENSION OF HEARING TILL [illegible] AND CONTINUED STUDY OF HOBBS TILL WOULD BE A CONSCIOUS AND DELIBERATE DECISION PERIOD PLEASE SEND COPY OF THIS TELEGRAM TO ALL INTERESTED.

HOLDEN AND ATTORNEYS

October 17, 1939

Honorable R. S. Blynn
Gulf Oil Corporation
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Blynn:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable E. W. Childers
Tidewater Association
Midland, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Childers:

The processed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable J. S. Griffith
Humble Oil & Refining Company
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Griffith:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable J. W. House
Humble Oil & Refining Company
Midland, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. House:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable R. A. Koenig
Ohio Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Koenig:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable Glenn Bish
Ohio Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Bish:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable Harry Leonard
Leonard Oil Company
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Leonard:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable H. M. Dow
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Hi:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:lk

October 17, 1939

Honorable James M. Murray
Lieutenant Governor
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Jim:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable Harvey E. Yates
Shoup & Yates
Artesia, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Yates:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Mr. R. S. Dewey
Humble Oil & Refining Company
Midland, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Dewey:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable L. F. Shiplet
The Texas Company
Midland, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Shiplet:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Honorable J. D. Atwood
Attorney at Law
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Colonel Atwood:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Honorable H. L. Johnston
Continental Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Johnston:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable D. R. Guinn
Cities Service Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Guinn:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:lk

October 17, 1939

Honorable D. D. Bodie
Cities Service Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Bodie:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable Edgar Kraus
Atlantic Refining Company
Carlsbad, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County,

Dear Mr. Kraus:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable J. N. Dunlavy
Skelly Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Dunlavy:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Honorable James Fitzgerald, Jr.
Skelly Oil Company
Midland, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Fitzgerald:

The recessed hearing set for October 23 in the above captioned matter has been postponed by the Commission to a date to be announced by the Commission later.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

October 17, 1939

Airmail

Honorable Paul A. McDermitt
Repollo Oil Company
Fort Worth, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. McDermitt:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable J. P. Cusack
Samedan Oil Corporation
Ardmore, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Cusack:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable J. S. Freeman
Skelly Oil Company
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Freeman:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 27, 1939

Airmail

Honorable H. A. Harrison
Plains Production Company
Dallas, Texas

Dear Mr. Harrison: Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Honorable W. O. Byrd
Byrd-Frost, Inc.
Dallas, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Byrd:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable A. E. Wellig
The Texas Company
Fort Worth, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Wellig:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable W. E. Hubbard
Humble Oil & Refining Company
Houston, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Hubbard:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Hon. Harvey Hardison
Standard Oil Company of Texas
Houston, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Hardison:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Hon. D. K. Knowlton
Phillips Petroleum Company
Bartlesville, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Knowlton:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Hon. D. D. Crites
Shell Oil Company
Houston, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Robbs and Monument Fields, Lea County.

Dear Mr. Crites:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Mr. George Card
Stanolind Oil & Gas Company
Fort Worth, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Card:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Mr. J. S. Noland
Box 2039
Barnsdall Oil Company
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Jim:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Mr. J. Steve Anderson, Vice-President
Anderson-Prichard Oil Corporation
Oklahoma City, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Anderson:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:lb
Enc.

October 17, 1939

Airmail

Mr. George W. Selinger
Skelly Oil Company
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Selinger:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Mr. S. G. Sanderson
General Superintendent
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the Revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Sanderson:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Honorable Glenn Staley
Proration Umpire
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Glenn:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable W. B. Cunningham
Oil Well Drilling Company
Dallas, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Cunningham:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Honorable Weston Payne
Anderson-Prichard Oil Company
Oklahoma City, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Payne:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable Howard P. Holmes
Two States Oil Company
Dallas, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Holmes:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable H. B. Hurley
Continental Oil Company
Fort Worth, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Hurley:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable M. G. Lowe
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Lowe:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

October 17, 1939

Airmail

Honorable R. S. Christie
Amerada Petroleum Corporation
Fort Worth, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Christie:

Enclosed please find copy of telegram from Mr. Worden and Mr. Andreas, postponing the New Mexico Oil Conservation Commission meeting at Santa Fe on October 23, which telegram is self-explanatory.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

October 11, 1939

Honorable J. O. Seth
Attorney at Law
Santa Fe, New Mexico

My dear Mr. Seth: Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Your letter of October 10 regarding the recessed hearing in the above captioned matter will be called to the attention of Mr. Andreas and Mr. Worden as soon as they arrive.

It is specifically noted that Mr. McCorkle has called a meeting of the Lea County Operators at Fort Worth on October 16 and that it is requested that the Commission make no definite decision concerning the postponement of the October 23 hearing until after the meeting of the operators in Fort Worth on the 16th.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

COPY

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

October 9, 1939

COPY

Airmail

Mr. George W. Selinger
Skelly Oil Company
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Selinger:

The several requests by letter, telegram and long distance for further continuance of the hearing in the above captioned matter, which is set for eleven o'clock A. M., October 23, at Santa Fe, will be brought to the attention of the Commission as soon as is possible. However, at this writing both Mr. Andreas and Mr. Worden are attending a national timber meeting in the East and the Governor is expected to return to Santa Fe sometime today.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

October 9, 1939

Airmail

Mr. J. Steve Anderson, Vice-President
Anderson-Prichard Oil Corporation
Oklahoma City, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Anderson:

The several requests by letter, telegram and long distance for further continuance of the hearing in the above captioned matter, which is set for eleven o'clock A. M., October 23, at Santa Fe, will be brought to the attention of the Commission as soon as is possible. However, at this writing both Mr. Andreas and Mr. Worden are attending a national timber meeting in the East and the Governor is expected to return to Santa Fe sometime today.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

October 9, 1939

C

Airmail

O

Mr. J. S. Holand
Box 2039
Barnsdall Oil Company
Tulsa, Oklahoma

P

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Y

My dear Jim:

The several requests by letter, telegram and long distance for further continuance of the hearing in the above captioned matter, which is set for eleven o'clock A. M., October 23, at Santa Fe, will be brought to the attention of the Commission as soon as is possible. However, at this writing both Mr. Andreas and Mr. Worden are attending a national timber meeting in the East and the Governor is expected to return to Santa Fe sometime today.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

September 20th, 1939

Mr. Carl B. Livingston, Attorney,
%Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Livingston:

I appreciate your letter and wire received this morning in which you advise the resetting of Case No. 14 for October 23rd.

Again thanking you, I am,

Yours truly,

Russell Lowe

RGL.W

C. J. DEXTER, PRES.
M. E. BAISH
D. D. BODIE

EXECUTIVE COMMITTEE
VAN S. WELCH, V. PRES.
GLENN BISH
F. J. DANGLADE

HARRY LEONARD, SECY.
J. C. CLOWER
W. R. HINES

NEW MEXICO OIL AND GAS ASSOCIATION

OFFICE OF SECRETARY
ROSWELL, NEW MEXICO

September 20, 1939

Mr. Carl B. Livingston, Attorney
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Dear Carl:

Thanks very much for copy of the Commission's order on case No. 14. This information is being passed on to our membership today.

Yours very truly,

HL:BM

NEW MEXICO OIL & GAS ASS'N
By Harry Leonard
Harry Leonard, Sec'y

September 20, 1939

Mr. R. G. Lowe
Gulf Oil Corporation
P. O. Box 661
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Lowe:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 15, 1939

AIRMAIL

Mr. E. G. Lowe
Gulf Oil Corporation
P. O. Box 661
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Lowe:

Referring to your long distance call from Tulsa a few minutes ago with regard to the hearing in the above captioned matter, pertaining to the revising of the Hobbs and Monument Fields proration orders, recessed to September 18, it is definitely understood that the Commission is to entertain a court motion before it on the 18th for the continuance of this case to sometime in the future. Your suggestion that the resetting of this case be for sometime after October 10 will be brought to the Commission's attention.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
cc - Honorable Frank Worden
cc - Honorable A. Andreas
cc - Honorable Roy Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

CLASS OF SERVICE DESIRED			
DOMESTIC		CABLE	
TELEGRAM	X	FULL RATE	
DAY LETTER		DEFERRED	
NIGHT MESSAGE		NIGHT LETTER	
NIGHT LETTER		SHIP RADIOGRAM	

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

WESTERN UNION

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

1217-A

CHECK
ACCT'G INFMN.
TIME FILED

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

SANTA FE, NEW MEXICO
SEPTEMBER 19, 1939

MR. R. G. LOWE
GULF OIL CORPORATION
TULSA, OKLAHOMA

HEARING CASE FOURTEEN SET OCTOBER TWENTY-THIRD.

CARL B. LIVINGSTON, ATTORNEY
OIL CONSERVATION COMMISSION

(Send Collect)

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

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.

(06)

WESTERN UNION

1201

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

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

Received at

VE155 11 NM=GO TULSA OKLA 19

193 SEP 19 PM 4 09

CARL B LIVINGSTON=

ATTORNEY OIL CONSERVATION COMMISSION

PLEASE WIRE COLLECT DATE CASE NUMBER FOURTEEN IS SET FOR HEARING.=

RUSSELL G LOWE.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

A. M. McCORKLE, CHAIRMAN
OPERATORS COMMITTEE

GLENN STALEY, CHAIRMAN
ENGINEERING COMMITTEE

LEA COUNTY OPERATORS COMMITTEE

HOBBS, NEW MEXICO
August 8, 1939

TO ALL OPERATORS:

GENTLEMEN:

The following letter was addressed to the Oil Conservation Commission on August 4:

"The special committee appointed to study Hobbs and Monument proration problems is making considerable headway, and it is hoped will arrive at unanimous recommendations.

Several factors, however, make it desirable in the minds of the committee to ask that the hearing originally scheduled for September 18 be postponed. Some of these conditions are as follows:

(a) A general state-wide hearing has been called in Texas on the same date.

(b) The committee has been largely occupied with Hobbs and feels now that sufficient time should be given to the study of Monument to avoid any future regret that more time was not devoted to that subject.

(c) Many members of the committee are planning vacations and will be deprived of them if the hearing can not be postponed.

There is a mid-year meeting of the A.I.M.E. in Galveston on October 4 to 6, inclusive, and many of the engineers will wish to attend. I would suggest, therefore, that the hearing be postponed until approximately October 10 or 11 at the convenience of the Commission."

The Commission now advises that legally, the hearing was recessed to September 18 and would have to be called at that time. If, however, all operators agree that the hearing should be postponed, a motion to that effect will probably be accepted and the hearing continued to a later date.

Will you please indicate whether or not you approve of such a procedure.

Glenn Staley, Representative
Lea County Operators

GS:M

This is agreeable with me.
Fred Turner Jr.

THE TEXAS COMPANY

TEXACO PETROLEUM PRODUCTS

PRODUCING DEPARTMENT
WEST TEXAS DIVISION
H. S. COLE, JR. DIVISION MANAGER

P. O. BOX 1720
FORT WORTH, TEXAS

September 6, 1939

CONSERVATION & PRORATION
Lea County, New Mexico

Mr. Glenn Staley,
Chairman Engineering Committee,
Hobbs, New Mexico.

Dear Sir:

This is to advise that The Texas Company is agreeable to postponement of the hearing in connection with the Hobbs and Monument proration problems scheduled for September 18 until the time suggested in your circular letter of August 8, 1939. We presume that we will be advised of the definite action taken on this matter in sufficient time so that we may have a representative present on the date it is finally decided to call the subject meeting.

Yours very truly,

THE TEXAS COMPANY
Producing Department
H. S. Cole, Jr.
Division Manager

By A. E. Willig
A. E. Willig
Division Engineer

AEW-RGW

REPOLLO OIL COMPANY

MIDLAND, TEXAS

August 9th, 1939.

Mr. C.G. Staley, Representative,
Lea County Operators Committee,
Hobbs, New Mexico.

Dear Sir:

Relative your letter dated August 8th to all Lea County Operators, stating that the meeting as called by the Oil Conservation Commission for September 18th may be postponed, should the Operators agree to such postponement:

On account of conflicting dates, postponement of hearing until October 10th-11th as suggested in your letter would be a more suitable date.

Very truly yours,

Jack H. Rankin

JTR/JHR/cb

Jack H Rankin -

STANDARD OIL COMPANY OF TEXAS

P. O. Box 1249
Houston, Texas
August 22, 1939

Mr. Glenn Staley, Representative
Lea County Operators
Hobbs, New Mexico

Dear Sir:

For the reason given in your letter to the Oil Conservation Commission, it will be satisfactory to us to request that the hearing, originally scheduled for September 18, be postponed. We approve of your suggestion that the hearing be held October 10 or 11 at the convenience of the Commission.

Yours very truly,

STANDARD OIL COMPANY OF TEXAS

By Harvey Hardison

JB/rs

GENERAL OFFICES: PHILADELPHIA, PA.

SUN OIL COMPANY

SOUTHWEST DIVISION

FIRST NAT. BANK BUILDING

DALLAS, TEXAS

M. B. SWEENEY, GENERAL AGENT

J. H. PRESSLEY
MGR. OF LAND DEPT.

J. EDGAR PEW, VICE PRES.
GENERAL DIRECTOR
PHILADELPHIA, PA.

JNO. G. PEW
ASSISTANT TO VICE PRES.
DALLAS, TEXAS

Aug. 21, 1939

Mr. Glen C. Staley
Lea County Operators Committee
Hobbs, New Mexico

Dear Sir:

We certainly would agree to the Hobbs-Monument hearing being set up for the date of approximately October 10 or 11, if the other operators and Commission agree to it. This is in reply to your letter of August 8, which stated that it looked as if the program outlined for study could not be completed and that there was a conflict of other hearings with the date originally set.

Yours truly,

F. E. Heath

FEH:jc

cc - Mr. Jno. G. Pew

Form 506

STANOLIND OIL AND GAS COMPANY

712 MAIN ST. P. O. BOX 3092

HOUSTON, TEXAS

A. M. McCORKLE
VICE PRESIDENT

August 11, 1939

Mr. Glenn Staley,

Hobbs, New Mexico.

Dear Sir:

Referring to your letter of August 8 stating that a letter had been addressed to the Oil Conservation Commission on August 4 requesting that the hearing on the Hobbs and Monument Fields be postponed until October 10 or 11 at the convenience of the Commission due to the fact that (a) a general Statewide hearing had been called in Texas on the same date; (b) Committee has been occupied largely with Hobbs and will not have sufficient time to study the Monument situation; and (c) Many members are planning vacations.

This is to advise that insofar as Stanolind Oil and Gas Company is concerned, we are ready to go ahead with the Hobbs hearing and while we would prefer that the hearing be held on September 18 as originally scheduled, we will not insist on this if it is the view of the Special Committee that it should be postponed. We are, however, extremely anxious to get matter over with and would have preferred, in the first place, that hearing be set for earlier than September 18.

I would appreciate if you would please let me know as soon as possible what the Commission decides to do, and also advise who requested postponment, provided you have this information.

Yours very truly,

AMM:JU
cc - JHM
MCH
GSB
JOS

August 14, 1939

Mr. A.M. McCorkle

Stanolind Oil & Gas Co.

Box 1410,

Ft. Worth, Texas

Dear Mr. McCorkle:

Referring to your letter of August 11 regarding postponement of hearing before the State Oil Conservation Commission set for September 18, beg to advise that this postponement was asked for by Mr. Edgar Kraus, Chairman of the Special Engineers Committee.

I shall let you know just as soon as possible the decision of the Commission in this matter. There may be some delay on the part of the Commission as Mr. Frank Worden is critically ill and Mr. Andreas is on his way to attend the Interstate Oil Compact meeting being held in Oklahoma City tomorrow, August 15.

Yours very truly,

GS:M

Aug 16, 1933

Atlantic

approves

post payment.

E. E. Gas Kolen

SM-138

SHELL OIL COMPANY

INCORPORATED

FORMERLY

SHELL PETROLEUM CORPORATION

PETROLEUM BUILDING

MIDLAND, TEXAS

August 9, 1939

~~HEAD OFFICE~~
~~SHELL BUILDING~~
~~ST. LOUIS, MO.~~

CABLE ADDRESS SHELPETCO ST. LOUIS

Lea County Operators Committee
Hobbs, New Mexico

Attn: Mr. Glenn Staley

Gentlemen:

In response to your letter of August 8th, please be advised that the Shell approves postponing the hearing called by the New Mexico Oil Conservation Commission for September 18th until October 10th.

Very truly yours,

SHELL OIL COMPANY, Incorporated

By: H J Kemler
General Manager - West Texas

HJK:br

A. M. McCORKLE, CHAIRMAN
OPERATORS COMMITTEE

GLENN STALEY, CHAIRMAN
ENGINEERING COMMITTEE

LEA COUNTY OPERATORS COMMITTEE

HOBBS, NEW MEXICO
August 8, 1939

TO ALL OPERATORS:

GENTLEMEN:

The following letter was addressed to the Oil Conservation Commission on August 4:

"The special committee appointed to study Hobbs and Monument proration problems is making considerable headway, and it is hoped will arrive at unanimous recommendations.

Several factors, however, make it desirable in the minds of the committee to ask that the hearing originally scheduled for September 18 be postponed. Some of these conditions are as follows:

(a) A general state-wide hearing has been called in Texas on the same date.

(b) The committee has been largely occupied with Hobbs and feels now that sufficient time should be given to the study of Monument to avoid any future regret that more time was not devoted to that subject.

(c) Many members of the committee are planning vacations and will be deprived of them if the hearing can not be postponed.

There is a mid-year meeting of the A.I.M.E. in Galveston on October 4 to 6, inclusive, and many of the engineers will wish to attend. I would suggest, therefore, that the hearing be postponed until approximately October 10 or 11 at the convenience of the Commission."

The Commission now advises that legally, the hearing was recessed to September 18 and would have to be called at that time. If, however, all operators agree that the hearing should be postponed, a motion to that effect will probably be accepted and the hearing continued to a later date.

Will you please indicate whether or not you approve of such a procedure. O.K. Glenn for Oct 10 or 11 - If you make it Oct 16. I will be for holding a meeting in Alpine, Arizona with a Bear and a couple of Wild Turkeys Regards. Harry Nalley

Glenn Staley

GS:M

Glenn Staley, Representative
Lea County Operators

MAGNOLIA PETROLEUM COMPANY

A SOCONY-VACUUM COMPANY

PRODUCING DIVISION

Dallas, Texas
August 10, 1939.

Mr. Glenn Staley,
Hobbs, New Mexico.

Dear Mr. Staley:

In reply to your letter of August 8th, addressed to all operators, please be advised that it will be satisfactory with us for the hearing to be postponed to a later date.

Yours very truly,

D. V. Carter.

DVC:MA

GENERAL OFFICES
120 BROADWAY, NEW YORK
BEACON BLDG., TULSA

AMERADA PETROLEUM CORPORATION

W. T. WAGGONER BUILDING
P. O. BOX 1348

Fort Worth, Texas

August 10th, 1939.

Mr. Glenn Staley, Chairman,
Lea County Operators Engineering Committee,
Hobbs, New Mexico

Dear Sir:

For the reasons set out in your letter of August 8th relative to September 18th hearing, we believe it advisable to postpone the meeting to the date suggested by the Chairman of the special committee.

Very truly yours,

AMERADA PETROLEUM CORPORATION

BY R. S. Christie.

RSC:or

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

GYPSY DIVISION

TULSA · OKLAHOMA

August 10, 1939

Mr. Glenn Staley
Lea County Operators
Hobbs, New Mexico

Dear Sir:

I have your letter of August 8 regarding postponement of New Mexico Conservation Commission hearing scheduled for September 18.

It is agreeable with the Gulf Oil Corporation for the hearing to be postponed until a later date. I suggest that the hearing be postponed until around the 1st of November so that sufficient time is given to complete the investigation and a second postponement is avoided.

Very truly yours,

General Superintendent

SGS:AL

THE SUPERIOR OIL COMPANY

(A CALIFORNIA CORPORATION)
GULF BUILDING
HOUSTON, TEXAS

August 10, 1939

Mr. Glenn Staley,

Lea County Operators Committee,

Hobbs, New Mexico.

Dear Mr. Staley:-

This is to advise that we entirely approve of postponing the meeting of the special committe originally called for September 18, 1939 until a more opportune time.

Yours very truly,

THE SUPERIOR OIL COMPANY -

W. A. Pruett - Vice President

wap'ee

SKELLY OIL COMPANY

TULSA, OKLAHOMA

PRODUCTION DEPARTMENT
H. M. STALCUP, VICE PRESIDENT
J. S. FREEMAN, ASSISTANT

August 10, 1939

Mr. Glenn Staley, Engineering Committee Chairman
Lea County Operators Committee
Hobbs, New Mexico

Dear Sir:

In response to your notice of August 8, regarding the hearing which is scheduled for September 18, as to whether or not same should be postponed, please be advised that we are agreeable for the postponement of this hearing to October 11, 1939, or later in the month, and such postponement has our hearty approval.

Yours very truly,

George W. Selinger

GWS/mb
cc - Mr. Dunlavey

CITIES SERVICE OIL COMPANY

HOBBS, NEW MEXICO

August 10, 1939

Mr. Glen Staley
Lea County Operators Committee
Hobbs, New Mexico

Dear Sir:

Please be advised that the Cities Service Oil Company approves the request that the New Mexico Oil Conservation Committee postpone to a later date the recessed hearing scheduled for September 18, 1939.

Yours very truly,

D. D. Bodie

D. D. Bodie, Division Sup't.

DDB/LJ

TEXAS PACIFIC COAL AND OIL COMPANY

EXECUTIVE OFFICES
FORT WORTH,
TEXAS

August 10, 1939

Mr. Glenn Staley, Representative
Lea County Operators Committee
Hobbs, New Mexico

Dear Sir:

Replying to your letter of August 8th, regarding postponement of September 18th, Hobbs-Monument hearing date, wish to advise, for the reasons given in your letter, this Company would prefer a later date for said meeting.

Yours very truly,

TEXAS PACIFIC COAL AND OIL COMPANY
By G E Schafer

G.E.Schafer:MD

OIL WELL DRILLING COMPANY
NO STOCKHOLDERS LIABILITY
606 NORTH FIELD STREET
DALLAS, TEXAS

August 11, 1939

Lea County Operators Committee
Hobbs, New Mexico

Attention: Mr. Glenn Staley

Gentlemen:

Answering your letter of August 8th, with reference to the proration meeting for the study of the Hobbs and Monument proration problems.

It will be agreeable with us to have the meeting on October 10th or 11th. Please advise us the date of this meeting as we wish to have a representative there.

Yours very truly,

C. C. Conrad

C. C. Conrad - President

CCC.rjs

CONTINENTAL OIL COMPANY

Fort Worth, Texas
August 11, 1939

Lea County Operators Committee
Hobbs, New Mexico

Attention: Mr. Glenn Staley

Dear Sir:

Referring to your letter of August 8, 1939, addressed to the operators of Lea County, this is to inform you that Continental Oil Company is agreeable to the postponement of the hearing originally scheduled for September 18th. We approve postponing this meeting until approximately October 10th or 11th, at the convenience of the Oil Conservation Commission.

Yours very truly,

H. B. SIMCOX
General Superintendent
Texas-New Mexico Division
Production & Drilling Department

MLF-GEW

cc:HLJ
cc RVAM.

BARNSDALL OIL COMPANY

PETROLEUM BUILDING

TULSA, OKLA.

August 14th 1939

Mr. C. G. Staley
Lea County Operators Committee
Hobbs, New Mexico

Dear Sir:

This refers to your letter of August 8th regarding postponement of hearing on the Hobbs and Monument Pools which was recessed to September 18th.

For the reasons outlined in your letter, we are agreeable to the proposed postponement until approximately October 10th or 11th, or later.

Yours very truly,

J. S. Noland

J. S. Noland

RDC:ELM

cc Gov. John E. Miles
Chairman - Santa Fe

Mr.A. Andreas
State Geologist
Santa Fe

Mr.Frank Worden
State Land Commissioner
Santa Fe

CASE NO. 14.

ORDER OF PROCEDURE TO CONSIDER THE CASE CONCERNING THE REVISION OF THE PRORATION PLANS FOR THE HOBBS AND MONUMENT FIELDS.

1. GOVERNOR MILES OPENS MEETING AND MAKES SUCH REMARKS AS HE DEEMS APPROPRIATE.

2. COMMISSIONER WORDEN ORDERS READING OF NOTICE OF HEARING.

3. WHEN READING OF NOTICE IS FINISHED, COMMISSIONER WORDEN ANNOUNCES THAT THE COMMISSION IS READY TO PROCEED.

4. THE COMMISSION ANNOUNCES: THAT THERE IS AN ORAL COURT MOTION FOR THE CONTINUANCE OF THIS CASE TO A FUTURE DATE TO BE PRESENTED BEFORE THE COMMISSION AND THAT THE COMMISSION IS READY TO HEAR SUCH MOTION.

5. IF SUCH MOTION IS PRESENTED, THEN THE COMMISSION CONSIDERS SUCH MOTION FOR CONTINUANCE OF THE HEARING TO SOME DEFINITE DATE IN THE FUTURE.

6. THE COMMISSION EXECUTES A FORMAL ORDER FOR CONTINUANCE OF THE HEARING IN SAID CASE.

September 18, 1939

Hon. J. O. Seth
Attorney at Law
Santa Fe, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Judge Seth:

Enclosed please find two copies of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

September 18, 1939

Honorable J. D. Atwood
Attorney at Law
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Colonel Atwood:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:lk
Enc.

September 18th 1939

Honorable Hayes McCoy
Cities Service Oil Co.
Bartlesville, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. McCoy:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable Roy Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Yarbrough:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable George H. Card
Stanolind Oil & Gas Co.
Fort Worth, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear George:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

September 18, 1939

Honorable Glenn Bish
Ohio Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Glenn:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable D. D. Bodie
Cities Service Oil Company
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Dan:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable James M. Murray
Lieutenant Governor
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Jim:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable J. S. Noland
Barnsdall Oil Co.
Petroleum Building
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Jim:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable James Fitzgerald, Jr.
Skelly Oil Company
Midland, Texas

My dear Colonel Jim:

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable H. M. Dow
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Hi:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable Harry Leonard
Roswell, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. Leonard:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable A. M. McCorkle
Stanolind Oil Company
Fort Worth, Texas

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

Dear Mr. McCorkle:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 18, 1939

Honorable Glenn Staley
Proration Umpire
Hobbs, New Mexico

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County, New Mexico.

Dear Mr. Staley:

Enclosed please find copy of the Commission's order continuing the hearing upon the above captioned matter.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

September 15, 1939

AIRMAIL

Mr. R. G. Lowe
Gulf Oil Corporation
P. O. Box 661
Tulsa, Oklahoma

Re: Case No. 14, for the considering of the revising of existing proration plans for Hobbs and Monument Fields, Lea County.

My dear Mr. Lowe:

Referring to your long distance call from Tulsa a few minutes ago with regard to the hearing in the above captioned matter, pertaining to the revising of the Hobbs and Monument Fields proration orders, recessed to September 18, it is definitely understood that the Commission is to entertain a court motion before it on the 18th for the continuance of this case to sometime in the future. Your suggestion that the resetting of this case be for sometime after October 10 will be brought to the Commission's attention.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
cc - Honorable Frank Worden
cc - Honorable A. Andreas
cc - Honorable Roy Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

A. M. McCORKLE, CHAIRMAN
OPERATORS COMMITTEE

GLENN STALEY, CHAIRMAN
ENGINEERING COMMITTEE

NEW MEXICO
OIL CONSERVATION COMMISSION
AUG 10 1939
RECEIVED

LEA COUNTY OPERATORS COMMITTEE

HOBBS, NEW MEXICO
August 8, 1939

TO ALL OPERATORS:

GENTLEMEN:

The following letter was addressed to the Oil Conservation Commission on August 4:

> "The special committee appointed to study Hobbs and Monument proration problems is making considerable headway, and it is hoped will arrive at unanimous recommendations.
>
> Several factors, however, make it desirable in the minds of the committee to ask that the hearing originally scheduled for September 18 be postponed. Some of these conditions are as follows:
>
> (a) A general state-wide hearing has been called in Texas on the same date.
> (b) The committee has been largely occupied with Hobbs and feels now that sufficient time should be given to the study of Monument to avoid any future regret that more time was not devoted to that subject.
> (c) Many members of the committee are planning vacations and will be deprived of them if the hearing can not be postponed.
>
> There is a mid-year meeting of the A.I.M.E. in Galveston on October 4 to 6, inclusive, and many of the engineers will wish to attend. I would suggest, therefore, that the hearing be postponed until approximately October 10 or 11 at the convenience of the Commission."

The Commission now advises that legally, the hearing was recessed to September 18 and would have to be called at that time. If, however, all operators agree that the hearing should be postponed, a motion to that effect will probably be accepted and the hearing continued to a later date.

Will you please indicate whether or not you approve of such a procedure.

Glenn Staley

Glenn Staley, Representative
Lea County Operators

GS:M

ORDER OF PROCEDURE

1. HEARING CALLED TO ORDER BY GOVERNOR.

2. CALL FOR THE READING OF THE NOTICE OF HEARING.

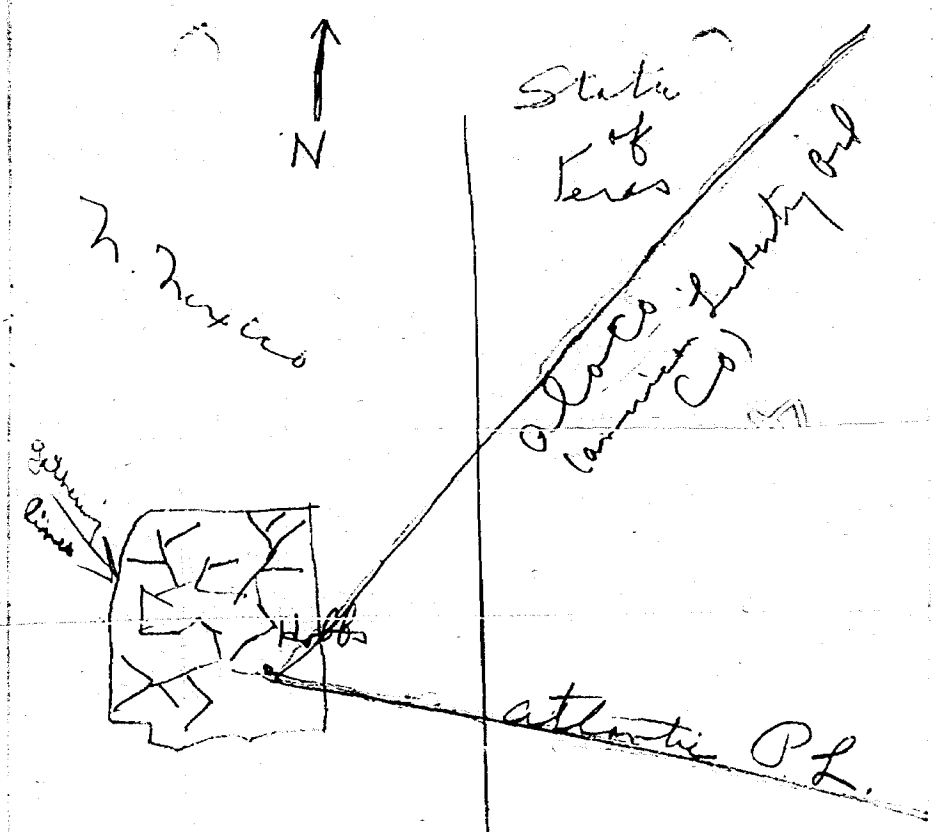
3. ANNOUNCEMENT SHOULD BE MADE AS TO WHICH PRORATION ORDER - HOBBS OR MONUMENT - SHOULD BE CONSIDERED FIRST.

4. THE GROUP DESIRING CHANGE OF THE EXISTING PRORATION ORDERS FOR MONUMENT AND HOBBS FIELDS HAS THE BURDEN AND SHOULD PUT ON THEIR CASE BY INTRODUCTION OF TESTIMONY.

5. EACH WITNESS MUST BE SWORN.

6. CROSS-EXAMINATION MAY BE MADE BY MEMBERS OF THE COMMISSION AND SHOULD BE INVITED BY ANYONE ELSE SO DESIRING.

7. WHEN THOSE DESIRING CHANGE HAVE MADE THEIR CASE, THEY REST; AND THOSE NOT DESIRING CHANGE MAY PUT ON TESTIMONY TO SUSTAIN THEIR SIDE IF THEY SO DESIRE.


N
N. Mexico
State of Texas
Gulf of Mexico (coastline)
Gulf coastline
Atlantic P.L.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

COPY

June 24, 1939

Honorable H. M. Dow
Roswell, New Mexico

My dear Hi:

Enclosed please find the Commission's order for dismissal of case No. 13, and the Commission's order for recessing the hearing in case No. 14 until September 18.

Also enclosed is call for hearing to be held July 21.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

COPY

June 24, 1939

Colonel J. D. Atwood
Roswell, New Mexico

Dear Colonel Atwood:

Enclosed please find the Commission's order for dismissal of Case No. 13, and the Commission's order for recessing the hearing in Case No. 14 until September 18.

Also enclosed is call for hearing to be held July 21.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

COPY

June 24, 1939

Honorable J. O. Seth
Santa Fe, New Mexico

Dear Mr. Seth:

Enclosed please find the Commission's order for dismissal of case No. 13, and the Commission's order for recessing the hearing in case No. 14 until September 18.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

COPY

June 24, 1939

Mr. A. M. McCorkle
Stanolind Oil Company
Fort Worth, Texas

Dear Mr. McCorkle:

Enclosed please find the Commission's order for dismissal of case No. 13, and the Commission's order for recessing the hearing in case No. 14 until September 18.

Also enclosed is call for hearing to be held July 21.

Also enclosed is a list of those appearing at the hearing in Case No. 14 and a list of those appearing in Case No. 13.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

COPY

May 18, 1939

Honorable J. S. Noland
Barnsdall Oil Company
Petroleum Building
Tulsa, Oklahoma

My dear Jim:

As requested in your letter of May 15, enclosed is the notice for hearing to be held in Santa Fe on June 23, which notice is self-explanatory.

There is also to be another hearing on June 26, which relates to the consideration by the Commission of a smaller spacing and smaller units of production than are now in use, to effect San Juan County only.

With best good wishes,

Very truly yours,

Carl B. Livingston
Attorney

CBL:ik
Enc.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

COPY

May 23, 1939

Mr. George W. Selinger
Skelly Oil Company
Tulsa, Oklahoma

Re: Public hearing to be held at the Capitol, Santa Fe, New Mexico, on the 23d day of June, 1939, for the consideration of the revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

Dear Mr. Selinger:

In response to your letter of May 22 regarding the moving up of the date of the above captioned hearing, please be advised that service by publication has already been completed and it would tend to confusion. If, however, the situation were a matter of moving the hearing in question to a later date, then there would be sufficient time to re-publish the notices and time for all concerned to receive information as to such change.

As requested by you, enclosed please find Orders Nos. 33 and 48 of the Commission.

Very truly yours,

A. Andreas
State Geologist and
Member of the Commission.

AA:L:k
Encls.

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

COPY

May 12, 1939

Honorable J. O. Seth
Attorney at Law
Santa Fe, New Mexico

My dear Judge:

Enclosed is a Notice of Hearing affecting the Hobbs and Monument Fields. It is understood that the main matter to be considered in the revision of the respective proration orders for those two fields is the matter of allocating by acreage in lieu of the present plan wherein acreage is only partly considered in conjunction with bottom-hole pressure.

Also enclosed is a Notice of Hearing which affects spacing and unit of production for San Juan County only. That area appears to have a very shallow lenticular horizon which justifies the consideration of a closer spacing and smaller unit of production than exist generally for the state. The operators of San Juan County have petitioned for this hearing.

Very truly yours,

OIL CONSERVATION COMMISSION

By Carl B. Livingston
Attorney

CBL:ik
Encls.

NEW MEXICO STATE LAND OFFICE

COPY

May 12, 1939

Honorable Roy Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

Dear Mr. Yarbrough:

Enclosed is a notice of hearing to be held at Santa Fe which affects the Hobbs and Monument Fields. Please call at the Hobbs Daily News-Sun to see that that paper publishes the notice which I am today sending it and to urge them to be sure to return their publisher's affidavit. I have had considerable difficulty in getting that paper to send the publisher's affidavit promptly. It is all important for jurisdiction of the Commission sitting in its quasi judicial capacity, so please keep an eye on this paper to see that publication is made and the publisher's affidavit made and forwarded to Santa Fe.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

May 12, 1939

Hobbs Daily News-Sun
Hobbs, New Mexico

Gentlemen:

There is enclosed herewith a Notice for Publication, which you are kindly requested to publish once immediately. You are also requested to furnish this Commission with a copy containing this publication.

Immediately upon completion of the publication be sure to transmit to the Oil Conservation Commission your affidavit of publication.

Upon sending to the Commission your affidavit of publication, please send your statement in duplicate and enclosed purchase voucher, also in duplicate.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

May 12, 1939

Honorable Hiram M. Dow
Roswell, New Mexico

My dear Hi:

Enclosed is a Notice of Hearing which affects the Hobbs and Monument Fields.

Also enclosed is a Notice of Hearing which affects spacing and unit of production matters for San Juan County only. That area has a shallow lenticular producing horizon which appears to justify a smaller spacing and smaller unit of production than those in effect for the state generally.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Encls.

May 12, 1939

New Mexico Examiner
Santa Fe, New Mexico

Gentlemen:

There is enclosed herewith a Notice for Publication, which you are kindly requested to publish once immediately. You are also requested to furnish this Commission with a copy containing this publication.

Immediately upon completion of the publication be sure to transmit to the Oil Conservation Commission your affidavit of publication.

Upon sending to the Commission your affidavit of publication please send your statement in duplicate and enclosed purchae voucher, also in duplicate.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

May 12, 1939

Honorable Roy Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

Dear Mr. Yarbrough:

Enclosed is a notice of hearing to be held at Santa Fe which affects the Hobbs and Monument Fields. Please call at the Hobbs Daily News-Sun to see that that paper publishes the notice which I am today sending it and to urge them to be sure to return their publisher's affidavit. I have had considerable difficulty in getting that paper to send the publisher's affidavit promptly. It is all important for jurisdiction of the Commission sitting in its quasi judicial capacity, so please keep an eye on this paper to see that publication is made and the publisher's affidavit made and forwarded to Santa Fe.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

BEFORE THE OIL CONSERVATION
COMMISSION OF THE STATE
OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:

CASE NO. 14

ORDER NO. 398

THE REVISING, MODIFYING AND AMENDING
THE EXISTING PRORATION PLAN FOR
HOBBS FIELD, LEA COUNTY, DESIGNATED
AS ORDER NO. 48, OF THE COMMISSION.

ORDER OF THE COMMISSION

BY THE COMMISSION:

WHEREAS, ORDER NO. 329 promulgated by the Commission December 31, 1940, for the revision of Order No. 48, the Proration Plan for the Hobbs Field, Lea County, reserved in the Commission jurisdiction for further determination as to all other matters in said Order No. 48 not affected by the changes provided for in Order No. 329;

WHEREAS, the Oil Conservation Commission at its meeting of June 25, 1941, announced its intent to take such action as may be necessary for clarification of Order No. 329.

IT IS NOW THEREFORE ORDERED by the Commission on this 12 TH day of September, 1941, that the order herein be and is hereby promulgated and is designated

THE PRORATION PLAN FOR HOBBS FIELD:

Sec. 1 The total allowable production of oil in the Hobbs Field shall be allocated within the field by productive units. Units shall not be allocated more oil than they can produce without waste.

Sec. 2 Productive units shall be classified as marginal and non-marginal, a marginal unit being one that cannot produce the acreage unit allowable, and a non-marginal unit one with an average daily potential production equal to or larger than the acreage unit allowable. Marginal units shall be allocated approximately the amount of oil they can produce.

Sec. 3 The total allocation to marginal units shall be deducted from the total daily field allowable and the resulting number of barrels shall be designated as the total daily non-marginal field allowable.

Sec. 4 As far as possible, the field shall be divided into forty (40) acre tracts in the form of a square, constituting regular sub-divisions of sections according to the Government surveys. Each

such tract shall be considered a unit for the purposes of proration hereunder. If it should develop that there are tracts of land owned by individual operators or lease holders constituting less than a unit as above defined or in such form as not to constitute a unit as above defined, then the Commission in its discretion may create and outline fractional units or units of a form other than a square. However, 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.

Sec. 5 The following 40-acre units not in the form of a square shall be considered as regular units for proration purposes:

Walker Terry G, N-1/2 SW-1/4 SE-1/4 and N-1/2 SE-1/4 SE-1/4 Sec. 10, T. 19S., R. 38E.

Walker Terry G-a, S-1/2 SW-1/4 SE-1/4 and S-1/2 SE-1/4 SE-1/4, Sec. 10, T. 19S., R. 38E.

Repollo Crump B, N-1/2 NW-1/4 NE-1/4 and N-1/2 NE-1/4 NE-1/4, Sec. 15, T. 19S., R. 38E.

Repollo Crump B-a, S-1/2 NW-1/4 NE-1/4 and S-1/2 NE-1/4 NE-1/4, Sec. 15, T. 19S, R. 38E.

Stanolind State C., N-1/2 NE-1/4 NW-1/4 and N-1/2 NW-1/4 NW-1/4, Sec. 15, T. 19S, R. 38E.

Stanolind State C-a, S-1/2 NW-1/4 NW-1/4 and S-1/2 NE-1/4 NW-1/4, Sec. 15, T. 19S., R. 38E.

Sec. 6 Eighty (80) per cent of the non-marginal field allowable shall be allocated among the various units without reference to their producing ability or pressures; all forty (40) acre units participating equally and each fractional unit receiving allocation as compared to the allocation of a forty (40) acre unit, in the ratio that its area in acres bears to forty (40) acres. This allocation to each unit shall be designated as the acreage unit allowable.

Sec. 7 The remaining twenty (20) per cent of the daily non-marginal field allowable shall be prorated to the different non-marginal units on the basis of the static bottom hole pressure of the wells. For computation purposes, the bottom hole pressures for all the wells shall be added together, and this sum shall be divided into the total number of barrels to be allocated to the field according to bottom hole pressures. The quotient obtained shall be designated

the bottom hole pressure factor. To obtain the bottom hole pressure allowance for each well, or unit, this factor shall be multiplied by the bottom hole pressure of the unit. The sum of the unit acreage allowance and the bottom hole pressure allowance shall be the total allocation for each non-marginal unit.

Sec. 8 The Commission each six months shall determine the bottom hole pressure of each well in the field, provided that for each well in which the bottom hole pressure cannot be determined for mechanical reasons, such well shall have assigned to it the bottom hole pressure of the nearest well in which a bottom hole pressure is taken, or if equidistant from two or more wells in which bottom hole pressures are taken such well shall have assigned to it the average of the bottom hole pressures of said equidistant wells.

Sec. 9 The Commission shall notify the operator of the day and hour that a well is to be shut in for bottom hole pressure test. The bottom hole pressure shall be measured not less than 24 hours nor more than 36 hours following said specified time. Notice to the operator shall be given by the Commission not less than 24 hours before the time for the well to be shut in. The well shall produce its regular allocation during the 24-hour period ending at the time the well is shut in.

Sec. 10 Pressures shall be taken as nearly as possible at a common datum level of 400 feet below sea level and all pressures shall be adjusted to that datum, and correction shall be made in gas or oil depending on the medium in which the bottom hole pressure gauge is stopped.

Sec. 11 Wells completed during a proration period occuring between bottom hole pressure surveys will be allocated the average non-marginal unit allowable for the field until static bottom hole pressures can be taken. Then these pressures shall be used in determining their allowable for the following periods.

Sec. 12 Allocations to the Hobbs Field as a whole shall be determined according to the plan of Order No. 1 of the Commission, "General State Proration Order", adopted June 29, 1935, and Order No. 45, "Revision of Order No. 1 of the Commission 'General State Proration Order'", adopted November 12, 1936. Allocations for the field and

the wells therein shall be included in "General State Proration Orders" of the Commission. This order supersedes any provisions of Order No. 1 or other orders with which this order is in conflict, is in lieu of Order No. 329, and fully revokes Order No. 48. The Order herein shall become effective on the first day of the proration month next following the date of adoption.

OIL CONSERVATION COMMISSION

JOHN E. MILES, CHAIRMAN

H. R. RODGERS, MEMBER

JOHN M. KELLY, SECRETARY

EXCERPTS FROM
MINUTES OF THE MEETING OF THE
OIL CONSERVATION COMMISSION HELD
ON TUESDAY, DECEMBER 31, 1940

* * * * *

In the matter of the proposed change in the proration plan for Hobbs Field, Lea County, provided by Order No. 48, upon which hearings have heretofore been had by the Commission and the determination thereof taken under advisement by the Commission,

NOW, on this day, in regular meeting of the Commission, after full consideration of the evidence submitted on such hearings heretofore held before the Commission, consideration of the evidence taken thereat, and examination of the maps produced before the Commission, the Commission determines that said Order No. 48 be modified and amended as follows:

WHEREAS, the proration plan for the Hobbs Field has heretofore been based upon a basis of sixty (60) per cent acreage and forty (40) per cent of the potential production of the wells, it is determined by the Commission that said proration be changed and modified, and for such purpose the Commission does hereby resolve that Section 9 of the said Order No. 48 heretofore in force by this Commission and having been adopted November 12, 1936, be amended to read as follows:

"Section 9 (a). The total daily non-marginal field allowable shall be allocated among the various units on the following basis: Eighty (80) per cent of the non-marginal allowable shall be allocated to units without reference to their producing ability; all 40-acre units participating equally and each fractional unit receiving an allocation, as compared to the allocation of a 40-acre unit, in the ratio that its area in acres bears to 40 acres. This allocation to each unit shall be designated as the acreage unit allowable.

"Section 9 (b). That the balance of twenty (20) per cent allocated to such units as provided in Section 9 (a) shall be based upon twenty (20) per cent of the bottom hole pressure (B.H.P.) of each and every well participating in such proration."

This order shall be designated as Hobbs Order No. 329, and the above modification and change of proration shall become effective and be in force as of February 1, 1941; and as to all other matters in said Order No. 48 not affected by this change in proration, the same are continued in full force and effect until the further determination of the Commission.

The matter of modification of Case No. 2, Order No. 33, involving a change of proration plan for the Monument Field, Lea County, having heretofore been submitted to the Commission and after the submission of evidence, maps, and other data, and the determination of said proration having been taken under advisement by the Commission;

IT IS NOW ORDERED that any change or modification in said Order No. 33, Case No. 2, heretofore in effect as to proration in the Monument Field, Lea County, be not made, and the proration plan for Monument Field as now in effect is hereby ordered to continue until further order of the Commission. This order shall be designated as Monument Order No. 330. * * * *

OIL CONSERVATION COMMISSION
By (Sgd.) JOHN E. MILES, Governor
Chairman
By (Sgd.) FRANK WORDEN
Commissioner of Public Lands,
Secretary
By (Sgd.) A. ANDREAS, State Geologist

January 2, 1941

NOTE: Copies have been mailed and delivered to the following:

Hon. Russell G. Lowe, Gulf Oil Corp., Tulsa, Oklahoma;
Hon. W. M. Fleetwood, Jr., Barnsdall Oil Co., Tulsa, Oklahoma;
Hon. J. S. Noland, Barnsdall Oil Co., Tulsa, Oklahoma;
Hon. J. D. Atwood, Roswell, New Mexico;
Hon. Glenn Staley, Proration Umpire, Hobbs, New Mexico;
Hon. J. O. Seth, Santa Fe, New Mexico.
Jan. 4, '41 Hon. Edgar Kraus, Atlantic Refining Co., Carlsbad, New Mexico;
" " " Hon. Ernest A. Hanson, Supervisor, Oil & Gas Operations, Department of Interior, Roswell, N.M

January 2, 1941

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Hon. J. D. Atwood, Roswell, New Mexico;
Hon. Glenn Staley, Proration Umpire, Hobbs, New Mexico;
Hon. J. O. Seth, Santa Fe, New Mexico.

CASE NO. 14.

ORDER OF PROCEDURE TO CONSIDER THE CASE CONCERNING THE REVISION OF THE PRORATION PLANS FOR THE HOBBS AND MONUMENT FIELDS.

1. GOVERNOR MILES OPENS MEETING AND MAKES SUCH REMARKS AS HE DEEMS APPROPRIATE.

2. COMMISSIONER WORDEN ORDERS READING OF NOTICE OF HEARING.

3. WHEN READING OF NOTICE IS FINISHED, COMMISSIONER WORDEN ANNOUNCES THAT THE COMMISSION IS READY TO PROCEED AND SUGGESTS THAT INASMUCH AS THERE ARE TWO MATTERS TO BE CONSIDERED, NAMELY, THE HOBBS PRORATION ORDER AND THE MONUMENT PRORATION ORDER, THAT ONE OF THESE MATTERS BE CONSIDERED AT A TIME. THOSE PROPOSING ANY REVISION WILL HAVE THE BURDEN. WITNESSES MAY NOW BE CALLED AND SWORN.

NOTICE FOR PUBLICATION

STATE OF NEW MEXICO

OIL CONSERVATION COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 6th day of December 1939, at two o'clock P. M., for the purpose of considering the following:

Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on October 31, 1939.

OIL CONSERVATION COMMISSION

By _____
Governor

By Thos. L. Wordell
Commissioner of Public Lands

By R. A. Anderson
State Geologist

STATE OF NEW MEXICO

HEARING BEFORE THE OIL CONSERVATION COMMISSION

Held at Santa Fe, New Mexico

June 23, 1939

PRESENT:

Hon. John E. Miles, Governor, Chairman of Commission
Hon. Frank Worden, Commissioner of Public Lands, Secretary
Mr. A. Andreas, State Geologist, Member of Commission
Mr. Carl B. Livingston, Attorney for Commission
Mr. C. C. Royall, Attorney

J. O. Seth	Stanolind	Santa Fe, N.M.
Glenn Staley	Lea County Operators	Hobbs, N.M.
L. F. Shiplet	The Texas Co.	Midland, Texas
R. S. Dewey	Humble Oil & Ref. Co.	Midland, Texas
G. H. Card	Stanolind Oil & Gas Co.	Ft.Worth, Texas
G. S. Bays	"	
R. W. Tesch	"	
R. E. Rader	"	Hobbs, N.M.
T. B. Sudderth	Me-Tex Sup. Co.	Hobbs, N.M.
Harvey E. Yates	Shoup & Yates	Artesia, N.M.
B. A. Barnes	Me-Tex	Hobbs, N.M.
D. D. Crites	Shell Oil Co.	Houston, Texas
M. Albertson	"	Houston, Texas
R. G. Schuehle	"	Hobbs, N.M.
M. T. Smith	"	Midland, Texas
Glenn Bish	Ohio Oil Co.	Hobbs, N.M.
R. A. Koenig	Ohio Oil Co.	Hobbs, N.M.
J. W. House	Humble Oil & Refg. Co.	Midland, Texas
J. S. Griffith	H. O. & R. Co.	Roswell, N.M.
D. R. Knowlton	Phillips Pet. Co.	Bartlesville, Okla.
O. W. Daniels	Phillips Pet. Co.	Amarillo, Texas
E. W. Childers	Tidewater Assn.	Midland, Texas
Harvey Hardison	Standard Oil of Texas	Houston, Texas
F. E. Heath	Sun Oil Co.	
W. E. Hubbard	Humble Oil Co.	Houston, Texas
A. E. Wellig	The Texas Co.	Ft.Worth, Texas
R. S. Blynn	Gulf Oil Corp.	Hobbs, N.M.
Ira Van Tuyl	Gulf Oil Corp.	Hobbs, N.M.
James Fitzgerald, Jr.	Skelly Oil Co.	Midland, Texas
J. N. Dunlavy	Skelly Oil Co.	Hobbs, N.M.
W. C. Byrd	Byrd-Frost, Inc.	Dallas, Texas
H. A. Harrison	Plains Production Co.	Dallas, Texas
J. S. Freeman	Skelly Oil Co.	Tulsa, Okla.
J. P. Cusack	Samedan Oil Corp.	Ardmore, Okla.
Paul A. McDermitt	Repollo Oil Co.	Ft.Worth, Texas
R. S. Christie	Amerada Pet. Corp.	Ft.Worth, Texas
Edgar Kraus	Atlantic	Carlsbad, N.M.
M. M. Fleetwood, Jr.	Barnsdall Oil Co.	Tulsa, Okla.
J. S. Noland	Barnsdall Oil Co.	Tulsa, Okla.
Ralph D. Curtis	Barnsdall Oil Co.	Tulsa, Okla.
A. P. Loskanys	Barnsdall Oil Co.	Midland, Texas
A. F. McCorkle	Stanolind Oil & Gas Co.	Ft.Worth, Texas
D. D. Bodie	Cities Service Oil Co.	Hobbs, N.M.
D. A. Howard	"	Bartlesville, Okla.

D. R. Guinn	Cities Service Oil Co.	Hobbs, N.M.
A. B. Gibson	"	Hobbs, N.M.
R. W. Ely	"	Hobbs, N.M.
R. G. Lowe	Gulf Oil Corp.	Tulsa, Okla.
S.G.Sanderson	"	Tulsa, Okla.
R. S. Knappen	"	Tulsa, Okla.
L. L. Gray	"	Tulsa, Okla.
H. B. Hurley	Continental Oil Co.	Ft.Worth,Texas
H. L. Johnston	"	Hobbs, N.M.
J. P. Malott	"	Hobbs, N.M.
Howard P.Holmes	Two States Oil Co.	Dallas,Texas
J. D. Atwood	Cities Service Oil Co.	Roswell, N.M.
Weston Payne	Anderson-Prichard Oil	Okla.City,Okla.
Frank Gray	"	Hobbs, N.M.
W.E.Cunningham	Oil Well Drilling Co.	Dallas,Texas
J. H. Moyar	Stanolind Oil & Gas Co.	Ft.Forth,Texas
R. Van A. Mills	Continental Oil Co.	
Ernest C. Arnold	U.S.G.S.	
H. S. Cole, Jr.	The Texas Co.	
George W.Selinger	Skelly Oil Co. Getty Oil Co.	
Colin C. Rae	" "	
Z. G. Summy	Repollo Oil Co.	
Jack H. Rankin	Repollo Oil Co.	
H. J. Kemler	Shell Oil Co.	
N. B. Larsh	Repollo Oil Co.	

The hearing was opened by Governor Miles, who welcomed the representatives present.

Whereupon, the meeting was turned over to Mr. Worden, who thereafter presided.

Notice of the hearing was read by Mr. Livingston, as follows:

"NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 23d day of June, 1939, at 9:00 A. M., for the purpose of considering the following:

Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on May 11, 1939.

OIL CONSERVATION COMMISSION

By (Sgd.) JOHN E. MILES
Governor

By (Sgd.) FRANK WORDEN
Commissioner of Public Lands

(SEAL)

By (Sgd.) A. ANDREAS
State Geologist"

Thereupon Mr. W. E. Hubbard suggested that the meeting be recessed until 3:00 o'clock, P. M., in order that the operators have an opportunity to work out a recommendation acceptable to the Commission and to the operators, which suggestion was adopted, and the hearing stood in recess until 3:00 P. M.

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Pursuant to recess, the hearing was resumed at 3:00 P. M., with Mr. Worden presiding.

A special committee appointed by the operators, reported their recommendations to the Commission as follows:

That a committee of competent engineers be appointed to make a study of the field, and that a recess of not less than sixty days be granted for this committee to do their work and make their report.

It is also understood that if this report is not unanimous, it is not binding, and is not to be made the basis of an order by the Commission, and is not to be used in evidence by any person, and not to be used under any circumstances.

Mr. Seth moved that the meeting of the Commission be recessed until 10:00 o'clock, A. M. of September 18th, 1939, at the Capitol in Santa Fe, New Mexico.

Which motion, having been duly seconded, was put to the meeting, and unanimously carried.

Whereupon, it being concurred in by the other persons present, whose appearances are noted herein, it was ordered by the Commission that said hearing shall be recessed until September 18th, 1939, at 10:00 o'clock in the morning of said day, at Santa Fe, New Mexico, the formal order being in the docket of this case.

There being no further business to come before the Commission, the hearing stood in recess until September 18th, 1939.

---oOo---

CERTIFICATE

I, Esther M. Barton, do hereby certify that I was the official stenographer for the hearing of the above entitled cause, and that the foregoing and annexed four pages of typewritten matter is a true, correct and complete transcript of the shorthand notes taken by me, and by me extended into typewriting, on the date of the hearing on June 23, 1939.

Esther M Barton

BEFORE THE OIL CONSERVATION
COMMISSION OF THE STATE
OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

THE REVISING, MODIFYING AND AMENDING THE EXISTING PRORATION PLAN FOR HOBBS FIELD, LEA COUNTY, DESIGNATED AS ORDER NO. 48 OF THE COMMISSION, AND THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, DESIGNATED AS ORDER NO. 33 OF THE COMMISSION.

CASE NO. 14.

ORDER NO. 183.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing June 23, 1939, at Santa Fe, New Mexico, with reference to the above designated matter.

Upon oral motion made before the Commission, moving that the hearing upon the matters in the cause herein be recessed until September 18 next, which motion was concurred in orally by those appearing at said hearing, whose appearances are registered in the case file of the proceedings herein, the Commission considered the merits of said motion and hereby orders that said hearing be and is hereby recessed to ten o'clock A. M., September 18, 1939, at Santa Fe, New Mexico.

OIL CONSERVATION COMMISSION

By John E. Miles
Governor

By Thos. Woodward
Commissioner of Public Lands

By R. Cochran
State Geologist

AFFIDAVIT OF PUBLICATION

State of New Mexico, }
County of Lea }

I, Robert L. Dunnigan
Advertising Manager

Of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once ~~a week~~ in the regular and entire issue of said paper, and not in a supplement thereof for a

period of ~~---------~~

One issue ~~words~~,

~~beginning with~~ the issue dated

May 15, 1939

~~and ending with the issue dated~~

~~---------~~, 193~~-~~

Robert L. Dunnigan
Adv. Mgr. ~~Publisher.~~

Sworn and subscribed to before me

this 16 day of

May, 1939

Ola Bright Montgomery
Notary Public.

My commission expires

February 5, 1942

(Seal)

~~This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.~~

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO, OIL CONSERVATION COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this state and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 23rd day of June, 1939, at 9:00 a.m., for the purpose of considering the following:

Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48, of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission of Santa Fe, New Mexico, on May 11, 1939.

OIL CONSERVATION COMMISSION,
By JOHN E. MILES,
Governor
By FRANK WORDEN,
Commissioner of Public Lands
By A. ANDREAS,
State Geologist.
(SEAL)

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 23rd day of June, 1939, at 9:00 A. M. for the purpose of considering the following:

Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on May 11, 1939.

OIL CONSERVATION COMMISSION,
By (Sgd.) JOHN E. MILES,
Governor.
By (Sgd.) FRANK WORDEN,
Commissioner of Public Lands.
By (Sgd.) A. ANDREAS,
State Geologist.

(SEAL)
Published May 16, 1939

Affidavit of Publication

May 16 19 39

TE OF NEW MEXICO
UNTY OF SANTA FE
Y OF SANTA FE } ss.

Larry Bynon, hereby swear

affirm that I am the Publisher

he New Mexico Examiner, a newspaper of general circulation
he City of Santa Fe, the County of Santa Fe, and the State of
w Mexico, printed daily in the City of Santa Fe; that the at-

hed is a true copy of Publication

t appeared in the New Mexico Examiner, issues of

May 16, 1939, in a full and complete

tion of the paper.

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Sec. 3, Chapter 167, Laws of 1937.

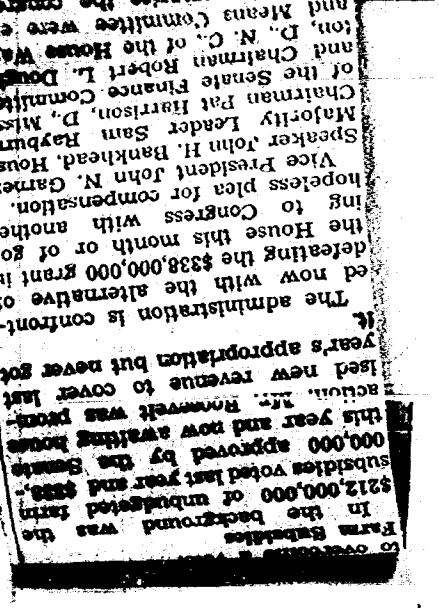
Signed: Larry Bynon

STATE OF NEW MEXICO
COUNTY OF SANTA FE } ss.
CITY OF SANTA FE

Larry Bynon appeared before me this 16 day of May, 1939, known to me to be the person above making affidavit, and after being duly sworn, deposes and says that the statements above made are true and accurate to the best of his knowledge.

Edna Draper
Notary Public in and for Santa Fe County, State of New Mexico.

My Commission expires: April 24, 1943.



Affidavit of Publication

May 16 19 39

STATE OF NEW MEXICO
COUNTY OF SANTA FE
CITY OF SANTA FE
} ss.

I, Larry Bynon, hereby swear and affirm that I am the Publisher of the New Mexico Examiner, a newspaper of general circulation in the City of Santa Fe, the County of Santa Fe, and the State of New Mexico, printed daily in the City of Santa Fe; that the attached is a true copy of Publication as it appeared in the New Mexico Examiner, issues of May 16, 1939, in a full and complete edition of the paper.

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Sec. 3, Chapter 167, Laws of 1937.

Signed: Larry Bynon

STATE OF NEW MEXICO
COUNTY OF SANTA FE
CITY OF SANTA FE
} ss.

Larry Bynon appeared before me this 16 day of May, 1939, known to me to be the person above making affidavit, and after being duly sworn, deposes and says that the statements above made are true and accurate to the best of his knowledge.

Edna L. Graham
Notary Public in and for Santa Fe County, State of New Mexico.

My Commission expires: April 24, 1943.

AFFIDAVIT OF PUBLICATION

State of New Mexico, }
County of Lea }

I, THOMAS C. SUMMERS

PUBLISHER

Of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not in a supplement thereof for a

period of

ONE weeks,

beginning with the issue dated

NOVEMBER 8, 1939

and ending with the issue dated

NOVEMBER 8, 1939

Thomas C. Summers
Publisher.

Sworn and subscribed to before me

this NINTH day of

NOVEMBER, 1939.

J. W. Barker
Notary Public.

My commission expires

OCT 17, 1943, 193

(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publicaton has been made.

(Pub. Nov. 8, 1939)

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 6th day of December 1939, at two o'clock P. M., for the purpose of considering the following:

Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 38 of the Commission.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on October 31, 1939.

OIL CONSERVATION COMMISSION
By (Sgd) FRANK WORDEN
Commissioner of Public Lands
By (Sgd.) A. ANDREAS,
State Geologist
(SEAL)

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 6th day of December, 1939, at two o'clock P. M., for the purpose of considering the following:

Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on October 31, 1939.

OIL CONSERVATION COMMISSION.
(SEAL) By (Sgd.) Frank Worden
Commissioner of Public Lands.
By (Sgd.) A. Andreas,
State Geologist.

Published Nov. 3, 1939.

Affidavit of Publication

Nov. 8, 1939

E OF NEW MEXICO
NTY OF SANTA FE } ss.
OF SANTA FE

Larry Bynon, hereby swear

firm that I am the Publisher

New Mexico Examiner, a newspaper of general circulation City of Santa Fe, the County of Santa Fe, and the State of Mexico, printed daily in the City of Santa Fe; that the at-

is a true copy of Publication

peared in the New Mexico Examiner, issues of

Tuesday 3, 1939, in a full and complete of the paper.

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Sec. 3, Chapter 167, Laws of 1937.

Signed: Larry Bynon

STATE OF NEW MEXICO
COUNTY OF SANTA FE } ss.
CITY OF SANTA FE

Larry Bynon appeared before me this 8th day of November, 1939, known to me to be the person above making affidavit, and after being duly sworn, deposes and says that the statements above made are true and accurate to the best of his knowledge.

Ina V. Vrooe
Notary Public in and for Santa Fe County, State of New Mexico.

My Commission expires: April 24th, 1944

BEFORE THE OIL CONSERVATION
COMMISSION OF THE STATE
OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 14.

ORDER NO. 205.

THE REVISING, MODIFYING AND AMENDING THE EXISTING PRORATION PLAN FOR HOBBS FIELD, LEA COUNTY, DESIGNATED AS ORDER NO. 48 OF THE COMMISSION, AND THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, DESIGNATED AS ORDER NO. 33 OF THE COMMISSION.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for recessed hearing on September 18, 1939, at Santa Fe, New Mexico, with reference to the above designated matter.

Upon oral motion made before the Commission, moving that the recessed hearing upon the matters in the cause herein be further recessed until the twenty-third day of October, 1939, the Commission considered the merits of said motion and hereby orders that said hearing be and is hereby recessed to eleven o'clock A. M., on the twenty-third day of October, 1939, at Santa Fe, New Mexico.

OIL CONSERVATION COMMISSION

By John E. Miles
Governor

By Frank Worden
Commissioner of Public Lands

By R. Andrews
State Geologist

FORM 569-1-39

STANOLIND OIL AND GAS COMPANY
HOUSTON, TEXAS

June 27, 1939

Honorable John E. Miles, Governor,
Chairman, New Mexico Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Sir:

For your information and for the files of the Oil Conservation Commission, I am enclosing copy of minutes of special meeting of the Lea County Operators Committee held at Santa Fe, New Mexico, June 23, 1939.

Yours very truly,

ORIGINAL SIGNED BY
A. M. McCORKLE

AMM:JU
Enclosure.
cc - Honorable Frank Gordon, Secretary
New Mexico Oil Conservation Commission
Santa Fe, New Mexico.

Honorable A. Andreas, Commissioner,
New Mexico Oil Conservation Commission
Santa Fe, New Mexico.

Honorable Carl B. Livingston,
Santa Fe, New Mexico.

COPY

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Harvey E. Yates	Yates & Yates	Artesia, New Mexico
F. S. Prowse	Skelly Oil Co.	Tulsa, Oklahoma
George W. Selinger	Skelly Oil Co. (& Delhi)	Tulsa, Oklahoma
[illegible]	[illegible]	[illegible]
James Fitzgerald, Jr.	Skelly Oil Co.	Midland, Texas
J. M. Shirley	Skelly Oil Co.	Hobbs, New Mexico
Harvey Harrison	Standard Oil of Texas	Houston, Texas
A. M. McCorkle	Stanolind Oil and Gas Co.	Fort Worth, Texas
C. K. Cone	Stanolind Oil and Gas Co.	Fort Worth, Texas
R. T. Keech	Stanolind Oil and Gas Co.	Fort Worth, Texas
[illegible]	[illegible]	[illegible]
R. E. Bedey	Stanolind Oil and Gas Co.	Hobbs, New Mexico
J. N. Moyer	Stanolind Oil and Gas Co.	Fort Worth, Texas
J. C. Seth	Stanolind Oil and Gas Co.	Santa Fe, New Mexico
V. E. Heath	Sun Oil Company	Dallas, Texas
L. F. Shipley	The Texas Company	Midland, Texas
A. E. Billig	The Texas Company	Fort Worth, Texas
H. S. Cole, Jr.	The Texas Company	Fort Worth, Texas
R. W. Childers	Tide Water Associated Oil	Midland, Texas
Howard P. Holmes	Two States Oil Co.	Dallas, Texas.

On motion made by Harvey Harrison and seconded by V. E. Heath, the following resolution was unanimously adopted:

"WHEREAS, a number of oil operators in the Hobbs Field, Lea County, New Mexico, in 1930 formed an organization known as the "Hobbs Proration Committee" for the purposes of administering the proration agreement in the Hobbs Field; and

WHEREAS, the sum of Four Thousand and No/100ths ($4000.00) Dollars was collected by the Hobbs Proration Committee in the year 1930 for the purposes of financing its operations; and

WHEREAS, the said sum of Four Thousand and No/100ths ($4000.00) Dollars was contributed by the following:

Amerada Petroleum Corp.	$250.00	Shell Petroleum Corp.	$250.00
Cities Service Oil Co.	$250.00	Standard Oil Co. of Texas	$250.00
Continental Oil Co.	$250.00	Stanolind Oil and Gas Co.	$250.00
Gulf Oil Co.	$250.00	Sun Oil Co.	$250.00
Gulf Oil Corporation	$250.00	The Texas Company	$250.00
[illegible]	[illegible]	[illegible]	[illegible]
Ohio Oil Co.	$250.00	Tide Water Associated Oil Co.	$250.00
[illegible]	[illegible]	[illegible]	[illegible]

and

WHEREAS, [illegible] Committee for [illegible] as hereinafter set forth, [illegible]

[illegible]

NOTICE FOR PUBLICATION

STATE OF NEW MEXICO

OIL CONSERVATION COMMISSION

Pursuant to Chapter 72, Session Laws of 1935, State of New Mexico, by which Act the Oil Conservation Commission of New Mexico was created, investing said Commission with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 23d day of June, 1939, at 9:00 A. M., for the purpose of considering the following:

Case No. 14.

The revising, modifying and amending the existing proration plan for Hobbs Field, Lea County, designated as Order No. 48 of the Commission, and the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on May 11, 1939.

OIL CONSERVATION COMMISSION

By John E. Miles
Governor

By Frank Wordus
Commissioner of Public Lands

By R. Andrews
State Geologist

Those In Attendance in Hearing upon Case 14 — Hobbs-Monument Proration Matters.

NAME	COMPANY	ADDRESS
[illegible]	Gearhart	
Glenn Staley	Sea Coming Operations	Hobbs
[illegible]	The Texas Co —	Midland
R. L. Lowry	Humble Oil & Ref. Co	Midland Texas
R. A. Card	Standard Oil Prod.	Ft. Worth, Texas
R. Knapp	"	
R. H. Pruett	"	
[illegible]	"	Hobbs
J. B. Burdette	M. E. Tex Sup.	Hobbs
Harvey E. Yates	Sloop & Yates	Artesia, N.M.
B. A. Burns	M-Tex	Hobbs N.M.
W. N. Whites	Shell Oil Co. -	Houston
W. Albertson	" "	"
[illegible]	" "	Hobbs N. Mex.
[illegible]	" "	Midland Texas
[illegible]	Ohio Oil	Hobbs -
[illegible]	Ohio Oil.	Hobbs.
[illegible]	H&GN RR Co	Midland Tex
[illegible]	H&O RR Co	Roswell, N.M.
[illegible]	Phillips Pet. Co.	Bartlesville, Okla.
[illegible]	Phillips Pet. Co	Amarillo, Tex
[illegible]	Tide Water Assoc.	Midland, Tex.
[illegible]	Magnolia Pet. Co.	Houston
[illegible]	Sun Oil Co.	
[illegible]	Humble Oil	Houston
[illegible]	The Texas Co.	Ft. Worth, Texas.
[illegible]		
[illegible]		
[illegible]	

W. A. Byrd	Byrd-Frost Inc	Dallas, Tex.
H. Robinson	Plains Production Co.	Dallas "
J. E. Freeman	Kelly Oil Co.	Tulsa Ok
J. E. Crump	Sandusky Oil & Gas Co	Edmond Okla
Paul Allen Dermott	Republic Nat'l Co	Ft Worth
R. S. Christie	Amerada Petr. Corp	—
Elgin Isaacs	Atlantic	Carlsbad, N. Mex
[illegible] Fleetwood	Barnsdall Oil Co.	Tulsa.
J. B. Noland	Barnsdall Oil	Tulsa
Ralph D. Curtis	—	—
A. P. Lankamer	—	—
A. M. McCorkle	—	Midland
G. F. Hays Hays	Standolind Oil Gasco	Fort Worth
W. C. Lard	✓	Tulsa
R. B. Teoch	✓	Fort Worth
J. O. Seth	✓	✓
D. D. Bodie	✓	Santa Fe
D. A. Howard	Cities Service Oil Co.	Hobbs
D. A. Quinn	—	Bartlesville Ok.
A. B. Gibson	—	Hobbs
R. W. Ely	—	—
R. G. Lowe	—	—
J. G. Sanderson	Gulf Oil Corp	Tulsa
R. A. Knappen	—	—
L. L. Gray	✓	—
J. A. Van Dyke	—	—
J. B. Hurley	✓	—
H. Johnston	Continental Oil Co	Hobbs
J. F. Mabott	✓	Ft. Worth.
Howard P. Holmes	—	Hobbs
J. R. Brown	Two State Oil Co.,	Dallas, Tex.
Weston Payne - Anderson-Prichard Oil Corp	Cities Service Oil Co.	Roswell
Frank Gray	Do	Oklahoma City
W. L. Cunningham	Oil Well Drilling Co,	Hobbs
J. H. Moyers	Standard Oil & Gas Co	Dallas
		Ft Worth Tex

T. Sun A. Mills Continental Oil Co
Ernest C Arnold H. S. Ely et al
H. Coley - The Texas Co.
Geary W Bringer - Skelly Oil Co. Getty Oil Co
Chas C Roe " " " " " "
Mummy Republic Pet Co
Jack H Rankin Republic Oil Co.
H J Fenler - Shell Oil Co
M. B. Lasch Republic Oil Co.

Case No.

14 file #3

Application, Transcript,
Small Exhibits, Etc.

CASE NO. 14

BEFORE THE OIL CONSERVATION COMMISSION OF
THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED FOR THE PURPOSE OF CONSIDERING THE REVISING, MODIFYING AND AMENDING OF THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, NEW MEXICO, DESIGNATED AS ORDER NO. 33 OF THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO.

I N D E X

TO TRANSCRIPT OF HEARING ON MARCH 1, 1940

Name of Witness	Direct	Cross	Re-Direct	Re-Cross
R. D. Curtis	3	16 - Mr.Kraus	20	27 - Mr.Seth
		17 - Mr. Seth	28	29 - Mr.Selinger
		17 - Mr.Dewey	35	32 - Mr.Seth
		17 - Mr.Seth	36	32 - Mr. Bish
		18 - Mr. Bays		
Barnsdall Oil Co. Rests - 35				
R.G.Schuehle	37	52 - Mr.Fleetwood		
		62 - Mr.Christie		
		62 - Mr. Fleetwood		
Geo.H.Card	64	66 - Mr.Fleetwood		
Stanolind Oil Co. Rests - 70				
A.P. Loskamp	71			
E.A.Markley	72	74 - Mr. Seth	76	

CASE NO. 14

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED FOR THE PURPOSE OF CONSIDERING THE REVISING, MODIFYING AND AMENDING OF THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, NEW MEXICO, DESIGNATED AS ORDER NO. 33 OF THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO.

TRANSCRIPT OF PROCEEDINGS AT HEARING
STATE CAPITOL BUILDING
SANTA FE, NEW MEXICO
MARCH 7, 1940

Pursuant to Order of the Commission No. 243, duly made and entered, setting March 7, 1940, at ten o'clock A. M., for resumption of hearing in the above entitled matter, said hearing was convened at ten o'clock, A. M., of March 7, 1940, in the hall of the House of Representatives, Capitol Building, Santa Fe, New Mexico, the Commission setting as follows:

HON. FRANK WORDEN, Commissioner of Public Lands, Secretary
HON. A. ANDREAS, State Geologist, Member
HON. CARL B. LIVINGSTON, Attorney for Commission.

APPEARANCES:

NAME	COMPANY	ADDRESS
J. S. Noland	Barnsdall Oil Co.	Tulsa, Okla.
W.M.Fleetwood, Jr.	" " "	" "
R. D. Curtis	" " "	" "
E. A. Markley	" " "	" "
A. P. Loskamp	" " "	Midland, Texas
R. S. Christie	Amerada Petroleum Corp.	Ft. Worth, Texas
G. H. Card	Stanolind O. & G. Co.	Ft. Worth, Texas
R. W. Tesch	" " "	" " "
Rex E. Rader	" " "	Hobbs, N. M.
R. S. Dewey	Humble Oil & Rfg. Co.	Midland, Texas
Roy Yarbrough	Oil Conservation Com.	Hobbs, N. M.
Glenn Staley	Proration Office	Hobbs, N. M.
H. J. Summy	Reppolo Oil Co.	Midland, Texas
J. B. Kennedy	" " "	" "
N. B. Larsh	" " "	" "
S. P. Hannifin	Magnolia Pet. Co.	Roswell, N. M.
Ed. Downing	" " "	Kermit, Texas
J. O. Seth	Stanolind Oil & Gas Co.	Santa Fe, N. M.
A. M. McCorkle	" " " "	Ft. Worth, Texas
Lloyd L. Gray	Gulf Oil Corp.	Tulsa, Okla.
J. R. Graham	Tide Water Associated Oil Co.	Houston, Texas
E. W. Childers	" " " " "	Midland, Texas
N. E. Trumbill	The Ohio Oil Co.	Hobbs, N. M.
J. F. Wheeler	" " " "	Houston, Texas
S. G. Sanderson	Gulf Oil Corp.	Tulsa, Okla.
Russell G. Lowe	" " "	" "
M. Albertson	Shell Oil Co., Inc.	Houston, Texas
George W.Selinger	Skelly Oil Co.	Tulsa, Okla.
Edgar Kraus	Atlantic Rfg. Co.	Carlsbad, N. M.

Frank Gray	Anderson-Penhard	Hobbs, N. M.
Weston Payne	" "	Oklahoma City, Okla.
James W. Murray	Me-Tex	Hobbs, N. M.
Howard P. Holmes	Two States Oil Co.	Dallas, Texas
Delmar R. Guinn	Cities Service Oil Co.	Hobbs, N. M.
E. P. Keeler	Continental Oil Co.	Hobbs, N. M.
H. B. Hurley	" " "	Ft. Worth, Texas
Harry Leonard	Leonard Oil Co.	Roswell, N. M.
A. J. Holland	The Texas Co.	Hobbs, N. M.
Glenn Bish	Ohio Oil Co.	Hobbs, N. M.
D. D. Bodie	Cities Service Oil Co.	Hobbs, N. M.
D. R. McKeithan	Phillips Pet. Co.	Bartlesville, Okla.
D. R. Knowlton	" " "	" "
Paul N. Colliston	" " "	Midland, Texas
H. J. Kemler	Shell Oil Co.	Midland, Texas
R. G. Schuehle	" " "	" "
A. E. Willig	The Texas Co.	Ft. Worth, Texas

The meeting was called to order by Mr. Frank Worden, who announced that Governor Miles would join the Commission in a short time. Mr. Worden then called upon Mr. Livingston to read the notice of hearing.

BY MR. LIVINGSTON: This notice of hearing will consist in the reading of Order No. 243 of the Commission, which was published as notice of this hearing, and the reading of the order will explain itself -- skipping the heading of the order: (Reading)

"WHEREAS, the hearing called by the Oil Conservation Commission of the State of New Mexico for the purpose of considering the revising, modifying and amending the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission, heretofore recessed to February 5, 1940, could not be heard on said date by reason of conflict with the hearing on the Cole Bill before the Sub-committee of Interstate and Foreign Commerce held in Washington, D. C., and

WHEREAS, a written notice, so advising and unofficially designating March 7, 1940, at ten o'clock A. M. for the resumption of said hearing, was sent by first-class mail to each of the parties who had made appearance in the case herein,

IT IS THEREFORE ORDERED by the Commission that said unofficial notice is confirmed and March 7, 1940, at ten o'clock A. M., Santa Fe, New Mexico, is set for the resumption of said hearing.

IT IS FURTHER ORDERED that this order be published as

notice of said hearing as prescribed by law.

DONE at Santa Fe, New Mexico, this 20th day of February, 1940."

And the publication was made as provided by law, and the purpose of this order was to retain jurisdiction of this case by setting a new date, the new publication and setting of new date by order of the Commission.

BY MR. WORDEN: Gentlemen, the Commission is ready to proceed with the recessed hearing.

BY MR. LIVINGSTON: Gentlemen, for your information, the testimony ended, at the hearing on December 9th, with Mr. R. D. Curtis being interrogated.

BY MR. SETH: There is some question as to whether that testimony is part of this new hearing. I suggest the testimony already taken be made a part of this hearing.

BY MR. FLEETWOOD: We would also like, in the interest of expediency, to ask that all other hearings before this Commission, in engineering matters, that the minutes be considered as part of this hearing, with the understanding that if there is any omissions in the other hearings, Barnsdall will be glad to fill those omissions, taking them up one at a time. If there is no objection, we would like that to be so considered.

BY MR. WORDEN: There are no objections.

R. D. CURTIS,

being called as a witness and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Q Mr. Curtis, you are the same R. D. Curtis who was testifying in this matter on December 9, 1939, when the meeting recessed here until today, were you not?

A I am.

Q To connect up that testimony, I will ask you if you didn't, in a general way, testify that you were a petroleum engineer in the proration department of the Barnsdall Oil Company, and

that your duties consisted in keeping in touch with Lea County pools, particularly Monument, New Mexico, and that you have access to all their records on proration affecting that field?

A I did.

Q You were preceded by the first witness, Mr. Card, of Stanolind. Without going into the testimony he presented, I will ask you if the summation I gave is not what you, generally, testified to?

A It is.

Q Your testimony ended with the request that you outline the present proration plan now in force in the Monument Pool in Lea County?

A Yes, sir.

Q Will you now outline that plan?

A The present plan of proration in the Monument Pool provides for the allocation of the pool on the basis of 80% acreage and 20% bottom hole factor.

Q Does that mean that four out of five barrels allocated to the pool are distributed on the unit or acreage basis, and that one out of five is distributed under the formula to bottom hole pressure?

A Yes, sir.

Q Mr. Curtis, as engineer, have you had under your direct supervision and authority the preparation of five bottom hole pressure maps which we have with us today, and which we will use as exhibits?

A I have.

Q Did you obtain that information reflected on those maps from the official records of the Conservation Commission of the State of New Mexico office?

A Yes, sir.

Q Mr. Curtis, I show you what has been marked "Barnsdall's Exhibit No. 1", and ask you to identify that.

A Exhibit No. 1 is a bottom hole pressure survey map of the Monument Field, Lea County, New Mexico, as of April, 1936.

BY MR. FLEETWOOD: We offer this in evidence, if the Commission please.

(The exhibit is placed on map stand)

Q Mr. Curtis, will you get up there at the board and just explain to the Commission more in detail what that exhibit is, what it shows, and what your conclusions are from that exhibit?

A Exhibit No. 1 is a bottom hole pressure survey map of Monument field as of April, 1936. The Monument Pool is located in Townships 19 and 20 South, Ranges 36 and 37 East. This is a map of the first official bottom hole pressure survey made in the field, and made under the direction of Mr. Staley's office. At this time there were 89 wells within the field, 77 of which were included in the first pressure survey.

The highest bottom hole pressure reported was 1506 pounds; the lowest pressure reported 1122 pounds, or a difference between the highest and the lowest of 384 pounds. The average pressure of all wells surveyed was 1430 pounds.

On this map the bottom hole pressures as recorded in this survey of 1936 are entered under each well. The color legend is this: All wells appearing in the red areas have pressures of 1300 pounds or less. All in the green areas cover a range from 1300 to 1349 pounds. The purple areas cover a range from 1350 to 1399 pounds. The next area, the yellow, from 1400 to 1449. The next higher, the blue, covers a range from 1450 to 1499. And the orange range covers those pressures above 1500 pounds.

The Monument Pool was opened by the Amerada Petroleum Corporation on March 3, 1935, when they drilled the No. 1 State D, located on the NW¼ NW¼ of Sec. 1, T. 20 S., R. 36 E. From the date of the discovery until the date of this survey, or approximately one year, there were 88 more wells completed in the pool. During that same period every well in the pool received a flat top, or 100% to acreage allowable. In the early part of 1936 the Barnsdall Oil Company felt that a proration plan based on 100% acreage was not equitable within the pool, and petitioned the Commission to change the method of allocation. As a result of that hearing, held in February,

1936, Order No. 22 was issued. This order changed the method of allocation within the field from 100% in the field based on acreage, to 80% acreage and 20% to bottom hole pressure factor. This survey which, as I mentioned before, was the first or initial survey made in that pool under Order No. 22 -- pardon me -- this survey was made for the purpose of administering Order No. 22.

Prior to discovery of this field, we feel that the entire reservoir was in equilibrium, that is, throughout the reservoir on a common plane or level the same pressure existed. We see that a year later, under a proration plan of 100% on acreage, we have in the pool great differences in pressure, and when we have those differences in pressure we have drainage existing from the high pressure to low pressure areas. In other words, one man's oil is being drained by another man. Barnsdall felt that Order No. 22 did not give enough to the pressure factor, and petitioned the Commission for a re-hearing. This re-hearing was held in June, 1936, and as a result Order No. 33 was issued by the Commission. This modified Order No. 22 but slightly, the percentage on acreage still being 80% and the percentage to the pressure factor still being 20%.

Q Mr. Curtis, did I understand that prior to the discovery of the field by the Amerada it was generally thought that on the same plane, in the ground, in the reservoir, all pressures were the same?

A That is right.

Q And oil was not migrating?

A No, it was not. The gas was above the oil, then the oil and the water below that.

Q You say on that map shown there, about a year later, wells having been drilled and produced under a flat top allowable, these pressure differentials set up?

A That is correct.

Q Did you say that all of the wells in the blue areas come within the same range of pressures?

A I did.

Q What is that?

A 1450 to 1499 pounds.

Q Does that mean that between that range there is no drainage between wells in that area?

A No. That color is used for pressures from 1450 to 1499 pounds, so that there will be pressures within the blue range that may vary as much as 49 pounds of each other.

Q Do you have any knowledge of the potential ability to produce at that time?

A Yes, sir. At that time, April, 1936, there were wells in the pool which were tested. Incidentally, most operators make an initial potential test of some sort. There were wells in the pool capable of producing at the rate of 30,000 barrels a day. Other wells, less than 100 barrels per day. Incidentally, the Lea County flat top allowable given Monument was somewhat over a hundred barrels per day, so we have a situation of some wells being allowed to produce to capacity, and other wells, with a high potential range, being severely restricted.

Q A 100 barrel well was allowed to produce up to its capacity, wide open, and a twenty or thirty thousand barrel well was shut down to that point?

A Yes, sir.

Q And is it your opinion that drainage existed?

A Yes, pressure differentials set up and caused drainage from one property to another.

Q Could that have been remedied prior to April, 1936?

A Yes, I believe it could have been.

Q How?

A If an allocation formula had been used that kept the pressure as near equal as possible throughout the field.

Q Mr. Curtis, will you identify what the reporter has marked "Exhibit No. 2"? Tell what it is?

A Exhibit No. 2 is a bottom hole pressure survey map as of April, 1937 of the Monument field.

BY MR. FLEETWOOD: We would like to offer that in evidence, if the

Commission please.

Q Will you explain to the Commission what Exhibit No. 2 shows, and what your conclusions are from that exhibit?

A Exhibit No. 2 is a map showing the results of the bottom hole pressure survey made by the Hobbs Proration Office in April, 1937. Incidentally there were surveys made in July, 1936, October of 1936, and January of 1937. These were all official surveys. We, however, did not make maps of them. This shows the yearly period starting with April, 1936.

At this time there were 359 wells in the Monument Pool, or an increase over April, 1936, of 270 wells. Included in the survey of April, 1937, were 310 wells, with the highest recorded pressure being 1483 pounds per square inch, and the lowest recorded being 753 pounds per square inch, or a difference between the highest and the lowest of 730 pounds. The same color legend was used on this map as on Exhibit No. 1, and was used throughout on our exhibits.

This map shows the results of one year's operation under a proration formula based on 80% acreage and 20% bottom hole pressure factor. Inspection of the map shows there were still great differentials in pressure within the pool. The application of this formula may have done some good, but it is apparent that if the bottom hole pressure factor in the formula had been greater, we probably would not have had the great bottom hole pressure differentials existing in the pool. We still felt at this time there was drainage from one property to another.

Q Was that drainage still the result of differences in pressure?

A It is.

Q Where does that drainage occur?

A Between the high pressure areas and the low pressure areas. Oil will drain from a high pressure area to a low pressure area.

Q Does that mean there was drainage between wells in the same color area, as well as the different colors?

A Yes, it may be possible, within an area, that the pressure may vary as much as 49 pounds to the square inch.

Q This exhibit (indicating another map on map stand) has been marked "Exhibit No. 3", and I will ask you to again identify that so that it may be admitted in evidence.

A Exhibit No. 3 is a bottom hole pressure survey map of the Monument field as of April, 1938.

BY MR. FLEETWOOD: We ask that it be admitted in evidence.

Q Will you again explain what that map shows and what your conclusions are?

A This is another bottom hole pressure survey map of the Monument field made from the official survey by the Hobbs Proration Office, made in April, 1938. There was a survey made in September, 1937, but, as I mentioned before, we took the yearly interval beginning April, 1936. At this time 468 wells had been drilled in the Monument field, or an increase, since April of 1937 of 109 wells. In the survey of April, 1938, 425 wells were included.

The maximum pressure recorded was 1433 pounds per square inch, and the minimum 862 pounds per square inch, or a difference between the highest and lowest pressure of 571 pounds per square inch. The average of the 425 wells included in the bottom hole pressure survey was 1341 pounds. This survey was made one year after the survey shown on Exhibit No. 2, and still shows great differentials in pressure existed within the pool, with resulting drainage from one property to another.

BY MR. SELINGER: Will you give, from Exhibit No. 2, the average bottom hole pressure?

A 1385 pounds.

BY MR. FLEETWOOD:

Q Once again will you identify what has been marked "Exhibit No. 4, so that it may be admitted in evidence?

A Exhibit No. 4 is a bottom hole pressure survey map of the Monument field of April, 1939.

BY MR. FLEETWOOD: We ask that it be admitted.

Q Will you explain Exhibit No. 4 to us?

A Exhibit No. 4 is a similar map, made in a similar manner as the other survey maps made, and shows the bottom hole pressure survey made by the Hobbs Proration Office in April, 1939.

At this time there were 484 wells in the field, or an increase over April of 1938 of 16 wells. In other words, during the year between April, 1938 and April, 1939, there were only 16 wells completed in the pool.

In this survey there were 438 wells, that is, in the bottom hole pressure survey, with a maximum bottom hole pressure of 1451 pounds, and a minimum of 824 pounds, or a difference between the two of 627 pounds. The average of the 438 wells included in the survey was 1320 pounds per square inch.

At this time we find but little difference in the pool, in that there are still great differences in pressures, with resulting drainage from one property to another.

Q Mr. Curtis, here is Exhibit No. 5. Will you identify that one for us?

A Exhibit No. 5 is a bottom hole pressure survey in the Monument field as of November and December, 1939.

BY MR. FLEETWOOD: We ask that it be admitted in evidence, if you please, sir.

Q Will you explain that to us, Mr. Curtis?

A This is a map showing the latest bottom hole pressure survey by the Hobbs Proration Office, and was just completed in the early part of January. We have shown it as November and December because the bulk of the work was done then.

There were 493 wells in the field, only nine more wells than are shown in April, 1939. In other words, the field is, for all practical purposes, fully developed.

The maximum pressure recorded in this survey is 1397 pounds per square inch; the minimum pressure recorded is 525 pounds per square inch, or a difference between the highest and lowest pressures recorded of 872 pounds per square inch. The average for the 445 wells which were included in this survey was 1300 pounds per square inch.

On this map, as well as on the others, we still find great

differences in pressure in the reservoir. Since April, 1936, the allocation to the field has been based on the 80% acreage and 20% bottom hole pressure formula, and today, as shown back on the earlier maps, we still have great differences in pressure, with resultant drainage from one property to another.

Q Mr. Curtis, as I understand Exhibit No. 1, it is the result of a bottom hole pressure survey made prior to Order No. 22 or 33, and shows the result of 100% acreage, is that right?

A Yes, sir.

Q Exhibit No. 2 shows the bottom hole pressures as under Order No. 22 for about three months, and under order No. 33 the rest of the period?

A Yes, sir.

Q The next exhibits, Nos. 3, 4 and 5, as I understand, are the results of the application of Order No. 33?

A That is right.

Q That has never been changed from that year on?

A Yes, sir.

Q And that is the 80% acreage, 20% bottom hole pressure?

A It is.

Q That red area shows wells which have bottom hole pressure of 1300 pounds or less?

A Yes, sir.

Q That is the lowest pressure area shown?

A That is the lowest we have used.

Q Will you explain why the relative amount of wells shown in the red area increase all the way across from Exhibit No. 1 to Exhibit No. 5?

A The red area should increase because it includes all pressures below 1300 pounds per square inch, and as withdrawals are made from the field, the whole field average is going down, so naturally there would be more wells in the red area.

Q Is it your opinion the wells in the red area have, or have not, drained oil from other wells?

A Yes, because there have been differentials in pressure. Those in the red area have lower pressures than the green; those in

purple area have higher than the green.

Q What has been the practice as to bottom hole pressures? How often are they taken?

A Bottom hole pressures have been taken by the Hobbs Proration Office, and are static bottom hole pressures after a 24 or 36-hour shut-in period, at a sub-sea datum of 250 feet, or a point 250 feet below sea level.

Q Is it possible there are wells on some properties that are less permeable and would require a longer time to show the highest bottom hole pressure? Would it be necessary, perhaps, to shut some wells in longer than others to get the maximum pressure in them?

A It might be necessary in some cases. There may be some wells which, after being shut in, would not reach the maximum build-up pressure within 24 or 36 hours.

Q As an engineer, would you say any such operator should be given a longer time, or should the pressure be taken the same as the other wells?

A No, he should be given an opportunity to reach the maximum pressure.

Q I notice across here (indicating) the field stops abruptly at this south boundary, as shown by the heavy black line.

A That line is shown on Exhibits Nos. 3, 4 and 5, and it is called the Monument-Eunice difiding line. A hearing was had before the Commission, I believe in May of 1937, and as a result of this hearing an order was made by the Commission setting this boundary line, effective August 1, 1937, as the boundary line between what is known as the Eunice Pool and the Monument Pool. Prior to that an engineering committee had set the boundary at a point three-quarters of a mile south of the line later set by the Commission's order.

Q You don't mean, by carrying the maps in that way, that line is the place where this field stops?

A No, sir.

Q It is simply an official designation, which you have been using?

A No, the area north of the line -- the wells north of the line

are included in the Monument field proration schedule.

Q I noticed when you told the number of wells in the field, you then told the number of wells in which the bottom hole pressures were recorded. As I recall, the number of wells with recorded pressures was less than the number of wells in the field. Is there any explanation of that?

A Yes. There may have been a few new wells in there which were completed shortly after the survey was made. Also, in low pressure areas there is always a good number of wells in which no pressure was taken because such wells had low bottom hole pressure and would receive only that portion of the allowable allotted to acreage, or an 80% flat top.

Q What did you say that now the average field bottom hole pressure is?

A 1300 pounds.

Q The average?

A An average of the wells included in the survey, or 445.

Q Under Order No. 33 do all wells with a pressure under 1300 pounds get the same allowable, if they can make it?

A No.

Q Explain why?

A Under Order No. 33, the average of the three lowest pressures in the field, or 80% of the highest recorded pressure, whichever of those two happens to be the highest, is used. The working of the order has been such that 80% of the highest pressure has always been used. In February, of 1940, the maximum pressure recorded was 1397 pounds. 80% of that was 1118 pounds. In the operation of the formula, every well with a pressure of 1118 pounds per square inch or less is allowed an 80% flat top allowable, or 47 barrels -- or 38 barrels, unless incapable of making that much, and then it is allowed what it will make.

Q You mean that any well that can make 38 barrels is allowed to make that?

A Yes.

Q What is the highest allowable any well can get?

A 52 barrels.

Q It ranges from 52 barrels down to 38 or less?

A Down to 38 or less. There may be some wells that make considerably less.

Q As an engineer can you tell whether even with a one-pound difference in bottom hole pressure, that will cause oil to migrate from an area of greater pressure to an area of lesser?

A You would have a pressure differential which would be very slight.

Q Suppose you have a difference of 872 pounds, as your map shows, between the highest and the lowest pressures. Would there be migration from the high to the low in a case like that?

A Yes, there will be migration from the high pressure area to the low pressure area.

Q With that great difference, would the migration of oil be extensive?

A Yes, you would look for it to be.

Q Is it your opinion as an engineer that on all five of these exhibits there is shown drainage of oil from one man's property to another that has been going on from the beginning of the field and is going on today?

A That is my opinion.

Q What is the remedy you propose for that?

A The remedy is the use of a bottom hole pressure factor of greater than 20%. In other words, a proration schedule which would give less to acreage and a greater percentage to the bottom hole pressure factor.

Q Would you suggest to the Commission just exactly how that be done?

A As I recall, we suggested before, back in 1936, a formula giving 25% to acreage and 75% to bottom hole pressure factor. That would give you, over a period of time, ordinarily uniform pressures throughout the pool.

Q Do you make that recommendation now?

A I do.

Q Do you think it is needed more, or less, now than in 1936?

A It has been needed all along. Probably more now than then, since the pool is now fully developed.

Q Would the enactment of such a formula be considered by engineers as a perfect solution?

A No, it might not be a perfect solution. In other words, engineers recommend that the most perfect plan would be a plan of 100% bottom hole pressure.

Q Is it possible that in giving 75% to bottom hole pressure, some wells might decline very rapidly, or too rapidly?

A They would decline less than under the present formula.

Q Would it be difficult to adjust any differences that might crop up on a 25%-75% basis?

A No. The plan would work so that a high pressure well which, for some reason, was given too much allowable, would be lowered perhaps during the following survey period, and between that period and the next would have less allowable, so that the over-all during the year would average.

Q Can you tell whether it is possible to accurately determine the amount of oil in place under each tract in the Monument Pool?

A I believe we could roughly determine it, but I don't believe an accurate enough estimate could be arrived at for allowable within the pool. Fortunately we do have two factors capable of accurate measurement, and that is the acreage of each well and its static bottom hole pressure. In the absence of other factors for the proper estimation of reserves, we have these two factors just mentioned which, if applied to the proration formula, should keep uniform pressure throughout the pool with but little drainage between tracts.

Q Do I understand you correctly that your thought is in this recommendation that since we cannot ascertain accurately the amount of oil under each property, that applying this bottom hole pressure formula would stop drainage, and thereby every man's oil would stay beneath his own property?

A Yes, I believe that is true.

Q Have you calculated what the minimum allowable on this 75-25 basis would be?

A In February it would have been 25% of 47 barrels, or an increase of twelve barrels a day.

Q In your opinion will twelve barrels a day repay lifting costs in the Monument Pool?

A I believe on an average it will pay a reasonable lifting cost.

Q Would that minimum be a constant minimum, or would there be a chance to get a greater one?

A No, in some cases it would be on a temporary basis. I man might get the twelve barrels on one survey, and on the next pressure period the next man might get it.

Q In conclusion, Mr. Curtis, you recommend that the Commission's Order No. 33 be modified so that the formula will be 25% on acreage and 75% bottom hole pressure factor?

A I do.

BY MR. FLEETWOOD: That is all.

CROSS EXAMINATION By Mr. Kraus:

Q Will you tell how many barrels of oil have been withdrawn from the Monument field between the dates of the first survey and the dates of the last survey?

A The figures I have show that as of December 1, 1939 -- this is a rough figure, was 31,950,000 barrels from discovery, and as of January 1, 1936 -- the earliest day I have is April, 1936, the map there, was 56,000 barrels.

Q So about 30,000,000 barrels have been produced between these two dates?

A Yes, sir.

Q With that amount of production, do you, as an engineer, believe a drop in bottom hole pressure, average for the field, of 130 pounds is an indication, in a general way, of good operation or poor operation?

A I think, in a general way, it shows good operation through the field. A pressure drop that has amounted to -- what did you say?

Q 130 pounds?

A Merely an eight pound pressure drop for one million barrels of oil produced.

Q In a general way, you would not feel there had been much waste?

A Not a tremendous amount of waste, no.

CROSS EXAMINATION By Mr. Seth:

Q Would you mind pointing out on the map the location of the Barnsdall leases? I understand they are all in one body?

A Yes, sir. The Barnsdall Cooper lease is located on the $E\frac{1}{2}$ $E\frac{1}{2}$ of Sec. 12, T. 20 S., R. 36 E., and the $W\frac{1}{2}$ $W\frac{1}{2}$ of Sec. 7, T. 20 S., R. 37 E., and consists of 320 acres.

Q Eight wells?

A Yes, sir.

CROSS EXAMINATION By Mr. Dewey:

Q You indicated in your formula you would reduce the formula on some of the lower units to a possible 12 barrels per day?

A That is what it would do; in a flat top allowance of 47 barrels, which was made in February, 1940 -- I say 12 -- it is a little over eleven, but the Proration Office always carries whole figures, so I called it twelve.

Q I wonder if you have calculated the allowance Barnsdall would have under the same condition?

A No, I have not made the calculation; I could make it.

Q It would be rather interesting to know what they would have.

CROSS EXAMINATION BY Mr. Seth:

Q Those maps indicate the low pressure areas are particularly along the south line, the line between Monument and Eunice?

A That shows a low pressure area, yes, sir.

Q Can you explain that?

A My explanation of that is that those wells probably have had, under the present proration formula, a larger allowable than they should have had.

Q Isn't that a very tight area?

A I understand it is.

Q You are not familiar with conditions there?

A Not personally familiar. However, I have always understood that some wells were very difficult to complete in that area.

Q A tight area, or one of low permeability extends along there?

CROSS EXAMINATION By Mr. Bays:

Q Would you have the Commission prorate Monument so that all pressures would be uniform? So that all pressures would become uniform?

A So that they would be more nearly uniform.

Q If they were completely uniform you think there would be no drainage?

A I think if the pressures were completely uniform there would be no drainage.

Q Is there quite a variation in permeability in the field?

A Yes, I think so.

Q Would you think a man that had a barrel of oil in a highly permeable area would be entitled to the same pressure as a low permeable area?

A I think every man is entitled to produce the oil under his land.

Q Do you know the relationship of permeability and energy requirements for bringing the oil to the bore hole?

A There will be more energy required in an area of low permeability.

Q You were present here when Dr. Muscat produced his formula which shows the energy requirements are directly in proportion to the permeability of a well?

BY MR. FLEETWOOD: I don't want to be highly technical, and we want that record to be part of this hearing --

Q Do you know that to be a fact? He has testified as a petroleum engineer.

BY MR. FLEETWOOD: All I want is an agreement by all that the Hobbs record be made a part of this record. We want it in -- we would prefer to have it a part of this record.

BY MR. BAYS: Wasn't the Hobbs hearing the previous hearing?

BY MR. FLEETWOOD: It was, and we would be glad to have it made a part of this record.

Q I will ask if you can answer that question?

A It will take more of an engineer than I am to tell that.

Q Isn't it directly in proportion?

A I believe it is in the formula -- I am not certain.

Q If a man had a barrel of oil in a tight area the relationship

would be ten to one -- it would require ten times as much energy?

A It would take more.

Q It would take ten times as much, based on this formula?

A Yes.

Q Where would he get that energy?

A In the gas dissolved within the oil; possibly with the occlude gas; possibly some free gas.

Q If he used more energy would he have a drop in bottom hole pressure?

A No, I don't believe that necessary.

Q Why would he need more bottom hole pressure if -- I would like to know why you would like an equalization of bottom hole pressures if they have nothing to do with reservoir energy?

A There is a great deal of reservoir energy, probably more than will ever be needed to move the oil there.

Q Will you explain to the Commission why, if a man has a barrel of oil in a tight area, it requires ten times as much energy to get it out?

A He may not have as much oil under his property.

Q I did not say that. How will he produce his barrel of oil and use ten times as much energy without a drop in bottom hole pressure? If you equalize bottom hole pressure you will keep that man from producing his oil.

A No, if you equalize it, he will get more oil.

Q How can you equalize -- if you restrain him from using that, you reduce the out-go.

A If he reduces the pressure in the well, on static pressure tests, and is given enough time to get the maximum build up around the well, he may not have as much oil under his property. Certainly there is much energy in the reservoir, certainly more than enough to move the oil to the well and up to the surface.

Q You want to say he can use ten times as much energy, and still have the same bottom hole pressure?

A He may use more energy --

Q (Interrupting) And still have the same bottom hole pressure?

A In lifting it?

Q Use ten times as much energy to get his oil.

A Not getting his oil, he may have less to get.

Q That is not the question. How can he use ten times as much energy to get one barrel of oil as is needed to get a barrel of oil in some other well, and not have a drop in bottom hole pressure?

A Nevertheless I still think the pressures should be maintained as near equal throughout the pool as possible.

RE-DIRECT EXAMINATION By Mr. Fleetwood:

Q Mr. Curtis, do you find you are alone in believing in these engineering principles you have advocated here this morning?

A No, sir, I have known and heard of a number of other engineers who have advocated the same principles.

Q Mr. Curtis, the Honorable Hiram M. Dow, of this state, advised by Judge J. O. Seth and Carl Livingston, wrote a paper which was published by the Mineral Law Section of the American Bar Association, and in that paper he states, "the taking of bottom hole pressure measurements permits a more accurate control of the reservoir energy" --

BY MR. SETH: Mr. Dow is not an engineer.

BY MR. FLEETWOOD: He is a very eminent New Mexican whose opinion I value very highly.

Q Do you, as an engineer, agree with Mr. Dow, Judge Seth and Mr. Livingston?

A Yes, sir, I think their conclusions are self-evident.

Q In that same volume published by the American Bar Association. Mr. Robert E. Hardwicke, an attorney and engineer of Fort Worth, Texas, who has frequently appeared here in this state, stated "the creation of low pressure areas causes dissipation of reservoir energy and also causes damaging encroachment of salt water thereby bringing about underground waste, which is another way of saying that the ultimate recovery from the pool will be less than it would have been if efficient production practices had been used." And he also says, in the same paper, "the property of one operator must not, in effect, be given to another by a discriminatory method of allocation which results in drainage which is not off-set by counter

drainage". Do you agree with engineer and lawyer Hardwicke in that respect?

A Yes, sir, I agree with him.

Q On July 19th and 20th, 1939, here in Santa Fe, the Interstate Oil Compact Commission held a meeting, at which time Governor Dow stated, "There are three ways of measuring waste in an oil field: the rate of drop in bottom hole pressure, gas-oil ratios, and irregularity of water encroachment". At the same meeting Colonel Ernest Thompson, of the Texas Railroad Commission, stated: "We have found that certainly there is a direct relationship between the flow and bottom hole pressure reaction". Also the Advisory Committee on Economics to that Commission, a committee composed of Mr. deGolyer, Mr. Sachs and Mr. Pogue, reported that one of the two principles which embody the fundamentals of conservation are "equity amongst competing interests be done by operating wells in such manner that cross drainage is minimized, The several properties in a single pool shall be so produced that the development of pressure differentials within the reservoir is minimized." Also another gentleman, not an engineer, Senator Clint Small, of the State of Texas, stated: "It seems funny to look back and to think that we ever had an idea to allow a poor well to produce as much as a good one. We cannot say that because each of you has holes in the ground you are entitled to produce the same amount of oil."

Mr. Curtis, I have read a lot of excerpts here, and I will not ask you to comment on each of them. Do any of the quotations differ, or interfere with the principles of engineering you have been advocating, or are they in agreement with those principles, in general practice?

A I believe they are in agreement. These gentlemen have stated in a much better fashion than I have, the same principles.

Q According to the minutes of a meeting of the Hobbs Engineering Committee, held in Santa Fe on June 11, 1936, a report was made to Mr. Glenn Staley by a special committee composed of Mr.

E. H. Wahlstrom, of the Stanolind, Mr. R. S. Christie, of the Amerada, Mr. Lloyd Gray, of the Gulf, Mr. J. E. Heath, of the Sun Oil Company, and Mr. Colin Rae, of the Skelly. In this report these gentlemen, after stating their reasons for not recommending to them the use of potential factors, flowing pressure, build-up pressures, and thickness of pay formations as elements in a proration formula applicable to the Monument Field, stated that acreage should be considered, and that static bottom hole pressure, defined as 24-hour shut-in bottom hole pressure "is the best known factor to prevent drainage across property lines. It is also an index as to the proper functioning of the producing reservoir, thus serving to promote conservation." Do you believe these gentlemen, Mr. Wahlstrom, Mr. Christie, Mr. Gray, Mr. Heath and Mr. Rae, were correct in that report?

A Yes, I believe they were correct in that report, and they also expressed the opinion of a large number of engineers.

Q Do you know who Mr. J. E. Wooten is?

A Yes, sir.

Q Will you tell the Commission who Mr. Wooten is?

A He was, in June, 1936, employed by the Stanolind Oil Company as division engineer, out of the Fort Worth office.

Q On June 12, 1936, Mr. Wooten testified at a hearing before this Commission with reference to Order No. 22, covering the Monument field, as follows: "Any method employing bottom hole pressure would have to be in operation for some length of time to determine how pressures range, going up or down or equalize. As long as bottom hole pressures are included the plan can be modified from time to time as desired." Also, "One hundred per cent bottom hole pressure is the most desirable plan". And "To select the plan at the start of a field, I would select the 100% bottom hole pressure. I think bottom hole pressure would attain results that are desired in the plan, that is, to prevent physical waste." Mr. Wooten was asked "Why do you think 100% bottom hole pressure better than Order No. 22?" And Mr. Wooten answered, "It would

prevent waste over a long period of time." Mr. Wooten was also asked, "You answered your questions that it was true the nearer we approach 100% bottom hole pressure, the more we would give to bottom hole pressure, just that much nearer we would come to the point of minimizing to the smallest degree drainage across property lines?" And Mr. Wooten answered, "That is true." Mr. Selinger, of the Skelly Oil Company, asked: "What was your statement in regard to the effect of placing the Monument Field strictly on a 100% bottom hole pressure?" Mr. Wooten responded: "100% bottom hole pressure would tend to equalize pressures, and I think fundamentally 100% bottom hole pressure is correct."

Mr. Curtis, do you find yourself in agreement with Mr. Wooten's statements?

A I think Mr. Wooten is absolutely correct in his testimony.

Q On February 25th and 26th, 1936, here in Santa Fe, at a hearing before this Commission, Mr. Jack Rankin, of Repollo, testified it was correct to say "A unit allowable plus some sort of allocation on bottom hole pressure would be desirable, provided you give enough weight to minimum allowable." Mr. Rankin also testified: "In order to be scientific, to be secure from the tendency of drainage, we should have a plan to equalize bottom hole pressures," and "As far as the method is concerned, I rather favor the static bottom hole pressure," which was advocated as a plan. He also stated that he believed that a beginning along those lines should be made by assigning a small value to bottom hole pressures and increase their values as rapidly as conditions justified. Do you agree with Mr. Rankin's basic idea?

A Yes, sir. The only objection I had at that time, the time of the hearing, and ever since, is that we have just been crawling along. I believe a plan giving more to bottom hole pressure factor should have been made earlier in the life of the field.

Q As an engineer, very definitely I want you to answer one final question. I want to read to you from the opinion of a three-judge federal court, dated February 20, 1940, in the Humble

and Rowan Nichols case in Texas, and I want you to tell what you think of this statement of the federal court: "The evidence here, however, is that even with a pumping well, production can be profitably continued on five to ten barrels per day. We can think of no good reason why a higher allowable should be fixed for non-marginal wells when to do so would take three-fourths of the distributable oil on a basis which is neither according to the productive capacity of the well nor according to the amount of oil on the leases. To distribute three-fourths of the allowable on a flat basis per well without regard to oil reserves of the leases, of the productive capacities of the wells, which constitutes the value of the property, is unreasonable, and therefore in violation of the Constitution and the statutes." What do you think about that?

A Not being a lawyer, I cannot say that the procedure is unconstitutional. However, as an engineer, I certainly agree with the court that to distribute three-fourths of the field allowable on a flat basis per well or unit, without regard to the oil in place, certainly is contrary to engineering principles, and is unreasonable, in my opinion. Here in the Monument field we actually distribute more than 75%, or 80%, on a flat acreage basis.

Q At the Seventh midyear meeting of the American Petroleum Institute, on June 2, 1937, Mr. Langdon L. Foley stated "Some fields have been prorated on the basis of acreage * * * * for example, Monument Field in New Mexico, has 80% of the allowed production based on acreage and 20% according to reservoir pressure. The allocation according to acreage presumes that one acre is as good as another, which is not always the case.

Are you also in agreement with Mr. Foley?

A I am.

Q Mr. Curtis, do you know who Mr. C. V. Millikan is?

A Yes, sir.

Q Mr. Millikan is Chief Production Engineer of the Amerada Petroleum Corporation in Tulsa, is he not?

A Yes, sir.

Q What interest has the Amerada Petroleum Corporation in the Monument field?

A The Amerada has 103 production units out of the 483 in the field, or approximately 20% of the units in the field.

Q Mr. Curtis, I ask you to examine this exhibit (handing witness a printed pamphlet which has been marked "Barnsdall Exhibit No. 6). Will you examine Exhibit No. 6 and identify it?

A Exhibit No. 6 is a reprint from the transactions of the American Institute of Mining Engineers, 1933, 103 of Petroleum Development and Technology, and is entitled "Reservoir and Bottom-hole Producing Pressures as a Basis for Proration". This paper was written by C. V. Millikan.

Q Of the Amerada?

A Yes, sir.

Q Turning to page 3 of that paper, will you read what is marked there?

A (Reading) "Maintenance of uniform reservoir pressures is the most equitable method of prorating. If the reservoir pressure in a field is maintained uniform at all stages of depletion, there will be no migration of oil and gas from the drainage area of one well to that of another. At any stage in the life of the field each well will have withdrawn the same proportion of its recoverable reserves as any other well.

"When allowed production is allocated on the basis of decline of reservoir pressure, some tentative distribution must be made. A method which considers the rate of production seems most logical. The tentative allocation, however, need not be established with the accuracy that is necessary when the proration is based on the capacity of the wells to produce. The allowable would be adjusted when the next set of closed-in pressures is taken. Wells which have a greater decline in

reservoir pressure than the average in the field will have their allowed production correspondingly decreased while the allowed production of those in which the reservoir pressure had declined less than the average will be proportionately increased. These periodic adjustments will equalize the reservoir pressures of the various wells to the end that a uniform decline of the reservoir pressure in the field will be maintained. When the field is exhausted each well will have produced the same proportion of the original oil and gas content in the reservoir within the drainage area of the well as the total recovery of the field is to the total original oil and gas content of the field."

Q Now, Mr. Curtis, as an engineer, would you say that the application of those principles advocated by Mr. Millikan is similar to the advocation of the principles you have been advancing here this morning?

A They are.

Q Would you, as an engineer, say that the law of the State of New Mexico, which reads: "The rules, regulations or orders of the Commission shall, so far as it is practicable to do so, afford to the owner of each property in a pool the opportunity to produce his just and equitable share of the oil and gas in the pool, being an amount, so far as can be practically determined and so far as such can be practicably obtained without waste, substantially in the proportion that the quantity of the recoverable oil and the gas under such property bears to the total recoverable oil and gas in the pool, and for this purpose, to use his just and equitable share of the reservoir energy." You believe the application of Mr. Millikan's principles, or the principles advocated by Mr. Millikan would obtain this result, giving every operator an opportunity to produce his proportionate share of the oil and gas and use his share of the reservoir energy?

A Yes, sir, I believe it would come very near to obtaining this result.

RE-CROSS EXAMINATION By Mr. Seth:

Q Do you intend to tell the Commission that in that Humble and Rowan Nichols case 75% of the allowable was allocated on a unit basis?

A Not on an acreage basis, as I understand.

Q You know well that what the courts condemned was an allocation on a per well basis?

A They mentioned units in their argument.

Q You know what the court condemned was giving 75%, or the same proportion to a well on one-tenth of an acre as to one on ten acres?

A That may be so. I am not certain.

Q You are not certain of what?

A I don't know whether they used a unit or well.

Q Are there any units in East Texas?

A Acreage is taken into consideration.

Q The court condemns the 74% on a per well basis, didn't they?

A Yes, sir.

Q In that 75% one well, even on an area where there were seven wells to a half acre, each well would get as much as a well on ten acres?

A Yes, sir, it will, but the number of acres is taken into consideration under any formula.

Q 25% of it?

A I believe it is.

Q What the court condemns is not the taking of acreage into consideration, but the 75% on the per well basis?

A It may have been.

Q You testified, on the first round, that you could not determine the amount of oil in place with any degree of accuracy?

A I said you could not determine it with any degree of accuracy, but I wish to explain that for the purposes of allocation, it would be difficult to cover all units in the field so that all operators would be agreeable to that determination.

Q You know it varies widely?

A Yes, sir.

Q And you know it cannot be determined with any degree of accuracy?

A That was my statement.

Q The acreage is the only definite factor, except bottom hole pressure, that might be used as a corrective factor?

A As I recall, I said you have two factors which can be accurately determined, one being acreage and the other static bottom hole pressure.

Q You wouldn't content that bottom hole pressure is a measure of oil in place?

A Not necessarily.

Q That will leave acreage as the only factor that could be accurately determined as bearing on the oil in place?

A With unit spacing, if you had differentials in pressure you would have drainage from one man's property to another.

Q But pressure does not indica-te the oil in place?

A Not necessarily.

Q The only definite factor in the field is the acreage as indicating the oil in place?

A Acreage is used as one of the factors in determining oil in place.

Q I asked, isn't that the only definite factor you have?

A Yes, sir.

RE-DIRECT EXAMINATION By Mr. Fleetwood:

Q You don't mean that each 40-acre tract has the same amount of oil in place as every other 40-acre tract?

A No, sir.

Q Then it is not in the size of the tracts that the differences exist, because they are all the same?

A Yes, in the Monument field we have one well to each forty acres. Each and every unit is the same size. No matter what plan is used, in acreage each and every unit is aloke.

Q And anything giving acreage as a factor is the same as a minimum allowable?

A Yes, sir.

Q Is it your testimony that just as long as pressure differentials

exist, the oil will drain from one man's property to another's?

A Yes, sir.

RE-CROSS EXAMINATION BY Mr. Selinger:

Q What position do you hold with the Barnsdall Oil Company?

A Proration engineer.

Q As such, are you familiar with the holdings of the Barnsdall Oil Company in all states where they have production?

A With most of the prorated wells. Some wells in what is called the stripper areas I am not familiar with.

Q As I understand your testimony, the only two factors on which you have accurate information are acreage and bottom hole pressure?

A I believe that is what I said.

Q Those two factors are considered under the present order by the Commission?

A They are.

Q You are familiar with the weight given each of the two factors?

A Yes.

Q On your suggestion of 25% to acreage and 75% bottom hole pressure, you told the Commission it would approach a minimum allowable of twelve barrels, is that right?

A I said that is the case for the month of February, 1940.

Q In other words, on that acreage factor, a small well on the edge would participate in the acreage allowable estimated at approximately twelve barrels?

A Yes, sir.

Q If the allocation on the per well allowable decreases, that minimum allowable is liable to decrease?

A That is true.

Q It might be the minimum allowable would get as low as seven or eight barrels?

A It might be possible.

Q In that particular case it will?

A I said it might be possible.

Q You recommend to this Commission what amounts to a minimum allowable per well, or per unit?

A Per unit.

Q In this state a unit is how many acres?

A Forty.

Q Have you recommended a margin allowable in other states where the Barnsdall Oil Company has holdings?

BY MR. FLEETWOOD: We object to that as incompetent, irrelevant and immaterial. This question is in regard to fields in other states.

BY MR. SELINGER: If I don't tie it in I will agree to have it deleted.

BY MR. WORDEN: I think you should confine your question to the Monument area.

BY MR. BAYS: Practically all the papers quoted from has to do with the East Texas field where they are allowed to drill seven wells to an acre.

BY MR. FLEETWOOD: No objection was made. If anyone had objected we would have agreed to have that evidence stricken.

BY MR. SETH: We move that all the evidence read as to some other pool be stricken?

BY MR. FLEETWOOD: We agree that anything we have offered that has reference to other pools be stricken.

BY MR. SELINGER: My question, the quotation I had in mind has a bearing on the Monument Pool.

BY MR. WORDEN: Since we have agreed we are going to strike the evidence as to other fields, we will confine everything to the Monument area.

BY MR. SELINGER: That is the point I was getting down to, whether the experts had known of other pools that had other considerations.

BY MR. WORDEN: The Commission feels we should confine the testimony to the Monument Pool. Inasmuch as those quotations were offered here, and the counsel who offered them has agreed that they be stricken, we will confine the testimony to the Monument Pool.

BY MR. SELINGER: Your Honor is striking the opinion read by Mr. Fleetwood?

BY MR. WORDEN: That is my understanding, that all the testimony offered in regard to other pools than the Monument Pool will be disregarded.

BY MR. FLEETWOOD: The Commission's ruling is the testimony Mr. Curtis gave with reference to quotations referring to pools other than the Monument Pool will be stricken, but that the quotations referring to the Monument Pool directly will not be stricken?

BY MR. WORDEN: Anything directly pertaining to the Monument Pool, that has any bea ring directly on that pool will not be stricken.

BY MR. SELINGER:

Q So that you recommend to this Commission that the minimum allowable in the Monument Pool be placed at twelve barrels per unit?

A It would have been in February under the recommended plan.

Q It would have been in February, 1940?

A Yes, sir.

Q What would the per well allowable for March be?

A I don't know what it is. If you can tell me what the allowable is, I can take that and figure it.

Q In February the minimum allowable was twelve barrels per forty acre unit?

A Yes.

Q Would that have the effect of having a lower minimum allowable in the State of New Mexico than in other pools?

BY MR. FLEETWOOD: Same objection, if he refers to pools outside of the state, or inside the state other than Monument.

Q As compared with other pools in the State of New Mexico.

BY MR. FLEETWOOD: No objection.

A I expect the order written by the Commission would apply only to the Monument field. This says Order No. 33 applies only to the Monument field.

Q That is not the question. The question is, would it have the effect of having a lower minimum allowable than other pools in the state?

A Other pools in the state are operated on other plans.

Q Would the effect be that the minimum allowable under your plan would be less?

A The minimum allowable would be less.

RE-CROSS EXAMINATION By Mr. Bish:

Q Mr. Curtis, are you aware of the fact there has been several packers set in the Monument Pool to conserve gas?

A Yes, sir, I am.

Q In your opinion, does that reflect, after setting the packer you take the bottom hole pressues, does that bottom hole pressure reflect through the pressure in the reservoir?

A Not necessarily so. At the previous hearing held in December I believe there was a committee recommendation made at that time by Mr. Kraus for the taking of pressures in packer wells.

Q In your opinion as an engineer, should there be an adjustment made for packer wells at Monument?

A Yes, sir, operators should not be penalized because he has set a packer.

RE-CROSS EXAMINATION By Mr. Seth:

Q Will you come over to your Exhibit No. 5 for a minute? Does the Barnsdall area lie in the W½ W½ of Sec. 7? Is that what you stated?

A Yes, sir, the W½ W½ of Seven and the E½ E½ of 12.

Q Now that shows the bottom hole pressures at the last survey, I believe in November and December, 1959?

A Yes, sir.

Q Take your No. 3, which is the northermost well of the eastern tier. What is the bottom hole pressure?

A 1350 pounds.

Q What is the bottom hole pressure of the offset well, the Anderson-Prichard, immediately east?

A 1360 pounds.

Q The offset well to the east is ten pounds higher than your well?

A Yes, sir.

Q Take the one immediately south, your No. 2?

A 1355 pounds.

Q And the offset well, the Anderson-Prichard No. 1?

A 1360 pounds.

Q Then the offset well is five pounds higher. Take your No. 7, what is that pressure?

A 1352 pounds.

Q And the offset well to the east?

A 1359 pounds.

Q Seven pounds differential. Take your No. 6.

A 1352.

Q And the No. 6 Anderson-Prichard immediately east?

A 1358 pounds.

Q On all four of those wells, your east offset had higher pressures?

A Yes, sir.

Q You contend Barnsdall is draining oil from the wells to the east?

A Yes, sir, wherever there is a difference in pressure there will be drainage.

Q Take the offset to the south, Continental No. 1, what is the pressure?

A 1367 pounds.

Q And your well to the north of that?

A 1352.

Q Your pressure is 15 pounds lower than the offset well. Come over here to your No. 8 in Sec. 12, what is that pressure?

A 1350.

Q And the one immediately south, the Amerada No. 1?

A 1355 pounds.

Q And the one immediately west, the Amerada No. 6?

A 1365 pounds.

Q The Amerada well is 15 pounds higher than your No. 8?

A Yes, sir.

Q Come up here to the next one, Amerada No. 3?

A 1330 pounds.

Q And what is the pressure of your well immediately east of that?

A 1356 pounds.

Q And the next one, the Amerada No. 2?

A 1360 pounds.

Q And yours immediately east?

A 1357.

Q And the Amerada No. 1?

A 1356 pounds.

Q And your well?

A 1356.

Q And the Skelly State, what is that?

A 1362 pounds.

Q Except in a few instances your wells had some five to 13 pounds lower pressures than the offset wells?

A Yes, sir.

Q And you think you are draining a lot of oil from your neighbors?

A We may have for a period. However, we will have less allowable because we have less pressure than our neighbors.

Q When will that happen?

A This new pressure survey was placed in effect on the proration schedule in February, 1940.

Q This difference in pressure, your wells being lower than the offset wells, will that continue for some time?

A Here they are higher than the offset (indicating).

Q Not to the west on this map, they average ten pounds difference. You were draining from your west offsets?

A Yes, there was a pressure differential across there.

Q And if you increased the bottom hole pressure formula to twenty pounds difference, or to some higher figure, it would increase the drainage?

A No, sir, you would give the wells with the higher pressure more allowable.

Q It wouldn't increase the drainage?

A No, those with the lower pressure would get less allowable.

Q You are way above the scale that would take the minimum in the application of your formula, that was eleven hundred something?

A 1118 pounds.

Q You are above that?

A Yes, sir.

Q You would get a higher allowable for that percentage?

A We would get a somewhat higher allowable. Those offsets with higher pressures would get more than we would.

Q Your drainage would continue if you get a higher allowable?

A No, it would tend to equalize it.

RE-DIRECT EXAMINATION By Mr. Fleetwood:

Q On the question of the offset wells, is it your opinion as an engineer that we are entitled to drain any oil from our neighbors?

A Not unless the offsets, by counter drainage, were making it up.

Q You don't contend that Barnsdall is entitled to drain from anyone else?

A No, sir. If we are in a low pressure area, we would drain from the high pressure area. We are not asking for anything we consider out of line.

Witness dismissed.

BY MR. FLEETWOOD: We do not have any further testimony or questions at this time.

BY MR. WORDEN: We will recess until 1:30 o'clock this afternoon.

Pursuant to recess taken, the hearing was convened at 1:30 o'clock, P. M. The hearing was called to order by Mr. Worden, and the following proceedings were had:

BY MR. FLEETWOOD: This fine New Mexico air reminds me of two more questions we would like to ask Mr. Curtis, with your permission.

BY MR. WORDEN: Proceed.

R. D. CURTIS,

recalled by Barnsdall for further re-direct examination:

BY MR. FLEETWOOD:

Q Mr. Curtis, we may have created the impression this morning that our sole interest in this proposed formula was the result simply of a matter of principle, and I admit that may be an important interest. I want to ask you if some difficulties and inequities which Barnsdall has suffered will be corrected or benefitted by the application of this formula, and if so, just what would be the nature of that benefit?

A Yes, I have figured what the allowable would be, and Barnsdall would gain six or seven barrels per well, or about, approximately 58 to 60 barrels per lease.

Q Judge Seth asked you as to the offset properties, some of which had slightly higher bottom hole pressures, ranging from five to thirteen pounds, and you testified there would doubtless be some drainage from those leases to our leases?

A Yes.

Q Is that the important thing in this picture, and if not, what is the important thing?

A The important thing is the equalization of pressures, where you wouldn't have the present great differentials. We have pressures ranging from 1300 -- nearly 1400 pounds on down to 500 pounds, and maybe less on some wells which are not included in this survey.

Q Is evening up the spread from 500 to 1400 pounds the vital thing, evening up the present great differentials in pressure?

A That is right. We would like to see the next survey show a more even distribution of pressures throughout the pool.

Witness dismissed.

R. G. SCHUEHLE,

being called as a witness, and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Seth, and testified as follows:

DIRECT EXAMINATION

Q Please state your name?

A R. G. Schuehle.

Q What is your profession, Mr. Schuehle?

A Petroleum engineer and geologist.

Q By whom are you employed?

A Shell Oil Company.

Q Will you state briefly your training and experience as a petroleum engineer and geologist?

BY MR. FLEETWOOD: Unless you want to go into that, I will be glad to admit his qualifications.

Q Your training has included geology as well as engineering?

A That is right. I have had advanced work in geology.

Q Are you acquainted with the Monument Pool in Lea County?

A Yes, I am.

Q Were you present when the discovery well was brought in?

A Yes, I was present when the discovery well was brought in.

Q When was that?

A May, 1935.

Q Have you been familiar with that pool ever since?

A I have been directly in charge of engineering and geology work in the field since the beginning.

Q And you are familiar with all of the wells and all development in this pool?

A Yes, I am.

Q Will you give an account of the stratigraphy of the field, if that is the right term?

A Yes, I will do that.

Q Have you a map of that?

A I have a cross section I would like to use.

(Cross section placed on map stand and marked "Shell Exhibit No. 1")

Q Mr. Schuehle, this diagram, Shell Exhibit No. 1, was that prepared by you or under your direction?

A Yes, sir.

Q Will you explain to the Commission just what that means?

A I am using part of that -- several parts or zones on that cross section to illustrate the strata of the field. Oil, gas and water are accumulated in the Permian lime formation, and that is the most important formation which is present in the field, and I will spend most of the time discussing it rather than the limestone formation.

The top, indicated by the uppermost green band, and that is overlain with anhydrite, and as you penetrate the limestone formation, you first find it composed of a series of crystalline and sandy limestone zones. The uppermost zone penetrated in the limestome section is persistent throughout the field, a horizon of sandy, dense limestone indicated on this cross section by these green gands. The green means sandy limestone. I wish to explain that the entire section, from here down to here (indicating on cross section) is sandy limestone.

Q That means between the two uppermost green lines?

A That is right.

The next segment, between the next two green bands, is pure crystalline limes --

Q Between the second and third bands going down?

A That is right. It contains a certain amount of sandy limestone greatly improved. The next has been designated the Sandy phase and incompasses this area (indicating). You will notice it is a zone in which we have angular green lines, indicating the present lenticular formation underlying that. For the moment we will ignore that. The brown color in the section, underlying the lowermost green phase is a pure crystalline limestone body.

Q To get that definitely, above the uppermost green line is anhydrite?

A That is true.

Q Between the first and second green line, reading from the top

to bottom, is sandy lime?

A That is right.

Q Between the second and third green lines is white crystalline limestone?

A That is right.

Q And between the third and fourth green lines is a body of sandy lime with lenticular formations in it?

A It represents a formation or horizon of crystalline lime with some minor amounts in the second, and the lower is pure.

Q While it may not be right in point here, on Exhibit No. 1, the line at the bottom represents the water, is that true?

A That is right.

Q And the heavy brown line that runs through the third and fourth green lines, what does that represent?

A That represents the uppermost limits of the oil accumulation.

Q Is it the contact between the oil and gas?

A That is right.

Q Could you state in what direction that cross section runs?

A It is an east-west cross section, through the middle of the field, approximately.

Q Will you take up the structure of the pool?

A At the present known informations shows we have an east-west dip over the limits of the field. On this particular section, this (indicating) is the extreme eastern well, and this is the extreme west well. That is as far as we have control at the present time. From the closure we have a dip from both flanks.

BY MR. SETH: We offer in evidence Shell Exhibit No. 1.

Q Will you get the other maps you want?

(Witness places a map on the map stand). (Marked Shell Exhibit No. 2).

What does Shell Exhibit No. 2 represent?

A A north-south cross section through the long length of the Monument field. I wish to present and show the same conditions are present throughout the field, on a north-south line, as I have shown on Exhibit No. 1. You will notice also a certain degree of dip to the south and a smaller degree of

dip due north.

Q Do these green lines mean the same thing as on Exhibit No. 1?

A Yes, the color and lines are identical.

Q Will you state, these various lines up and down the exhibit, what do they represent, wells?

A Each line represents a well.

Q On the wells, in places there are small dots. What do they mean?

A We have triangles here, and one triangle means the casing point.

Q It means that below that point the well is not cased?

A That is right. There are other smaller lines, and when all such data as presented on the section is compiled, we have the structure outline of the zone by contours on this map.

Q On Exhibit No. 3?

A On Exhibit No. 3, they are the black waving lines.

Q What is the contour interval?

A 20 feet on this map.

Q Does the contour represent the top of the formation as you have shown it?

A The contour of this so-called upper sandy phase.

Q Do you want to discuss the contour of the structure?

A That would be commonly termed anticlinal.

Q With some minor closures?

A The contour shows to minor closures, one in 19 S., R. 36 E. -- R. 37 E., instead; and another closure located -- the predominate or main closure in T. 20 S., ranges 36 and 37 E.

Q Anything further you want to state?

A I believe it is quite obvious.

Q Porosity -- what do you show with respect to porosity?

A Porosity in the Monument Pool is extremely erratic, as we all know. It has been found to occur predominately in the pure crystalline lime phases. Over geologic time we know there is a certain degree of porosity throughout, but it has been found, by tests and experiments in various wells, as far as the producing life of the field is concerned, effective porosity is found only in the pure crystalline phases. Under those con-

ditions, we find in the Monument Pool three zones in which effective porosity is present, indicated as Zone 1, extending between the second and third green lines, and the second zone which occurs between the third and fourth, and the third zone underlying the lowest green zone.

Q That is, between the green and the water?

A Between the green and as far down as the water.

Q Is there at the present time, in your opinion, any intercommunication between the three "pays", as you might call them?

A Other than through bore holes, there isn't any communication between the so-called zones.

Q In a natural state, before wells were drilled, the bore holes making no connection, you believe they were not connected for any practical purpose?

A As far as the life of the field goes, that is right.

Q Has your detailed work shown you anything as to permeability?

A Yes, in addition, permeability is very erratic. One measure of permeability, and solely permeability, we have found on examining the map, the potential range is very erratic. Just picking any particular well, I find a well here has a potential of 744 barrels a day, whereas over in this area (indicating) a mile away, the potential is 3504. There are extreme variations in permeability. There is another point we found in studying porosity in the field, that porosity apparently is more effective laterally.

Q Do you mean porosity or permeability?

A Permeability -- pardon me -- is more effective parallel to the bedding planes than to the vertical.

Q That means oil will flow more readily laterally than it will up and down?

A That is right. I might now point out that very little movement of fluid takes place vertically. Practically all of the movement is laterally.

Q Is that all on the matter of porosity? If it is, take up the accumulation of oil.

A Having covered porosity in a rather brief manner, we have found after various tests on wells and checking samples, extremely

detailed work, that oil has accumulated when porosity permits as high as 175 feet below sea level, and not any farther. I wish to state that was the original top oil accumulation, and the original water accumulation occurred immediately below, 340 feet below sea level. In other words, you have a horizontal oil column found wherever porisity would permit the oil to be accumulated. Now, gas is found immediately overlying the oil.

To go back to structure for a minute, I mentioned we had an anticlinal fold. Oil, gas and water are accumulated in the lenticular formation, accumulated there in a trap formed by deformation, and sealed by the overlying anhydrite, and the limits of the oil accumulation, the ultimate limit of the oil accumulation was when the anhydrite intersepted the oil column. However, as I stated, within the oil column, or within the limestone formation -- pardon me -- the structure has not compelled the accumulation of oil. That is indicated in this manner: we have this green formation, (indicating on map) meaning a sandy limestone, dense and impervious. The brown is oil accumulation, the upper line indicating the upper limit. We have further found evidence of some oil, of a non-producible quantity, the oil showing around the bore hole down at the same point in the highest permeability section. That is indicated, the impervious structure, by this line across the green. We have, therefore, keeping in mind this zoning affect and the fact that lateral permeability greatly exceeds vertical permeability, we have been able to set up definite zones, and during the exploitation of a well those can be followed. We have been able to outline these zones and locate a well so that we may intercept the permeable zone within the oil column. If you should be drilling a well, and are unfortunate enough to find this entire interval entered by you there dense and impervious, with porosity tight and erratic, find a dense zone in the crystalline lime which you find throughout this interval, you would be very unfortunate to have a dry hole or a very small well. Therefore, since we have these zones in the field, and we have barriers separating this zone from this. I

point out this well on the extreme north end --

Q (Interrupting) Exhibit No. 2 you are referring to?

A That is Exhibit No. 2. I think it would be preferable to use No. 1 at the present moment. You will observe the same picture continues through the field, making the extreme -- this is the east-west cross section (Exhibit No. 1) -- making as the extreme west well, I believe, Shell Foster No. 2. You will observe it encountered oil accumulated entirely within the so-called first zone. The same thing happened in the next three wells -- all of the production from within the first zone. Then go to the center part of the field and select, for example, a well, here, I believe Gulf Graham - State 4F encountered oil accumulation only within the lower horizon, this zone, which carries oil in place in the so-called second zone being above the gas-oil contact; thus, keeping in mind we have an absolute barrier in this green phase and this green phase (indicating on map) -- that is, little production in this zone (indicating). This zone (indicating on map) is also oil bearing in places, it has prolific wells, is also separated from the other two by a dense, impervious barrier. We have three separate reservoirs within the Monument Pool between which no intercommunication exists other than through the bore holes. To show conditions --

Q (Interrupting) Let me take this first -- I don't know that the Commission exactly understands. This area between the two upper green lines marked "Main Sandy Phase", is not oil bearing?

A It is not.

Q Between the second and third, marked "First Zone", between the second green line and the third green line, that is oil and gas bearing?

A That is right.

Q This heavy brown line which runs across this cross section, marked "Original Gas-Oil Contact", that represents the top of the oil?

A Originally.

Q In this zone marked "First Zone, between the second and third

green lines, all above the brown line is gas?

A That is right.

Q And this zone has oil only where it extends below the brown line?

A That is right.

Q At the north, the middle, and again at the extreme south?

A That is right.

Q Come down between the third and fourth green lines, the "Second Zone", that is also oil bearing?

A That is also oil bearing.

Q Where that projects above the brown line, it is gas bearing only?

A That is correct.

Q Below the lowest green line it is again oil bearing?

A That is correct.

Q The "Third Zone"?

A That is right.

Q And beneath that is the water?

A That is right.

Q When you speak of wells penetrating the zones, you mean this (indicating first zone), or this (indicating second zone) or this (indicating third zone)?

A That is correct. Since we have three zones, and you have probably noticed the zones overlap, in which wells may produce from one, two or as many as three zones colored on this map --

Q (Interrupting) That is Exhibit No. 3?

A Yes. I wish to make a statement at the present time. Although I stated a well has penetrated the first, second and third zones, I am stating that all three zones produce at one and the same time in the same well, the porosity variations may be such that only one zone produces in a well. However, it is possible that should the porosity be developed, then the well might produce all zones. On this map, Exhibit No. 3, the colors show the groups of wells producing from the various zones.

The blue shade, shown on the extreme flank, means wells that have penetrated only the first zone within the oil column,

or this area right here (indicating on map).

The yellow are wells that have penetrated the first and second zones within the oil column. We will use as an example the Texas-American Insurance Company No. 1 well. It penetrated the first and second zones within the oil column.

The orange color, this small area here (indicating) and another area here (indicating) are wells so located that they have been able to penetrate all three producing zones within the oil column. We might make an example of Shell-State D No. 1. You see the illustration of this particular well (indicating on Exhibit No. 2).

So not only are there three separate reservoirs open in the field, each having its own variations of porosity and permeability, but you have overlaps, or six types of wells to make a further complication, making it rather impossible to determine what reservoir characteristics apply, and if so, of what value they are.

To make it a little more clear, and to show the exact relationship between this map and the cross section, I have another exhibit I would like to present.

(Witness produced map marked "Shell Exhibit No. 4).

Q Will you please explain Shell Exhibit No. 4.

A Yes. That is a three dimensional presentation of the north half of the Monument structure. This entire exhibit presents the field from the so-called range lime --

Q (Interrupting) You mean the range lime shown on Exhibit No. 3?

A The range lime shown on Exhibit No. 3, yes. Shown here by colors having the same meaning as on the cross section, a generalized section through the field. Here is the first Sandy Phase --

Q (Interrupting) When you speak of "here" that does not get into the record. You are speaking of this mark?

A The uppermost green section represents the main sandy phase. The next section, this white portion here (indicating) ignoring the brown, is the first zone. This solid green is the so-

called lower sandy phase. And then this (indicating) represents the lenticular or second producing zone. We have three wide so-called beds through there. The third zone is from here (indicating) on down.

We have here on this line an oil well, the Amerada Hanley No. 1, located on this map in the yellow, on the zone map, and it has penetrated and produced in the first and second zones, the oil accumulation within the first zone and able to penetrate the second. This particular well, the Amerada Hanley No. 1 is producing from two horizons, the first and second.

Then, showing a different degree, we have another well located, the Ohio Barber No. 3. That well is producing from the second and third zones.

Near the middle of the exhibit is the Repollo Phillips No. A2, producing only from the third zone.

Q The upper part of the exhibit, above here (indicating), what is that?

A The blank contours on here represent contours on the north. they have been distorted somewhat due to perspective, the blue here being shown on this particular well, Shell Foster No. 1, located over here in the blue area, seen here in the blue area, produces solely from the first zone. The same color value meaning the same zoning.

Q On this map, Exhibit No. 4, you have immediately below the top lower sandy phase, or representing the second zone, you have drawn substantially parallel lines. Does that mean the same thing as that represented by these lines (indicating)?

A Yes, sir.

Q You don't mean the sandy lime and the lime are laid down parallel?

A No, that is merely an idealized representation and is drawn parallel, and are continucus throughout the zone as shown.

Q This heavy brown line or mark, is that gas?

A Above that is gas.

Q And the line along the bottom of the picture?

A Means water.

Q The only area that produces oil is between the brown line

and the water?

A That is right.

Q Below this area (indicating) is a gas cap?

A That is right.

Q Turning to Exhibit No. 2, across this area marked "Lower Sandy Phase" are well bores, are some brown lines. What does that mean?

A Because this lower zone shows some effect --

Q (Interrupting) You don't mean the lower zone do you?

A No, the second zone shows some effect of lenticularity, this color, brown, through the well bore indicates a good oil showing, a good oil bearing porous sand. That particular well. We have not attempted to evaluate the oil accululation between the wells, and have shown it only in this particular well.

Q In this so-called second zone, the lenticular zone, is oil sometimes found in substantial quantities?

A Yes, some very prolific wells have been completed in that zone.

Q Do wells producing from the same zone always function alike?

A No, definitely not. Previously I have mentioned you have variations of permeability within zones, between layers. In other words, the porosity, I would say from this first zone, indicated by the second and third lines in this cross section, does have the same porosity value, not permeability. Through there there are little layers varying within themselves.

Q The same is t rue of the other zones?

A The same is true of the other zones.

Q And vary between zones?

A Apparently also there is considerable variation between zones.

Q What effect in the functioning between zones is the fact that there is more permeability laterally than vertically, does that have an effect in the operation of a well?

A Definitely. Now, as I have said before, the movement of fluids have been laterally, coming in this manner, the vertical porosity is small -- relatively small, and since there is the zoning effect, the movements of fluid have all been parallel to

bedding planes, which would be apparently parallel to this green line in this zone. The result has been the water movement has been very erratic at the present time, and the gas movement is erratic, varies. The gas-oil content at the present time in the oil columns is very disturbed.

Q Have you a water map which shows that?

A Yes, I have. (Witness produces map which is marked "Shell Exhibit No. 5).

BY MR. SETH: We offer in evidence Shell Exhibits Nos. 2, 3 and 4.

Q Will you please explain Shell Exhibit No. 5, Mr. Schuehle?

A Each colored unit represents a unit at the present time producing water. The various colors means different percentages. The blue, zero to 5% water; yellow is 5% to 15%; the orange -- an example is the Skelly well, State No. 1 -- runs 15% to 30%; the purple, over 30%.

As you will observe, there is no uniformity of water encroachment, and there is not any uniformity of time of encroachment; it is scattered heterogeneously across the field. That is due primarily to lateral movement. If you have a lateral movement, if this well is securing production in the upper area, in here --

Q To what well are you referring?

A Gulf No. 3 -- I don't recall whether it is a water well -- I am using it as an example. This well, when it is producing, the oil moves in this manner --

Q Parallel?

A Parallel with the bedding planes, the water drive will function up to 100 feet either side, and the movement, also parallel, of the gas does the same thing. If disturbed, it moves downward along the bedding planes, which accounts for the extreme difficulty we have had in setting packers.

Q That appearance of water is very erratic?

A Extremely erratic, yes. And exactly what you would expect in a reservoir of this kind.

Q What is the energy in that Monument Pool that produces the oil?

A The energy is both gas and water.

Q This gas cap, would you say an area north of this brown line, and between it and the second green line, you say is gas?

A That is right.

Q About how thick is that, roughly?

A It is possible to find gas over an area of as much as -- assuming a small amount of gas found immediately at the top -- you would say the ultimate limit, in the vicinity of 500 feet.

Q That gas lies in the portion of the second zone which extends above the gas oil contact?

A That is right.

Q You say the field is operated under both water and gas drive?

A Yes, it does. Some layers can be identified definitely as gas drive, at least, in parts, and others water drive, in parts.

Q The pool varies?

A Yes, sir.

Q Would you say some were almost entirely gas drive?

A Some are almost entirely gas drive, and some very nearly water drive.

Q Which is the more efficient? Are you able to compare them? Which produces the most energy?

A That would depend entirely on the porosity and permeability.

Q And which force would equalize quicker under shut-in conditions, gas or water?

A Gas equalizes more rapidly.

Q You have stated, Mr. Schuehle, that in your opinion the field was originally divided into three zones in which gas and oil were found?

A That is quite right.

Q You mean, that is as far as your investigation discloses?

A That is right.

Q There might be fractures causing intercommunication?

A There may possibly be some fractures.

Q Have you seen any evidence of it?

A I have seen no evidence of it.

Q The zones are connected through the well bores, I believe you stated?

A Quite right.

Q By that you mean a well, whose casing point is above the contact between the oil and gas, the bore hole going down permits gas --

A (Interrupting) It could exert pressure on another zone.

Q How many wells in the pool or field are there through which that pressure might be exerted, roughly?

A Roughly, it would be through all wells within the yellow, purple and orange, about 250 to 300.

Q There are now 250 to 300 openings through which there may be intercommunication between zones?

A That is quite so.

Q Does that permit the gas in the large gas cap in the first zone to exert its pressure on the oil in the other zones?

A That is quite possible, yes.

Q Now, Mr. Schuehle, when a well is shut in and builds up bottom hole pressure, may that indicate that it has more ready access to the gas cap?

A It may indicate that.

Q It does not necessarily indicate a water drive is coming in and building up the pressure?

A In some areas it would probably be water drive. It depends entirely on the well and the zone you are considering.

Q And you could not fix any uniform rule throughout the pool, could you?

A No, you couldn't.

Q Would that build-up of bottom hole pressure when a well is shut in have any relationship to the recoverable oil in place?

A None whatever.

Q You stated that gas pressure equalizes much more rapidly than water?

A That is right.

Q Gas travels through openings in lime much more quickly than water?

A That is quite right.

Q If a well builds up quickly, it might mean it had direct

connection with the gas cap?

A That is right.

Q And had no relationship whatever to the oil in place?

A None whatever.

Q An increase in the present bottom hole factor at Monument might give a well an advantage that merely had direct connection with the gas cap?

A That is quite right.

Q You could not lay down any rule generally applicable that would apply to bottom hole pressure?

A None whatever. We have a complexity of reservoirs at Monument, none of which function like the others.

Q And the bottom hole pressure does not mean anything?

A Bottom hole pressure does not mean anything in reservoirs of this character.

Q In the bottom hole pressure, is there any evidence of water coming in from the sides?

A Oh, yes. I might cite a particular well, Shell Foster No. 2. That well is producing from the first zone only. I believe you will find that well on this cross ~~x~~ section, Exhibit No. 1, if I am not mistaken, it is this particular well (indicating). The original water level is immediately below -340 feet. That particular well found oil at -326 feet, and is producing in excess of 30% water. That well, completed approximately 12 months ago, found the horizon at that time was water bearing above the original oil-water contact. Whereas the next well immediately east, Shell-Foster No. 1, produced in the same horizon, the same total depth, which is somewhat higher on the structure, probably in the same zones open at the same total depth, that well is water free. Water moving up structure has reached this point, climbing progressively in this manner, and will ultimately reach Shell-Foster No. 1. At the present time we can expect to state the horizon or layer in which the water might appear.

Q And you stated a while ago that the oil, water and gas moves more easily laterally, following the bedding planes of the

structure?

A That is right.

Q A well of high pressure may be drawing oil horizontally from neighboring leases?

A That is it, oil going from one to the next, moving laterally.

Q Mr. Schuehle, is there any definite factor in the Monument Pool which, in your judgment, can be used for proration other than acreage?

A None whatever. It is the only one that can be determined.

Q Porosity cannot be determined?

A No, sir. Bottom hole pressure means absolutely nothing, because of the different types, the extreme complexity in the structure.

Q And the same well may have three different phases?

A That is right.

Q Mr. Schuehle, would you recommend any increase in the percentage now allowed for bottom hole pressure?

A Definitely not.

Q Your recommendation would be that there be no increase?

A That is quite right.

Q What do you feel about continuing the present formula?

A Since there is a faint possibility there may be a slight degree of intercommunication and at the present time have some intercommunication, both in honesty and in fairness, I think you may be able to use a small bottom hole factor, but certainly it should not be increased.

CROSS EXAMINATION By Mr. Fleetwood:

Q Mr. Schuehle, you do say there is drainage between the various zones?

A No, I didn't say there is drainage between zones. I said there isn't between wells, as far as we know.

Q Why is it you want to give 25% to bottom hole pressure?

A I did not say 25%; I said 20%.

Q You want to give 20%?

A That is ample.

Q Why do you want to give that much?

A In case, because we cannot see between the bore holes, there may be some small degree of fracture and a very small tendency to equalize pressure.

Q There may be drainage?

A Very slight, if any.

Q I believe you advised the Commission in your best judgment acreage is the only factor we could properly consider in a proration formula at Monument?

A That is right.

Q If every acre has the same amount of oil beneath it, is that a good system?

A Yes, sir.

Q And if every acre does not have the same amount, it is not good?

A If we knew that every acre does not have, it would not be, but we do not know.

Q It is your opinion that at Monument every acre does have the same amount of oil as every other acre?

A I am not in position to state.

Q You have an opinion?

A Information is so controversial, there are so many factors present, such a complexity, that an answer to that now could not justifiably be made.

Q You don't want to tell your opinion?

A I am glad to tell it.

Q And that is?

A I have studied this reservoir in such detail, over a period of time that I find I am not able to judge.

Q You have not formed an opinion?

A My opinion is that it is a section of such complexity that it is just impossible to answer that question.

Q Mr. Schuehle, I understood, from this complex testimony, that you stated there were at least three separate and distinct zones, one almost entirely separate from the other two?

A That is right.

Q What is the basis of that?

A I know that to be the case from very detailed, careful study of numerous wells. We are able to find these dense, non-productive layers throughout these layers, when the well is drilled to depths sufficient to encounter such zones, it is present.

Q At various depths?

A At various depths, depending on the structural position.

Q How is it you know the third and fourth green lines is wholly impervious and furnish a sealed space or barrier between the zones? How do you know that?

A A detailed study of these cross sections show a relatively few number of wells -- more or less present in all wells. On examining them further, you will find sandy zones at relatively uniform depths in every well placed where logically you would expect to find them.

Q You used a word in your testimony that I am not familiar with, that is, lenticular. The best I understood that was that there were streaks of porosity?

A That interrupts non-continuous areas, areas that may not be continuous.

Q Various types and degrees of porosity?

A That is right.

Q And I believe you said that exists between the third and fourth green lines?

A I said those green lines represent lenticular bodies of sand. I was discussing the presence of sandy limestone that has porosity varying through it.

Q Is there varying porosity and permeability in the third and fourth green bands?

A Within the band itself?

Q Yes, this one here (indicating on map) Are the porosity and permeability both varying, or are both of these remarkably porous or permeable?

A It depends on how you use the terms. Over geologic time there was a certain degree of porosity, intercommunication, but during the production life of the field that porosity is not effective.

Q You say that the oil was laid down on that horizontal plane?

A No.

Q You say it is not?

A It is now. It is accumulated.

Q I will say accumulated, in that horizontal band?

A Originally.

Q In order to do that it had to go through non-permeable structure?

A Certainly.

Q But it took a long time to get through?

A That is true.

Q We are not going to be so long taking the oil out, so we disregard that?

A We can disregard that because it is ineffective.

Q From what zone is the most oil produced?

A All three zones are open in the field.

Q I was curious to know which zone produces the most oil. Roughly, just in a general way. I will not hold you to the number of barrels.

A That is pretty well divided, as shown by the zone map there.

Q Now, Mr. Schuehle, in any one of the three zones, looking back over on this Exhibit No. 3 cross section -- the north and south cross section -- Exhibit No. 2. Suppose for the moment that in any one of those zones there are differences of bottom hole pressure, would there be drainage from well to well, or property to property, within that zone?

A If they were connected.

Q In the same zone?

A I stated that within the zones there were layers.

Q That is right.

A If two particular wells were open in the same layer, the identical layer, with different bottom hole pressures, that would cause migration.

Q From the high to the low?

A From the high to the low.

Q You think the majority of wells within any one zone are intercommunicating within that zone?

A Not necessarily.

Q I concede it would not be necessary, but what is your judgment?

A Frankly, there are so many porosity variations and so many layers open -- if you want to refine the point to where it would group wells producing in the same zone and the same layer, it becomes ridiculous -- you get to the point where you have two wells here, and two wells here --

Q (Interrupting) In the same zone?

A This proposition presented here can be refined to an almost ridiculous point.

Q Mr. Schuehle, maybe you can enlighten us further: ordinarily speaking, in one production zone or reservoir, disregarding the known theories relative to Monument, within any ordinary zone or horizon where there are differences in bottom hole pressure, does drainage exist between two wells?

A When there are proper conditions of permeability and porosity, there will be movement of fluid from high to low.

Q Those conditions do usually exist?

A In Monument?

Q Yes, those conditions do usually exist?

A Not in limestone.

Q So in limestone fields it does not necessarily follow there is drainage from high to low?

A That is right, because of the barriers.

Q An impervious, cementlike dam?

A That is right.

Q That is very frequently the case?

A Extremely.

Q You know of very few reservoirs in limestone?

A That is too general a statement; I would not care to say.

Q Do you know of other fields where there is little drainage?

A Yes, any limestone produces the same effect.

Q There will be no drainage between zones?

A Not when it is entered.

Q So that there would not be intercommunication?

A I said --

Q Ordinarily do they communicate, or not?

A You would have to cite specific examples, and I would answer you.

Q Can you tell what would be the adverse effect of giving more weight to bottom hole pressure factor in a formula?

A In the first place, attempting to prorate numerous reservoirs, under varying conditions, there are gas drives of all degrees and water drive, you can't make a bottom hole pressure factor that would work because you cannot determine the facts.

Q What we should do is divide this field up into three or four or half a dozen areas, and prorate each separately?

A Suppose you difide it up into three areas, it would not work, because I said you could refine that point to a ridiculous degree, you would not know where to stop, you might have to prorate each one on a different basis.

Q You say there are three reservoirs. Wouldn't it be proper to prorate them separately?

A No.

Q What pressure, in general, do the most recently drilled wells have? Is it higher or lower that the early wells?

A Naturally lower.

Q Why?

A Some degree of depletion has taken place.

Q On all three zones?

A Naturally.

Q Is that not because of intercommunication?

A No, certainly not. There is no intercommunication between zones.

Q Now, Mr. Schuehle, you said, and I think properly, that bottom hole pressure is no indication of oil in place?

A Quite right.

Q You stated that a well which obtains pressure as a result of the presence of gas, or the gas cap, builds up pressure more rapidly than under water drive?

A I admit that statement.

Q You see any objection to giving wells which rely on water pressure a longer time in which to build up?

A Yes, I do, because you do not know, and you will not be able to find out until too late, whether you have water drive or gas

drive.

Q I thought we knew, in certain wells we had water drive?

A I showed water drive, but I did not say it was the main source of energy.

Q That water drive on Exhibit No. 1, is that the result of higher or lower bottom hole pressures than the field average?

A That usually, as I recall, is lower than the average.

Q Around the edges the bottom hole pressures are generally lower?

A No.

Q Generally speaking, that is not true?

A You can't generalize here.

Q I am asking if it is not more apt to be the case?

A That may be due to many causes.

Q In that end of the field (indicating) you have low and you have high. Most of the low pressures are around the edge of the field isn't it?

A I would not want to make that generalization.

Q You would not say that is not true?

A I am not prepared to go into that.

Q You think there is any drainage between properties going on in this field?

A When you have lateral movement it is rather hard to prevent drainage.

Q So what is your conclusion? There is migration of oil?

A There is some.

Q There is some?

A That is right. It may be compensated, it may be moving from a property that is getting it from some other property.

Q The ideal thing would be for every man to keep the oil under his own tract?

A Naturally.

Q That is not occurring at Monument?

A We don't know.

Q Didn't you just say there was some migration?

A I said it might be compensated.

Q There might be compensation for the drainage?

A Certainly.

Q Would you say some of the wells are producing from two or three zones at one time?

A Yes, some do.

Q That connects those zones?

A Through the bore holes there is some connection.

Q After all, wells in the field are holes in the ground through which there is some connection?

A You are interpreting my statement.

Q I don't want to interpret.

A I said wells have penetrated as many as three zones within the oil column. I immediately went on to say further that did not mean that every individual well produced in all three zones.

Q I jotted down a note that you said there were 250 to 300 wells the bores of which permitted intercommunication. Did I misunderstand you?

A No, that is right.

Q So wouldn't those 250 to 300 wells, with an average of a 7-inch opening --

A (Interrupting) Six to seven inch.

Q Would they permit intercommunication between zones?

A Yes, some degree.

Q And there may be some fracturing, although you did not see any evidence of it?

A That is right.

Q Is the permeability and porosity of the three zones greatly varying?

A Extremely varying.

Q Except in this impervious strata that is not true?

A Your degree may be extreme, but the entire range is very small, and therefore you can eliminate it.

Q Do you know why some wells, which you refer to, were drilled so as to take in only one or two zones, and others to take in the entire oil column?

A You mean all three zones?

Q In all three zones?

A Naturally the point is, I should say, a number of wells were drilled before this setup was recognized to its most completest extent.

Q When did engineers and geologists recognize this to exist?

A That has been gradually increasing since the inception of the field.

Q If you had -- let us suppose the State of New Mexico had leases, and you, as an engineer and geologist, told them they were located in Zone No. 1, and all around wells were drilled, and you told them they were drilled in No. 2 and No. 3, and that Zone 2 and 3 did not communicate with No. 1. Would you give them the advice that they could sit idly by and they need not drill offsets on their lands; that there was no danger of their lands being drained?

A I don't suppose I would give such advice, but I would not give it from an engineering standpoint. I would probably say it would be better to go ahead and drill.

Q Why keep on drilling if there is no danger of drainage?

A The legal profession does not know that condition exists, so they presuppose that there would be drainage. That condition does exist but the courts do not know it.

Q If you knew that all these wells were drilled right up to your property line, you would not hesitate to advise your client that he need not drill here because he would not be drained?

A If I was working there and found that condition as you suggest, I would say, from an engineering and geological standpoint that drilling was unnecessary because you would not suffer drainage, but there are other factors that keep you drilling.

Q You would not tell him he would not be drained?

A It depends entirely on conditions I found there.

Q It follows than, dosen't it, Mr. Schuehle, if we may assume an idealistic view of the thing, if we could shut Zone 3 off, and never touch it, could we produce all of the oil from Zones 1 and 2, and with the sealed dam above Zone 3, that the oil in Zone 3 would never migrate into Zones 1 and 2, and the reservoir pressure would never be lessened as a result of

producing the oil from Zones 1 and 2?

A Do you mean if we had been able to foresee this early, understand the setup before any wells were drilled, and had been able to drill down and stop the wells above Zone 3, and never enter it?

Q That is right.

A Then you have a barrier other than as I mentioned the possibility of fracture.

Q But if you knew you did not have that. Outside of that?

A Then you could.

Q Would you be pretty certain that no oil would migrate from that zone?

A That is right.

Q And you would be equally certain the reservoir pressure would never be decreased in Zones 1 and 2?

A State that again.

Q Decreased in Zone 2&1, if you are certain it would not be?

A Not of any importance.

Q None at all. It is impervious?

A Effectively so.

Q And you would be equally certain the reservoir pressure in Zone 3 would not be decreased?

A Yes, I think you can say so if it were never opened, if you permitted it to remain in a natural state, then you could exhaust the upper zones.

Q And it not be distrubed?

A Yes

Q Does not water encroach in all zones?

A It is encroaching all over the field.

Q You don't mean it is going through this impervious zone?

A I think not.

Q Then it is encroaching on all zones?

A Water is tending to replace all the oil that has been withdrawn from the reservoir or reservoirs.

CROSS EXAMINATION By Mr. Christie:

Q Mr. Schuehle, what is the geological formation, the so-called formation here?

A Permian limestone.

Q What geological name does it have?

A We are calling it Permian limestone.

Q What is the geological formation of your No. 2 zone?

A The whole section technically is a formation, and that is refined to horizons, those formations, or layers, so the entire limestone section is a formation.

Q All three zones are producing from the same geologic formation?

A That is right.

RE-CROSS EXAMINATION By Mr. Fleetwood:

Q One more question. The official records of the Proration Office of the State of New Mexico, quotes Mr. Edgar Kraus, as follows: "One reservoir in Cooper, Eunice and Monument are present and that although several porous zones may exist, that the gas, oil and water accumulation cuts across such stratigraphic zones, and that therefore the gas-oil contact and the oil-water contact are essentially horizontal planes, irregularities being due to differences in porosity near such contact. With such a picture of the reservoir it must be plain that there is communication between zones, and therefore there must be drainage between zones. Whether such drainage is rapid or slow depends upon local conditions." That is dated June, 1936. Do you disagree with Mr. Kraus?

A In some parts he is quite right. In one part, however, I do not agree. I agree with the zones, that is the same theory presented here. He is quite right about having intercommunication during geologic time, I am sure he is correct there.

Q The quotation states "is" communication there.

A I don't agree with the present drainage.

Q Mr. Wahlstrom, of the Stanolind Oil & Gas Company, testified here before the Proration Commission on January 20, 1936, stating: "I agree with Mr. Kraus' statement, under each one of these fields you have these porous horizons. However, they are connected vertically and in communication, and as the gas,

oil and water contacts are found, they have relation of depth which would practically convince you there is this connection or you would not have found oil, gas and water in that relation. I am assuming here that there are not any particular zone or strata pays, they are all intercommunicating. We have several specific examples in each one of these fields that show definite intercommunication in wells 1320 feet apart." Would you say Mr. Wahlstrom also was mistaken?

A Of course, you must realize those statements were made early in the life of the field. Little development had taken place. They had not been able to get the zoning effect. It had not been evaluated to the degree we can evaluate it now.

Q You think later developments --

A (Interrupting) They had a very good start on the right track.

Q Further development have shown the error of their ways, in some respects?

A Their statements, so far as active intercommunication at the present time is concerned, I do not agree with them.

Q And similarly, Mr. Schuehle, the procurement of additional information in the future may altar your opinion?

A That field at the present time is so nearly completely developed, we might say we have so much knowledge and information at the present time, that any changes would be in minor details.

Q In other words, this is the latest, and perhaps the best and last engineering and geological theory that will be advanced?

A That is quite right.

Witness dismissed.

GEORGE H. CARD,

being called as a witness, and being first duly sworn, was examined by Mr. Seth, and testified as follows:

DIRECT EXAMINATION

Q Stat e your name please.

A George H. Card.

Q Are you the same Mr. Card who heretofore testified as a witness for Barnsdall?

A I testified back at the Monument hearing in December.

Q What is your profession?

A Petroleum engineer.

Q How long have you been engaged in that profession?

BY MR. FLEETWOOD: We will admit his qualifications.

Q Mr. Card, we have had a lot of talk here about the movement of fluids. Do you agree with the theory advanced that oil moves from a high pressure to a low pressure area?

A Yes, under certain conditions.

Q What are those conditions?

A In a reservoir having uniform permeability.

Q Are there any limestone fields with which you are familiar that have uniform permeability?

A No.

Q What is tho situation at Monument? Is it a limestone field?

A It is a limestone field, yes, sir.

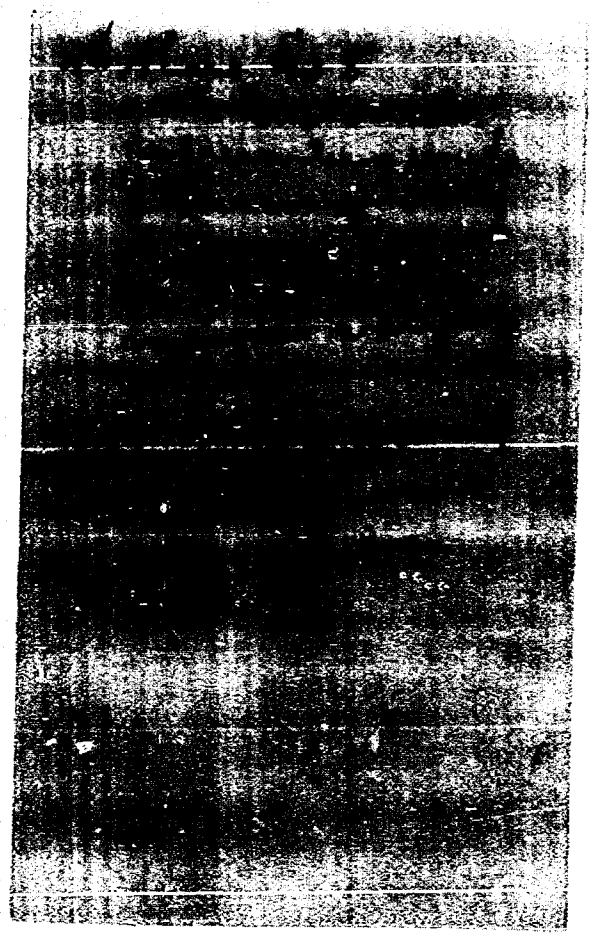
Q Does it have uniform permeability?

A No, it does not. It varies widely.

Q In a limestone field of varying permeability, what is the effect of equalizing the bottom hole pressure at the well bore?

A With two adjacent wells, one well having a permeability much higher than the permeability of the other unit, the pressure gradient of the well having low permeability would be much steeper than the well having higher permeability, therefore the drainage area of the well having the high permeability would move into the unit having low permeability, and would drain the oil from the unit having low permeability.

Q Could you illustrate that with a sketch of some kind?





(Witness draws a sketch, marked Shell Exhibit No. 6).

A You take the dividing line between the units, the vertical line, the wells being an equal distance from the dividing line. This would be the shut-in pressure at the bore hole of the two wells being equal.

Q Will you indicate the high permeability well with an "H"?

A This one would have low permeability; this would have high.

Q You have indinated that by the words "Low" and "High"?

A Yes. We would assume production, or recovery, so as to equalize the bottom hole pressure at the bore hole of the wells as this line here (indicating). Then the pressure gradient away from the bore hole of the low permeability well would be rather steep, whereas the pressure gradient of the well having high permeability would be much less, and would intersect this well over here (indicating);on this unit the slope, this drainage, would of course be greater because over here in this area is low permeability, so that the drainage area of this well is moving over into the unit of low permeability and draining part of its oil.

Q The slanting lines, under the word "Low" and under the word "High" represent the pressure gradient?

A Yes, pressure.

Q Somewhat in the nature of a curve, rather than a straight line?

A When the wells are flowing it is more of a curve.

Q Roughly, in a straight line?

A This represents the shut-in pressure.

Q The slanting line from the well under "Low" that represents the pressure gradient of the low pressure well?

A Low permea bility. We assume the pressure is equal at the two wells.

Q The low pressure well, the pressure gradient is much more steep. Is that due to the fact -- was that due to the fact that the low permeability takes more pressure to get the oil out?

A That is right.

Q In the high permeability well it takes less energy to get the oil out?

A That is true.

Q In the high permeability well it reaches farther away from the bore hole than in the low permeability?

A Not necessarily. It does until it intersects the drainage area of the other well.

Q Oil moves much more easily through the ground -- in other words, in the high permeability well gets this drainage, it may reach over into the unit on which there is low permeability, or on which the low permeability well is located?

A That is true.

Q And take oil from that unit?

A That is true.

Q And the oil ta ken from that unit is not moving against pressure, but the high pressure is bringing it to the well?

A Yes, the higher pressure here.

Q And forces it to the well?

A Yes, sir.

Q And might rob its neighbor of low permeability?

A Yes, sir.

Q Now, Mr. Card, referring back to another matter: If we assume intercommunication between the different producing zones, due to interconnection of the zones by the wells, or by any fracturing that may possibly exist, is there any assurance that such movement of oil and gas can be prevented by means of bottom hole pressure?

A No assurance.

Q Makes it impossible to adjust production capacity satisfactorily by bottom hole pressure?

A I should say so, yes.

CROSS EXAMINATION By Mr. Fleetwood:

Q Mr. Card, did you say you had to have uniform permeability before oil would drain from a high pressure area to a low pressure area?

A Yes, uniform permeability with very slight variations.

Q I believe you followed that statement by saying in no lime-stone reservoir you know of does oil migrate from high bottom hole pressure areas to low bottom hole pressure areas?

A

A No, I did not say that. I said I did not know of any limestone fields of uniform permeability.

Q So you do not know of any limestone fields where there is migration of oil from a high bottom hole pressure area to a low bottom hole pressure area?

A If you have uniform permeability between those wells, and had differences in pressure, it is expected you would have migration.

Q So that if you lack uniformity in permeability in lime production fields, you do not know of any limestone field where oil migrates from high to low pressure areas?

A In most limestone fields permeability varies so widely you would assume it would be impossible to show migration.

Q You don't know of any limestone field where there is migration from high to low pressure areas?

A I don't know of any.

Q You state that generally, weighting the bottom hole pressure factor in a field would cause migration of oil from low bottom hole pressure areas to high?

A I don't understand what you mean by "weighting".

Q Giving 20%, as you recommend, as against 75%, you do not believe oil will migrate, or come from the low to the high?

A I said between two wells, if you have uniform permeability, there is a possibility of drainage.

Q What is your judgment as to drainage going on in the Monument field?

A It is very hard to say.

Q What is your judgment -- I will strike that question. Assume it is going on and is draining from the high to the low -- or from the low to the high pressure areas?

A You are talking about the shut-in pressure at the well bore, or the pressure when the well is flowing?

Q Whichever you testified to.

A I don't know what the pressure line is between wells.

Q Suppose there is a well with 1350 pounds bottom hole pressure here, and suppose that across the line is a well with 1000 pounds bottom hole pressure; is there supposed to be drainage

going on, and if all those things are true, which way would the drainage be, from low to high, or high to low?

A You would have to know where the drainage areas intersect.

Q You are not sure it always goes on from low to high?

A Oil will migrate from high to low where you have uniform permeability.

Q Referring to your sketch --

BY MR. SETH: May I interrupt, and have that marked Exhibit No. 6, and introduce it in evidence?

Q Referring to Exhibit No. 6, as I understand that is a drawing of a well log and beneath the word "High" that means the well is in a fairly high permeability area?

A Yes, sir.

Q In other words, oil moves through the formation with considerable ease?

A Yes.

Q And the well beneath the word "Low" is in a low permeability area, "tight", as they call it, and the oil does not flow with much ease?

A That is right.

Q Did I understand that if both wells had equal static bottom hole pressure, and were allowed the same production per day --

A (Interrupting) No, I said they were produced so as to give them the same bottom hole pressure. I did not say the same production.

Q They have been produced so as to give them the same bottom hole pressure?

A That is right.

Q I will begin about equalization: Ajust the proration so as to give the same allowable, so we get two wells with the same bottom hole pressure, two wells with the same allowable, one in a high permeability area and one in a low. Under such conditions, is it your opinion oil will migrate from the low to the high?

A Yes, if the pressure were graded back so that it would be less in the high permeability well.

Q Oil would go from the low permeability section to the high, no

matter whether the bottom hole pressure was even or not?

A What do you mean, "even"?

Q Just as you take it at Monument?

A Shut-in, at the bore hole?

Q Is that the way it is taken at Monument?

A Yes, sir.

Q How would oil migrate under those conditions?

A I do not understand.

Q We will start all over again. You have two wells, one in a low, and one in a high permeability section.

A Yes.

Q Both have the same static bottom hole pressure; both have the same allowable per day. Is it your opinion there would be drainage from one property to the other?

A Let me see what you said -- you adjust the allowable on these wells so you have brought the bottom hole pressure equal, then you are going to give the same allowable for the next period?

Q Start the period with the same bottom hole pressure and the same allowable, will there be drainage from one property to the other?

A Under conditions as exists there, it shows the high permeability well would take it from the low permeability well.

Q We will start all over again. I will pencil in this very lightly so that you can take it off. I have written in that each of those wells have 1,000 pounds static bottom hole pressure, and I have written that each of the wells have an allowable of 30 barrels per day; if they are produced under that assumption, will there be drainage between the wells from one to the other?

A The next time you take the bottom hole pressure --

Q (Interrupting) Get this out of the way first so I can follow you: Will there be drainage from one to the other?

A Here is the thing: take the next pressure survey, and your high permeability well will probably have a higher pressure than the low.

Q Will there be drainage from one to the other, with the same pressure?

A The drainage reaches back farther into the area in one than the other.

BY MR. SETH: You mean to say they have the same permeability?

BY MR. FLEETWOOD: No, sir. We have the two wells Mr. Card has been testifying about. I will start the routine once more.

Q We have a well in a low permeability section, and one in a high permeability section. Both have the same bottom hole pressure and the same allowable. Will there be drainage from one property to the other?

A Under those conditions as I have written them up, I would think there would be drainage.

Q I want to know, under the conditions I am stating, whether there would be drainage?

A The drainage area of the high permeability well would reach back into the low.

Q Would oil from that property migrate to the other property?

A I should think so.

Q Is that right?

A Yes, under the conditions I illustrated there.

Q Under the conditions I have stated?

A You mean will the oil move from the low to the high permeability area?

Q I don't know.

A I should think it would.

Q It would move from the low to the high if they have the same bottom hole pressure?

A Your high permeability well would be producing longer.

Q Would there be migration of oil from one to the other?

A You would have to know how much the allowable was, how far back it goes, how far the oil moves to the bore hole.

Witness dismissed.

BY MR. SETH: That is our case.

A. P. LOSKAMP,

being called as a witness, and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Q State your name.

A A. P. Loskamp.

Q You are a geologist with the Barnsdall?

A Yes, sir.

Q Stationed at Midland, Texas?

A Yes, sir.

Q And do New Mexico fields in which Barnsdall have interests come under your immediate supervision?

A They do.

Q How long have you been in touch with the Monument field?

A Ever since the discovery.

Q Have you had access to the data, facts and field records accumulated by Barnsdall?

A I do.

Q Have you studied them to the best of your ability?

A Yes.

Q Were you educated as a geologist?

A I was.

Q Tell where.

A At Syracuse and Sanford.

Q How long have you been practicing the profession of geology?

A About 17 years.

Q How long have you been stationed at Midland?

A 12 years.

Q How long have you been in touch with the Monument field as geologist for the Barnsdall Oil Company?

A Ever since its discovery.

Q Did you hear the testimony presented this afternoon by Mr. Schuehle, of the Shell Oil Company?

A Yes, sir.

Q Are you in general accord with the opinions which Mr. Schuehle expressed on the witness stand?

A With some of them. Some are contrary to my ideas of reservoir conditions.

Q Point out to the Commission what particular point, or points, you hold a different professional opinion than those advanced by Mr. Schuehle.

A It seems quite probable there are zones of production, porous zones. They are awful hard to trace, especially from well samples, the information is very poor. It is quite likely there are three, or more, zones, but it has been my opinion, and still is, that these zones have vertical movements between zones, and that the reservoir, for all practical purposes, should be considered as one reservoir.

Q I understand you to mean it is your opinion that they are interconnected, and are not separate and sealed off one from the other?

A I believe there is connection between zones, if the zones are present.

Q Would it follow, or would it not follow, if there is a high bottom hole pressure area, and a low bottom hole pressure area in another place, that there would be a tendency for the oil to migrate from the high bottom hole pressure area to the low?

A I am not qualified as an engineer. However, that is my idea of the migration of oil, from the high to the low areas, and that they had a certain migration over the reservoir.

BY MR. FLEETWOOD: You may cross examine.

BY MR. SETH: No cross.

Witness dismissed.

E. A. MARKLEY,

being called as a witness, and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Q Mr. Markley, you are Chief Geologist for the Barnsdall Oil Company?

A Yes, sir.

Q How long have you held that position?

A Five years.

Q Prior to that time were you a geologist with that company?

A Yes, sir.

Q For how long?

A 16 years.

Q Where did you receive your education?

A The University of Kansas and California.

Q And you have been practicing geology how many years altogether?

A About 18 years.

Q As Chief Geologist, with Barnsdall, does your duty include supervision of geology looking to the accumulation of data and information in the various fields in the states in which the company is active?

A Yes, sir.

Q Have you had contact with the Monument field in Lea County, New Mexico?

A Yes, sir.

Q Has that been of a general supervisory nature?

A That is right.

Q And have you had access to the data so accumulated?

A Yes, sir.

Q And have you attempted to study the data to the best of your ability?

A I have.

Q You heard Mr. Schuehle, of the Shell Oil Company, testify as to the zonal pattern which he thinks exists in the Monument field?

A I did.

Q I would like to have you tell the Commission what your opinion is, in a general way, as to those matters.

A My opinion is that there are differences in degree of porosity. Those differences are recognized. Those harder, more dense, less porous streaks are known to exist in the field, but it is a matter of degree. We do not believe those impervious zones, or non-porous zones would prevent the migration of oil from one zone to another.

Q You think if the zones exist, they are interconnected and communicating?

A I wouldn't think that could be proven.

Q What is your judgment? In other words, do you believe there are three, or more, zones, and that each one is sealed off and separate?

A I believe zones are there -- we recognize three zones as being zones in which porosity is less than it is in a sandy zone and the pay section,- that portion which is occupied by the oil production.

Q Do you think the zones are connected?

A Yes, sir.

Q Would it necessarily follow that with high pressure areas and low pressure areas, would that result in migration of oil from high pressure areas to low?

A I think it would.

Q I may have misunderstood Mr. Schuehle, but according to him, the zones laid down were about as if a concrete wall had been laid down horizontally between the zones. Is that your opinion?

A No, sir. That is, the samples, the showings of the logs was that there was porosity present, in these particular logs.

Q You think they are intercommunicating?

A I think they are intercommunicating. I think the evidence shows the fact that there is intercommunication between the separate zones. Certainly there is no evidence that would prove, in my opinion, that there is not drainage possible within the so-called zones.

CROSS EXAMINATION By Mr. Seth:

Q You mean the zones are connected now by wells, bore holes? The various "pays" are connected by the bore holes?

A That is true too. That was brought out by Mr. Schuehle's testimony, that there are some 250 bore holes connecting the zones.

Q Can you give some maps or data as the basis of your opinion?

A No, sir, our opinion is based on development in our own wells, where we found extremely porous conditions existing,

and we are firmly of the opinion that migration of oil not only is possible, but does take place between wells in sections as porous as the one mentioned.

Q Have you made any study of the field as a whole in an effort to determine whether the zones are separated by an impenetrable wall?

A No, sir, we never have made that study.

Q You have never made a study outside of your own wells relative to the zonal pattern of that field?

A No, sir, we have never made a detailed study.

Q Your opinion is based on tata which your company has in their office?

A Based on the nature of the reservoir, with the common water level which originally existed, a sub-sea datum of -350 feet,- I believe the testimony was it was -340 feet. We all agree within those limitations originally pressures were equalized throughout the reservoir. We find, as indicated on this map, that the so-called impervious zones, which are supposed to separate the oil in each zone, do have a degree of porosity and saturation.

Q In the second zone?

A In this zone supposed to prevent the migration of oil in the reservoir from this zone.

Q Did you do the field work yourself?

A I have been in the Monument field.

Q Once?

A One time, on one of our wells, only once.

Q All of your testimony is based on what has been reported to you?

A That is right, but it comes under my direction.

Q You have not examined cuttings of the wells personally?

A Not personally.

Q Not throughout the field?

A No, sir.

Q Your opinion is just an assumption?

A It is an opinion that has been concurred in up until recently I think by the majority of geologists familiar with this area.

Q How many years was that oil leveling off in there, how many, many years has it taken that oil and water to level off?

A I am not that good a mathematician.

Q Couldn't it level off in this unlimited period of geologic time just through one small opening?

A You mean this horizontal zone of production which cuts across the stratigraphy? Couldn't it level off through one small opening?

Q One small opening?

A Not knowing how long it has taken, I don't think that question could be answered.

Q You know it has been long enough that one small opening could have leveled the whole thing off?

A In my opinion, sir, no.

RE-DIRECT EXAMINATION By Mr. Fleetwood:

Q Mr. Schuehle stated there are some 250 to 300 well bores which, at least in his opinion, connected the three zones he spoke of vertically?

A Yes, sir.

Q You recall one of the first Barnsdall wells could have made 25,000 or 30,000 barrels a day?

A 28,000 barrels.

Q Through one six or seven inch hole?

A That is right.

Q You think it is unimportant that 250 to 300 such holes interconnect these zones?

A I think that is very important.

Witness dismissed.

BY MR. FLEETWOOD: We rest.

BY MR. SETH: We rest.

BY MR. LIVINGSTON: Those who wish to submit briefs or statements in the Monument hearing may do so by the 23rd of March.

Whereupon the Commission adjourned.

---oOo---

C E R T I F I C A T E

I hereby certify that the foregoing and attached seventy-six pages of typewritten matter, numbered one to seventy-six, both inclusive, are a true, correct and complete transcript of the shorthand notes taken by me at the hearing in the above entitled case on the 7th day of March, 1940, and by me extended into typewriting.

Witness my hand this 12th day of March, 1940.

Esther Barton

CASE NO. 14.

ORDER OF PROCEDURE FOR THE RECESSED HEARING RELATING TO ANY CHANGES TO BE MADE IN THE MONUMENT PRORATION PLAN, ORDER NO. 33.
(Recessed to March 7 at ~~ten~~ o'clock A. M.)

10:15

10:15 a.m. by S.L.C. from Worden

1. AT TEN O'CLOCK GOVERNOR ~~MILES~~ OPENS THE MEETING AND MAKES SUCH REMARKS AS HE DEEMS APPROPRIATE.

2. COMMISSIONER WORDEN ORDERS READING OF NOTICE OF HEARING.

3. WHEN READING OF NOTICE OF HEARING IS FINISHED, COMMISSIONER WORDEN INFORMS THOSE WHO HAVE APPEARED THAT THE COMMISSION IS NOW READY TO PROCEED WITH THE RECESSED HEARING.

* * * *

CASE NO. 14.

RECESSED HEARING RELATING TO ANY CHANGES TO BE MADE IN THE MONUMENT PRORATION PLAN, ORDER NO. 33.

NAME	COMPANY	ADDRESS
[illegible]	Ramsdall Oil Co.	Tulsa
W. H. Hectwood Jr.	Ramsdall Oil Co.	Tulsa
A. D. Curtis	"	"
E. A. Markley	"	"
A. P. Lockamy	"	Midland Texas
R. S. Christie	Amerada Petroleum Corp.	Ft. Worth
M. N. Card	Stanolind Oil & Gas Co.	Ft. Worth
R. W. Tesch	"	"
A. E. Nader	"	Hobbs New Mex.
R. S. Dewey	Humble Oil & Ref. Co	Midland Texas
Ray Yarbrough	Oil conservation Com	Hobbs
Glenn Staley	Conservation office	Hobbs N. Mex.
Tommy Reppeto	Oil Co	Midland Texas
J. B. Keasler	"	"
N. B. Leach	"	"
[illegible]	Magnolia Pet Co	Roswell, N. Mex.
Ed Downing		Kermit, Texas
J. O. Seth	Stanolind Oil & Gas Co	Santa Fe
A. M. McCorkle	Stanolind Oil & Gas Co	Fort Worth
Floyd Berry	Gulf Oil Corp	Tulsa Okla
J. R. Graham	Sidwell Nelson Research Co	Houston Texas
E. W. Christian	"	Midland "
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	Houston, Texas
[illegible]	Gulf	Tulsa Okla
[illegible]	Gulf Corp	" "
M. Albertson	Shell Oil Co Inc	Houston Texas

Mary W Dillingham	[illegible]	Tulsa Okla
Edgar Kraus	Atlantic Ref Co	Cal-o-Q Tex
[illegible]	[illegible]	[illegible]
Weston Payne	Do.	Oklahoma City
[illegible]	Mc Tex	[illegible]
Howard P. Holmes	Two States Oil Co.,	Dallas, Tex.
Herman R. Grimm	Cities Service Co.	Hobbs, N.M.
E. R. Kade	Cities Service Oil Co.	Hobbs, N.M.
H. B. Hundley	" "	Ft Worth, Tex.
Harry L. Guard	Leonard Oil Co.	Roswell
A. J. Holland	The Texas Co.	Hobbs, N.M.
[illegible]	[illegible]	[illegible]
D. D. Bodie	Cities Service Oil Co.	Hobbs
D. R. McKeithan	Phillips Pet. Co.	Bartlesville Okla.
D. R. Knowlton	"	" "
Carl M. Allston	"	Midland, Texas.
H. J. Kemler	Shell Oil Co.	Midland Tex.
[illegible]	[illegible]	[illegible]
A. L. Elliott	The Texas Co.	Hallsworth Tex.

AFFIDAVIT OF PUBLICATION

State of New Mexico, }
County of Lea }

I, THOMAS G. SUMMERS

PUBLISHER

Of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not in a supplement thereof for a

period of

1 DAY ~~weeks~~

beginning with the issue dated

FEB 23, 1940

and ending with the issue dated

FEB 23, 1940

Thomas G Summers
Publisher.

Sworn and subscribed to before me

this 24th day of

Feb, 1940

J M Barker
Notary Public.

My commission expires

10-17-43, 193

(Seal)

This newspaper is d ly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publicaton has been made.

LEGAL NOTICES

Published February 23, 1940

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

THE REVISING, MODIFYING AND AMENDING THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, DESIGNATED AS ORDER NO. 33 OF THE COMMISSION.

ORDER OF THE COMMISSION SETTING MARCH 7, 1940, FOR RESUMPTION OF HEARING OF MONUMENT PRORATION MATTER DESIGNATED IN THE CAPTION.

CASE NO. 14
ORDER NO. 248

BY THE COMMISSION:

WHEREAS, the hearing called by the Oil Conservation Commission of the State of New Mexico for the purpose of considering the revising, modifying and amending the existing proration plan for Monument Field, Lea County designated as Order No. 33 of the Commission, heretofore recessed to February 5, 1940, could not be heard on said date by reason of conflict with the hearing on the Cole Bill before the Sub-Committee of Interstate and Foreign Commerce held in Washington, D. C., and

WHEREAS, a written notice, so advising and unofficially designating March 7, 1940, at ten o'clock A. M., for the resumption of said hearing, was sent by first-class mail to each of the parties who had made appearance in the case herein,

IT IS THEREFORE ORDERED by the Commission that said unofficial notice is confirmed and March 7, 1940, at ten o'clock A. M., Santa Fe, New Mexico, is set for the resumption of said hearing.

IT IS FURTHER ORDERED that this order be published as notice of said hearing as prescribed by law.

DONE at Santa Fe, New Mexico, this 20th day of February, 1940.

NEW MEXICO OIL CONSERVATION COMMISSION,
BY JOHN E. MILES,
Governor.
BY FRANK WORDEN,
Commissioner of Public Lands
By A. ANDREAS,
State Geologist

(SEAL)

Legal Notices

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE [redacted] OIL [redacted] CONSIDERING:

CASE NO. 14.
ORDER NO. 243

THE REVISING, MODIFYING AND AMENDING THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, DESIGNATED AS ORDER NO. 53 OF THE COMMISSION.

ORDER OF THE COMMISSION SETTING MARCH 7, 1940, FOR RESUMPTION OF HEARING OF MONUMENT PRORATION MATTER DESIGNATED IN THE CAPTION BY THE COMMISSION:

WHEREAS, [redacted] to February 5, 1940, could not be heard on said date by reason of conflict with the hearing on the Colc Bill before the Subcommittee of Inierstate and Foreign Commerce held in Washington, D. C., and

WHEREAS, a written notice, so advising and unofficially designating March 7, 1940, at ten o'clock A. M. for the resumption of said hearing, was sent by first-class mail to eagh of the parties who had made appearance in the case herein,

IT IS THEREFORE ORDERED by the Commission that said unofficial notice is [redacted] and March 7, 1940, at ten o'clock A. M., Santa Fe, [redacted] is set for resumption [redacted] hearing.

IT [redacted] that [redacted] as notice of [redacted] prescribed by law.

DONE at Santa Fe, New Mexico, this 20th day of February, 1940.

NEW MEXICO OIL CONSERVATION COMMISSION,
(SEAL)
By JOHN E. MILES,
Governor.
By FRANK WORDEN,
Commissioner of Public Lands.
By A. ANDREAS,
State Geologist.

Published Feb. 22, 1940.

Affidavit of Publication

Feb. 27, 1940

E OF NEW MEXICO
NTY OF SANTA FE
OF SANTA FE
} ss.

Larry Byron, hereby swear

ffirm that I am the Publisher

New Mexico Examiner, a newspaper of general circulation City of Santa Fe, the County of Santa Fe, and the State of Mexico, printed daily in the City of Santa Fe; that the at-

is a true copy of Publication

ppeared in the New Mexico Examiner, issues of

eb. 22, 1940, in a full and complete

of the paper.

newspaper is duly qualified to publish legal notices or advertisements
in the meaning of Sec. 3, Chapter 167, Laws of 1937.

Signed: Larry O Byron

E OF NEW MEXICO
NTY OF SANTA FE
OF SANTA FE
} ss.

Larry Byron appeared before me this

th day of February, 1940, known to me the person above making affidavit, and after being duly deposes and says that the statements above made are true curate to the best of his knowledge.

Edna Draper
Notary Public in and for Santa Fe County, State of New Mexico.

ommission expires: April 24, 1943

February 21, 1940

Honorable Harry Leonard
Roswell, New Mexico

Re: Case No. 14, the revising, modifying and amending the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

My dear Harry:

Enclosed please find copy of order of the Commission setting March 7, 1940, for resumption of hearing of Monument proration matter designated in the caption.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

February 21, 1940

Honorable J. O. Seth
Attorney at Law
Santa Fe, New Mexico

Re: Case No. 14, the revising, modifying and amending the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission.

My dear Judge Seth:

Enclosed please find Order of the Commission setting March 7, 1940, for resumption of hearing of Monument Proration matter designated in the caption.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

OIL CONSERVATION COMMISSION

February 21, 1940

COPY

Honorable Roy Yarbrough
Oil Conservation Commission
Hobbs, New Mexico

Dear Mr. Yarbrough:

Enclosed is a notice of hearing to be held at Santa Fe which affects the Monument Field. Please call at the Hobbs Daily News-Sun to see that that paper publishes the notice which I am today sending it and to urge them to be sure to return their publisher's affidavit. I have had considerable difficulty in getting that paper to send the publisher's affidavit promptly.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

February 21, 1940

Hobbs Daily News-Sun
Hobbs, New Mexico

Gentlemen:

There is enclosed herewith a Notice for Publication, which you are kindly requested to publish once immediately. Please check the printer's proof with great care. Even a typographical error would be fatal as to the legality of the notice. You are also requested to furnish this Commission with a copy containing this publication.

Immediately upon completion of the publication, be sure to transmit to the Oil Conservation Commission your affidavit of publication.

Upon sending to the Commission your affidavit of publication, please send your statement in duplicate and enclosed purchase voucher also in duplicate.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
Encls.

February 21, 1940

New Mexico Examiner
Santa Fe, New Mexico

Gentlemen:

There is enclosed herewith a Notice for Publication, which you are kindly requested to publish once immediately. Please check the printer's proof with great care. Even a typographical error would be fatal as to the legality of the notice. You are also requested to furnish this Commission with a copy containing this publication.

Immediately upon completion of the publication, be sure to transmit to the Oil Conservation Commission your affidavit of publication.

Upon sending to the Commission your affidavit of publication, please send your statement in duplicate and enclosed purchase voucher also in duplicate.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

February 2nd, 1940

Mr. Carl B. Livingston, Attorney,
%Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Livingston:

Re: Case No. 14 - Monument Proration Plan
Commission Order No. 33

This acknowledges receipt of yours of the 31st ultimo advising the above case is assigned for hearing Thursday, March 7th, 1940, at ten o'clock A.M. Thanks.

Yours truly,

RGL.W

Russell G Lowe

February 7, 1940

Mr. George W. Selinger
Skelly Oil Company
Tulsa, Oklahoma

My dear Mr. Selinger:

Reference is had to your letter of February 5. The resumption of the hearing upon the Monument proration plan matter in Case No. 14 is Thursday, March 7.

For the purpose of making objections to Order No. 237 prescribing rules and regulations for the taking of gas-oil ratio surveys, and Order No. 238, fixing maximum gas-oil ratios for the various fields of the State of New Mexico, Case No. 19 is set for March 4.

There is not as much a gap between the hearings as you perhaps think. No one can foresee how long or how short the gas-oil ratios hearing for the purpose of entering objections will be. In between the two hearings mentioned above, on March 6 is the Corporation Commission's hearing upon the petition of various operators to have Rule 9 of the Corporation Commission's Rules for Gauging and Measuring Tanks amended so as to eliminate the arbitrary two per cent deduction. This matter before the Corporation Commission may involve among interested parties some preliminary conferences and informal meetings. Thus, you see, March 4, set aside for the gas-oil ratios hearing before the Oil Conservation Commission, with leeway for a portion of March 5 in case the hearing is not concluded, leaves at least a part of March 5 to the various interested parties for their preliminsry meetings in preparation for the hearing before the Corporation Commission on March 6, which latter meeting is followed on March 7 by the resumption of the hearing upon the Monument proration plan which may take one day but perhaps more.

A carbon copy of this letter is going forward to those noted at the bottom of the letter in order to preclude further confusion.

The various orders which you mention have been mimeographed by Mr. Glenn Staley's office at Roses and are by his office being distributed. Undoubtedly, you have by now received copies of all

four orders. At any rate, a carbon copy of this letter which is going forward to Mr. Staley should serve as a request to send you copies of these orders in case you could have been overlooked.

Very truly yours,

Carl B. Livingston
Attorney

CBL:ik

cc - Mr. Glenn Staley
Proration Umpire
Hobbs, New Mexico

cc - Mr. C. J. Dexter
c/o C. J. Dexter Company
Artesia, New Mexico

cc - Mr. J. M. Dunlavey
Skelly Oil Company
Hobbs, New Mexico

SKELLY OIL COMPANY

PRODUCTION DEPARTMENT
H. M. STALCUP, VICE PRESIDENT
J. S. FREEMAN, ASSISTANT

TULSA, OKLAHOMA

February 5, 1940

Mr. Carl B. Livingston, Attorney
New Mexico Oil Conservation Commission
State Capitol
Santa Fe, New Mexico

Dear Sir:

I am in receipt of a notice, dated January 31, from you advising that case No. 14, hearing upon Monument proration plan, designated as order No. 33 of the Commission, is set for Thursday, March 7, at 10:00 a.m.

This morning I am in receipt of a notice from the New Mexico Oil and Gas Association, dated February 1, stating that case No. 14, order No. 33, involving the proration plan for the Monument pool, is set for 10:00 a.m. March 4, 1940.

Will you kindly advise the exact date on which case No. 14, involving the proration plan for Monument, will be heard. In view of the fact that the gas/oil ratio hearing is set for March 4, and in order to avoid waiting three or four days unnecessarily, it is our suggestion that the Monument hearing be set for March 4 immediately following the gas/oil ratio hearing. This view has been concurred in by a number of other operators who have to travel a good distance to reach Santa Fe.

We should like to have copies of notices of case No. 15, order No. 235; case No. 19, order of the Commission prescribing rules and regulations for gas/oil ratios in New Mexico; and case No. 19, order No. 238.

Very truly yours,

George W. Selinger

George W. Selinger

GWS/mb
cc Mr. Dunlavey

BARNSDALL OIL COMPANY

PETROLEUM BUILDING

TULSA, OKLA.

January 25th 1940

RECEIVED
STATE LAND OFFICE
JAN 27 8 50 AM '40
SANTA FE, N. M.

Mr. Frank Worden
Santa Fe, New Mexico

Dear Frank:

There is enclosed copy of a letter to the LaFonda Hotel cancelling our reservations for February 4th and making new reservations for March 3rd. Since I have been unofficially advised that the Monument hearing has been postponed from February 5th to March 4th. If this is the correct date I would appreciate your advising me as soon as possible as it is sometimes quite hard to get reservations.

I regret to hear of the postponement of the Monument case but under the circumstances I know of nothing else that could be done and I am sure you will do a good job when you go to Washington, as I understand you are to do. In the meantime I shall plan on seeing you March 3rd and certainly hope that this time you and Mrs. Worden will have the time to have dinner with me.

Sincerely,

J. S. Noland

JSN:BLM
Encl.

RECEIVED
STATE LAND OFFICE
JAN 27 8 50 AM '40
SANTA FE, N. M.

January 25th 1940

La Fonda Hotel
Santa Fe, New Mexico

Gentlemen:

I had reservations made for three (3) rooms for February 4th. The reason for making these reservations was to attend the hearing to be held before the Oil and Gas Conservation Commission starting February 5th. This hearing has been postponed until March 4th.

It would be appreciated if you would cancel my reservations for three (3) rooms for February 4th and reserve me three (3) rooms for March 5, 1940. I would also like to have confirmation of this.

Yours very truly,

JHM:BLM

J. H. Boland

Bcc Mr. Frank Worden
Santa Fe, New Mexico

CLASS OF SERVICE

This is a full-rate Telegram or Cable-gram unless its de-ferred character is in-dicated by a suitable symbol above or pre-ceding the address.

WESTERN UNION

1220

R. B. WHITE, PRESIDENT
NEWCOMB CARLTON, CHAIRMAN OF THE BOARD
J. C. WILLEVER, FIRST VICE-PRESIDENT

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

Received at

DALLAS 6 PM 11 05

VIII98 103 NT=DALLAS TEX 6

OIL & GAS CONSERVATION COMMISSION ATTN GOVERNOR MILES=

SUN OIL COMPANY HAVING PRODUCTION IN THE MONUMET FIELD AND HAVING STUDIED THE RESULTS TO DATE OF METHOD OF ALLOCATION NOW IN FORCE FEELS THAT IT IS A REASONABLE METHOD TO CONTINUE UNDER AND RECOMMENDS THAT NO CHANGE BE MADE IN THE ALLOCATION FORMULA STOP WITH HIGH GAS-OIL RATIO WELLS NOW BEING PENALIZED IN OIL ALLOWABLE THE MORE FAVORABLY LOCATED WELLS ARE ENJOYING A GREATER CURRENT PART OF THE POOLS OUTLET AND A CONTINUATION OF THE PRESENT ORDER SHOULD ELIMINATE ANY MINOR INEQUITIES THAT MAY HAVE EXISTED IN THE PAST STOP WE REQUEST THAT THIS BE MADE A PART OF THE RECORD=

F E HEATH SUN OIL CO.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

NEW MEXICO
OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

Governor John E. Miles, Chairman
State Geologist A. Andreas, Member
State Land Commissioner Frank Worden, Sec'y

January 31, 1940

Re: Case No. 14, Hearing upon
Monument Proration Plan
Designated as Order No. 33
of the Commission.

Dear Sir:

In the notice dated January 29, designating March 7 as the date for the hearing in the above captioned matter, there was a typographical error in paragraph 2, first line, last word. The day "Monday" should be changed to "Thursday" -- in other words, the hearing is to be Thursday, March 7, at ten o'clock A. M.

Very truly yours,

OIL CONSERVATION COMMISSION

By Carl B Livingston
Carl B. Livingston
Attorney

CBL:ik

NEW MEXICO
OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

Governor John E. Miles, Chairman
State Geologist A. Andreas, Member
State Land Commissioner Frank Worden, Secty

January 29, 1940

Re: Case No. 14, Hearing upon
Monument Proration Plan
Designated as Order No. 33
of the Commission.

Dear Sir:

The above matter, which was continued by the Commission on December 9 to the first Monday in February (the 5th), conflicts with the committee hearing in Washington on the Cole Bill, and will therefore be continued.

The Commission has unofficially set Monday, March 7, at ten o'clock A. M., for the hearing in the above captioned matter. An order is to be entered by the Commission on February 5 so continuing that hearing.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

NEW MEXICO
OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

Governor John E. Miles, Chairman
State Geologist A. Andreas, Member
State Land Commissioner Frank Worden, Sec'y

January 29, 1940

Re: Case No. 14, Hearing upon Monument Proration Plan Designated as Order No. 33 of the Commission.

Dear Sir:

The above matter, which was continued by the Commission on December 9 to the first Monday in February (the 5th), conflicts with the committee hearing in Washington on the Cole Bill, and will therefore be continued.

The Commission has unofficially set Monday, March 7, at ten o'clock A. M., for the hearing in the above captioned matter. An order is to be entered by the Commission on February 5 so continuing that hearing.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

January 30, 1940

Honorable J. O. Seth
Attorney at Law
Santa Fe, New Mexico

Dear Judge Seth:

Enclosed is a carbon copy of a letter which I have just written to Mr. Staley, which letter is self-explanatory. I know you will appreciate the matters I have set out in the marked paragraph and the extreme handicap under which such work is done. The engineers acting as an advisory committee never seem to realize that full, clear and definite information must be the material out of which a sound order is woven.

Very truly yours,

Carl B. Livingston
Attorney

CBL:ik
Enc.

January 30, 1940

Special Delivery

Mr. Glenn Staley
Proration Umpire
Hobbs, New Mexico

My dear Glenn:

Enclosed please find the following orders of the Commission:

Order No. 238, prescribing maximum gas-oil ratios for the various fields in New Mexico;

Order No. 237, a companion order of the above order, prescribing regulations for gas-oil ratio surveys in New Mexico;

Order No. 236, setting the date of March 4 as the date upon which any interested party having any objections to the two foregoing orders may make them before the Commission at a hearing on said date;

Order No. 235, governing the issuance of the monthly proration schedule with the Commission's certificate thereto as to legality of oil produced thereunder and the making up of certain shortages.

You will note in the last paragraph of Order No. 235 a saving clause was introduced for the taking under further advisement and the issuance of a supplemental order governing transportation of crude oil and its products by means other than by pipe line. This is intended for an order governing transportation by trucks, tank cars and the like, but I have not the data before me and my recent experience in trying to get into shape the above orders at long range has convinced me that it is next to impossible to draw orders one place with the engineers who advise upon these matters in some other place. It is advisable that I come down and sit with you and other engineers on the spot and work out the details at a convenient time. On the other hand, you and other engineers, acting in the capacity of the advisory committee, could come to Santa Fe. But the difficulty is that they have other interests and other things to do and are in a hurry to get away and I, in turn, being accessible to everyone, would be handicapped by constant interruptions. In a matter of this kind, one simply has to be quiet with a little time for thought and technical information from the advisory committee readily at hand.

The hearing upon the Monument proration plan, Case No. 14, which was continued by the Commission on December 9 to the first

Thursday

Mr. Glenn Staley -2- 1/30/40

Monday in February (the 5th), conflicts with the committee hearing in Washington on the Cole Bill, and will necessarily be continued. The Commission has unofficially set Monday March 7, at ten o'clock A. M., for the hearing in the above captioned matter and an order is to be entered by the Commission on February 5 formally and officially, as a Court, continuing that hearing.

Enclosed is a list of appearances of the operators whom I surmise you would like to notify as to all of the above matters by mimeograph or such other way as you see fit. However, since time is so short, I have today sent out a notice to all parties appearing in Case No. 14 that the hearing upon the Monument proration plan was unofficially continued to March 7, and that on February 5 the Commission expected to issue a formal order to that effect.

In another connection, relating to the petition of the various operators to the New Mexico Corporation Commission to change its Rule 9 as to tank tables by eliminating the 2% arbitrary deduction, Honorable Robert Valdez of the Corporation Commission yesterday advised that the matter was set down for formal hearing before the Corporation Commission on March 6. The petitioners should be reminded that they have the burden of making their case before the Commission. They should get together with their counsel and make preparation for the presenting of their case. In this matter the Corporation Commission, as I see it, sits as a court. By all means, after the Cole Committee hearing in Washington, the petitioners (which means the operators) should hold an informal meeting themselves a week or two before the hearing before the Commission so a plan of legal strategy can be devised. Otherwise the proceedings of a large number of operators against a small handful of pipe line companies might be as ineffectual as the large Russian Army against the little Finns. I gave Mr. Worden a memorandum to advise Governor Murray somewhat along the lines of the foregoing suggestions.

Very truly yours,

Carl B. Livingston
Attorney

CBL:ix
Enc.

APPEARANCES

J. O. Seth	Stanolind Oil & Gas Co.	Santa Fe, New Mexico
D. D. Bodie	Cities Service Oil Co.	Hobbs, New Mexico
J. D. Atwood	Cities Service Oil Co.	Roswell, New Mexico
Lloyd L. Gray	Gulf Oil Corporation	Tulsa, Oklahoma
P. H. Bohart	Gulf Oil Corporation	Tulsa, Oklahoma
Russell G. Lowe	Gulf Oil Corporation	Tulsa, Oklahoma
R. S. Knaffen	Gulf Oil Corporation	Tulsa, Oklahoma
S. G. Sanderson	Gulf Oil Corporation	Tulsa, Oklahoma
A. D. Curtis	Barnsdall Oil Co.	Tulsa, Oklahoma
J. S. Noland	Barnsdall Oil Co.	Tulsa, Oklahoma
W. M. Fleetwood, Jr.	Barnsdall Oil Co.	Tulsa, Oklahoma
E. P. Keeler	Continental Oil Co.	Hobbs, New Mexico
R. S. Dewey	Humble Oil & Rfg. Co.	Midland, Texas
W. E. Hubbard	Humble Oil & Rfg. Co.	Houston, Texas
R. A. Koenig	Ohio Oil Co.	Hobbs, New Mexico
Glenn Bish	Ohio Oil Co.	Hobbs, New Mexico
H. L. Johnston	Continental Oil Co.	Hobbs, New Mexico
H. B. Burley	Continental Oil Co.	Fort Worth, Texas
D. R. McKeithan	Phillips Petroleum Co.	Bartlesville, Oklahoma
A. E. Willig	The Texas Co.	Fort Worth, Texas
Ira Van Tuyl	Gulf Oil Corp.	Hobbs, New Mexico
Ross M. Stuntz, Jr.	Gulf Oil Corp.	Tulsa, Oklahoma
S. P. Hannifin	Magnolia Petroleum Co.	Roswell, New Mexico
Delmer R. Guinn	Cities Service Oil Co.	Hobbs, New Mexico
Allen B. Gibson	Cities Service Oil Co.	Hobbs, New Mexico
D. A. Powell	Drlg. & Exploration Co.	Hobbs, New Mexico
Jack H. Rankin	Repollo Oil Co.	Midland, Texas
N. B. Larsh	Repollo Oil Co.	Midland, Texas
H. J. Summy	Repollo Oil Co.	Midland, Texas
Frank Gray	Anderson-Prichard Oil Corp.	Hobbs, New Mexico
Weston Payne	Anderson-Prichard Oil Corp.	Oklahoma City, Oklahoma
H. J. Kemler	Shell Oil Co.	Midland, Texas
O. D. Crites	Shell Oil Co.	Houston, Texas
M. T. Smith	Shell Oil Co.	Midland, Texas
F. E. Heath	Sun Oil Co.	Dallas, Texas
Harvey Hardison	Standard Oil Co. of Texas	Houston, Texas
Francis C. Wilson	Wilson Oil Co.	Santa Fe, New Mexico
Weldon Brigance	Rowan Drilling Co.	Fort Worth, Texas
R. S. Christie	Amerada Petroleum Co.	Fort Worth, Texas
C. G. Campbell	Tex.-Pacific Coal & Oil	Midland, Texas
O. F. Hedrick	Tex.-Pacific Coal & Oil	Midland, Texas
G. W. Selinger	Skelly Oil & Getty Oil	Tulsa, Oklahoma
Colin C. Rae	Skelly Oil Co.	Tulsa, Oklahoma
M. Albertson	Shell Oil Co., Inc.	Houston, Texas
R. G. Schuehle	Shell Oil Co.	Midland, Texas
E. W. Childers	Tidewater Assoc. Oil Co.	Midland, Texas
Edgar Kraus	Atlantic Rfg. Co.	Carlsbad, New Mexico
Lig Biddick	Samedan Oil Corp.	Ardmore, Oklahoma
J. P. Cusack	J. P. Cusack, Inc.	Midland, Texas
A. M. McCorkle	Stanolind Oil & Gas Co.	Fort Worth, Texas
G. H. Card	Stanolind Oil & Gas Co.	Fort Worth, Texas
Howard P. Holmes	Two States Oil Co.	Dallas, Texas
Roy Yarbrough	Oil Conservation Comm.	Hobbs, New Mexico
Rex E. Rader	Stanolind Oil & Gas Co.	Hobbs, New Mexico
R. W. Tesch	Stanolind Oil & Gas Co.	Fort Worth, Texas
Guy H. Woodward	Stanolind Oil & Gas Co.	Tulsa, Oklahoma
G. S. Bays	Stanolind Oil & Gas Co.	Tulsa, Oklahoma

January 31, 1940

Mr. Glenn Staley
Proration Umpire
Hobbs, New Mexico

My dear Glenn:

Reference is had to my letter of January 30 to you, wherein a typographical error occurred. On page 2, third line from the top, the word "Monday" should have been "Thursday" - in other words, the hearing in the Monument proration plan, Case No. 14, is to be Thursday, March 7, at ten o'clock A. M. Please correct your carbon copy accordingly.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

March 26, 1940

Mr. Glenn Staley
Proration Umpire
Hobbs, New Mexico

Re: Ohio-Barber Well #2, C 5-20S-37E, Monument, Lea County.

Re: Ohio-Barber Well #6, L 5-20S-37E, Monument, Lea County.

Re: Ohio-Barber Well #8, E 5-20S-37E, Monument, Lea County.

Re: Exception to Order No. 33 of the Commission.

Dear Mr. Staley:

Reference is made to the application of the Ohio Oil Company under date of January 19 addressed to you, in effect requesting exception to Order No. 33 of the Commission with regard to the above captioned wells because of reduced bottom-hole pressures resulting in the performing of remedial work to reduce gas-oil ratios prior to the adoption of Gas-Oil Ratio Order No. 238 and Emergency Order No. 248-A.

The applicant with regard to said wells is herewith granted an exception to Order No. 33 in accordance with the application.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Commissioner of Public Lands

By_____
State Geologist

CBL:ik
cc - Mr. Glenn Bish, Superintendent
The Ohio Oil Company
Hobbs, New Mexico
cc - Mr. Roy Yarbrough

BEFORE THE OIL CONSERVATION
COMMISSION OF THE STATE
OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

CASE NO. 14.

ORDER NO. 243.

THE REVISING, MODIFYING AND AMENDING THE EXISTING PRORATION PLAN FOR MONUMENT FIELD, LEA COUNTY, DESIGNATED AS ORDER NO. 33 OF THE COMMISSION.

ORDER OF THE COMMISSION
SETTING MARCH 7, 1940,
FOR RESUMPTION OF HEARING
OF MONUMENT PRORATION MATTER
DESIGNATED IN THE CAPTION.

BY THE COMMISSION:

WHEREAS, the hearing called by the Oil Conservation Commission of the State of New Mexico for the purpose of considering the revising, modifying and amending the existing proration plan for Monument Field, Lea County, designated as Order No. 33 of the Commission, heretofore recessed to February 5, 1940, could not be heard on said date by reason of conflict with the hearing on the Cole Bill before the Sub-committee of Interstate and Foreign Commerce held in Washington, D. C., and

WHEREAS, a written notice, so advising and unofficially designating March 7, 1940, at ten o'clock A. M. for the resumption of said hearing, was sent by first-class mail to each of the parties who had made appearance in the case herein,

IT IS THEREFORE ORDERED by the Commission that said unofficial notice is confirmed and March 7, 1940, at ten o'clock A. M., Santa Fe, New Mexico, is set for the resumption of said hearing.

IT IS FURTHER ORDERED that this order be published as notice of said hearing as prescribed by law.

DONE at Santa Fe, New Mexico, this 20th day of February, 1940.

NEW MEXICO OIL CONSERVATION COMMISSION

By John E. Miles
Governor

By Thos. E. Worden
Commissioner of Public Lands

By R. Andrews
State Geologist

RECESSED HEARING

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

Held at the House of Representatives,
State Capitol, Santa Fe, New Mexico,
at 9:00 o'clock A. M., December 9, 1939.

PRESENT:

Hon. John E. Miles, Governor, Chairman of Commission
Hon. Frank Worden, Commissioner of Public Lands, Secretary
Hon. A. Andreas, State Geologist, Member of Commission
Hon. Carl E. Livingston, Attorney for Commission.

Pursuant to the order made on December 6, 1939, separating the hearing on the Hobbs Proration Order and the Monument Proration Order, hearing on the Monument Proration Order was convened at nine o'clock, A. M., of December 9, 1939, the appearances being the same as on December 6, 1939, in this case, No. 14, whereupon the following proceedings were had, to-wit:

BY MR. SETH: I understand Mr. Kraus has a report from the Engineering Committee appointed last summer, and I suggest that Mr. Kraus be sworn.

EDGER KRAUS,

being first duly sworn to tell the truth, the whole truth and nothing but the truth, was examined by Mr. Seth, and testified as follows:

DIRECT EXAMINATION

Q State your name.

A Edgar Kraus.

Q What is your profession?

A Petroleum geologist and engineer.

Q By whom are you employed?

A Atlantic Refining Company.

Q Was a committee appointed last May or June, of engineers, to submit a report on Monument and Hobbs?

A There was.

Q Have they agreed on a report on Monument?

A They have.

Q Were you chairman of that committee?

A I was.

Q Will you please state the names of the members of the committee and read the report?

A The members were G. H. Card, of the Stanolind Oil & Gas Co.; Jack Rankin, of the Repollo Oil Co.; Lloyd Gray, of the Gulf Oil Corporation; M. Albertson, of the Shell Oil Corporation; R. S. Dewey, of the Humble Oil & Refining Company; and R. S. Christie, of the Amerada Petroleum Company; A. E. Gibson, of the Cities Service Oil Company, and myself as chairman.

In investigating conditions at Monument, we found one condition that the committee unanimously believed should be corrected. It appears that in some cases when packers are set in wells in the Monument field, bottom hole pressures are reduced. In view of the fact that the proration formula at Monument includes the bottom hole pressure factor, this reduction in pressure actually penalized some operators who set packers, in their daily allowable. Although the committee did not feel that operators setting packers should be rewarded for such work, since it was a conservation measure, they did feel that such operators should not be penalized. For that reason the following recommendation was made concerning the assignment of pressures to Monument packer wells: (Reading)

"METHOD OF ASSIGNING PRESSURES TO MONUMENT PACKER WELLS

The committee recommends the following procedure in determining the bottom hole pressure of wells in which packers have been set:

Pressures shall be taken in packer wells as in nonpacker wells, and the pressures used in determining the average bottom hole pressure of the field and the percentage rates of increase or decrease in the field's average bottom hole pressure.

If the operator elects, the bottom hole pressure of a packer well may be used to determine its allowable according to the formula in use.

If he elects not to use the measured pressure, and it has been determined to the satisfaction of the proration umpire that the packer has in fact been successful in conserving reservoir energy, then a bottom hole pressure may be assigned to the packer

well, which bottom hole pressure is to be used in determining the allowable of the well according to the formula. The assigned pressure shall be calculated by applying to the bottom hole pressure of the packer well the average percentage increase or decrease of bottom hole pressure in all of the non-packer wells on the eight units adjoining or cornering on the unit on which the packer well is situated. This average percentage increase or decrease shall be applied to the bottom hole pressure of the packer well found by actual test in the regular pressure survey run prior to the date the packer was effectively set. If none of the wells on the eight units described above are without a Packer, then in that event the percentage increase or decrease of the field's average bottom hole pressure may be used in determining the bottom hole pressure of the packer well in the same manner as described above.

When packers have been set before the effective date of the acceptance of these recommendations, and the packers are effective in conserving reservoir energy, then at the option of the operator the pressure of the packer well may be determined as described above and used in the future in determining allowable. In no event shall any change in such bottom hole pressure be used retroactively.

It is recommended that bottom hole pressure be taken in all wells in the field unless mechanically impossible so that averages of the two types mentioned above used in assigning pressures may be as representative as possible.

The committee urges that each operator do the necessary remedial work to reduce gas-oil ratios."

That ends the recommendation.

BY GOVERNOR MILES: Was it the unanimous decision by the committee that the packers be set?

A That is right.

BY MR. SETH:

Q You have had many years experience in Lea County wells, in all fields?

A Yes, sir.

BY MR. SETH: I think the Commission knows Mr. Kraus's qualifications without bringing that out.

Q Do you recommend the adoption of this report by the Commission?

A I do.

Q You believe it is a conservation measure?

A It is primarily for that purpose.

Q And will give an increase in the ultimate recovery of petroleum?

A Yes, sir.

Q And it will do no harm to wells or their equity?

A I believe it will do equity to all.

Q And in your judgment, should that be put into effect at the earliest possible date?

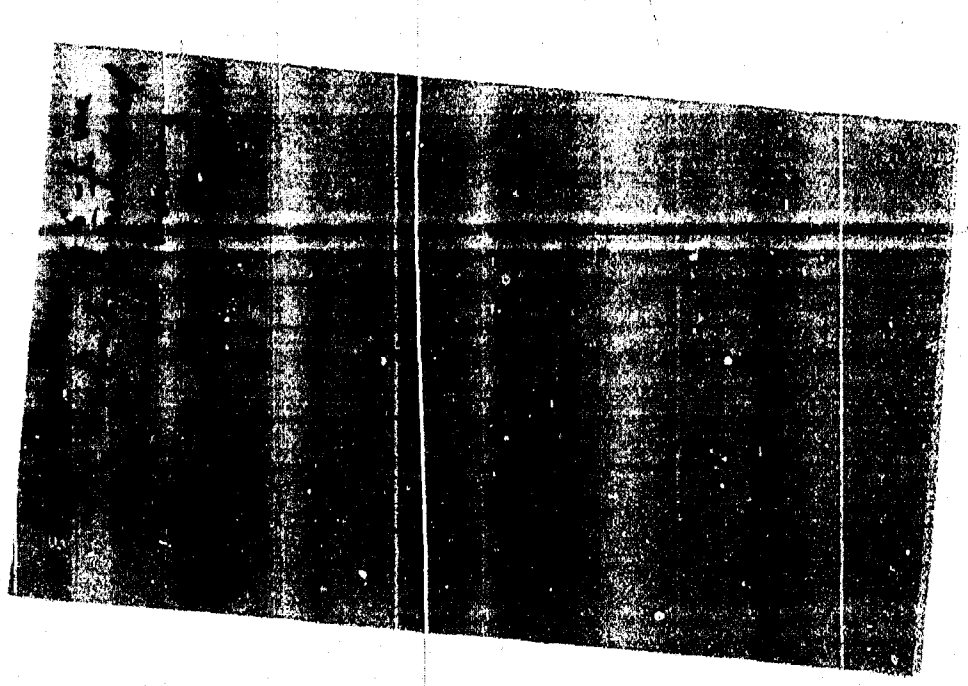
A Yes, sir, since it is designed for conservation purposes, I think it should be put in effect immediately.

BY MR. KOENIG (Of the Ohio Oil Co.):

We are in accord with everything brought out, except we have asked for an adjustment on allowables on three packer wells already completed. The thing we have in mind in asking for a re-adjustment in allowables has been delayed in some other matters. We hoped there would be some adjustments retroactively; on wells that have been completed for eight or ten months, and we have suffered considerable loss.

BY MR. ANDREAS: Was the Ohio represented on this committee?

A No, sir. The way it has been worked out and recommendations made, it is very satisfactory except for the retroactive factor. We have lost considerable oil, but we have been able to reduce our ratios; one well was 20 to 1, another 30 to 1. We have reduced the ratios in all wells running packers. The highest is 12 to 1, the lowest 4 to 1. We have been successful in running packers, and in all three of the wells in which we ran packers there was a reduction in pressure. We would like to set an example that packers can be run to help the field and help the gas-oil ratios. We have gone ahead very much in line with Mr. Andreas's suggestion. That is, it was in line with the suggestion of the Commission -- at least Mr. Andreas' suggestion was made approximately a year ago, and was that he would recommend packers being run in the high gas-oil ratio wells in Monument.



BY MR. HEDRICK: If the Commission, in its wisdom, has seen fit to change the formula and give more weight to bottom hole pressure, would your recommendation be the same?

A I think this has nothing to do with the allocation formula.

BY MR. SETH: That is all.

Witness dismissed.

BY MR. CHRISTIE: (Of Amarada Petroleum Co.): If this is the proper place, I would like to submit a change in the method of taking bottom hole pressure in the Monument Pool.

BY MR. WORDEN: Are you offering that?

A I am submitting it.

BY GOVERNOR MILES: Will you submit it to the committee?

A This was taken up by the operators.

BY MR. SETH: If he is going to be cross examined, I think he should be sworn.

R. S. CHRISTIE,

being first duly sworn to tell the truth, the whole truth and nothing but the truth, was examined by Mr. Seth, and testified as follows:

DIRECT EXAMINATION

Q State your name?

A R. S. Christie, of the Amerada Petroleum Corporation.

Q Are you a petroleum engineer?

A Yes, sir.

Q With many years experience in New Mexico?

A Yes, sir.

Q You desire to submit a recommendation as to the method of taking bottom hole pressures at Monument?

A Yes, sir. (Reading):

"Method of Taking Bottom Hole Pressures

in the Monument Field.

The bottom hole pressure shall be taken at a sub-sea depth of -250 ft. In event this depth cannot be reached, the gradient shall be determined between this sub-sea depth and the actual measured depth and the bottom hole pressure of the well corrected

according to the weight of the fluid or gas as determined by the gradient. If for any reason a gradient cannot be determined the well will be given the unit allowance."

BY MR. SETH: Any questions?

BY MR. RANKIN:

Q Mr. Christie, in case a packer is set with a chain in it, and that chain falls above the -250 mark, would your recommendation still hold true? What I am trying to get at, the operators has made an effort to do corrective work.

A Of course, we do not know there is fluid in the hole.

Q The effectiveness of the packer setting could shortly be determined before setting the packer?

A I believe in a case like that, the weight of the fluid in the bottom of the hole could be determined fairly accurately.

Q If ratios were taken before and after the packer setting, and conservation measures have resulted from setting the packer, and ratios are lowered, do you think the well should be penalized from the point the packer is set by measuring the gradient in that case to a -250 point?

A If you have established a low ratio well by reason of setting a packer, you will have fluid in the tube and can establish the gradient in the well. This is not intended to penalize anybody for conservation. It is just made inasmuch as, if pressure is used as a factor, I think that should be corrected.

BY MR. SETH:

Q Why do you make this recommendation?

A The formula for allocation of production at Monument has one factor of bottom hole pressure, and if you are going to use that, then it should be as correct as can be obtained.

Q What change would that make?

A At the present time, if you cannot reach -250 feet depth, the measured pressure is taken and corrected from that depth of -250, using the gradient of oil, which, in some cases, might give an additional pressure of 50 or 60 pounds. If your well is a completely gas well, you will have an additional 50 or 60 pounds you should not be entitled to.

Witness dismissed.

BY MR. FLEETWOOD: (Barnsdall Oil Co.) We are here to attend the hearing on any modification or alteration of the proration plan for Monument. We favor a change; however, we did not petition the Commission to set a hearing. If Mr. Livingston will allow a reference to the Hobbs hearing, we feel as we did in that case, that whoever did ask for the hearing, whether by petition or oral request, should at this time proceed on the request or application for change. If that is not the modus operandi, before we proceed we would like to request that information so that we may be advised of the identity of the person or persons who made the request. We do favor a change, but we would like to be advised of the method of procedure.

BY MR. RANKIN: Insofar as I have been able to determine, no operator asked for the hearing on the Monument field. It seems to me, as well as I can determine, the Commission asked for the hearing.

Insofar as the Repollo Oil Company is concerned, they are very well satisfied with conditions as they are.

BY MR. FLEETWOOD: If there is no one present that did request the hearing, we are quite willing to proceed.

BY MR. WORDEN: Proceed.

BY MR. FLEETWOOD: Perhaps I should outline our position so that there will be no misunderstanding.

The Barnsdall, ever since we obtained production at Monument, has been consistently endeavoring to secure the promulgation of a proration plan, or a set of rules which would permit every operator, insofar as is practical or possible, to produce ratably his oil in place. The Commission which formerly promulgated rules did not, we feel, and did feel at that time, ever write an order which would do equity between the operators and permit everyone to have his fair chance to produce his oil in place. We feel today we have evidence to prove that such rules should be, can be, and will be written. Our case today will be very brief. We came out here with the hope, which has been justified, that the Stanolind and Gulf would prove our case at Monument, and we feel they have adequately done that.

We are going to attempt to show that our oil in place is

being drained from under our land, and the oil of other operators is being drained, and that does not comply with the laws of the State of New Mexico.

Our second contention is that that condition can be remedied just as Dr. Knappen testified in the Hobbs case, by more greatly accenting the weight given to bottom hole pressure. If the Commission is willing, I will proceed.

BY GOVERNOR MILES: Proceed.

GEORGE H. CARD,

being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Q You are George Card, engineer for the Stanolind Oil and Gas Company, aren't you?

A Yes, sir.

Q You are the same Mr. Card who testified the other day before this Commission that the fields of Eunice, Hobbs and Monument were so nearly similar that there was no reason to have any different proration plans applicable to each of them?

A I didn't say they were similar, except that I said I couldn't see any essential difference in the three fields that would justify Eunice being on straight acreage and Hobbs should not be on straight acreage, and also that there was a higher straight acreage factor at Monument than Hobbs.

BY GOVERNOR MILES: You didn't say they were similar?

A I said I didn't see why Hobbs should not be on straight acreage if Eunice is.

BY MR. FLEETWOOD:

Q You did testify that the similarity between the fields was such that any proration plan applicable to one should be applicable to the three?

A I think straight acreage would be applicable to all.

Q Did you testify to that, that the three fields were so similar there was no reason for a different proration plan?

A The point I made was that straight acreage would be applicable.

BY MR. FLEETWOOD: We feel sure he did testify to that, and we would like to get the stenographic notes from the young lady who made the record. I think that will show he did so testify.

BY MR. RANKIN: It seems to me this case is getting very involved. We were talking about Monument and Hobbs, and now we have gone down to Eunice. Insofar as the Hepollo Oil Company is concerned, Eunice was not on this notice of hearing, and we are wholly unprepared. We would like to make a study of Eunice before that field is taken up.

BY MR. FLEETWOOD: Of course, Mr. Rankin realizes that this hearing is on Monument only. My only purpose in asking Mr. Card this question is to refresh the Commissioners' and the operators' memory to the effect that Mr. Card did testify to that effect, and I certainly think it is quite essential to a consideration of our program to determine that similarity.

BY MR. RANKIN: I suggest the witness testify to what he thinks he testified to.

BY MR. FLEETWOOD: I want that answer to be in the record.

BY GOVERNOR MILES: You can testify now.

A I just stated in the last answer.

BY GOVERNOR MILES: Was his answer satisfactory?

BY MR. FLEETWOOD: I would like to re-state the question and ask Mr. Card, did you, or did you not say that, and if he is not willing to do that, then ask the young lady to bring her notes. With the Commission's approval, I will ask that question.

Q Did you, or did you not testify that Eunice, Hobbs and Monument fields were so similar there was no reason why there should be any difference in the proration plans applicable to all three fields?

A The point I was making, as I told you --

BY MR. FLEETWOOD: He can answer that yes or no.

BY GOVERNOR MILES: We will ask that the record be brought up.

BY MR. FLEETWOOD: I withdraw Mr. Card from the witness stand. If the Commission please, I would like to replace Mr. Card with Mrs. Irene Kerchner and have her sworn.

MRS. IRENE KERCHNER,

being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Q Will you state your name.

A Mrs. Irene Kerchner.

Q Are you the reporter who made the stenographic shorthand notes during the first part of the Hobbs hearing?

A I was.

Q Is this transcript made from your shorthand notes?

A Yes, sir.

Q I will ask you if the transcript of the following question and answer is correct: "Question: In your opinion, is there such difference between the three pools as justifies any difference in the allocation of the allowable to the wells in each one?" Answer by Mr. Card: "No difference".

I will ask you if that is a correct quotation of that question and answer?

A That is a correct quotation.

Witness dismissed.

BY MR. FLEETWOOD: That is all I had to inquire of both Mrs. Kerchner and Mr. Card.

R. D. CURTIS,

being called as a witness and being first duly sworn to tell the truth, the whole truth, and nothing but the truth, was examined by Mr. Fleetwood, and testified as follows:

DIRECT EXAMINATION

Q Will you state your name?

A R. D. Curtis.

Q Are you an employee of the Barnsdall Oil Company?

A I am.

Q How long have you been employed by the Barnsdall Oil Company?

A Since February, 1936.

Q What position do you hold with that company?

A Proration engineer.

Q Will you briefly outline for the Commission your qualifications and experience?

A I graduated as a petroleum engineer from the Colorado School of Mines in 1926. I worked approximately six and a half years for the Typsy Oil Company, which is now the Gulf Oil Corporation, and I went with the Barnsdall Oil Company in February, 1936, for whom I am at present employed.

Q What are your duties with Barnsdall?

A My main duties are to take care of proration matters for the company, the engineering part of proration matters.

Q Have you ever, for these various people, Gypsy, Gulf, Barnsdall, worked in the field as field engineer?

A Not as field engineer, but I have been in the field.

Q What kind of work did you do?

A Roust-about.

Q In your job as proration engineer for Barnsdall, do the Lea County fields, and in particular, the Monument field, come under your observation?

A They do.

Q How much time, how many years have you spent, while working for the Barnsdall, accumulating date and making observations and drawing engineering conclusions relative to the Monument field?

A Close to four years now. I started work on that section when I went to work for them in February, 1936.

Q Have you, to the best of your ability, attempted to familiarize yourself with the facts and factors of engineering involved?

A I have tried my best.

Q In connection with your work is it necessary to ~~xxxx~~ be familiar with the proration plan in effect at Monument?

A It is.

Q Do you know, at the present time, what the proration plan at Monument is?

A I do.

Q Would you briefly outline the present proration plan at Monument?

A The present proration plan --

BY GOVERNOR MILES: It will be necessary to recess this meeting until the gas-oil ratio meeting is finished.

Pursuant to recess taken, this hearing was reconvened at eleven o'clock, December 9th.

BY GOVERNOR MILES: The decision of the Commission, in this Monument case, is that it will be continued until the first Monday in February, 1940. If there is no other statements to be made, the Commission will adjourn.

C E R T I F I C A T E

I hereby certify that the foregoing and attached eleven pages of typewritten matter are a true, correct and complete transcript of the shorthand notes made by me on the 9th day of December, 1939, in the hearing before the Oil Conservation Commission in Case No. 14, in the Monument division of such hearing.

Witness my hand this 4th day of January, 1940.

METHOD OF ASSIGNING PRESSURES TO MONUMENT PACKER WELLS

The committee recommends the following procedure in determining the bottom hole pressure of wells in which packers have been set:

Pressures shall be taken in packer wells as in nonpacker wells, and the pressures used in determining the average bottom hole pressure of the field and the percentage rate of increase or decrease in the field's average bottom hole pressure.

If the operator elects, the bottom hole pressure of a packer well may be used to determine its allowable according to the formula in use.

If he elects not to use the measured pressure, and it has been determined to the satisfaction of the proration umpire that the packer has in fact been successful in conserving reservoir energy, then a bottom hole pressure may be assigned to the packer well, which bottom hole pressure is to be used in determining the allowable of the well according to the formula. The assigned pressure shall be calculated by applying to the bottom hole pressure of the packer well the average percentage increase or decrease of bottom hole pressure in all of the non-packer wells on the eight units adjoining or cornering on the unit on which the packer well is situated. This average percentage increase or decrease shall be applied to the bottom hole pressure of the packer well found by actual test in the regular pressure survey run prior to the date the packer was effectively set. If none of the wells on the eight units described above are without a packer, then in that event the percentage increase or decrease of the field's average bottom hole pressure may be used in determining the bottom hole pressure of the packer well in the same manner as described above.

Where packers have been set before the effective date of the acceptance of these recommendations, and the packers are effective in conserving reservoir energy, then at the option of the operator the pressure of the packer well may be determined as described above and used in the future in determining allowable. In no event shall any change in such bottom hole pressure be used retroactively.

It is recommended that bottom hole pressure be taken in all wells in the field unless mechanically impossible so that averages of the two types mentioned above used in assigning pressures may be as representative as possible.

The committee urges that each operator do the necessary remedial work to reduce gas-oil ratios.

ENGINEERS COMMITTEE

Edgar Kraus.
Chairman.

METHOD OF APPLYING BOTTOM HOLE PRESSURES
IN THE MONUMENT FIELD.

The bottom hole pressure shall be taken at a sub-sea depth of -250 ft. In event this depth cannot be reached, the gradient shall be determined between this sub-sea depth and the actual measured depth and the bottom hole pressure of the well corrected according to the weight of the fluid or gas as determined by the gradient. If for any reason a gradient cannot be determined the well will be given the unit allowance.

Case No.

14 File #4

Application, Transcript,
Small Exhibits, Etc.

OIL CONSERVATION COMMISSION

May 9, 1940

Mr. R. D. Curtis
Barnsdall Oil Company
Petroleum Building
Tulsa, Oklahoma

C

O

P

Y

Re: Case No. 14, revising, modifying and amending existing proration plan for Monument Field, Lea County, New Mexico.

Dear Mr. Curtis:

As requested in your letter of May 7, enclosed please find copy of statement of the Skelly Oil Company in connection with the above captioned hearing.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

BARNSDALL OIL COMPANY

PETROLEUM BUILDING

TULSA, OKLA.

May 7th 1940

Honorable Carl B. Livingston
Attorney
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Livingston:

I have noted your letter of May 2nd to our Mr. J. S. Noland regarding statements that have been filed in the Monument case. Mr. Noland is out of the city this week and asked me to write you regarding these statements.

We would like very much to have a copy of the Skelly statement on the Monument case and also any other statements which may have been filed since you wrote to Mr. Noland. In case you do not have extra copies, we shall be glad to pay the cost of making such copies in your office.

Yours truly,

R. D. Curtis

RDC:blm

Ralph D. Curtis

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

(3)

COPY

June 28, 1939

Mr. W. E. Hubbard
Humble Oil & Refining Co.
Houston, Texas

Re: Authorization for the running of shortage.

Dear Mr. Hubbard:

Regarding the running of shortage in a meritorious case such as mechanical trouble and the like, enclosed please find a suggested form letter for authorization of running of such shortage. I shall be profoundly grateful to you for any suggestions you may have.

In order to remove doubt as to the legality of running such shortage, the Commission held a meeting on the afternoon of June 22 and promulgated Emergency Order No. 182 authorizing the running of shortage within the discretion of the Commission in certain meritorious cases, to endure for the first bimonthly period of July, with the intention of renewing said emergency order until formal hearing for the purpose of adopting a permanent order. By law, emergency orders can only endure fifteen days at a time.

At the same said meeting, the Commission ordered a hearing upon Case 15 for the purpose of adopting rules and regulations regarding the running of shortage and for the further purpose of providing for certificates of clearance in order to carry out the provisions of Sections 13 and 14, Chapter 72, Laws of 1935, our Conservation Law. A copy of notice of hearing is enclosed for your information.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Encls.

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

REPLY TO STATEMENT OF SKELLY OIL COMPANY

RE: MONUMENT FIELD.

Barnsdall Oil Company, having just received copy of statement filed by Skelly Oil Company with reference to the proration formula to be fixed for the Monument Field, Lea County, New Mexico, respectfully wishes to make reply thereto.

In the interests of brevity and simplicity, six quotations from the statement of Skelly Oil Company are hereinafter set forth, and each of said six quotations are immediately followed by the reply.

1. Skelly Oil Company statement: "Of the twenty-seven operators in the field only the Barnsdall Oil Company expressed dissatisfaction with the present proration formula."

Reply: This is an erroneous statement. The record will clearly show that Barnsdall Oil Company was joined by Gulf Oil Corporation and by Cities Service Oil Company, and that even Stanolind Oil & Gas Company and Shell Petroleum Company agree that the present formula is not the best one, although such companies disagree with the first named companies with regard to the most desirable remedy.

2. Skelly Oil Company statement: "We would like to point out that said evidence had nothing to say about waste."

Reply: The record is replete with uncontradicted testimony that drainage causes waste and that drainage is occurring in the Monument Field. It is elementary that the use of reservoir energy to move oil from one tract to another is a wasteful use of that energy, and that in the process of migration some of the oil is forever lost to recovery methods.

3. Skelly Oil Company statement: "The matter of drainage is one of equity only."

Reply: The fact that drainage causes waste is uncontrovertible as above set forth. In addition, the equitable treatment of producers is of equal importance with the prevention of waste.

4. Skelly Oil Company statement: "The true test of equity, in the absence of positive individual tract ascertainment of oil in place, is whether or not such proration order is reasonable."

Reply: It is generally acknowledged that it is impossible to "positively ascertain" the amount of oil in place under any individual tract, but it is certainly possible to prevent the drainage of the oil from one tract to another. As long as drainage is existing, and the evidence shows that it is, the proration formula which permits that drainage cannot be reasonable.

5. Skelly Oil Company statement: "What is a truer test of any order of the Commission than the fact that it meets the approval of almost every operator in this field?"

Reply: If "almost every operator" in any field owned edge properties with low bottom hole pressures and could drain oil from underneath the better properties high on the structure, such operators might very easily approve the proration plan which would permit such drainage of the other man's oil. That stamp of approval would not make the proration formula reasonable or legal.

6. Skelly Oil Company statement: "Any change in the present order would naturally injure some operators and benefit other operators."

Reply: If this statement means that a change in the present order would "injure" some operators by depriving them of the opportunity to drain oil from their neighbors, and would "benefit" other operators by stopping the drainage of their oil by their neighbors, we not only agree with the statement as quoted, but reiterate the fact that such result is exactly what we are seeking.

We respectfully urge that the Commission avail itself of the information set forth in the testimony so that it may promulgate a proration order for the Monument Field which will stop drainage across property lines and thereby do equity between operators and eliminate waste.

Respectfully submitted,

BARNSDALL OIL COMPANY

Dated: May 13, 1940

SKELLY OIL COMPANY

TULSA, OKLAHOMA

PRODUCTION DEPARTMENT
H. M. STALCUP, VICE PRESIDENT
J. S. FREEMAN, ASSISTANT

MAR 27 9 06 AM '40
N. M.

March 25, 1940

Mr. Frank Worden
Land Commissioner
Santa Fe, New Mexico

Dear Sir:

In line with the request of the Commission at the Monument field hearing, that producers and operators in the Monument field file statements, on behalf of the Skelly Oil Company we are attaching hereto three copies of statement which we would like to have considered part of the record.

Very truly yours,

George W. Selinger

GWS/mb
cc - Mr. Carl B. Livingston
Mr. J. N. Dunlavey

Mar 27 9 00 AM '48

S T A T E M E N T

The Skelly Oil Company are a producer and operator in the Monument field, having seventeen units, and therefore have a vital interest in the proration formula of the Monument field.

In the past hearings on this field, the Commission have permitted all of the operators to express themselves to the Commission. This year, however, due to the pressure of time, for brevity's sake the Commission are permitting written statements for the record.

If the Commission will recall, and the record being the best evidence will show that an announcement was made requesting that operators submit statements as to whether or not they were satisfied with the present proration formula in the Monument field. Of the twenty-seven operators in the field only the Barnsdall Oil Company expressed dissatisfaction with the present proration formula, and this should indicate that, with representatives of all operators being present, only one company has expressed dissatisfaction. Perhaps one or two others by their written statements - in which case we would have no knowledge - may have some slight grievance against the present plan, but by and large the vast majority of the operators seek no change in the present proration formula in the Monument field.

A great deal of technical and engineering evidence has been presented to the Commission, and we would like to point out that said evidence had nothing to say about waste, and the whole controversy narrowed down to the one proposition of equity, that is, which operator should get how much oil. Specifically, the matter of drainage is one of equity only, and the true test of equity, in the absence of positive individual tract ascertainment of oil in place, is whether or not such proration order is reasonable. What is a truer test of any order of the Commission than the fact that it meets the approval of almost every operator in this field? It is self evident that the order is a reasonable one as it so meets the express approval of almost all of the operators. In passing it might be well to state that any change in the present order would naturally injure some operators and benefit other operators, and it is quite obvious, therefore, that since equities have been established under the present plan, no change should be made by the Commission. The properties have been operated on the present plan with operators going along, and they are certainly entitled to have the Monument field proration plan settled once and for all, as operators look to the Commission for a proration formula which would create stabilization to which they certainly are entitled.

In conclusion, therefore, we most sincerely urge the Commission to retain the present proration formula in the Monument field because it is a practicable, reasonable and equitable proration formula.

Respectfully submitted,

SKELLY OIL COMPANY

By George W. Selinger
George W. Selinger

March 21, 1940

Honorable Oil & Gas Commission
State of New Mexico
Santa Fe, New Mexico

Governor John E. Miles, Chairman

Honorable Frank Worden
Land Commission Member

Honorable A. Andreas
State Geologist

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
MAR 30 1940

IN RE: Revising, Modifying and Amending Existing Proration Plan for the Monument Field, Lea County, New Mexico.

Gentlemen:

Since the discovery of the Monument Field, the Barnsdall Oil Company has consistently requested the Conservation Commission of the State of New Mexico to write an Order that will comply with the law (Chapter 72, 1935 Session Laws); a law so drawn and designed as to give to each operator the oil in place under his property, so as to promote equity and justice toward all operators, so as to give each operator the use of his just and equitable share of the reservoir energy, the first paragraph of Section 12 thereof being quoted:

> "Section 12. Whenever, to prevent waste, the total allowable production for any field or pool in the state is fixed by the Commission in an amount less than that which the field or pool could produce if no restriction were imposed, the Commission shall prorate or distribute the allowable production among the producers in the field or pool. Such proration or distribution shall be made on a reasonable basis. The rules, regulations or orders of the Commission shall, so far as it is practicable to do so, afford to the owner of each property in a pool the opportunity to produce his just and equitable share of the oil and gas in the pool, being an amount, so far as can be practicably determined, and so far as such can be practicably obtained without waste, substantially in the proportion that the quantity of the recoverable oil and gas under such property bears to the total recoverable oil and gas in the pool, and for this purpose to use his just and equitable share of the reservoir energy."

The Barnsdall Oil Company respectfully submits that in the various hearings called for the purpose of considering a proration order for the Monument Pool three undisputed facts stand forth:

1. Oil does migrate from areas of high pressure to areas of low pressure.

2. There are areas of high pressure and areas of low pressure in the Monument Pool.

3. Oil is and has been migrating across property lines in the Monument Pool.

The witnesses on behalf of Barnsdall Oil Company endeavored to present their expert opinions in as candid and as straight-forward a fashion as was possible. We welcome a comparison of their attitude as expressed by their testimony with the testimony given by witnesses in opposition to Barnsdall.

The Monument Pool has been in existence for years. During those years several hearings as to proration plans have been held and representatives of all the companies have attended many engineers' committee meetings. Suddenly in March 1939 the Commission and operators were confronted with the "latest and most advanced theory", which had never been heard of before.

Mr. R. G. Schuehle, geologist for Shell Petroleum Corporation, testified that geological conditions in the Monument Pool were so complex that it was useless to endeavor to prorate the field on any basis other than straight acreage, although he was willing to give twenty per cent weight to the bottom hole pressure formula.

Mr. Schuehle based his suggestion on the theory that the Monument Pool was really three pools, i.e., three reservoirs separated one from the other by impervious, impenetrable strata of rock. He stated that there was no "appreciable" migration of oil between these three zones because of this impervious stratum between each of the three zones. At the same time and in the same breath, he very candidly testified that the oil deposits cut across these zones and through those strata, and that there had always been and is intercommunication between the zones, but that the amount of same was so small as to be "ineffective". This witness also very frankly stated that there were between 250 and 300 bore holes of between six and seven inch diameters which vertically connect these various zones, if they do exist. He also stated that there are possibilities of fractures in these allegedly impervious strata between the three zones. Finally, he stated that since there was a possibility of intercommunication to some extent, he would favor leaving the formula as is so that if such intercommunication existed no great hardship would be sustained.

It was interesting to note that Mr. Schuehle testified that generally oil did migrate from high pressure areas to low pressure areas, yet Mr. George Card would not testify to that effect.

Messrs. A. P. Loskamp and E. A. Markley, District Geologist and Chief Geologist, respectively, for Barnsdall Oil Company, testified quite definitely that the Monument Pool was one common reservoir, intercommunicating and interconnecting in every respect. In this connection, it should be observed that Mr. Loskamp, the District Geologist who had spent so much time in the field, was not cross-examined, although an effort was then made to cross-examine and deride Mr. Markley, because he was Chief Geologist and as such relied on information and data accumulated by others rather than on actual field work.

So frequently have the beliefs and contentions of Barnsdall Oil Company been presented to the Commission, that we feel that no useful purpose would be served in burdening the Commission with a lengthy statement or brief. We only respectfully ask that the testimony be examined in order to ascertain whether the preponderance of the evidence shows that there is migration of oil across property lines in the Monument Pool which should be stopped by giving seventy-five per cent weight to the bottom hole pressure factor in the present Monument proration formula. We think that the candor, sincerity and lack of evasiveness of the various witnesses should be considered carefully. Further, we respectfully suggest that, even if Mr. Schuehle's new theory should be adopted, there is no reason why the proration plan suggested by Barnsdall should not also be adopted in order to prevent drainage of oil from one property to another within one zone. No one would be injured since, according to Mr. Schuehle, there could be no drainage from one zone into another.

In conclusion, we wish to reiterate that Barnsdall Oil Company does not wish to obtain one barrel of oil, nor one ounce of reservoir energy to which it is not entitled. However, this Company does believe that it is legally entitled to produce its own oil in place in so far as is possible, and that under the present Order of the Commission, known as Order No. 33, the oil rightfully belonging to Barnsdall Oil Company is being drained from

beneath its leases, and that Barnsdall Oil Company is being deprived not only of its oil, but of its just and equitable share of the reservoir energy.

A legal and technically correct, as well as just and equitable, order can and should be written by the Commission by adopting the proposal submitted that twenty-five per cent of the field allowable be allocated on an acreage basis, and seventy-five per cent be allocated on the bottom hole pressure factor now included in the formula.

Respectfully submitted.

BARNSDALL OIL COMPANY

By _____

Copy to Honorable Carl Livingston.

Case No.

14

Application, Transcript,
Small Exhibits, Etc.

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

July 2, 1941

Oil Conservation Commission,
Santa Fe, New Mexico.

Gentlemen:

Re: Case #14 - Hobbs Division Order #329
Hobbs Proration Plan
Petition for Rehearing

This acknowledges receipt of yours of the 27th of June and the Gulf Oil Corporation has no objection to withdrawing its petition for rehearing providing it will not be prejudiced by so doing and will be permitted to file petition for rehearing after the present order has been rewritten and clarified, in event the revised order is unsatisfactory.

Our production records show during the period the order has been in force, Gulf Oil Corporation has lost approximately 24,881 barrels in production and the areas in which additional allowables were granted have benefited approximately 58,233 barrels.

It is evident from the figures above, the order as written is detrimental to the interests of the Gulf Oil Corporation and its lessors and results in drainage.

Yours very truly,

Russell G Lowe

RGL.W.

The Ohio Oil Co.

P. O. BOX 3128
HOUSTON, TEXAS

July 1, 1941

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attn. of Mr. John M. Kelly, Secretary

Re: Case #14 - Hobbs Division Order #329 -
Hobbs Proration Plan - Petition for
Re-hearing

Gentlemen:

We acknowledge with thanks the receipt of your letter dated June 27, 1941, outlining the decision of the Commission on June 25th. in the above captioned case which is pending until issuance of a clarifying order.

Yours very truly,

THE OHIO OIL COMPANY

By: A. Allen Bush

General Superintendent

MARATHON

NEW MEXICO OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO

June 27, 1941

COPY

Russell G. Lowe, Esq.
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case #14 - Hobbs Division Order #329 - Hobbs Proration Plan - Petition for Re-hearing.

Dear Mr. Lowe:

At its Executive session June 25th, in connection with the petition for re-hearing in the above captioned matter, the Commission decided that in view of the fact that in the promulgation of Order #329 the Commission had made reservation of jurisdiction for further determination, it would be advisable to exercise that jurisdiction by the issuance of a clarifying order.

The Commission further reached the conclusion in its Executive meeting to request the petitioner and all those joining in such petition to withdraw the petition until the final order and clarification is promulgated.

Very truly yours,

Oil Conservation Commission

By

John M. Kelly
Secretary.

NEW MEXICO OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO

June 27, 1941

COPY

Mr. R. H. Foster
Executive Vice President
Landreth Production Corporation
Fort Worth, Texas

Re: Case #14 - Hobbs Division Order #329 - Hobbs Proration Plan - Petition for Re-hearing.

Dear Mr. Foster:

At its Executive session June 25th, in connection with the petition for re-hearing in the above captioned matter, the Commission decided that in view of the fact that in the promulgation of Order #329 the Commission had made reservation of jurisdiction for further determination, it would be advisable to exercise that jurisdiction by the issuance of a clarifying order.

The Commission further reached the conclusion in its Executive meeting to request the petitioner and all those joining in such petition to withdraw the petition until the final order and clarification is promulgated.

Very truly yours,

Oil Conservation Commission

By

John H. Kelly
Secretary.

CDL:S

NEW MEXICO OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO

June 27, 1941

COPY

Mr. H. B. Hurley
Assistant General Superintendent
Texas-New Mexico Division
Continental Oil Company
Fort Worth, Texas

Re: Case #14 - Hobbs Division Order #329 - Hobbs Proration Plan - Petition for Rehearing.

Dear Mr. Hurley:

At its Executive session June 25th, in connection with the petition for re-hearing in the above captioned matter, the Commission decided that in view of the fact that in the promulgation of Order #329 the Commission had made reservation of jurisdiction for further determination, it would be advisable to exercise that jurisdiction by the issuance of a clarifying order.

The Commission further reached the conclusion in its Executive meeting to request the petitioner and all those joining in such petition to withdraw the petition until the final order and clarification is promulgated.

Very truly yours,

Oil Conservation Commission

By

John M. Kelly
Secretary.

O.H.: h

NEW MEXICO OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO

June 27, 1941

COPY

Mr. Glenn Bish
General Superintendent
Ohio Oil Company
P. O. Box 3018
Houston, Texas

Re: Case #14 - Hobbs Division Order #329 - Hobbs Proration Plan - Petition for Re-hearing.

Dear Mr. Bish:

At its Executive session June 25th, in connection with the petition for re-hearing in the above captioned matter, the Commission decided that in view of the fact that in the promulgation of Order #329 the Commission had made reservation of jurisdiction for further determination, it would be advisable to exercise that jurisdiction by the issuance of a clarifying order.

The Commission further reached the conclusion in its Executive meeting to request the petitioner and all those joining in such petition to withdraw the petition until the final order and clarification is promulgated.

Very truly yours,

Oil Conservation Commission

By

John W. Kelly
Secretary

C.W.: G

NEW MEXICO OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

June 27, 1945

COPY

Hayes McCoy, Esq.
Cities Service Oil Company
Bartlesville, Oklahoma

Re: Case #14 - Hobbs Division Order #329 - Hobbs Proration Plan - Petition for Re-Hearing.

Dear Mr. McCoy:

At its Executive session June 25th, in connection with the petition for re-hearing in the above captioned matter, the Commission decided that in view of the fact that in the promulgation of Order #329 the Commission had made reservation of jurisdiction for further determination, it would be advisable to exercise that jurisdiction by the issuance of a clarifying order.

The Commission further reached the conclusion in its Executive meeting to request the petitioner and all those joining in such petition to withdraw the petition until the final order and clarification is promulgated.

Very truly yours,

Oil Conservation Commission

By

John W. Kelly
Secretary

JWK:IS

STANDARD TIME INDICATED

RECEIVED AT PLAZA HOTEL SANTA FE, NEW MEXICO

TELEPHONE YOUR TELEGRAMS TO POSTAL TELEGRAPH

Form 16 Dbl

Postal Telegraph

THIS IS A FULL RATE TELEGRAM, CABLEGRAM OR RADIOGRAM UNLESS OTHERWISE INDICATED BY SYMBOL IN THE PREAMBLE OR IN THE ADDRESS OF THE MESSAGE. SYMBOLS DESIGNATING SERVICE SELECTED ARE OUTLINED IN THE COMPANY'S TARIFFS ON HAND AT EACH OFFICE AND ON FILE WITH REGULATORY AUTHORITIES.

10VDE TWS PAID-3M- GY TULSA OKLA 1158A 6/25 '41

OIL CONSERVATION COMMISSION

SANTAFE NMEX

ON JANUARY 29 1941 I FORWARDED YOU PETITION FOR REHEARING AND RECONSIDERATION OF CASE NUMBER FOURTEEN SUBDIVISION 9RORATION ORDER THREE TWO NINE STOP WOULD APPRECIATE YOUR CONSIDERATE APPLICATION OF PETITION AND IF APPLICATION FOR REHEARING IS GRANTED FIX A DATE FOR HEARING.

GULF OIL CORPN, BY RUSSELL G. LOWE

1132A

SETH AND MONTGOMERY
ATTORNEYS AND COUNSELORS AT LAW
111 SAN FRANCISCO ST.
SANTA FE, NEW MEXICO

J. O. SETH
A. K. MONTGOMERY

June 19, 1941

Mr. John Kelly, Secretary
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Kelly:

Re: Case #14, Hobbs Division,
Proration Matters

Please refer to the Oil Conservation Commission's letter of February 4 in the above designation, addressed to Mr. A. M. McCorkle.

The Stanolind Oil and Gas Company believes that Order No. 329 is, in all respects, right and proper and believes that any petition for rehearing or reconsideration of said Order should be denied without further hearing.

We did not answer your letter earlier because we were one of the interested parties in this matter and did not see how there could be any doubt as to our views on the record made up.

Very truly yours,

Attorney for Stanolind
Oil and Gas Company

JOS/bf
cc/ Mr. A. M. McCorkle, Houston, Texas

February 4, 1941

Mr. A. M. McCorkle
Stanolind Oil & Gas Co.
Fort Worth, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. McCorkle:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik
cc - J. O. Seth.

TIDE WATER ASSOCIATED OIL COMPANY

MID-CONTINENT DIVISION

HOUSTON, TEXAS

March 31, 1941

Mr. Carl B. Livingston, Attorney
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

IN RE: CASE #14, HOBBS DIVISION,
PRORATION MATTERS.

Dear Mr. Livingston:

Under date of February 4, you advisedour Mr. J. E. Roth in our Tulsa office that the Gulf Oil Corporation had filed application for Rehearing and Reconsideration of your Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order. Your letter was referred to this office for reply.

After due consideration, we have decided that we will not request that Order No. 329 be changed. It so happens that our wells are located so that the new order has slight effect on our allowable production. We will lose about 9 barrels per day.

The only suggestion we might offer is that we do not favor any method of allocation in the Hobbs Field that will require testing the wells for potentials. We believe that due to the age of the field such procedure will do more harm than good.

Thanking you for calling this matter to our attention, we remain,

Very truly yours,

TIDE WATER ASSOCIATED OIL COMPANY

By- J. R. Gahan.

JRG:fn

CC-Mr. J. E. Roth
Mr. D. E. Legan

HUMBLE OIL & REFINING COMPANY
HOUSTON, TEXAS

February 28, 1941

Mr. Carl B. Livingston
Oil Conservation Commission
Santa Fe, New Mexico

Dear Sir:

We have carefully considered your letter of February 3 addressed to Mr. Suman concerning a hearing to reconsider Order No. 329.

We feel that a very complete record was made at the first hearing and recommend that no rehearing be held.

Very truly yours,

W. E.Hubbard

WEH:ed

STANDARD OIL COMPANY OF TEXAS

P. O. Box 1249
Houston, Texas
February 25, 1941

CASE #14, HOBBS DIVISION
PRORATION MATTERS

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attention: Mr. Carl B. Livingston

Gentlemen:

We hope that you will pardon our delay in answering your letter of February 4, 1941 addressed to our Mr. William Simpson of Midland, Texas, and concerning the application or petition of Gulf Oil Corporation for rehearing and reconsideration of the Commission's Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

You inquire as to our Company's attitude as to whether or not such rehearing and reconsideration should be considered. While we do not wish to appear in any way disobliging, it is our feeling that the question is one which lies entirely within the discretion of the Commission and upon which we could not, with propriety, make any recommendation. This attitude is fortified by the consideration that our interest in the disputed question is relatively trivial. Furthermore, although we are always ready to furnish the Commission with any factual information which it may desire, we have never had occasion for any serious complaint with respect to the Commission's judgment on matters of policy.

Yours very truly,

STANDARD OIL COMPANY OF TEXAS

By Lucius M Lamar

LML/ma

cc: Mr. William Simpson
c/o Standard Oil Company of Texas
Midland, Texas

GENERAL OFFICES
120 BROADWAY NEW YORK

AMERADA PETROLEUM CORPORATION
BEACON BUILDING
P. O. BOX 2040
TULSA, OKLA.

February 13, 1941

Oil Conservation Commission
Santa Fe, New Mexico

Attention: Mr. Carl B. Livingston

Gentlemen:

Your letter of February 4, directed to Mr. Marsh, regarding the re-hearing on the Commission's recent Order No. 329, affecting the Hobbs field, has been referred to me in Mr. Marsh's absence.

While we have always favored potentials as a factor in the allocation of production in the Hobbs field, we do not have additional data to submit. We are always interested in obtaining the most equitable allocation formula, and if a re-hearing on Hobbs might bring better allocation methods before the Commission, our attitude would be in favor of the re-hearing.

Yours very truly,

AMERADA PETROLEUM CORPORATION

By C. V. Milliken

C. V. Milliken
Chief Production Engineer

CVM:H
cc: Mr. H. E. Marsh

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
FEB 17 1941

SM-138

SHELL OIL COMPANY
INCORPORATED
PETROLEUM BUILDING
MIDLAND, TEXAS
February 7, 1941

RECEIVED
STATE LAND OFFICE
FEB 10 10 57 AM '41
SANTA FE, N.M.

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attention: Mr. Carl B. Livingston

Gentlemen:

We appreciate your letter of February 4th giving us an opportunity to give our views regarding your Commission's recent Order No. 329 covering Hobbs Proration. We think this is a good, sound order and see no reason whatever for a rehearing or a reconsideration of it by the Commission. Our general views on Hobbs and Monument proration formulas were given in our letter to you of December 27, 1939, a copy of which is herewith attached. We know of no new developments which have taken place since then to cause us to change our opinion and we think the principles involved remain the same.

Thanking you again for giving us this opportunity to express our views, we are,

Very truly yours,

SHELL OIL COMPANY, Incorporated

By: H. J. Kemler
General Manager - West Texas

HJK:br

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
FEB 10 1941

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RECEIVED
STATE LAND OFFICE
FEB 10 10 57 AM '41
SANTA FE, N. M.

Midland, Texas
December 27, 1939

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

At the close of the Hobbs and Monument hearings recently held in Santa Fe, you invited all interested operators who had not expressed themselves during the hearing to write you their views. Although we do not wish to become involved in the arguments of either the Stanolind or Gulf Companies, we thought we might avail ourselves of the opportunity you offered to express a belief in a principle, for whatever help our opinion may be to you in weighing the evidence presented. Since our properties at Hobbs and Monument lie in both the high and low pressure and high and low potential areas, we would neither gain nor lose if either the Stanolind or Gulf plan is adopted. Our opinion, therefore, is based on principle rather than any self-interest.

For the types of fields presently producing in Lea County, we believe that giving the greatest weight to the acreage factor when allocating allowables between leases results in the most equitable division of the oil in place under each lease and the most efficient and least wasteful recovery of the oil in the reservoir. Therefore, in the present instance, if a change is made in the proration formula at Hobbs, it should increase the acreage factor above sixty per cent rather than reduce it.

When emphasis is placed on the use of potentials in proration formulas, it leads to wasteful practices such as too deep penetration, excessive shooting and acidizing, high gas-oil ratios, early and rapid water encroachment and frequently to false potentials when taken by unscrupulous operators. It requires the construction of unnecessary tanks and in pumping fields the installation of expensive heavy-duty equipment not required under normal production practice. For these and other practical reasons, we and most operators believe in minimizing the influence of potentials in the allocating of allowables.

Very truly yours,
SHELL OIL COMPANY, Incorporated

Original Signed By
H. J. Kemler

By: _____

HJK:br

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
FEB 10 1941

MID-CONTINENT PETROLEUM CORPORATION

GENERAL OFFICES TULSA, OKLA.

February 6, 1941.

G. O. MOODY
VICE-PRESIDENT

STATE LAND OFFICE
FEB 8 8 54 AM '41
SANTA FE, N. M.

Oil Conservation Commission,
Santa Fe, New Mexico.

Gentlemen: Attention: Mr. Carl B. Livingston

Referring to yours of February 4 concerning Case #14, Hobbs Division, Proration Matters, this is to advise you that this company has no objection to the proration order now in effect being continued in operation.

Very truly yours,

MID-CONTINENT PETROLEUM CORPORATION

G. O. Moody.

GOM-w

THE TEXAS COMPANY

TEXACO PETROLEUM PRODUCTS

PRODUCING DEPARTMENT
WEST TEXAS DIVISION
H. S. COLE, JR., DIVISION MANAGER

P. O. BOX 1720
FORT WORTH, TEXAS

February 7, 1941.

CONSERVATION & PRORATION
RE: CASE #14, HOBBS DIVISION,
PRORATION MATTERS

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
FEB 10 1941

New Mexico Oil Conservation Commission,
Santa Fe, New Mexico.

Attention: Mr. Carl B. Livingston.

Dear Mr. Livingston:

This is to acknowledge receipt of your letter, under the above subject, dated February 4, 1941, which has particular reference to an application or petition filed by the Gulf Oil Corporation for re-hearing and re-consideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

This is to advise that we believe all the pertinent facts heretofore presented in this matter have been complete and that should a re-hearing be granted, we would enter no objection to the Order as recently issued by the Conservation Commission.

We wish to thank you for submitting this matter for our consideration and assure you of our continued cooperation.

Yours very truly,

THE TEXAS COMPANY,
Producing Department,
H. S. Cole, Jr.,
Division Manager.

By A. E. Willig
A. E. Willig,
Division Engineer.

AEW-DAT

SOUTHERN PETROLEUM EXPLORATION, INC.
Box 1017
ROSWELL, NEW MEXICO

GEOLOGICAL AND
LAND DEPARTMENT

February 8, 1941

Mr. Carl B. Livingston
Attorney for Oil Conservation Commission
Santa Fe, New Mexico

In re: Case No. 14, Hobbs Division
Proration Matters.

Dear Sir:

We are in receipt of your letter of February 4th, relating to petition for re-hearing of Commission Order No. 329 of the Gulf Oil Corporation, and asking our attitude as to whether or not re-hearing should be considered.

We know nothing of the merits of the arguments for or against the new order and do not wish to be active in it. We believe, however, the new order is favorable to our production and from a selfish point of view would wish the new order to stand. We do not know if the new order is beneficial to the field as a whole but believe that it is. However, everyone seems to take the selfish point of view and with that we would rather the order stand. We do not believe in the continual rehashing of arguments on production practices unless rulings or orders are essentially bad.

Very truly yours,

SOUTHERN PETROLEUM EXPLORATION, INC.,

By J B Headley

JBH:AMS

cc-Southern Petroleum Exploration, Inc.
Sistersville, West Virginia

GENERAL OFFICES PHILADELPHIA PA

SUN OIL COMPANY

SOUTHWEST DIVISION

M. B. SWEENEY, GENERAL AGENT
J. H. PRESSLEY
MGR OF LAND DEPT

FIRST NAT. BANK BUILDING
DALLAS, TEXAS

J. EDGAR PEW, VICE PRES
GENERAL DIRECTOR

JNO. G. PEW
ASSISTANT TO VICE PRES
DALLAS, TEXAS

Feb. 7, 1941

RE: Case #14 Hobbs Division, Proration Matters;
Specifically Order #329, Oil Conservation Comm.

Hon. Carl B. Livingston
New Mexico Oil Conservation
Commission
Santa Fe, New Mexico

Dear Sir:

I have received your letter of the 4th and also your letter of the 6th enclosing a copy of the New Mexico Conservation Commission Order #329 covering a change in the method of allocation of oil to the units in the Hobbs Field. The new order distributes the field allowable to the units on a basis of 80% to the acreage in the units and 20% to the bottom-hole pressure of the individual wells in the units. This is a change from a method of allocation based on distributing 60% of the field's allowable to the units on an acreage basis and 40% to the wells on the units on the basis of their relative potentials.

You have inquired whether Sun Oil Company feels that it desires a re-hearing and a re-consideration of this order by the Commission. You also advise us that the Gulf Oil Corporation has requested a re-hearing and re-consideration of this order.

This is to advise you that, after considering the two orders mentioned above, Sun Oil Company does not request a re-hearing on this matter. In making the above statement Sun Oil Company wishes it to be understood that it was not complaining of the prior order and is not complaining of the present order. We feel that your body has considered this matter and has made this change because of evidence introduced before it at a regular hearing, and that you have exercised properly the duties that are required of you.

I would like to point out that Sun Oil Company owns but one non-marginal producing lease in this field and that it has not complained of your orders in the past since it occupies the peculiar position of having wells in which packers have been set to cut off an erratic invasion of water in the producing horizon. We will be agreeable to closing our wells in and making bottom-hole pressure tests, even at the expense of possibly damaging packer seats.

Yours truly,

F. E. Heath

FEH:jc

cc - Mr. Jno. G. Pew
Mr. J. E. Regent
Mr. M. A. Row

THE ATLANTIC REFINING COMPANY

PETROLEUM PRODUCTS

IN REPLY REFER TO FILE

DOMESTIC PRODUCING DEPT.

Carlsbad, New Mexico
February 7th, 1941

Mr. Carl B. Livingston
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Livingston:

In reply to your letter of February 3rd asking that we inform you of our company's attitude concerning the petition for rehearing and reconsideration of Order No. 329 relating to Hobbs proration, please be advised that the Atlantic's position is as follows:

Because the interests we own in various leases at Hobbs are distributed rather equally, we will probably be unaffected as far as active participation in the pool's outlet is concerned, by the new order and are, therefore, not vitally concerned insofar as the actual position of the company in the field is concerned.

Unfortunately, the order as written has left many indeterminate points which we would like to see clarified even if the actual factors to be used and the percentage weight given to them is not to be reviewed by the Commission. For example, if a bottom hole pressure factor is to be used directly, as indicated in the order, very definite rules are needed concerning what to do with wells having packers set in them and what to do with wells in which, because of pumping equipment or other good reasons, pressures cannot be measured.

Briefly, then, we would favor a rehearing to clarify technical points in the administration of the order even if the Commission does not desire to reopen the whole question relating to choice of factors to be used and the percentage weight to be given them.

Yours very sincerely,

Edgar Kraus

Edgar Kraus.

EK:R
cc: L. A. Sunkel

J. P. CUSACK. [redacted]
Ft. Worth [redacted] TEXAS

February 11, 1941.

Oil Conservation Commission,
Santa Fe, New Mexico.

Re: Case #14 Hobbs Division,
Proration Matters.
Attention Mr. Livingston.

Gentlemen:

I have before me your letter dated Feb. 4th stating that the Gulf Oil Corporation has filed a Petition for rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration order.

I see no premise on which they are entitled to reconsideration for the reasons that conditions in this Pool have not changed since they introdueed their evidence and they as well as every operator had their day in Court.

Yours very truly,
J. P. Cusack.
3724 Country Club Circle.

JPC/L

CONTINENTAL OIL COMPANY

Fort Worth, Texas
February 11, 1941

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attention Mr. Carl B. Livingston, Attorney

Gentlemen:

I refer to your letter of February 3, 1941, reference Case No. 14, Hobbs Division, Proration Matters, in which you referred to the Commission's recent Order No. 329, amending Order No. 48.

It is the opinion of the Continental Oil Company that this case should be scheduled for rehearing and reconsideration, so all operators affected may have an opportunity to present their views. We recommend such rehearing be favorably considered by the Commission.

Yours very truly,

H. B. HURLEY
Assistent General Superintendent
Texas-New Mexico Division
Production & Drilling Department

MLF:CL
cc RVAM JGD HLJ

The Ohio Oil Co.
P. O. BOX 3128
HOUSTON, TEXAS

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
FEB 10 1941

February 6, 1941

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attention of Mr. Carl B. Livingston, Atty.

Re: Case No. 14, Hobbs Division, Proration Matters

Gentlemen:

We are pleased to acknowledge the receipt of your letter of February 3, 1941, in reference to the above-entitled case.

As one of the operators in the Hobbs pool, we are of the opinion that this matter should be reconsidered at a hearing, and it is our suggestion that this be done.

It will be appreciated if you will give us notice of any such hearing you may call, so that we may, if so desired at that time, present evidence.

We gratefully thank you for your letter and remain

Yours very truly,

THE OHIO OIL COMPANY

By: Glenn Bish

Glenn Bish
General Superintendent

MARATHON

CITIES SERVICE OIL COMPANY

PRODUCERS-REFINERS-MARKETERS OF PETROLEUM PRODUCTS

BARTLESVILLE
OKLAHOMA

Legal Division
February 11, 1941

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
FEB 13 1941

Oil Conservation Commission
State Capitol
Santa Fe, New Mexico

Attn. Hon. Carl B. Livingston

In re: Case No. 14 Hobbs Division,
Proration Matters

Gentlemen:

Your letter of February 3, 1941 addressed to our Mr. D. D. Bodie in regard to the captioned subject has been referred to me for answer.

We believe the rehearing in this case requested by Gulf Oil Corporation in its application or petition filed with you should be granted. We feel Order No. 329 of the Commission amending its Order No. 48 known as the Hobbs Proration Order is not authorized by the governing statutes and is therefore in excess of the Commission's jurisdiction under such statutes.

As we view this order, it denies us and some other operators the opportunity to recover our and their just and equitable share of the oil in this pool. As we interpret it, it does not accord us and them the opportunity to recover substantially in the proportion that the quantity of recoverable oil under our and their property bears to the total recoverable oil in the pool. It appears to us that any order which deprives us or any other operator in this field of the right to recover our proportion of the oil in the proportion herein stated exceeds the Commission's authority. We believe such rehearing will enable the Commission to procure a fuller

PRICES SUBJECT TO CHANGE WITHOUT NOTICE. ORDERS ACCEPTED CONTINGENT UPON STRIKES, ACCIDENTS, DELAYS BY CARRIERS, OR OTHER CAUSES BEYOND OUR CONTROL
ALL COMMUNICATIONS SHOULD BE ADDRESSED TO THE COMPANY

understanding of the facts necessary in determining the formula to be used in allocating the production among the several lease owners and of the mechanics to be provided in the order for the administration thereof.

You may treat this as a request for the granting of a rehearing on the application or petition of Gulf Oil Corporation.

Very truly yours,

CITIES SERVICE OIL COMPANY

By Hayes McCoy
Hayes McCoy
Assistant Chief Counsel

HMcC sm

LANDRETH PRODUCTION CORPORATION
SINCLAIR BUILDING
FORT WORTH, TEXAS

R. H. FOSTER
EXECUTIVE VICE-PRESIDENT

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
FEB 24 1941

February 21, 1941

Re: Case #14, Hobbs Division,
Proration Matters.

Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Gentlemen:

In connection with the petition of Gulf Oil Corporation for a rehearing and a reconsideration of the order entered December 31, 1940 amending Section 9 of order No. 48, we beg to offer the following suggestion.

We endorse in principal and in the main that which is presented by the Gulf Oil Corporation in its application. We believe that the order of December 31, 1940 should be set aside and the field prorated on the basis theretofore prevailing.

Without attempting to restate the ground as set forth by the Gulf Oil Corporation we simply join in its prayer for relief as above stated.

Yours very truly,

RHF:D
c:c Mr. Carl B. Livingston
Legal Dept. Oil Conservation Comm.
Santa Fe, N. M.
Gulf Oil Corporation
Tulsa, Oklahoma
T. P. Coal & Oil Co.
Ft. Worth, Texas

February 6, 1941

AIRMAIL

Honorable F. E. Heath
Sun Oil Company
Dallas, Texas

Re: Order No. 329 of the Oil Conservation Commission.

My dear Mr. Heath:

As requested in your telegram received today, enclosed please find copy of the above captioned order.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik
Enc.

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

R. B. WHITE
PRESIDENT

NEWCOMB CARLTON
CHAIRMAN OF THE BOARD

J. C. WILLEVER
FIRST VICE-PRESIDENT

SYMBOLS

DL = Day Letter
NT = Overnight Telegram
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

VE88 19=DALLAS TEX 6 1258P

CARL B LIVINGSTON, ATTORNEY=

NEWMEXICO OIL CONSERVATION COMMISSION

1941 FEB 6 PM 12 22

RE LETTER HAVE NOT RECEIVED COMMISSIONS ORDER 329 STOP

PLEASE FORWARD ONE AT ONCE AND WILL REVIEW AND ADVISE=

F E HEATH SUN OIL CO.

329 THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

A. M. McCORKLE, CHAIRMAN
OPERATORS COMMITTEE

GLENN STALEY, CHAIRMAN
ENGINEERING COMMITTEE

LEA COUNTY OPERATORS COMMITTEE

HOBBS, NEW MEXICO

February 3, 1941

HOBBS POOL

COMPANY	POLICY SETTING OFFICIAL	ADDRESS
✓ Amerada Petroleum Corp.	H.E. Marsh	Tulsa, Okla.
✓ Atlantic Refining Co.	Edger Kraus	Carlsbad, New Mexico
✓ Cities Service Oil Co.	D.D. Bodie	Hobbs, New Mexico
✓ Continental Oil Co.	H.B. Hurley	Ft. Worth, Texas
✓ Gulf Oil Corp.	S.C. Sanderson	Tulsa, Oklahoma
✓ Humble Oil & Rfg. Co.	John R. Suman	Houston, Texas
✓ Lendreth Prod. Corp.	E.A. Landreth	Ft. Worth, Texas
✓ Magnolia Pet. Co.	S.P. Hannifin	Roswell, N.M.
✓ Midcontinent Pet. Corp.	G.O. Moody	Tulsa, Okla.
✓ Ohio Oil Co.	Glenn Bish	Houston, Texas
✓ Repollo Oil Co.	H.J. Summy	Midland, Texas
✓ Samedan Oil Corp.	Lloyd Biddick	Ardmore, Okla.
✓ Shell Oil Co., Inc.	H.J. Kemler	Midland, Texas
✓ Skelly Oil Co.	J.M. Dunlavey	Hobbs, N.M.
✓ Southern Pet. Exploration Co-Inc.	J.B. Headley	Roswell, N.M.
✓ Standard Oil Co. of Texas	W.M. Simpson	Midland, Texas
✓ Stanolind Oil & Gas Co.	A.M. McCorkle	Ft. Worth, Texas
✓ Sun Oil Co.	Francis Heath	Dallas, Texas
✓ The Texas Co.	H.S. Cole, Jr.	Ft. Worth, Texas
✓ Texas Pacific Coal & Oil Co.	C.B. Yeager	Ft. Worth, Texas
✓ Tidewater Assoc. Oil Co.	Jack Roth	Tulsa, Okla.
Two States Oil Co.	Howard Holmes	Dallas, Texas
Walker Oil Corp.	Harry Walker	Wichita, Kansas

HOBBS POOL

COMPANY	POLICY-SETTING OFFICIAL	ADDRESS
Amerada Petroleum Corp.	R. D. Christie	Fort Worth, Texas
Atlantic Refining Co.	Edgar Kraus	Artesia, N. M.
Cities Service Oil Co.	J. D. Hoskins	Hobbs, N. M.
Continental Oil Co.	H. B. Hurley	Ft. Worth.
~~Getty Oil Co.~~		
~~Gulf Oil Corp.~~	~~S. G. Gundersen~~	~~Tulsa, Okla.~~
Humble Oil & Rfg. Co.	John R. Suman	Houston
Landreth Prod. Corp.	Ed Landreth	Ft. Worth
Magnolia Pet. Co.	E. P. Hamilton	Roswell
Midcontinent Pet. Corp.	Jno Scarborough Box 381	Tulsa, Okla.
Ohio Oil Co.	Glenn Beck	Houston, Tex.
Repollo Oil Co.	J. G. Simmons	Midland
Samedan Oil Corp.	Lloyd Bidwell	Artesia, N. M.
Shell Oil Co., Inc.	H. F. Kimbrell	Midland, Tex.
Skelly Oil Co.	J. M. Dunlavey	Hobbs.
Southern Pet. Exploration Co., Inc.	J. B. Hurley	Roswell
Standard Oil Co. of Texas	Harry Hardeman	Houston, Tex.
Stanolind Oil & Gas Co.	A. J. Hill & Wm. Pyle	Ft. Worth
Sun Oil Co.	Forrest Heath	Dallas
The Texas Co.	H. S. Cole, Jr.	Ft. Worth
Texas Pacific Coal & Oil Co.	O. H. Campbell	Midland, Texas
Tidewater Assoc. Oil Co.	L. W. Childers	Midland, Texas
Two States Oil Co.	Howard Holmes	Dallas, Texas
Walker Oil Corp.	Harry Walker	Manhattan, Kan., ~~Ft. Worth~~, Midland
J. P. Cusack, Inc.	J. P. Cusack,	

February 4, 1941

Mr. G. O. Moody
Midcontinent Petroleum Corporation
P. O. Box 381
Tulsa, Oklahoma

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Moody:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 3, 1941

Mr. Glenn Bish
Ohio Oil Company
Houston, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Bish:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 3, 1941

Mr. S. P. Hannifin
Magnolia Petroleum Company
Roswell, New Mexico

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Hannifin:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 3, 1941

Mr. Ed Landreth
Landreth Production Corporation
Fort Worth, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Landreth:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 3, 1941

Mr. John R. Suman
Humble Oil & Refining Co.
Houston, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Suman:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing or reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 3, 1941

Mr. H. B. Hurley
Continental Oil Co.
Fort Worth, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Hurley:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing or reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 3, 1941

Mr. D. D. Bodie
Cities Service Oil Co.
Hobbs, New Mexico

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Bodie:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing or reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 3, 1941

Mr. Edgar Kraus
Atlantic Refining Co.
Carlsbad, New Mexico

Re: Case #14, Hobbs Division, Proration Matters.

Dear Mr. Kraus:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing or reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. Howard Holmes
Two States Oil Company
Dallas, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Holmes:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. Jack Roth
Tidewater Assoc. Oil Co.
Tulsa, Oklahoma

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Roth:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. C. E. Yeager
Texas-Pacific Coal & Oil Co.
Fort Worth, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Yeager:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. H. S. Cole, Jr.
The Texas Company
Fort Worth, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Cole:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. Francis Heath
Sun Oil Company
Dallas, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Heath:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. W. M. Simpson
Standard Oil Co. of Texas
Midland, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Simpson:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. J. B. Headley
Southern Petroleum Exploration Co., Inc.
Roswell, New Mexico

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Headley:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 46 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. J. M. Dunlavey
Skelly Oil Company
Hobbs, New Mexico

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Dunlavey:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. H. J. Kemler
Shell Oil Co., Inc.
Midland, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Kemler:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By_____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. Lloyd Biddick
Samedan Oil Corporation
Ardmore, Oklahoma

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Biddick:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:lk

February 4, 1941

Mr. H. J. Summy
Repollo Oil Company
Midland, Texas

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Summy:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent Order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

February 4, 1941

Mr. H. E. Marsh
Amerada Petroleum Corp.
Tulsa, Oklahoma

Re: Case #14, Hobbs Division, Proration Matters.

My dear Mr. Marsh:

The Gulf Oil Corporation has filed its Application or Petition for Rehearing and Reconsideration of the Commission's recent order No. 329, amending Order No. 48 known as the Hobbs Proration Order.

As your Company is one of the operators within the Hobbs Pool and affected by the new order, please be good enough to inform the Commission of your Company's attitude as to whether or not such rehearing and reconsideration should be considered.

This will be profoundly appreciated.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

January 29, 1941

Honorable Russell G. Lowe
Gulf Oil Corporation
Tulsa, Oklahoma

Re: Case No. 14, Hobbs Division, Proration Order No. 329.

My dear Judge Lowe:

This is to acknowledge in behalf of the Commission receipt of your Application or Petition for Rehearing and Reconsideration of the above captioned order of the Commission, promulgated December 31, 1940.

Your Petition will be brought to the attention of the Commission.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

OIL CONSERVATION COMMISSION

January 29, 1941

C

Honorable Russell G. Lowe
Gulf Oil Corporation
Tulsa, Oklahoma

O

Re: Case No. 14, Hobbs Division, Proration Order No. 329.

My dear Judge Lowe:

P

This is to acknowledge in behalf of the Commission receipt of your Application or Petition for Rehearing and Reconsideration of the above captioned order of the Commission, promulgated December 31, 1940.

Y

Your Petition will be brought to the attention of the Commission.

Very truly yours,

OIL CONSERVATION COMMISSION

By _____
Carl B. Livingston
Attorney

CBL:ik

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

January 25, 1941

GYPSY DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

Hon. John E. Miles, Governor,
Chairman Oil Conservation Commission,
Hon. A. Andreas, State Geologist,
Member Oil Conservation Commission,
Hon. Commissioner Public Lands,
Secretary Oil Conservation Commission,
Hon. Carl Livingston, Attorney,
Oil Conservation Commission,

Santa Fe, New Mexico.

Gentlemen:

I am enclosing to each of you a copy of Application of Gulf Oil Corporation for rehearing of Proration Order No. 329 Hobbs Pool.

A copy of this Application has also been forwarded to Honorable J.O. Seth at Santa Fe.

Yours very truly,

Russell G Lowe

RGL.W
Enc.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

In the Matter of	:	
	:	APPLICATION OR PETITION
Hobbs Order No. 329	:	FOR REHEARING AND RECONSIDERATION

COMES now the GULF OIL CORPORATION, a Pennsylvania corporation, duly registered to do business in the State of New Mexico, and states it and its predecessors in interest are actively engaged in the exploration, development and production of oil and gas in the State of New Mexico, and that Gulf Oil Corporation is one of the larger producers of crude oil in that state.

A hearing was previously had in connection with proposed changes in the proration plan for Hobbs Field, Lea County, New Mexico, that was then governed by Order No. 48; evidence was introduced at the hearing, pro and con, brief filed and the cause taken under consideration by the Commission until December 31, 1940, on which date an order was promulgated amending Section 9 of Order No. 48 of the previous proration plan for Hobbs Field and substituting therefor Sections 9 (a) and 9 (b), which read as follows:

> "Section 9 (a). The total daily non-marginal field allowable shall be allocated among the various units on the following basis: Eighty (80) per cent of the non-marginal allowable shall be allocated to units without reference to their producing ability; all 40-acre units participating equally and each fractional unit receiving an allocation, as compared to the allocation of a 40-acre unit, in the ratio that its area in acres bears to 40 acres. This allocation to each unit shall be designated as the acreage unit allowable.
>
> "Section 9 (b). That the balance of twenty (20) per cent allocated to such units as provided in Section 9 (a) shall be based upon twenty (20) per cent of the bottom hole pressure (B.H.P.) of each and every well participating in such proration."

In all other respects, Proration Order No. 48 in the Hobbs Field, Lea County, New Mexico, was unchanged.

The previous order provided for 60% allowable for acreage and 40% allowable for potential or capacity of the wells to produce, and machinery was set up under which the oil could be allocated according to provisions of Order No. 48.

Order No. 329 changes Section 9 of Order 48 and introduces as an element of proration bottom hole pressure in lieu of potential or capacity of wells to produce, the acreage factor being increased from 60% to 80%, potential capacity eliminated, and 20% of the allowable based upon bottom hole pressure. It is an attempt by order to equalize wells and accomplish something that nature and the elements did not do originally and to that extent is a violation of the laws of the State of New Mexico.

Section 9(a) and 9(b) of Order 329 are not complete in themselves, are ambiguous and do not harmonize with other provisions of Order No. 48 and machinery is not provided nor method determined by which the 20% distributed according to bottom hole pressure can be computed and the plan made workable.

The power of the Commission to allocate oil is provided in Section 12 of the Laws of New Mexico 1935 and I quote the first and the fourth paragraphs of the Act:

> "Whenever, to prevent waste, the total allowable production for any field or pool in the state is fixed by the Commission in an amount less than that which the field or pool could produce if no restriction were imposed, the Commission shall prorate or distribute the allowable production among the producers in the field or pool. Such proration or distribution shall be made on a reasonable basis. The rules, regulations or orders of the Commission shall, so far as it is practicable to do so, afford to the owner of each property in a pool the opportunity to produce his just and equitable share of the oil and gas in the pool, being an amount, so far as can be practically determined, and so far as such can be practically obtained without waste, substantially in the proportion that the quantity of the recoverable oil and gas under such property bears to the total recoverable oil and gas in the pool, and for this purpose to use his just and equitable share of the reservoir energy."

> "Minimum allowable for some wells may be advisable from time to time, especially with respect to wells already drilled when this act takes effect, to the end that the production will repay reasonable lifting cost and thus prevent premature abandonment and resulting waste."

The subdivisions of Section 12 omitted have nothing to do with the allowable, except in those instances where there has been a pooling of properties under a spacing plan or proration unit agreed upon.

The provisions of Sections 9 (a) 9 (b) of Hobbs Order No. 329 are in defiance of the quoted provisions of Section 12 ante governing the power of the Commission to allocate oil.

The first paragraph of Section 12 ante just quoted gives the Commission power to allow production among the producers in the field when the total allowable production for any field or pool in the state fixed by the Commission is in an amount less than that which the field or pool could produce if no restriction was imposed. The duty imposed upon the Commission, so far as practicable in its allocation, is to afford to each owner of each property in the pool the opportunity to produce his just and equitable share of oil and gas in the pool, being in an amount so far as can be practically determined and so far as can be produced without waste, substantially in the proportion the quantity of recoverable oil and gas under such property bears to the total recoverable oil and gas in the pool, and to use his just and equitable share of the reservoir energy.

The fourth paragraph of Section 12 ante allows the Commission to provide for a minimum allowable as to wells drilled when the act took effect, to prevent premature abandonment and resulting waste.

Each owner of land in the pool is entitled to recover as nearly as possible the recoverable oil under his land and to receive and use his just and equitable proportion of the reservoir energy.

Sections 9(a) and 9(b) of Hobbs Order No. 329 do not have for their support the authority granted by Section 12 ante and are in open defiance of such authority.

The evidence that was introduced shows there existed in the Hobbs pool a great variance in bottom hole pressure, likewise there was a great difference in the porosity and permeability of the formations from which the oil and gas are being produced and a difference in the thickness of the producing formations in various portions of the field.

It will be remembered the evidence showed beyond question in the Southeastern portion of the field the porosity and permeability were much less than in the other portions of the pool; not only that, the thickness of the producing horizon was less in the Southeastern portion of the field than in other portions; add to that the fact the bottom hole pressures taken indicated the pressure in the Southeastern portion of the field was much less than in other portions of the field, and except in rare instances, represented what is known as the low pressure area. It is evident an increase of oil in that area violates Section 12 of the Laws of New Mexico 1935.

If a field or pool could be found in which the porosity and permeability, the thickness of the producing horizon, and the bottom hole pressure were the same, then allocation based upon acreage would be equitable as each owner would have the same amount of recoverable oil under his property and would be using his equitable share of the reservoir energy. Wherever such uniformity of conditions does not exist as is established in the Hobbs pool, the giving of more than nominal weight to the acreage factor is necessarily a violation of the first paragraph of Section 12; it is equivalent to the giving of a minimum allowable to all wells and may be authorized by the fourth paragraph of Section 12.

The wells that would be increased by Sections 9(a) and 9(b) of Hobbs Order No. 329 are in the Southeastern portion of the field where the porosity and permeability, the thickness of the pay and the bottom hole pressure is the smallest. It is an inexorable law of physics that when two bodies are connected and the space partially filled with a fluid, if the pressure at the two ends is unequal, the fluid would be driven by the higher pressure from the high pressure area to the low pressure area. In the Northern and Western part of the Hobbs field, where the porosity and permeability

are greater, where there is a greater thickness of pay and a higher bottom hole pressure, but one result can be reached where the withdrawals in all portions of the field are the same, the higher pressure and the greater accumulation of oil will be driven to the points where there is less oil and less pressure. There is no possible way to avoid this conclusion; it is a law of physics that anyone can demonstrate to his own satisfaction.

The first result therefore by increasing the acreage factor is to force the oil from the land under which it is located and under higher pressure to the low pressure areas and the recoverable oil under the high pressure areas is not allowed to the owner of such land, but a certain percentage of it is necessarily forced to seek the low pressure areas.

In addition to that, the larger allowable to the low pressure areas would in any event result in a rapid decline of pressures and to that extent the reservoir energy has been displaced and those with wells more favorably situated will not receive their just and equitable share of the reservoir energy.

By increasing the allowable to wells of low bottom hole pressure there will result a certain amount of gas coming out of solution which will further increase the gas-oil ratio and result in physical waste, not only depriving the entire field of the maximum reservoir energy, but penalizing those having wells more favorably situated. Another result of a large allowable to acreage is that the gas coming out of solution reduces the energy available to move oil to the wells which in turn will reduce the ultimate recovery of the pool.

The evidence on behalf of the Gulf Oil Corporation showed there had already been a large movement of the oil from the high pressure and more favorably located areas to the wells that will benefit by Sections 9(a) and 9(b) of Hobbs Order No. 329, and the movement will be increased by the enlargement of the acreage factor and the decrease of other factors.

It seems to us that the Commission before it is justified in making an order should determine the thickness of the producing horizon in the various parts of the field, the porosity and permeability, and the bottom hole pressure and from that form some conclusion as to the recoverable oil in the pool and in the various subdivisions thereof, and some method should then be determined by which there would be no movement of the oil from well-located properties to wells on properties not so favorably situated, and make the allowable so as to permit each owner to secure his proportionate part of the recoverable oil and use his just and equitable share of the reservoir energy.

The acreage factor does not form a part of the method provided in the law for determining allocation and cannot be taken into consideration. An order based on acreage is necessarily unauthorized. There might be instances, as outlined in an earlier portion of this application, where an acreage allocation or allowable would not be unjust - such could exist in an ideal pool only where all conditions are equal; however, when you place in an allowable order a distribution of any part of the oil upon an unauthorized element that does not take into consideration any of the well-known factors governing the accumulation and production of oil, except where the acreage factor is placed in the order to give each well a minimum allowable, the action is unauthorized by the laws of the State of New Mexico.

There was no evidence introduced at the hearing that pointed to an 80% acreage and a 20% bottom hole pressure division. The proponents of the change insist that acreage should be the determining factor and introduced no evidence supporting an optional plan. The evidence on behalf of Gulf Oil Corporation and others sharing its views was to the effect that the acreage factor should be constantly decreased and the bottom hole pressure factor increased and that the allocation should be made in strict conformity with Section 12 of the laws of New Mexico 1935.

It is impossible and impracticable to discuss all of the evidence that was introduced. We think it sufficient to point out the order that has been entered does not reflect the authority granted to the Commission

and that the mere amendment of Section 9 of Order 48 of the previous Hobbs Order will not afford the authority for the well owners to determine their allowable.

For the foregoing reasons, the Gulf Oil Corporation and those sharing its views, request Hobbs Order No. 329 be reconsidered, that findings be made by the Commission upon which the Order can be based under Section 12, Laws of New Mexico 1935, and that the enforcement of Hobbs Order No. 329 be suspended until a rehearing and reconsideration of the case can be had, and, in any event, the Order be held in abeyance until machinery has been provided by which the provisions of Sections 9(a) and 9(b) can be put into practice.

Respectfully submitted,

GULF OIL CORPORATION

By Russell Love
Attorney

EXCERPTS FROM
MINUTES OF THE MEETING OF THE
OIL CONSERVATION COMMISSION HELD
ON TUESDAY, DECEMBER 31, 1940

* * * * *

In the matter of the proposed change in the proration plan for Hobbs Field, Lea County, provided by Order No. 48, upon which hearings have heretofore been had by the Commission and the determination thereof taken under advisement by the Commission,

NOW, on this day, in regular meeting of the Commission, after full consideration of the evidence submitted on such hearings heretofore held before the Commission, consideration of the evidence taken thereat, and examination of the maps produced before the Commission, the Commission determines that said Order No. 48 be modified and amended as follows:

WHEREAS, the proration plan for the Hobbs Field has heretofore been based upon a basis of sixty (60) per cent acreage and forty (40) per cent of the potential production of the wells, it is determined by the Commission that said proration be changed and modified, and for such purpose the Commission does hereby resolve that Section 9 of the said Order No. 48 heretofore in force by this Commission and having been adopted November 12, 1936, be amended to read as follows:

> "Section 9 (a). The total daily non-marginal field allowable shall be allocated among the various units on the following basis: Eighty (80) per cent of the non-marginal allowable shall be allocated to units without reference to their producing ability; all 40-acre units participating equally and each fractional unit receiving an allocation, as compared to the allocation of a 40-acre unit, in the ratio that its area in acres bears to 40 acres. This allocation to each unit shall be designated as the acreage unit allowable.
>
> "Section 9 (b). That the balance of twenty (20) per cent allocated to such units as provided in Section 9 (a) shall be based upon twenty (20) per cent of the bottom hole pressure (B.H.P.) of each and every well participating in such proration."

This order shall be designated as Hobbs Order No. 329, and the above modification and change of proration shall become effective and be in force as of February 1, 1941; and as to all other matters in said Order No. 48 not affected by this change in proration, the same are continued in full force and effect until the further determination of the Commission.

The matter of modification of Case No. 2, Order No. 33, involving a change of proration plan for the Monument Field, Lea County, having heretofore been submitted to the Commission and after the submission of evidence, maps, and other data, and the determination of said proration having been taken under advisement by the Commission;

IT IS NOW ORDERED that any change or modification in said Order No. 33, Case No. 2, heretofore in effect as to proration in the Monument Field, Lea County, be not made, and the proration plan for Monument Field as now in effect is hereby ordered to continue until further order of the Commission. This order shall be designated as Monument Order No. 330. * * * *

OIL CONSERVATION COMMISSION

By (Sgd.) JOHN E. MILES, Governor
Chairman

By (Sgd.) FRANK WORDEN
Commissioner of Public Lands,
Secretary

By (Sgd.) A. ANDREAS, State Geologist.

RECEIVED

JAN 27 8 30 AM '41

January 25, 1941

Hon. John E. Miles, Governor,
Chairman Oil Conservation Commission,
Hon. A. Andreas, State Geologist,
Member Oil Conservation Commission,
Hon. Commissioner Public Lands,
Secretary Oil Conservation Commission,
Hon. Carl Livingston, Attorney,
Oil Conservation Commission,

Santa Fe, New Mexico.

Gentlemen:

I am enclosing to each of you a copy of Application of Gulf Oil Corporation for rehearing of Proration Order No. 329 Hobbs Pool.

A copy of this Application has also been forwarded to Honorable J.O. Seth at Santa Fe.

Yours very truly,

Russell Glover

RGL:b
Enc.

Case No.

14

Application, Transcript,
Small Exhibits, Etc.

RECEIVED
STATE LAND OFFICE
DEC 21 1 15 PM '39
SANTA FE, N. M.

SKELLY OIL COMPANY

TULSA, OKLAHOMA

PRODUCTION DEPARTMENT
H. M. STALCUP, VICE PRESIDENT
J. S. FREEMAN, ASSISTANT

December 20, 1939

Mr. Frank Worden, Land Commissioner
Santa Fe, New Mexico

Dear Sir:

Although the time limit for the filing of statements in the Hobbs matter has probably expired by this time, I trust you will permit me to file a supplemental statement to cover a point involving packer wells, to which the Commission's attention was directed during the hearing.

Yours very truly,

George W. Selinger

GWS/mb
cc-Mr. Livingston
Mr. Dumlavey

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DEC 21 1 15 PM '39
SANTA FE, N. M.

SUPPLEMENTAL STATEMENT

SKELLY OIL COMPANY -- GEORGE F. GETTY, INC.

The hearing proved that accurate evidence such as thickness of pay, porosity and permeability to compute the oil in place is not available. Also, while bottom hole pressures give some measure of the equity of the allocation formula, still they should not be given undue weight owing to several factors since the pressures represent only the locality around the bore hole; that over seventy wells have packers set and do not produce from the zones in which they had established their potential flows, and are given artificially adjusted pressures which are not based upon the pool bottom hole pressures of their particular producing formation. Therefore, these artificial potentials should not by any means be given any additional weight in the allocation formula. The fact that the packers may have conserved gas or energy has nothing to do with a fair analysis of equity in the field. The presence of these seventy packer wells prevent any real knowledge of bottom hole pressures or valid adjustments of present potentials, so that potential cannot be given too much weight.

Respectfully submitted,

George W. Selinger

George W. Selinger

SKELLY OIL COMPANY

TULSA, OKLAHOMA

PRODUCTION DEPARTMENT
H. M. STALCUP, VICE PRESIDENT
J. S. FREEMAN, ASSISTANT

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STATE LAND OFFICE
DEC 20 8 55 AM '39
SANTA FE, N. M.

December 18, 1939

Mr. Frank Gordon, Land Commissioner
Santa Fe, New Mexico

Dear Mr. Gordon:

In line with the request of the Commission that producers and operators in the Hobbs pool file statements, on behalf of the Skelly Oil Company and George P. Nebb, Inc., we are attaching three copies of statement which we would like to have considered part of the record.

Yours truly,

George W. Selinger

GWS/mc
cc-Oil & Gas Conservation Commission
Santa Fe, New Mexico
Mr. Dahlberg

RECEIVED
STATE LAND OFFICE
DEC 20 8 55 AM '39
SANTA FE, N. M.

S T A T E M E N T

The Skelly Oil Company and George F. Getty, Inc. each are producers in the Hobbs pool, having six units and four units respectively, and therefore have a vital interest in the proration formula in the Hobbs pool.

In the past hearings of the Hobbs pool the Commission have permitted all of the operators to express themselves to the Commission. This year, due to pressure of time, the Commission are permitting written statements for the record.

If the Commission will recall, and the record being the best evidence will show that an announcement was made requesting opening statements from those operators that were not satisfied with the present proration formula. Of the twenty-five operators in the pool only the Stanolind, Gulf, and, later during the trial, the Cities Service, companies expressed dissatisfaction with the present proration formula in the Hobbs pool. This should indicate that with representatives of all the operators being present only three companies have expressed dissatisfaction. Perhaps one or two others by their written statements may have some slight grievance against the present plan, but the point to emphasize to the Commission is the fact that by and large the vast majority of the operators seek no change and favor neither the contemplated change advocated by the Stanolind on one side, nor the Gulf-Cities Service on the other side.

A great deal of technical and engineering evidence has been presented to the Commission by both companies advocating an opposite change in the present plan. We would like to point out that neither had anything to say about waste and the whole controversy narrowed down to the one proposition of equity, that is, which operator should get how much oil. Specifically the matter of drainage is one of equity as expressed above. The true test of equity, in the absence of positive individual tract ascertainment of oil in place, is whether or not any order is reasonable. What is a truer test of the reasonableness of any order of the Commission then that which meets the approval of the majority so governed. In this case the Commission may well know whether or not the present order is an equitable and reasonable one by the mere fact that on its face an overwhelming majority of the operators are satisfied with the present order.

It should be, of course, quite obvious to the Commission that any change in the present plan would benefit some and injure other operators. While the Stanolind advocate a plan that would at the same time benefit them and injure the Gulf and Cities Service; and the Gulf-Cities Service plan would benefit themselves and injure the Stanolind, the changing from one position to the other would drag in other operators and injure them.

The Commission are faced with two extreme plans as compared with the present plan which is one that certainly appears a moderate one acceptable to the majority of operators over a period of months. Properties have been operated on the present plan, and operators have gone along and they certainly are entitled to have this matter settled once and for all. Operators look to the Commission for the stabilization they certainly are entitled to for the protection of operators, lessees and landowners - be they individuals, state or federal government.

One matter over which there can be no controversy as very ably put by a witness for the Gulf, is that the Hobbs pool has been prorated and managed in a far better way than most of the oil pools in the United States. With this in mind why should the Commission change a plan that has worked so satisfactorily these many months.

In conclusion, therefore, we most sincerely urge the Commission to retain the present proration formula in the Hobbs pool because it is a practicable and reasonable proration formula.

Respectfully submitted,

SKELLY OIL COMPANY

MERCH P. SMITH, INC.

By George W. Selinger
George W. Selinger

THE ATLANTIC REFINING COMPANY
PETROLEUM PRODUCTS
P. O. Box 808
Carlsbad, New Mexico
Jan. 2, 1940

NEW MEXICO OIL CONSERVATION COMMISSION
JAN 4 1940
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DOMESTIC PRODUCING DEPT.

IN REPLY REFER TO FILE

Statement:
The Atlantic Refining Company's
Position Concerning Hobbs Proration

The Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

The Atlantic holdings at Hobbs are relatively small. The acreage either held in our name or in which we have an interest not disclosed in the proration schedules is so situated on the structure and is so distributed in high and low potential areas that methods of proration or percentages assigned to different factors in the proration formula make little difference in the resulting participation by our company.

In principal, however, the Atlantic has always favored either a high percentage or 100 per cent. factor assigned to acreage in any proration formula, because such formulae then become much easier to administrate, permit more efficient completion and production methods, and save equipment and testing costs. It is our belief, also, that such proration plans result in substantial equity if ultimate yields are considered. In principal, we also believe that other things should be considered in a proration plan besides merely the purely legal or engineering phases. The cost and ease of administrating any plan should be considered. The result of sudden changes on royalty holders' income and the possible political effects of such sudden changes must also be considered.

At Hobbs, specifically, we believe that substantial equity has been accomplished and is now being done under the present plan, but certain minor changes appear desirable. We believe that administration of the proration plan at Hobbs has resulted in very efficient operation for the field as a whole, that the field is not being over-produced, that the gas-oil ratios are not excessive, and that the field may be set up as a model of proper proration, conservation, and administration. We feel that at the present rates of withdrawal, which are exceedingly low, no substantial drainage is occurring from one portion of the field to any other. In the low pressure areas the permeability is so low that movement into such areas is not readily possible.

The minor changes suggested would be those relating to the determination of the adjusted potential as used in the present formula. As both the Gulf

and the Stanolind admitted, the method of determining the adjusted potential for packer wells should be changed, and this feature should be retroactive to the time that packers were set in any wells. It is suggested that potentials of packer wells be declined by the average decline in potentials of the field rather than by the present method of declining them according to the average pressure decline of the field. It is also suggested that increasing potentials even though they are conceded to be merely adjusted potentials should not increase and that in the calculations of adjusted potentials no potential ever be permitted to increase; that if such increase does occur, the potential be fixed at the former figure. It is also suggested to the Commission that no special allowable be permitted to any unit in the field. Such concessions were made by the operators before proration was put entirely into the hands of the State in order to obtain unanimous approval. Under the present administration through the State no such special allowable is desirable or necessary.

This written statement is respectfully submitted to the Commission in lieu of any verbal statement at the hearing held December 6th, 7th, and 8th, 1939, in Santa Fe, and is submitted with the purpose only of acquainting the Commission with the general opinion among operators, especially those who took no definite side during the controversial hearing.

Yours very truly,

The Atlantic Refining Company
By

EK:T

Edgar Kraus

(COPY)

J. P. CUSACK
BOX 208
MIDLAND, TEXAS

February 13, 1940

Honorable John A. Miles
Chairman, Conservation Commission
Roswell, New Mexico

Dear Governor Miles:

Supplementing my statement before the Commission with reference to the Hobbs proration plan, which testimony was offered on or about December 12 in behalf of J. P. Cusack, Inc., I feel that the more equitable plan would be on a flat basis. However, should the Commission, after reviewing the testimony, feel that the present plan of 60 per cent acreage and 40 per cent potential should be the most equitable, then I feel that the Commission should take into consideration the bottom hole pressure, which all companies without exception have admitted is in error. This being the fact, according to their findings, then the equitable position to take would be to go back to the original potentials which occurred sometime in 1934 and predicate the present allowables upon that basis (that is, 60 per cent to be given to the acreage factor, which is a 40 acre unit, and 40 per cent to be given to the potentials as of on or about 1934.)

Referring to my statement before the Commission, in which I pointed out that by reason of bottom hole pressures, due to water drive, wells in 1934 that had approximately 16,000 barrel potential have increased by reason of the plan in force and effect; namely, bottom hole pressuring, to a potential of approximately 26,000 barrels. As stated before the Commission, it is preposterous that a well after producing five years at a given potential of 16,000 barrels, considering depletion, would still have a potential better by 10,000 barrels than its original given potential.

We have now before us your Case No. 19, Order No. 235, the same being with reference to oil-gas ratios which you have placed in effect as of February 1, using as a gauge the December gas-oil ratios as turned in by the operators.

While I do not wish to take exception to this provision, it seems to me that, before any plan as to gas and oil ratios can be rightfully placed, it should be upon actual gas-oil ratio tests. My reason for this objection is due to the fact that, as I have found it over a period of time in the oil and gas business, affidavits don't particularly give the facts. To be more explicit, I am inclined to believe that affidavits are used mostly for a selfish purpose. It appears, then, that those that have turned in affidavits setting forth gas-oil ratios which possibly are in error would be gaining an advantage and those who have turned in affidavits that definitely fit the position in the case are being penalized.

My suggestion, then, would be that the gas-oil ratios be withheld until such time as the actual tests on all wells and each individual pool have been taken.

Respectfully submitted,
J. P. CUSACK, INC., by J. P. Cusack, President

SM-138

SHELL OIL COMPANY
INCORPORATED
FORMERLY
SHELL PETROLEUM CORPORATION

PETROLEUM BUILDING
MIDLAND, TEXAS

December 27, 1939

HEAD OFFICE
SHELL BUILDING
ST. LOUIS, MO.
CABLE ADDRESS SHELPETCO ST. LOUIS

NEW MEXICO
OIL CONSERVATION COMMISSION
RECEIVED
DEC 29 1939

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

At the close of the Hobbs and Monument hearings recently held in Santa Fe, you invited all interested operators who had not expressed themselves during the hearing to write you their views. Although we do not wish to become involved in the arguments of either the Stanolind or Gulf Companies, we thought we might avail ourselves of the opportunity you offered to express a belief in a principle, for whatever help our opinion may be to you in weighing the evidence presented. Since our properties at Hobbs and Monument lie in both the high and low pressure and high and low potential areas, we would neither gain nor lose if either the Stanolind or Gulf plan is adopted. Our opinion, therefore, is based on principle rather than any self interest.

For the types of fields presently producing in Lea County, we believe that giving the greatest weight to the acreage factor when allocating allowables between leases results in the most equitable division of the oil in place under each lease and the most efficient and least wasteful recovery of the oil in the reservoir. Therefore, in the present instance, if a change is made in the proration formula at Hobbs, it should increase the acreage factor above sixty percent rather than reduce it.

When emphasis is placed on the use of potentials in proration formulas, it leads to wasteful practices such as too deep penetration, excessive shooting and acidizing, high gas-oil ratios, early and rapid water encroachment and frequently to false potentials when taken by unscrupulous operators. It requires the construction of unnecessary tanks

and in pumping fields the installation of expensive, heavy-duty equipment not required under normal production practice. For these and other practical reasons, we and most operators believe in minimizing the influence of potentials in the allocating of allowables.

Very truly yours,

SHELL OIL COMPANY, Incorporated

By: H. J. Kemler
General Manager- West Texas

HJK:br
cc: Judge J.O. Seth
Santa Fe, New Mexico

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

January 29th, 1940

Mr. Carl B. Livingston, Attorney,
Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Livingston:

Re: Case 14 - Hobbs Division of
Hobbs-Monument Proration Hearing

Thanks for yours of the 24th. This letter reached our office Saturday morning. The arrangements set out in your letter are entirely agreeable and I appreciate the courtesies extended.

Yours very truly,

RGL.W

Russell G. Lowe

January 24, 1940.

Russell G. Lowe, Esq.
Gulf Oil Corporation,
Tulsa, Oklahoma.

Dear Judge Lowe:

Re: Case, 14, Hobbs Division of Hobbs-Monument Proration Hearing.

Reference is made to your letter of January 23rd.

Your request was presented to Hon. Frank Worden, Secretary of the Commission. I am authorized to state that Mr. Worden recommends to the Commission as follows:

That the Stanolind Oil and Gas Company may have until February 10th for filing its statement and the Gulf Oil Corporation may have until March 1st, to file its answer statement.

Very truly yours

Carl B. Livingston,
Attorney - Oil Conservation Commission.

CBL:tsr

CC: Hon. J. O. Seth,
111 San Francisco St.,
Santa Fe, New Mexico.

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

RUSSELL G. LOWE
ASSISTANT ATTORNEY

January 23rd, 1940

AIR MAIL

Mr. Carl Livingston, Attorney,
%Oil Conservation Commission,
Santa Fe, New Mexico.

Dear Mr. Livingston:

Re: Hobbs Proration Hearing

The transcript reached us a week ago at a time when we were busily engaged in other matters. Each of the parties was given fifteen days in which to file a brief, after receipt of the transcript.

I assume since the Stanolind Oil & Gas Company was the aggressor in the proceeding that our brief should be in the nature of a response to its brief. I am wondering whether it would not be agreeable to the Commission to enlarge the time in which the Gulf Oil Corporation is to file brief for a period of, say ten days after receipt of copy of the brief prepared by the Stanolind. I am quite sure this would expedite the consideration of the question and might result in a curtailment of our brief and thereby lessen the labors of the Commission.

I suggest you let me hear from you by wire, collect.

With very kindest of personal regards, I am,

Yours very truly,

RGL.W

Russell G. Lowe.

To Stanolind
" March 1st

July 10, 1940

Brief of Gulf Oil Corporation given to Judge Seth, together with letter from Sanderson dated May 24, 1940.

Brief: "Statement of the Gulf Oil Corporation"

Returned
Nov. 25-40

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

TULSA · OKLAHOMA

GYPSY
DIVISION

May 24, 1940

The Honorable A. Andreas
Geologist, State of New Mexico
Santa Fe, New Mexico

Dear Sir:

I am transmitting herewith a copy of the statement of the Gulf Oil Corporation in the matter of Case No. 14 regarding the hearing before the Oil Conservation Commission December 6, 7 and 8, 1939, pertaining to the proration of the Hobbs Pool, located in Lea County, New Mexico.

Yours very truly,

LLG:RC

Att'd

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

RE: CASE NO. 14 - HOBBS POOL
HEARING DEC. 6, 7 & 8, 1939

STATEMENT OF THE GULF OIL CORPORATION

The Gulf Oil Corporation in the presentation of evidence before the Commission attempted to clarify as much as possible the conditions as they have existed in the Hobbs Pool. Also to present in an impartial manner the factors, considered by engineers in the industry, essential in the distribution of oil allowable under a proration plan. These factors were taken from the reports presented at technical society meetings and as such had general application without reference to company participation. Certain of these factors were admitted by the authors as unavailable in actual practice and others which did not have application in certain types of pools. Through a process of elimination it was found that only three factors had general application in the Hobbs Pool: Static Bottom Hole Pressure, Potential, and Acreage. These factors have been recognized not only by engineers but also by oil company executives and have been applied by State Commissions throughout the oil producing states. Essentially all authors recognized the value of potential and the reports or papers written since the advent of static bottom hole pressures measurements recommend the use of this factor to adjust the potential or the allowable of the well. The acreage factor considered most frequently as a part of the suggested proration plans had reference to the number of acres per well rather than being a flat percentage allowable. This acreage factor is already properly handled in New Mexico by the 40-acre unit. Other authors justified the use of a certain percentage for acreage on the basis of establishing a minimum allowable. A search of the technical publications does not disclose a single author who recommends the use of 100% acreage or per unit allowable as a means of affording each operator the opportunity to recover from each property his just and equitable share of the recoverable oil underlying that property. (Reference L. L. Foley 1937 Transaction API)

Itis not believed necessary to quote lengthy passages from the evidence presented by Mr. Gray and Mr. Knappen but a short resume of exhibits presented by Gulf will probably help in clarifying the issues involved.

Gulf Exhibit Q

This map shows the productive units in the Hobbs Pool and is colored to show the various types of 40-acre producing units. The one unit, colored pink, has received a special allowable for a number of years which has been greater than the normal allowable. The three units colored green are marginal units being able to produce only from 4 to 6 barrels daily each and are permitted to produce at capacity. The remaining 248 units colored yellow are non-marginal units and come under the provisions of the proration plan which allocates allowable among the units on the basis of 40% for adjusted potential and 60% for acreage. The term "adjusted potential" should be clarified. It is the last physically tested potential of the well which has been adjusted at intervals of six months in accordance with the proration formula by static bottom hole pressure. It should more properly be termed the"pressure-potential"factor or the"potential-anti-drainage" factor.

Gulf Exhibit No. 1

Exhibit No. 1 is a map of the Hobbs Pool with the producing acreage colored or hatched to show the holdings of different operators. To illustrate, all leases owned by Stanolind Oil & Gas Company are blue, Shell Oil Company, Inc. pink, and Gulf Oil Corporation light green. Due to an inadequate number of colors and tints the properties of the Getty, Two State, Oil Well Drilling, Magnolia, Mid-Continent and Walker Companies are not colored. It will be noted that Gulf leases are scattered throughout the central and northern portions of the pool while Stanolind's are more or less grouped in the southern portion.

Gulf Exhibit No. 2

This is a map of the Hobbs Pool showing the structure of the top of the white lime or Hobbs dolomite which is the principal producing formation. All wells drilled within the producing limits of the pool and a few dry holes on the outskirts of the pool are shown on the map. The map was prepared by the Hobbs Engineering Committee and published in January 1936. It was revised, however, in May 1939 to show the additional information obtained from a few wells which were drilled subsequent to January 1936. The structure map shows by means of contour lines the relief of the top of the white lime. The elevation shown on each contour line is the distance below sea level and for that reason the lines showing the smaller figures represent the higher portions of the structure. The elevation at which

each well penetrates the top of the white lime is shown just below the well location and it is by the use of these elevations that the geologist or engineer is enabled to locate and draw the contour line on the map. The difference in elevation between each contour line is 25 feet so that when they are spaced far apart it indicates a gentle slope, but when close together a relatively steep slope is indicated. For convenience in picturing the higher and lower portions of the structure the map has been colored. For areas below 450' subsea it is colored green and areas above 450' subsea are colored yellow. This is merely another way of saying that green represents areas having less than 150' of thickness of the producing formation and yellow for areas having more than 150' of producing formation.

The highest part of the structure lies in the central portion of the field which is the northeast portion of Section 32 and the northwest portion of Section 33. Here the Amerada State "A" No. 2 encountered the top of white lime at 512' below sea level. It is interesting to note that from this point northwestward to the farthest producing wells the structure is nearly level. The most northwestern producing well in the pool is only 31' lower than the highest well in the pool. Southeastward the structure slopes down gradually to the Texas No. 1 Selman which found the top of the white lime at 550' below sea level or 238' lower than the highest well. The structure slopes off more rapidly to the northeast and southwest. The lowest wells in the pool are Two State No. 1 Morris and Ohio No. 1 State in Section 9. Both of these wells encountered the top of the white lime at 583' below sea level or 271' lower than the highest well.

The structure of a pool is always of vital interest to an oil man during the exploration and early development. Since he naturally wishes to buy and develop leases near the top of the structure. This is the area that has the thickest pay and, other things being equal, will have the greatest amount of oil underlying it and should have the least trouble from water encroachment.

Gulf Exhibit No. 3

In order to exhibit more clearly the structure of the Hobbs Pool a cross section of the producing formation from the northwest to the southeast along the general axis of the pool was prepared. Exhibit No. 3 shows the location of the wells which have been used in constructing this cross section. The wells used are shown in red circles and joined by red lines. It will be

noted that the line is not straight, it zigzags from well to well. This is due to the fact that we had more complete and detailed geological and engineering information on these wells. The wells, however, are in an approximate straight line and give a very good picture of the structure of the Hobbs Pool.

Gulf Exhibit No. 4

This is a cross section of the oil producing zone in the Hobbs Pool along the red line shown in Exhibit No. 3. It is as an observer would see it looking from the southwest toward the northeast. The oil producing zone has been colored red, the top limit of the colored portion being the top of the white lime or Hobbs dolomite. In the central portion of the colored area there is a heavy black line which depicts the top of the sand break. This is a well defined geological marker which has been identified in the formation samples from most of the wells. The section shows how the structure rises precipitously in the northwest, then a gentle rise to the top of the structure, then a greater slope downward to the southeastern portion of the field. The bottom of the colored portion which is shown by a straight horizontal line is at 614' subsea and is the Hobbs Geological Committee's estimate of the bottom of the oil pay. This would be what is commonly called the initial oil-water contact and has been variously estimated at from 600 to 614' below sea level. Originally the structure was filled with oil from this elevation to the top of the white lime. All the engineering and geology in oil exploration and production depend upon the basic fact that oil is lighter than water and gas is lighter than oil. The structure merely acts as a trap and if these materials are contained in the structure the gas will collect at the top, the oil below the gas and the water below the oil. We are not certain that there was any free gas in the Hobbs Pool when it was first discovered but there were large volumes of gas dissolved in the oil. As oil was removed from the field and the pressure on the oil reduced, some of the gas came out of solution in exactly the same way that gas comes out of solution in ginger ale or soda when the cap is taken off the bottle. Accordingly shortly after production began gas began accumulating in considerable volume in the top portions of the structure, forcing the oil downward.

As previously stated, the initial oil-water contact was approximately 600' below sea level. No operator wished to produce water with his oil, therefore drilling was stopped at the lowest point at which the operator

believed he could safely drill without encountering water. The vertical lines on the exhibit indicate wells drilled and the bottom of the lines, the depth to which they were drilled. Wells high on structure drilled deep into the oil zone while wells on the flank could only drill relatively short distances before the operator felt he was in danger of encountering water. For this reason the bottoms of the wells, in general, lie between 550' and 600' below sea level.

Gulf Exhibit No. 5

This is a structure map of the Hobbs Pool the same as used in Exhibits 2 and 3 except that the areas have been colored by 50' thick zones. That is to say, all of the pink area lies between the structure contours 325 and 375, all the green between 375 and 425, etc. As shown in the last exhibit the operator high on structure could safely drill much deeper into the producing formation than the operator on the side of the structure where there was less thickness of pay. This is not mere theory but is a fact recognized by all operators in the pool. This recognition is shown by the depth to which the wells were drilled. For example, on top of the structure the wells were drilled an average of 217' into the producing formation; in the pink area the average is only 182'. In the green area the average was 156'; in the purple area they averaged 112'; in the brown area the average was only 73'. The brown area covers a range of 100' and if broken down into the 50' zones used in other areas the thickness penetrated would be 60 and 44' respectively. This means that the operator on top of the structure penetrated five times as much producing formation as the operator did in the areas between 525' and 575' below sea level. Thickness of producing formation is not the only means of determining capacity of the formation to produce. If everything else were equal the operator with the thickest pay would have the most oil under the lease and would therefore be entitled to produce the largest volume of oil. If thickness of pay were the only basis of determining the oil under the land the operator in the yellow area would be entitled to produce five times as much oil as the operator in the lower portion of the brown area. However, not all of the producing formation contains oil. Much of the zone consists of rock which is so tight and solid that *no* oil is present. Accordingly, we have to look for a better measure of oil in place underground than the simple consideration of pay thickness. The amount of oil under a 40-acre unit depends (1) on the thickness of the pay, (2) on porosity of the pay, and (3) on the extent of saturation of the pay. So far as we know in the Hobbs Pool essentially all the pore space above the water table was originally filled

with oil. The volume of oil-filled pore space determines the amount of oil under the unit. The recoverable oil under the unit, however, is the only product of interest so a recovery factor must be introduced which depends upon the permeability, bottom hole pressure, amount of adhesion of the oil to the surface area of the pore space, as well as several other factors. Porosity is a measure of the volume of the space which can be filled with oil. Permeability is a measure of the rate at which the liquid may move through the rock.

In the Hobbs Pool there are areas of high porosity and very high permeability and other areas that have low porosity and low permeability. In addition there is a wide range in the thickness of the producing formation and in the portion of this formation that is porous. A well drilled into a zone of high porosity, high permeability and thick producing zone will produce oil rapidly and its potential will be high. If on the other hand the permeability is low, the producing section thin, and/or the porosity slight, the potential of the well will be low because the oil can come into the well only at a slow rate. Accordingly the best first measure of the amount of recoverable oil underground is the potential of the well. Wells with high potentials indicate large volumes of oil beneath the surface.

The potential, however, is not an entirely satisfactory measure of oil in place. If a well encounters a fissure only half an inch wide the oil will be produced at a very high rate and give the well a high potential. If, however, the surrounding rock has very low porosity the oil will be quickly exhausted. Accordingly, the potentials while being used as the first measure of oil in place should be repeatedly corrected upward or downward according to whether the bottom hole pressure remains high or falls off rapidly.

Gulf Exhibit No. 6

Bottom hole pressure is the pressure under which the oil, water and gas exist in the pool. Before the first well was drilled at Hobbs, pressure at any given elevation in the producing formation was the same. Over millions of years oil, water and gas had accumulated in the pool. Water lay beneath the oil and all of the fluids in the reservoir were under high pressure. If there had been differences in pressure in the pool those differences would have forced the fluids to move from points of high pressure to points of low pressure until the pressure was brought into equilibrium. The movement of oil, gas and water in any oil pool move under exactly the same rules as water

moves through the distributing mains of a city water system. It moves from points of high pressure to points of low pressure. Accordingly, if an operator is to recover the oil under his land without losing oil to adjoining leases or draining from them, the pressure on his land must remain the same as the pressure on adjoining leases. If an operator reduces his pressure below the pressure of adjoining leases oil will be drained from his neighbors to his well. The ideal way to operate an oil field is to maintain the pressure as nearly equal as possible throughout the field. Mr. Fred E. Wood, Chief Production Engineer of the Standard Oil Company of Indiana, (the parent company of the Stanolind Oil & Gas Company,) has well expressed this rule; if the allowable on any lease is set too high the bottom hole pressure under the lease will fall off too rapidly. The allowable on this lease should be diminished thereafter so that its bottom hole pressure will rise or so that its bottom hole pressure will drop less rapidly than the offset operators. By maintaining the pressures equal on adjoining leases the drainage of oil from one lease to another can be prevented.

As previously stated, the pressure in Hobbs Pool was uniform before the first well was completed. As soon as oil was removed from this well the pressure at that point was reduced and there was a tendency for the oil to move in from all other points of the pool to this lower pressure point. As more wells were completed and more oil was produced the pressure was dropped still further. There was a further movement of oil to low pressure points and the water tended to move into the field to replace the oil. Originally the oil was saturated with gas which means that the oil contained all the gas it could dissolve. As soon as the pressure dropped some gas came out of solution, the amount that came out of solution depending entirely upon how much the pressure was lowered. The lower the pressure the greater the volume of gas coming out of solution. This gas moved into the higher parts of the field under the rule that gas is lighter than oil so that a gas cap developed.

From the date of discovery in December 1928 until July 1930 the only restriction on production at Hobbs was the limitation of market outlet. In July 1930 after a thorough study of proration plans the so-called 75-25 plan was adopted by voluntary agreement of the operators and state officials. Under that plan 75% of the production was distributed in proportion to the potentials of the wells and 25% of the total was distributed equally to the 40-acre units. The 25% allowed in equal amounts was intended to permit

production from every well in sufficient amount so that the operator would be able to pay the operating expenses and recover the investment in his well. Until July 1930 there had been no proration and no attempt to take oil in proportion to the oil under the property. Each property was produced as rapidly as the operator was able to market the oil. As a result some properties produced at such high rate the pressure under those properties dropped below the average in the pool.

The first survey of bottom hole pressure was made in December 1931. At that time the average bottom hole pressure in the field was 1431 lbs. per sq. in. Original bottom hole pressure has been estimated by the Hobbs Engineering Committee at from 1500 to 1525 lbs. per sq. in. In three years of production the average pressure in the pool had dropped about 84 lbs. per sq. in. The drop, however, was not uniform.

Exhibit 6 shows the bottom hole pressure survey of December 1931. On this map lines have been drawn through points of equal bottom hole pressure. These pressures were all taken or adjusted to a common datum of 400' below sea level. Since these lines are drawn through points of equal bottom hole pressure there would be no tendency for oil, gas or water to move along any one of these lines because there would be no force tending to move fluids along a line of equal pressure. There is, however, a strong tendency for oil to move across the pressure lines. Where these lines are close together the tendency to move is very great and rapid drainage will occur. Where the lines are far apart there is relatively less tendency for drainage or movement.

On this map more than 80% of the pool shows a pressure between 1400 and 1450 lbs. per sq. in. There are, however, three low pressure areas in which the pressures are less than the pool average, indicating that production had been excessive in those areas. Since there was no pressure survey prior to December 1931 we have no way of knowing how great the pressure differences were at the time the 75-25 plan was adopted. At the time of the December 1931 survey the highest pressure in the field was 1483 lbs. per sq. in. in the Shell McKinley B No. 1, and the lowest pressure was 1275 lbs. per sq. in. in Stanolind Leech No. 24 in the southeastern portion of the field. This means that there was a pressure difference, in a distance of 5 miles, of 208 lbs. per sq. in. tending to move the oil from the Shell well toward the Stanolind well. With the exception of the southeastern end of the field this pressure map indicates fairly satisfactory pressure distribution through the field but of course the lower the pressure differential the less movement there can be of reservoir fluids.

Gulf Exhibit No. 7

This is the bottom hole pressure survey made in October 1933. At that time the pool had operated more than three years under the 75-25 plan. The map is colored in the same way as Exhibit 6, the yellow color being used for the average pool pressure which at that time was about 1350 lbs. per sq. in. Since the first survey the pressure has dropped 85 lbs. per sq. in. There is, however, evidence of equallization of pressures during this time. The highest pressure is 1395 lbs. per sq. in. in the Amerada Harden No. 1, and the lowest pressure is 1245 lbs. per sq. in. in Repollo Crump No. 2 in southeastern part of the pool. The differences in pressures from the highest to the lowest in the field is only 150 lbs. per sq. in. as compared with 208 lbs. per sq. in. about two years earlier. There are now only two low pressure areas and the average pressure covers a much larger part of the field. The map shows that under the 75-25 plan the field was being produced in such a way that each operator was securing his oil from beneath his land with little drainage from one property to another. About the time this pressure survey was made the proration plan was changed permitting an increase in allowable for certain wells producing water. Under this plan any well producing 2% or more water was allowed to produce on the basis of 60% for potential and 40% for acreage.

Gulf Exhibit No. 8

This is a bottom hole pressure map of the survey August 1936. At this time the pool had operated for about six years under the 75-25 plan, three years of which 60% for potential and 40% for acreage was permitted for wells producing water. This survey shows that several areas were producing excessive amounts of oil. The highest pressure in this survey is still in the north-eastern part of the field where Shell State No. 2 in Section 24 had a pressure of 1320#, and the lowest pressure was in Repollo Crump No. 1 in the south-eastern corner of the field with a pressure of 1000#. In the 1933 survey pressure differential across the field was only 150# and had diminished from the 1931 survey. In 1936 the pressure differential had increased and excessive production is indicated by the closely crowded pressure lines in the south-eastern part and east central part of the field. It is indicated that the water allowable should have been reduced and adjustment for bottom hole pressure should have been increased in order to secure more uniform pressures throughout the field. Instead, the proration plan was changed on January 1, 1937, to give 60% of the pool's allowable to the units regardless of their

potential and only 40% of the pool's allowable was assigned on the basis of potential.

Gulf Exhibit No. 9

The result of the change in the proration plan is shown in the bottom hole pressure survey of September 1939, the last survey which has been made. On this survey the highest pressures are still shown in the northwestern part of the field where several wells have a pressure of 1245# and the lowest pressures are shown in the eastern part of the field where the Texas No. 1 Selman has a pressure of only 881 lbs. per sq. in. The pressure differential has increased to 374 lbs. per sq. in. This increase in pressure differential has greatly accelerated the drainage from high pressure areas to low pressure areas. Not only has the pressure differential increased in the last three years but pressure in the southeastern area is barely 2/3 of the pressure in the northwest and less than 75% of the pool average. The closely crowded pressure lines in the southeastern part of the field indicate a tendency for rapid movement of oil from a large portion of the field into the southeastern area. The only way in which this unfair condition can be corrected is by restoration of the plan allocating 25% of the pool allowable equally to the 40-acre units and 75% of the pool allowable on a potential basis with a proper adjustment for bottom hole pressure.

It will be noted that only four bottom hole pressure surveys have been shown by these exhibits. Bottom hole pressure surveys have been made from one to five times per year and the presentation of this mass of data would add little if any pertinent information. Exhibit #6 shows the first general bottom hole pressure survey, Exhibits #7 and 8 were the last surveys before each change made in the proration plan and Exhibit #9 shows the last survey completed. The pressures shown on each map are for non-packer wells only so this series of exhibits shows the effect of each proration plan on the reservoir pressure.

Gulf Exhibit No. 10

This exhibit repeats the geological cross section previously shown in Exhibit 4 and in addition shows in the chart at the bottom the pressure surveys which have been shown on previous exhibits for the wells represented in the cross section. The highest line on the chart shows the December 1931 pressure along the line of wells used in making the cross section. This shows that throughout the major portion of the field the bottom hole pressures

of the wells were reasonably uniform. Unfortunately, however, pressures were not taken in wells in the extreme southeastern portion. The second line shows the pressures for October 1933 which indicates that at that time the pressure situation was fairly satisfactory. The third line indicates the pressure for August 1936 and shows that all of the section northwest of Section 10 was above the pool average and the wells in the southeastern part of the field were below the field average. It shows, just as water runs down hill, so reservoir fluids from the areas of high pressure will move to areas of low pressure, and the pressure line indicates the direction of drainage of oil in the field. The last line shown on the chart is for February 1939. It shows the disastrous effect of the order of 1937 which gave 60% of the pool's allowable outlet to each unit and allotted only 40% on the basis of adjusted potential. There has been a sharp increase in the pressure differential and the wells close to the low pressure area have dropped in pressure much faster than the average wells in the pool, and there has been a continuation and magnification of the drainage from high pressure areas to the low pressure area.

Gulf Exhibit No. 11

Repeats the pressure map of August, 1936, the last pressure survey prior to the time when the proration plan was changed in January 1937. On this map, however, colors depict the manner in which the allowable was changed. The units colored red is where the allowable per day increased 20 barrels or more as a result of the plan change, and all units colored green were decreased 20 barrels or more as result of the change. There is a scattering of red units or large gain units around the fringe of the pool but primarily the gains are concentrated in the low pressure southeastern areas. On the other hand, the heavy losses are spread throughout the high pressure area showing that the order of January 1937 reduced the allowable of the high pressure wells and increased the allowable of the low pressure wells. This naturally resulted in the increase in pressure differential as shown on the last exhibit.

Gulf Exhibit No. 11-A

In order that the effect of the water allowable order and the order of January 1937, bottom hole pressure map of October 1933 when pressures were most nearly equalized, is repeated. Next is shown that area where the large increases in production are concentrated as shown on Exhibit 11 and which was

obviously the area of low pressure in October 1933, When the pressure distribution was most nearly ideal during the history of the pool. At the right is shown the present bottom hole pressure survey. Increased allowable in this southeastern area has greatly increased pressure differentials and greatly increased the drainage of oil from the northwest into the southeast portion of the pool.

Gulf Exhibit No. 12

So far we have been concerned mainly with potentials, acreage, pay thickness and pressure differentials. Mr. Tesch of the Stanolind introduced the radial flow formula. This formula may be utilized to determine the amount of movement across any given line if full information is available. In Exhibit 12 there are indicated three wells located on the diagonal red line whose potentials and bottom hole pressures are known over a long period and which are offset to the north by three wells and to the south by three wells on which we have frequent pressure surveys. From the potential of the wells, their spacing and pay thickness, the productivity of the formation may be calculated. Using these data we find that the wells produce 2 barrels per day for each pound of pressure drop in the well.

After the wells have produced for a time there will be an accumulation of gas bubbles in the pay which interfere with the movement of oil through the producing formation. This is a principle which has long been recognized and is commonly known to petroleum engineers as the Jamin Effect. The Jamin Effect will reduce the productivity of the formation about 1/4 but in order to be very conservative in estimation a reduction of 37½% was used, making the productivity 1.25 barrels per day per pound drop in pressure. The pressures are known in the wells to the north and to the south and from these pressures and the productivity of the wells along the red line a linear relationship can be established and the amount of drainage from the northwest to the southeast across this line can be determined in barrels per day. The calculation shows that in September 1939 there was a movement of 362 barrels every day toward the southeast. This means that the low pressure southeastern area was taking from the higher pressure northwest, 362 barrels every day. Over the producing history of the pool the drainage has varied with the difference in pressure between the wells northeast of the line and southeast of the line, being less when the pressure difference was less and being greatest at the present time.

Taking into consideration the differences in pressures which have existed at various times, it is calculated that the total movement of oil from northwest to southeast across the red line has been 551,000 barrels. Up to September 1, 1939, the production from wells southeast of the red line had been only 3,488,000 barrels. Since these wells have drained 551,000 barrels of oil from the northwestern area, it appears that the wells in the southeastern part of the pool have taken 15.8% of their total production away from the high pressure and more prolific areas to the northwest. It should be remembered that this calculation is very conservative, first, because of the high value given to the Jamin Effect; second, because calculation has been made only for drainage across the diagonals of three 40-acre units. There are actually six 40-acre units along the red line and its possible extensions. It has not been possible to make the calculation for the drainage across all six units because we did not have pressure data on wells northwest and southeast of all six of these units. It seems reasonable, however, to conclude that the drainage by the southeastern area has been far in excess of 551,000 barrels and that these wells have taken much more than 16% of their production from properties under which the oil originally accumulated. It may easily be that the amount of this drainage has been as much as 25% of all the oil so far produced by these wells, and the present rate of drainage, 362 barrels daily, will continue to increase as long as the present excessive allowables are granted to the wells in the southeastern area.

STATIC BOTTOM HOLE PRESSURE AND MOVEMENT OF FLUIDS IN THE RESERVOIR

The principle that fluids move from points or areas of high pressure to those of low pressure has been recognized and used by scientists and engineers since the beginning of our knowledge of hydraulics. If the conditions are known, such as in a pipe system, any competent engineer can calculate with a high degree of accuracy the volume of fluid or liquid that will be moved in any given length of time. Every major hydro-electric system or well planned city water system was calculated in minute detail before any actual work on the project was begun. In a complex system, such as a porous lime reservoir having varying degrees of porosity and permeability and in which liquid and gas are moving, the calculation is more difficult and the degree of accuracy less. However, by the use of recognized published formulae, this also can be done with reasonable accuracy. Mr. Tesch of the

Stanolind Oil and Gas Company presented to the Commission the radial flow formula from Dr. Muscat's book. (Stanolind Exhibit F) One of the basic features of that formula is the recognized fact that fluids (both liquids and gases) flow from areas of high pressure to those of low pressure. Both Mr. Teach and Mr. Card recognized this principle in considering flow to a well bore but refused to understand how it could be applied when considering areas and static bottom hole pressures. Judging from their testimony these men agreed there would be movement of reservoir fluids if the reservoir pressure varied but did not believe that static bottom hole pressures represented relative reservoir pressures.

It is, of course, obvious that a bottom hole pressure taken in a well upon completion but before being produced represents the reservoir pressure. The Hobbs Engineering Committee has estimated that the initial reservoir pressure in the Hobbs Pool was between 1500-1525 lbs. per sq. in. If there was no movement of reservoir fluids due to pressure differences the initial bottom hole pressures of all newly completed wells would have been 1500 lbs. per sq. in. History of the Hobbs Pool, on the other hand, clearly shows that the initial bottom hole pressures of newly completed wells were progressively lower as development progressed and, in essentially all cases, reasonably represented the average bottom hole pressure of offsetting wells which had been producing for a considerable period of time. (Hobbs Engineering Committee Records) If the well was drilled in a low pressure area its initial BHP was low; if in a high pressure area its initial pressure was comparable to producing offsets. Dr. Knappen testified, page 125 and 126, regarding the relation of BHP in Continental Grimes No. 3, a new well, to the producing offsets Continental Grimes No. 1 and Jamedon Moon No. 1. These two wells were one-half mile apart with a difference in pressure of 25 pounds. The initial pressure of Continental Grimes No. 3, which was midway between, was within 3½ pounds of the average pressure of the other two wells.

Mr. Card testified that the pressure at the boundary line was the point of interest rather than the pressure at the well. The pressure of Continental Grimes #3 midway between two other producing wells indicates that the pressure gradient between given wells is reasonably constant. On the same basis the boundry line pressure could reasonably be calculated in proportion to its distance from the wells tested. Such a plan could be used but its calculation would consume so much time that its application would be unreasonable, particularly since it is obvious there would be no essential difference in the unit allowables.

The records of the Hobbs Engineering Committee show only 11 wells in which bottom hole pressures were taken within 60 days after completion. The potentials of the wells ranged from 2788 to 16192 barrels per day and the average total oil recovery was 3496 barrels per well which was not enough to seriously effect the initial pressure. The average BHP of these wells was 1299 pounds as compared to an average of 1298 pounds for all measured offsetting wells that had been producing for a considerable period of time. In the Hobbs Pool maximum static bottom hole pressures, properly taken and adjusted are, without question, a reasonable reflection of the reservoir pressure.

This does not mean there is no difference in pressure difference between offsetting units but that the pressure gradient between wells on the units is reasonably constant.

NATURE OF THE WATER DRIVE AND WATER PACKERS IN NORTHWESTERN PORTION OF POOL

Contrary to statement (Page 3, Stanolind statement) water encroachment does not encircle the field. Active water movement is shown only from the west and north. The water being produced in Sections 19 and 20 is apparently moving in from the neighborhood of Section 18, in all other areas from the west. Water production from eastern wells, such as Samedan Turner B-1, is due to excessive penetration. That particular well penetrated the formation below the initial water table. (Reference Hobbs Engineering Committee Records) Apparently there is no effective water movement from the eastern side of the Hobbs Pool.

Wells most remote from the effective water drive will have the longest life. This would include wells in the eastern, southeastern and highest structural areas. Ultimately water will undoubtedly encroach to these wells and in the last stages of production in the pool it will be necessary to produce large quantities of water in order to properly drain the pool. These wells will then be in the same condition as certain wells in the southwestern and northwestern areas where packers cannot be set to shut off the water. The production of water in a pool such as Hobbs is essential in order to obtain the greatest ultimate oil recovery.

Mr. Card inferred (Page A 17) that operators in the northwestern part of the pool had not set packers because by so doing their allowable would have been reduced. Under cross examination he admitted that Stanolind (Page 43-44) had failed to get a water shutoff in two wells in the southern portion of the field but attributed the failure to a thin producing section such that a separation of the water and oil could not be accomplished.

Mr. Card's inference that operators did not set packers in the northwestern portion of the pool for selfish reasons is most unfair. Gulf attempted to shut off water in three wells on the Graham State and Hardin leases, without success. Packers were run a total of five times in Graham State No. 4. Packers were set three times in each of the Hardin wells without changing the percentage of water produced. (Hobbs Engineering Committee Records) It was not a case of the packer not holding but that all pays open in the wells produced water. Other companies have had the same experience. In the extreme north and northwestern portion of the pool, packers are only occasionally successful, which accounts for the small number of installations in that area.

Stanolind's Leadership Questionable

Stanolind's contention that it was a leader in the setting of packers is misleading. The following is the order of companies setting packers: Texas, Standard of Texas, Shell, Sun, Gulf, Continental, Amerada, Stanolind, Tide Water, Humble, Ohio, Getty, Samedan and Cities Service. (Hobbs Pool General Report) Stanolind was the eighth company to set a packer and 12 packers had been set before Stanolind's first packer. In addition most of the water packers set by Stanolind were in wells incapable of or were having difficulty in producing the allowable oil. Some of their wells were producing such large volumes of water that its handling and disposal was a serious operating problem. Mr. Card admitted (Page 41) that even the last two wells in which the Stanolind set water packers had to be swabbed in order to obtain the allowable production before the packers were set.

The following table calculated from the records of the Hobbs Engineering Committee shows the relative position of the several companies who have set water or gas packers.

	1 % of Wells In Which Packers Have Been Set	2 % of Packer Wells In Pool	3 % of Non-Marginal Wells in Pool	4 Ratio Column 2 ÷ Column 3
Amerada	37.5	6.9	6.2	1.11
Cities Service	12.5	1.2	3.1	.38
Continental	55.6	11.5	7.0	1.64
Getty	50.0	2.3	1.5	1.53
Gulf	43.5	11.5	8.9	1.29
Humble	33.3	5.8	5.8	1.00
Ohio	55.6	5.8	3.5	1.65
Shell	41.0	18.4	15.1	1.22
Samedan	14.3	2.3	5.4	.43
Std. of Texas	66.7	4.6	2.3	2.00
Stanolind	32.8	21.9	22.4	.98
Sun	100.0	4.6	1.5	3.06
Texas	12.5	1.2	3.1	.38
Tide Water	22.2	2.3	3.5	.66

Stanolind ranks ninth in the percentage of their wells in which packers have been set. They also rank ninth in the ratio of percentage of total packer wells to their percentage of total pool non-marginal wells. The rank of eighth and ninth certainly does not constitute leadership.

There is no intention to belittle Stanolind's achievements since the positions of both Gulf and Stanolind might properly be termed average. This is a result of circumstance rather than intent for apparently all companies have carried out remedial work as prudent operators should.

The Present Percentage of Allocation Based on Acreage Much Too High

Mr. Card testified regarding a group of wells having no adjusted potential and therefore were allowed oil only on the 60% acreage factor. It is quite obvious that the present percentage of allowable distributed equally to the 40-acre units is far too much. The range in average penetration into the producing formation by 50' structural contours is from 44' to 217' or a ratio of 1 to 5 (Gulf Exhibit #5). It is true that thickness of producing section without regard to quality is very misleading but the comparison of 1 to 5 was arrived at by an average within a 50' structure contour internal. The range from the thinnest to the thickest would be much greater as also would be the range of potentials. It is interesting to note that the 1 to 5 ratio would indicate a 20% acreage factor while the proration plan which embodied 25% for acreage maintained the best reservoir conditions at Hobbs. When the amount of oil produced per year is taken into consideration, much greater bottom hole pressure differentials have been established in the 2½ years since the 60% acreage factor became effective than during the previous six years.

Mr. Tesch testified,(page 77) "I believe that is right", in answer to Dr. Muscat's question, "If you did know the reservoir pressure in the southeastern area, and if you found those to be lower than elsewhere, in spite of the fact that less oil had been recovered, and considering the fact that water had not come in to displace the oil recovered, wouldn't that be evidence of the fact that originally they had less oil in place?" This is an admission that the area for which Stanolind is requesting a large allowable increase had less initial oil in place than other areas and that it has already depleted the initial reserve more than other areas for it has been established that (1) a number of these wells have produced no water. (2) The wells which produce water are producing it as fast as it enters the area, thus eliminating any effective water drive as indicated by (a) progressively lower bottom hole pressure toward the south and (b) the fact that there has been no apparent movement of the water front in that area for over four years. (3) The bottom hole pressure is much lower than in other areas. (4) It has been established that static bottom hole pressure reasonably reflects relative reservoir pressure.

It is a reasonable conclusion that the units which now participate in the 60% acreage factor only have produced a much larger proportion of the original oil in place than other units in the pool and by reason of this now have low bottom hole pressure. It is essential that the allowable of such wells be reduced if the distribution is to be on a reasonable basis and this can be done only by reducing the percentage allocated on the basis of "acreage".

Comparison of Potential and Recoverable Oil in Place

Stanolind made quite a point that potential is not a measure of oil in place. Gulf has not contended that potential is a precise measure of recoverable oil in place (Knappen, page 118) but that it was the best first rough indicator of relative recoverable oil in place. Not a single term commonly used in precise estimates of recoverable oil in place will in itself evaluate even relative recoverable oil. These terms are porosity, permeability, pay thickness, bottom hole pressure, per cent saturation, per cent recovery and acreage. If any one of these terms is equal to zero there will be no recoverable oil; likewise, if any of the terms equal zero, there can be no potential. It is a reasonable conclusion that potential integrates between all of these terms and, when modified by the number of producing acres, is a good first indicator of relative recoverable oil. It should, however, be frequently and properly adjusted by static bottom hole pressure (an anti-drainage factor) in order that the owner of each property may be afforded the opportunity to recover the recoverable oil underlying that property.

Stanolind Experiment

The experiment presented by Mr. Tesch was quite misleading because he failed to mention a number of factors contributing to oil recovery and the analogy to the Hobbs Pool. Three of these are worthy of further discussion.

(1) In the experiment it was explained that the porosity in the two sands was essentially equal but one sand was finer grained than the other. It was demonstrated that the "oil in place" was equal and inferred that all other conditions were equal and analogous to conditions in the Hobbs Pool. He did not mention that recoverable oil and

not oil in place is the product under consideration and that recoverable oil varies with the size of the pores of the porosity if other conditions are equal. Geologists and petroleum engineers have recognized this principle from the beginning of their analysis of oil reservoirs. As an illustration many shales contain more oil in place than loose sands or conglomerates yet the recoverable oil from shales by normal methods is nil while from loose sands and conglomerates it is very high. He failed to recognize the essential recovery factor.

(2) He failed also to recognize that in recovering "2½ times the liquid" from the "loose sand" he had permitted its bottom hole pressure to drop below that of the "tight sand". Had this occurred in a reservoir it would have resulted in migration from the high to the low pressure unit. (Christie cross examination, page 69). On the other hand, had frequent and proper adjustments been made for bottom hole pressure, the allowable rates would have been varied such that ultimately both sands would have the same pressure and no migration exist. (Knappen, page 160)

(3)It was inferred (page 68-69) that such a condition (equal porosity but widely different permeabilities) was common in the Hobbs Pool. Such an inference is of course difficult to deny by the use of factual data. We can not minutely examine the producing formation both vertically and horizontally but must rely upon information obtained from a small bore hole, geological opinion as to the type and cause of the porosity and permeability or conditions in similar formations which it is possible to minutely examine. The situation might be compared to the Carlsbad caverns, which are a porous permeable limestone, if they were filled with oil. The operator whose property was underlain by the "Big Room" would have a very high potential compared to the operator who drilled into the relatively nonporous lime bordering the "Big Room". As a matter of fact, the operator who penetrated the big room would have more recoverable oil than the potential would indicate so other factors would be needed to evaluate the allowable rate his property justified. Certainly acreage would not be a proper measure. An anti-drainage factor appears to be the only reasonable solution. If the operator having the low potential believes a portion of the "Big Room" underlies his property he should be permitted to establish that fact by acidation, shooting or

to crowd the boundary by drilling a 330-ft. location. Certainly he should not be granted equal allowable merely by confusingly stating that there is a wide variation in conditions and because of that fact all 40-acre tracts should be rated the same.

Geologists and petroleum engineers generally agree that the effective porosity and permeability at Hobbs is secondary. That is, it was formed by the solutioning action of percolating waters. This is the manner in which the Carlsbad caverns were formed. It is not believed that the range of conditions is nearly so great as at Carlsbad but Mr. Wahlstrom's description of "from mouse holes to caverns" (page 103) appears quite fitting, particularly since a stalactite was actually blown from a well at Hobbs. Virtually at Hobbs there is effective porosity only by reason that the initial slight permeability permitted ground waters to circulate which in turn, due to solution action, increased both the porosity and permeability. This would indicate that in the Hobbs pool there is a relationship between porosity and permeability. It also indicates that another statement of Mr. Wahlstrom's "The only index of porosity in the Hobbs field is the initial production of oil", is also true (page 103).

Attorney for Stanolind appears to be confused as to the meaning of the last sentence of a paragraph of Mr. Wahlstrom's report which he insisted upon being read into the record (page 199). Mr. Wahlstrom wrote, "The top productive member of the 'white lime' is cavernous on the crest of the structure, fairly porous on the flanks, and off structure is in places only slightly porous, in other places somewhat porous. On the flanks the lower porous member, particularly the Capps pay, all relatively unimportant on the Crest, generally yield much more oil than the top member". The following assumed table illustrates the meaning of the author:

		Crest Location	Flank Location
Recoverable oil	Top Member	300,000	15,000
	Middle Member	200,000	25,000
	Lower Member	100,000	75,000

Relatively the lower member is unimportant at the Crest location but is relatively most important at the flank location, but it does not mean that the lower member on the flank is relatively more important than the upper member on the Crest. This is the correct interpretation of what the author intended and did say. Had Mr. Woodward understood the true technical meaning of the sentence it is doubtful if he would have insisted that it be read into the record.

Attorney for Stanolind (page 9 Stanolind Statement) referred to Gulf Exhibits 6, 7, 8 and 9 as follows: "Attention is called to the fact, however, that these exhibits do not reflect the formation in which such pressures were taken, nor do they reflect, as a matter of fact, that such pressures were taken in different formations, at different periods, and in many cases comparative pressures for offset wells may have been for entirely different formations". The statement is not based on the facts or record and is a fair example of a number of other fallacious statements. Great care was taken in preparing Gulf Exhibits 6, 7, 8 and 9 that the pressures shown were for non-packer wells only and as such would be comparable from one survey to another and that the pressures taken would be in the same formation.

Contrary to the Stanolind Statement, page 10, Mr. Knappen made no point that oil from the northwest portion of the pool migrated the entire distance to the southeast portion but merely that the trend was in that direction as shown by bottom hole pressures. It was only under cross examination by Mr. Woodward that he outlined the manner in which it could occur, page 175. If, as Mr. Woodward states, there is a high pressure barrier along the township line there could be no migration past that line but <u>there would be</u> migration from it. The progressively lower pressure to the southeast definitely shows that migration must exist. (Gulf Exhibit #9). Since the area involves at least eight separate leaseholds and since Continental, Sun, Atlantic, Texas, Shell, Samedan, Skelly, Repollo and Walker own leases within the general area of Stanolind's block, it appears that both landowners and companies are involved. Certainly it is indicated that the "anti-drainage" or so-called "adjusted potential factor" should be increased in percentage participation.

Stanolind Witnesses Unfamiliar with Conditions at Hobbs

The testimony of Stanolind witnesses clearly shows that they were presenting technical alibis for Stanolind's expressed position in the case. Their testimony not only showed unfamiliarity with actual conditions within the pool, the reasons certain factors were incorporated in the proration plan, but was also shot through with contradictions. Mr. Card on direct examination testified that packers were set in Stanolind water wells for reasons of conservation (Page A15) and that large volumes of oil remained above the water packers, (Page 56) while some wells in which gas packers were set could not produce the allowable oil (page 54) and that very little oil remained above the gas packers. This group of answers shows unfamiliarity with conditions and/or a studied attempt to mislead the Commission. Upon cross examination Mr. Card admitted that even the last two Stanolind wells had to be swabbed in order to get the allowable production before the water packer was set and that packers were usually set in water wells when trouble was encountered in operating the well or difficulty was experienced in treating the oil. (Page 41-42). He did not know that some Stanolind water wells could not produce the allowable even when pumped nor that one Stanolind well, State 11, Section 5, was at the point of abandonment when The Texas Company demonstrated the technique of setting a packer to shut off water (Page 62). He could not name a single well that could not produce its allowable before the gas packer was set and vaguely replied that the condition was "often the case in other fields and probably was true of some wells in the Hobbs Field". The facts could not more grossly have been misconstrued. Every well in the Hobbs Pool in which a gas packer has been set could easily produce its allowable and the setting of the packer was for the purpose of conservation only. (Can be established by examination of the Hobbs proration statements.)

Mr. Card testified (Page 60) "the engineers did not have in mind maintaining the pressure in any particular part of the reservoir, but the reservoir generally". Mr. Tesch testified,"You have got me--- I could not tell. Many don't think there is one", when asked "what is the theory of bottom hole pressure (adjustment) in the Hobbs field?" Both Mr. Card and Mr. Tesch were assistants to Mr. E. A.Wahlstrom who

prior to March 1937 was Division Engineer for Stanolind at Fort Worth. Mr. Wahlstrom was quite familiar with Plan 2A Bottom Hole Pressure Adjustment and was favorably impressed by it.

Contrary to Mr. Card's statement, Plan 2A Bottom Hole Pressure adjustment of potential had a two-fold purpose: (1) to decline the potential of all wells by a common fraction $\frac{\text{Present Pool Average BHP-1000}}{\text{Previous Pool Average BHP-1000}}$. (The 1000 was later changed to 2/3 of previous pool average BHP). This was for the purpose of keeping the potential of Hobbs Pool wells in line with declining average pressures. (2) To further adjust the potential up or down, depending upon whether the well was above or below average bottom hole pressure for the purpose of increasing the allowable of high pressure wells and decreasing the allowable in low pressure wells. (Reference minutes and records of Hobbs Engineering Committee). This in turn would tend to reduce the rate of pressure decline in the lower pressure wells, tend toward pressure equalization within the reservoir resulting in minimizing the movement of reservoir fluids.

The plan is both sensible and workable. It was designed to operate with adjusted potential a 75% participation factor and, of course, was inadequate when adjusted potential was reduced to a 40% participation factor.

Stanolind's Sincerity Questioned

Mr. Card testified regarding the so-called "loss" of oil from Stanolind's properties in Sections 4 and 5, Township 19 South, Range 38 East. He stated the "loss" was due to the application of an inequitable proration plan and proposed that the plan should now be changed to 100% acreage (per unit allowable) in order to correct the

condition. Upon cross examination (page 48) he admitted that the units from which the "loss" allegedly occurred would receive a lower allowable under the plan he proposed. When asked how that would correct the condition he replied "You have to consider all of our leases". In substance (page 48-49) he testified that Stanolind would gain 300 barrels of oil allowable per day if the proration plan was changed to 100% acreage. That the units from which Stanolind claimed loss would be reduced in allowable but that units in the southeastern area would receive such large allowable increases as to give a net gain of 300 barrels daily.

This same Southeastern, low pressure, low potential, thin producing section, area accounted for all of Stanolind's net allowable gain of 422 barrels daily when the proration plan was changed January 1, 1937. (Gulf Exhibit #11). The fallacy of that change is now indicated by the greatly accelerated bottom hole pressure decline and by the fact that the gas-oil ratio in that area has increased five times more than the balance of the pool. (Knappen page 139).

Gulf Exhibit #12 evaluated the drainage into a small portion of this Southeastern area. Mr. Tesch presented the basic formula in Stanolind Exhibit F which was used in the calculation. Attorney for Stanolind in the Stanolind statement page 12 "<u>If Gulf Drainage Theory Hold True Stanolind Leases Would Drain to Stanolind Leases</u>". In the first portion of Stanolind's statement is quoted Section 12 of the existing conservation law, a portion of which reads as follows: "Shall ---afford to the owner of <u>each property</u> in the pool the opportunity to produce his just and equitable share of the oil and gas in the pool -----". It appears that the proper interpretation of the law would be that the lease (each property) is the unit to be considered rather than the total productive acreage of a company. It would be inferred that it was the intention of the Legislature to prohibit a company from obtaining production from one lease at the expense of another or other leases owned by the same company as well as from leases owned by other companies. Surely it could not have been the intention of the Legislature to permit the Stanolind to obtain a reduced allowable for leases

from which it claimed drainage but permit a greatly increased allowable for leases from which no drainage was claimed. Under the Stanolind plan there would be a transfer of allowable from the high bottom hole pressure, higher potential, thick producing section and lower gas-oil ratio areas to areas of low potential, low bottom hole pressure, thin producing section and high gas-oil ratios. It is also the area that received the large allowable increase in January 1937 which caused the gas-oil ratios in that area to increase precipitously and the bottom hole pressure to drop more rapidly. (Gulf Exhibit 11A and Knappen, page 139).

It appears that if Stanolind was sincere about correcting the status of the leases from which loss is claimed, it would propose changes in the proration plan, such as an increase in bottom hole pressure adjustment, since it was claimed that the wells had high bottom hole pressure and a change in the manner of adjusting the potential or allowable of the packer wells and an increase in the percentage of the adjusted potential factor. Each of these would improve the allowable of Stanolind wells in the area from which loss is claimed. Gulf proposed these changes: Gray's testimony, page 90, and Knappen's testimony, page 143.

No impartial observer could reasonably deny that there had been movement of reservoir fluids in the Hobbs Pool. Stanolind claimed movement in the southwestern area due to water drive and reservoir pressure differences (Card page A16). The two terms are synonymous for water drive is merely another means of implying pressure differences. Oil and gas do not move by virtue of the presence of water but because in a water drive pool there is a pressure differential between the water front and certain other areas. Stanolind seemed to have a clear understanding of the situation when applied to movement off its properties, but denied the condition when the formula presented by Mr. Tesch was applied showing movement to its leases in the southeastern portion of the pool. It is not a question whether there has been movement but how much and where it moves and whether, so far as an individual lease is concerned, there was counter movement. The real problem is the means by which the movement can be stopped or reduced. When a company

claims loss and requests a proration plan which would improve its allowable as a whole but not for the properties from which loss is claimed the sincerity of the claims must be questioned.

If the proposition is put on a company basis, the question should be, has the company sustained greater loss than other companies? Stanolind has 24 units to which water has encroached or 42% of its wells compared to a pool total of 114 or 46% while Gulf has 13 or 59.9%. (Stanolind Exhibit C). Stanolind has 6 units with gas packers or 10.5% as compared to 41 units for the pool or 16.5% while Gulf has 5 or 22.7%. (Calculated from records of Hobbs Engineering Committee). In spite of this apparent advantage Stanolind has requested a proration plan which would increase the allowable of a group of its wells having the least amount of recoverable oil.

Recommendations

Records of the Hobbs Engineering Committee and testimony of witnesses together with the statements of attorneys and representatives of a number of companies indicate that there are a few inequities in the Hobbs Proration Plan that should be corrected, as follows:

1. The potential adjustment of packer wells has not worked out as intended. It is recommended that the potential of packer wells be readjusted from the time the packer was set or from June 1, 1935, whichever was the latest, in accordance with the percentage change in total pool potential except, of course, the potential of new wells as they are completed will not be used in calculating the percentage potential change; and that this manner of adjustment be used in the future except as modified in (2) below.

2. Some packer wells have high bottom hole pressures. Since there is no intention of penalizing the packer wells it is recommended that in the future the potential of such wells be adjusted as in (1) above or in accordance with the bottom hole pressure of the packer well at the option of the operator.

3. In a very few cases it is indicated that the bottom hole pressures do not quite reach the maximum in 36 hours. It is recommended

that the time limit for shutin be eliminated and that the operator be notified only the date the pressure will be taken and that such notice be delivered at least six days before the pressure is to be measured.

4. It is obvious that wide differences in reservoir pressure exist which is permitting the migration of reservoir fluids. To correct this condition it is essential that the effect of the bottom hole pressure adjustment be increased.

5. The difference in reservoir pressures and gas-oil ratios has increased precipitously in certain portions of the pool since January 1, 1937 when the participation factors were changed. It is recommended that the participation factor be changed to 75% for adjusted potential and 25% for acreage. Conditions within the pool were much more nearly ideal when these percentage factors were in use and a return to them at this time would probably also satisfactorily correct the conditions referred to in (4) above.

It is obvious that the proposals of Stanolind Oil & Gas Company are merely an attempt to disguise its real purpose; to botain an increase in allowable. The changes it proposed would increase the allowable of an entirely different group of leases and wells than the ones from which loss was claimed.

The proposals of the Gulf Oil Corporation, on the other hand, did not all tend to increase Gulf allowable as, for instance, the change in the treatment of packer wells. This would increase Stanolind's allowable and decrease Gulf allowable. All of the changes proposed by Gulf would improve the status of well allowables for the area from which Stanolind claimed loss and would most nearly afford the owner of <u>each property</u> in the pool the opportunity to recover (from that property) his just and equitable share of the (recoverable) oil and gas in the pool.

Signed

JAMES B. DIGGS

WILLIAM C. LIEDTKE

RUSSELL G. LOWE

REDMOND S. COLE

C. L. BILLINGS

Attorney for Gulf Oil Corporation
JAMES B. DIGGS, Jr.

Case No.

15

Application, Transcript,
Small Exhibits, Etc.

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

ORDER NO. 204

(a) THE ADOPTION OF RULES, REGULATIONS AND ORDERS AS MAY BE NECESSARY TO MAKE EFFECTIVE THE PROHIBITIONS CONTAINED IN SECTION 13, CHAPTER 72, LAWS OF NEW MEXICO 1935, AND FOR THE ISSUANCE OF CERTIFICATES OF CLEARANCE OR TENDERS, OR SOME OTHER METHOD, SO THAT ANY PERSON MAY HAVE AN OPPORTUNITY TO DETERMINE WHETHER ANY CONTEMPLATED TRANSACTION OF SALE OR PURCHASE OR ACQUISITION, OR OF TRANSPORTATION, REFINING, PROCESSING, OR HANDLING IN ANY OTHER WAY, INVOLVES ILLEGAL OIL OR ILLEGAL OIL PRODUCT.
(b) THE ADOPTION OF RULES, REGULATIONS AND ORDERS RELATING TO THE MAKING UP OF SHORTAGE OR BACK ALLOWABLE.

ORDER OF THE COMMISSION PROMULGATING RULES AND REGULATIONS GOVERNING THE ISSUANCE OF THE MONTHLY PRORATION SCHEDULE AND SUPPLEMENT THERETO, THE CERTIFICATE OF THE COMMISSION AUTHORIZING THE PRODUCTION, PURCHASE AND TRANSPORTATION OF OIL PRODUCED UNDER SUCH SCHEDULES AND THE MAKING UP OF CERTAIN SHORTAGES.

BY THE COMMISSION:

This cause came on for hearing at nine o'clock A. M. on the 21st day of July, 1939, at Santa Fe, New Mexico.

NOW, on this 13th day of January, 1940, the Commission having before it for consideration the evidence adduced at the hearing in said case and being fully advised in the premises, the Commission adopted the order promulgating rules and regulations governing the issuance of the monthly proration schedule and supplement thereto, the certificate of the Commission authorizing the production, purchase and transportation of oil produced under such schedules and the making up of certain shortages, as follows:

1. The New Mexico Oil Conserva[illegible]

[illegible] meeting with [illegible] other evidence of market demand, and will determine the amount of oil to be produced from all pools in the State of New Mexico during the [illegible] allocated among the various pools in the State in accordance with existing regulations and among the various units in each pool, in accordance with the regulations governing each pool. The Commission will thereupon issue a proration schedule which will specify the amount of oil each unit in the State may produce each day during the following calendar month, including shortages which may be made up and lawful overages. Allowables for wells completed between the first and sixteenth of each month shall be included in a supplementary proration schedule to the current monthly proration schedule. This supplement shall be issued on the sixteenth of each month. Such monthly proration schedule and such supplementary proration schedule shall each constitute the certificate of the Commission authorizing thereunder:

(1.) The production of oil from the various units in accordance with such respective schedules;

(2.) The purchase of oil so produced by the purchasing companies; and,

(3.) The transportation of oil so produced by the various pipe line companies.

2. The monthly schedule provided for in paragraph "1" hereinabove shall show accrued shortages for two succeeding months and [illegible] same period of time; or

purpose of conserving valuable energy had caused the shortage.

be cumulative and allowed. Such shortages shall be shown on the cumulative column on the proration schedule and the amount of cumulative shortage authorized to be run shall be added to the current allowable and total shown as net allowable.

4. In no event should shortages when authorized, be produced in such manner or in such daily amounts as to constitute waste.

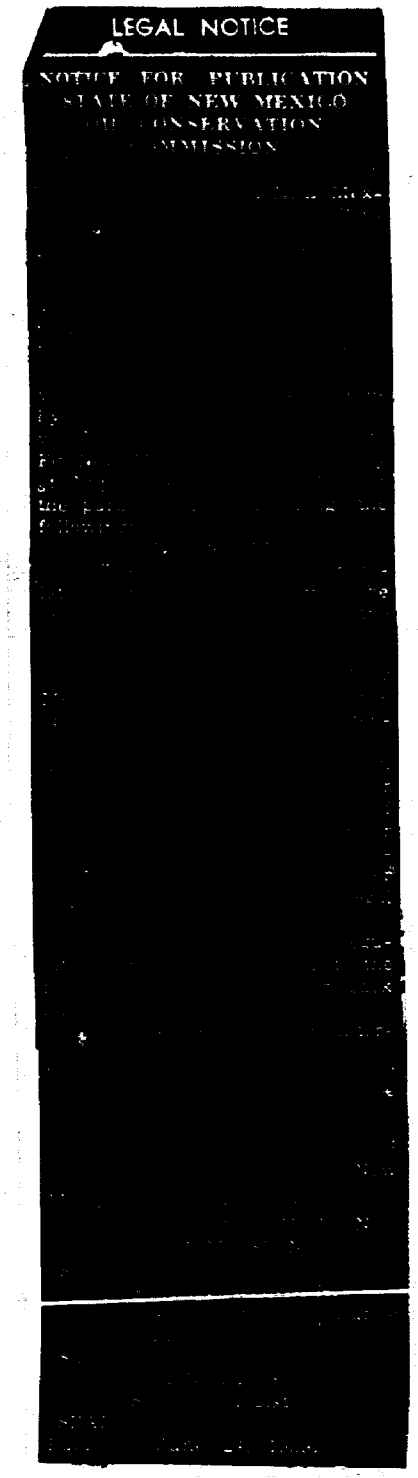
For the purpose of taking under further advisement, the Commission reserves herein for a supplemental order the matters in this case in so far as they relate to the transportation of oil and the products thereof by means other than by pipe line.

DONE at Santa Fe, New Mexico, this 13th day of January, 1940.

NEW MEXICO OIL CONSERVATION COMMISSION

By Frank Bowden
Commissioner of Public Lands

By R. Anderson
State Geologist.


LEGAL NOTICE

NOTICE FOR PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION
COMMISSION

Affidavit of Publication

June 24 1939

STATE OF NEW MEXICO
COUNTY OF SANTA FE } ss.
CITY OF SANTA FE

I, Larry Byron, hereby swear and affirm that I am the Publisher of the New Mexico Examiner, a newspaper of general circulation in the City of Santa Fe, the County of Santa Fe, and the State of New Mexico, printed daily in the City of Santa Fe: that the attached is a true copy of Publication as it appeared in the New Mexico Examiner, issues of June 24 1939 in a full and complete edition of the paper.

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Sec. 3, Chapter 167, Laws of 1937.

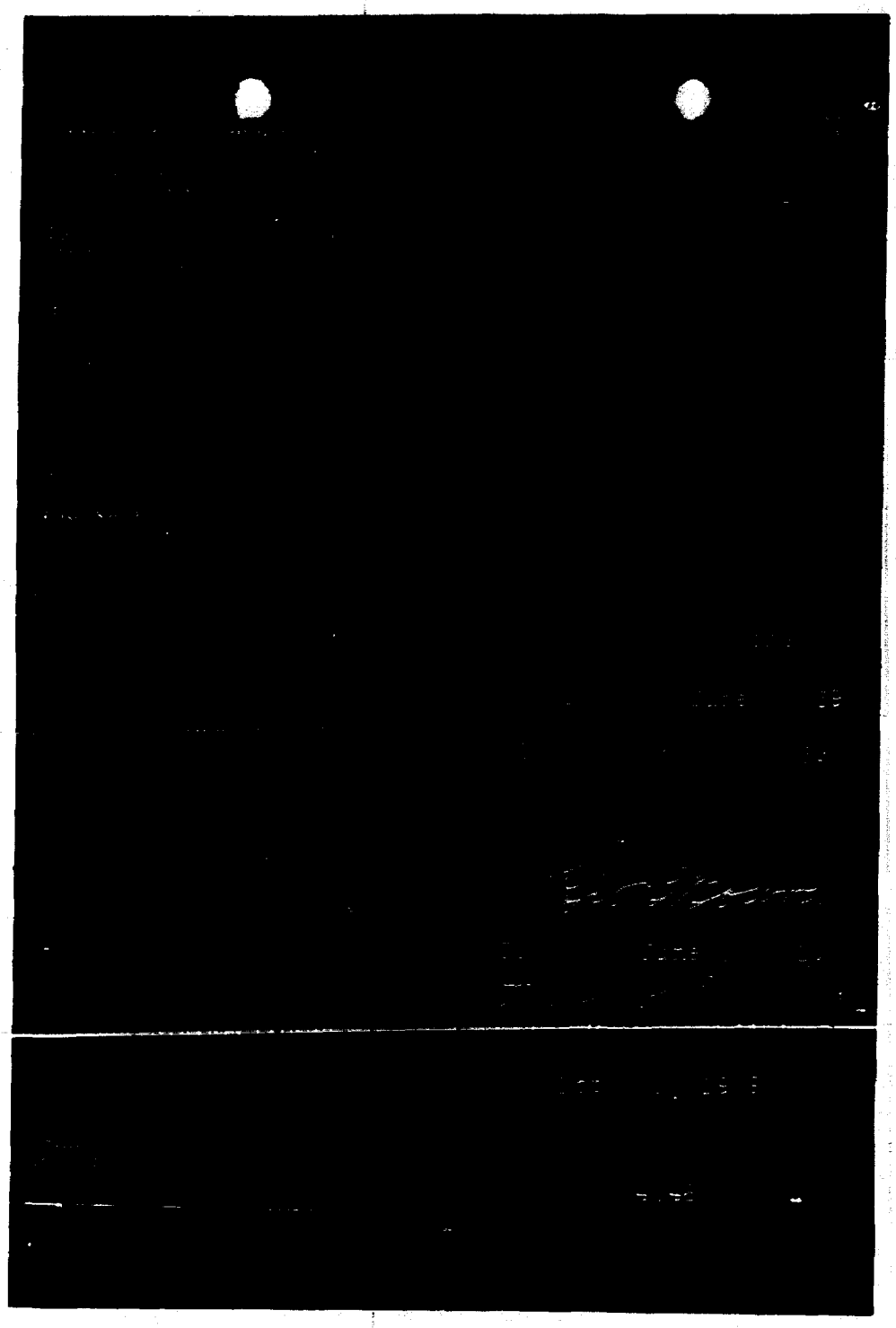
Signed Larry Byron

STATE OF NEW MEXICO
COUNTY OF SANTA FE } ss.
CITY OF SANTA FE

Larry Byron appeared before me this 26 day of June, 1939, known to me to be the person above making affidavit, and after being duly sworn, deposes and says that the statements above made are true and accurate to the best of his knowledge.

Notary Public in and for Santa Fe County, State of New Mexico.

My Commission expires: Feb 24 1943



State of New Mexico,
County of Lea.

Thomas B. Summers

Publisher

Of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once ~~a week~~ in the regular and entire issue of said paper, and not in a supplement thereof for a

period of

One issue weeks,

beginning with the issue dated

June 27, 1939

and ending with the issue dated

, 193

Thomas B. Summers
Publisher.

Sworn and subscribed to before me

this 27 day of

June, 1939.

Ina Mae Montgomery
Notary Public.

My commission expires February

5, 1942

(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 [redacted] of [redacted] County.

(Seal)

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION
COMMISSION

Pursuant to Chapter 72, Regulations of 1935, State of New Mexico Oil Conservation Commission, New Mexico, has called a hearing before said Commission, with the jurisdiction and authority stated, on matters relating to the conservation of oil and gas in this State, and of the enforcement of the provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 21st day of July, 1939, at 9:00 A. M., for the purpose of considering the following:

Case No. 15.

(a) The adoption of rules, regulations and orders as may be necessary to make effective the prohibitions contained in Section 13, Chapter 72, Laws of New Mexico 1935, and for the issuance of certificates of clearance or tenders, or some other method, so that any person may have an opportunity to determine whether any contemplated transaction of sale or purchase or acquisition, or of transportation, running, processing, or handling in any other way, involves illegal oil or illegal oil product.

(b) The adoption of rules, regulations and orders relating to the making up of shortage or back allowable.

Any person having any interest in the subject of the said hearing shall be entitled to be heard.

Given under the seal of said Commission at Santa Fe, New Mexico, on June 22, 1939.

OIL CONSERVATION COMMISSION

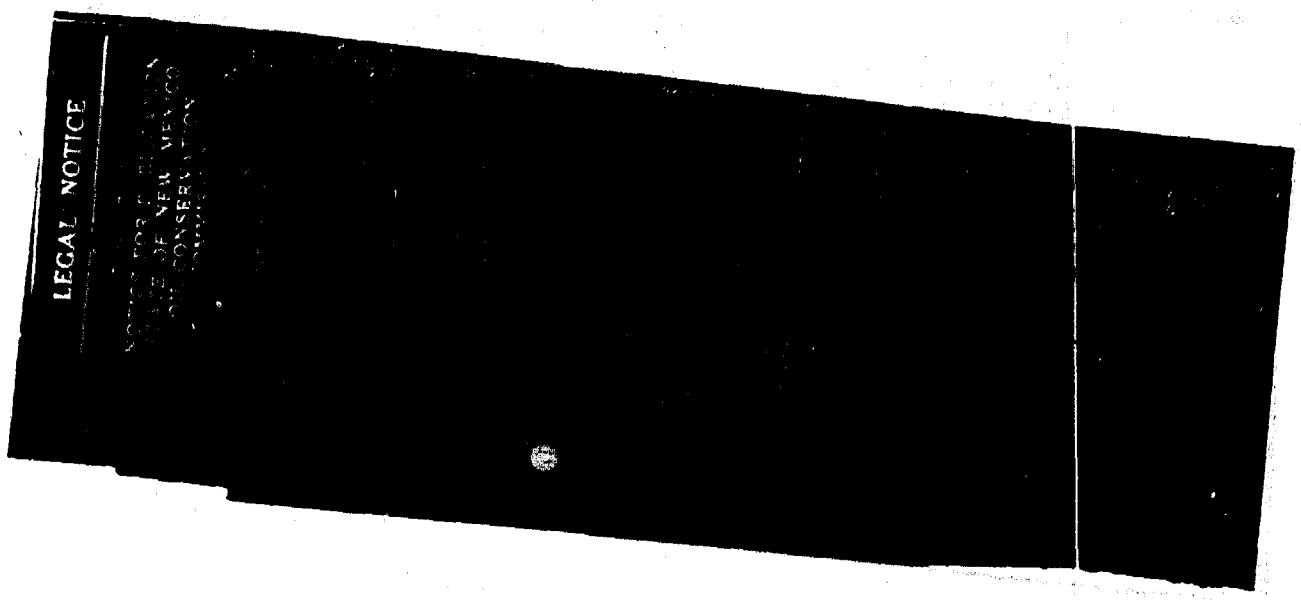
By (Sgd.) Frank Worden
Commissioner of Public Lands

(SEAL)

By (Sgd.) A. Andreas
State Geologist.

1311

ILLEGIBLE



...of New Mexico

...the jurisdiction and

...conservation of oil and

...all provisions of said

...public hearing will be held at

...on the 21st day of July, 1939,

...of considering the following:

...rules, regulations and orders as may be

...waiving the prohibitions contained

...Chapter 72, Laws of New Mexico 1935, and

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...so that any person may have an

...to determine whether any contemplated trans-

...sale or purchase or acquisition, or of transporta-

...tion, processing, or handling in any other way,

...of oil or illegal oil product.

...adoption of rules, regulations and orders relating

...to the make-up of shortage or back allowable.

...may have any interest in the subject of the said

...shall be heard.

...under the Seal of said Commission at Santa Fe, New

...22, 1939.

OIL CONSERVATION COMMISSION

...Commissioner of Public Lands

...Governor

T 13 S
R 31 E

H E A R I N G

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO.

Held in Room 130 at La Fonda Hotel, Santa Fe, New Mexico, at nine o'clock, A. M., July 21, 1939.

[illegible] BOYKIN, JOHN H. MILES, Chairman;
FRANK WORDEN, State Land Commissioner, Secretary;
A. ANDREAS, State Geologist;
[illegible] L. LEVERETTE, Attorney for Oil Conservation Commission;
[illegible] SETH, Santa Fe, New Mexico;
[illegible] Humble Oil & Refining Co., Houston, Texas;
[illegible] Gulf of Atlantic Ref. Co., Magnolia Bldg., Dallas, Texas;
[illegible] Gulf of Atlantic Ref. Co., Carlsbad, New Mexico;
[illegible] Shell Oil Co., Houston, Texas;
[illegible] Magnolia Petroleum Co., Dallas, Texas
[illegible] Humble Oil Co., Houston, Texas;
[illegible] Magnolia Oil Co., Midland, Texas;
[illegible] Skelly Oil Co., Eldorado,
[illegible]
[illegible]
[illegible]

with the jurisdiction and authority over all matters relating to the conservation of oil and gas in this State and of the enforcement of all provisions of said Act, notice is hereby given that a public hearing will be held at the Capitol, Santa Fe, New Mexico, on the 21st day of July, 1939, at 9:00 A. M., for the purpose of considering the following:

"Case No. 15.

"(a) The adoption of rules, regulations and orders as may be necessary to make effective the prohibitions contained in Section 13, Chapter 72, Laws of New Mexico 1935, and for the issuance of certificates of clearance or tenders, or some other method, so that any person may have an opportunity to determine whether any contemplated transaction of sale or purchase or acquisition, or of transportation, refining, processing, or handling in any other way, involves illegal oil or illegal oil product.

(b) The adoption of rules, regulations and orders relating to the making up of shortage or back allowable.

"Any person having any interest in the subject of the said hearing shall be entitled to be heard.

"Given under the seal of said Commission at Santa Fe, New Mexico, on June 21, 1939.

NEW MEXICO OIL CONSERVATION COMMISSION

By (Sgd.) Tom Ford (SEAL)
Commissioner of Public Lands

By (Sgd.) E. S. Walker
State Geologist"

MR. SETH: Gentlemen, we are now ready to proceed, and anybody desiring to express himself, either by his attorney or representative, may now do so.

MR. SETH: I'd like to put Mr. Glenn Staley on the stand.

Thereupon, Mr. Glenn Staley was called and duly sworn by the Land Commissioner. Mr. Staley testified as follows:

EXAMINATION BY MR. SETH.

Question: State your name, please.

Answer: Glenn Staley.

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Q. What position do you occupy in New Mexico, Mr. Staley?

A. Proration Umpire.

Q. In Lea County?

A. Yes, sir.

Q. And how long have you held that position?

A. For over nine years.

Q. Are you familiar with the present procedure in handling the current allowable, that is, what documents are given the operators, or to anyone else in interest?

A. I am.

Q. Will you please state the present practice.

A. The present procedure is that of having the company who has shortage - -

Q. I am not speaking about back allowable - just the current allowable.

A. The Oil Conservation Commission of the State of New Mexico issues an order at the beginning of each month, stating the amount of oil that shall be allocated to each field and the wells within the field, and this total amount is taken and divided according to the proration scheme used within each field by our office and which is approved by the Commission.

Q. And is anything issued to the producer or anyone after the proration schedule is made up?

A. Only the proration schedule, which is an order to the operators and the pipe lines (we have always considered it as such) that so much oil could be produced from each well.

Q. Do you issue a separate letter to anyone?

A. No.

Q. Just the proration schedule?

A. Yes.

Q. And is that furnished the purchaser, transporter and everyone interested?

A. Yes, sir.

Q. Now, has that proration schedule been accepted generally as the necessary authority to produce and transport the oil?

A. Yes, sir.

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Q. Coming to the back allowable, how has this back allowable originated, or what are the reasons for it?

A. There are a number of reasons. One reason is, say a well is being worked over for the purpose of producing or operating the well more efficiently from the standpoint of gas/oil ratio, and the setting of packers to eliminate water and for various mechanical reasons, and while this work is being done the well naturally cannot produce its allowable. Another reason is wells that are off to one side in some of the fields and difficult to get a pipe line connection, that is, the pipe lines gathering excesses, extended to this new completion, sometimes it will take a while for the pipe lines to make this connection, or it may be that the battery for a well (a newly completed well) is so situated that pumping equipment will have to be installed; it is not convenient for the pipe line to set this pump or for the operator to set the pump, and it may go a week or two (as a rule, it doesn't set over that long a period), but causes a shortage for that connection. Another cause of shortage is what we call marginal wells, small wells that are erratic in their production; we will say a well that can output forty barrels a day and, say, that it will only produce thirty-six or thirty, consequently the connection will run short due to the inability of the well to produce the amount of oil allocated to it. Another reason is what we term as pipe line proration due to economic and mechanical conditions. The pipe line is unable to take the total amount allocated through all of its connections. That causes a shortage in all the connections.

Q. Then back allowable is due to the inability to get a connection, to mechanical difficulties, with pipe lines and due to the refusal of purchasing companies to buy?

A. At the present time.

Q. Are there any large back allowables in Lea County at this time?

A. There are.

Q. Will you please state one of them, the Shell, for instance?

A. The Shell, in April, 1938, had some refinery trouble in Texas regarding the market for the majority of the oil coming from Southeastern New Mexico and it became impossible for them to take their full allowable, so they prorated all of their takes twenty per cent.

Q. And about how much did that amount to?

A. Perhaps three-quarters of a million barrels.

Q. Are they making up that allowable?

A. Yes, they are.

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Q. At what rate?

A. They first started making it up at the rate of five barrels a day and at the present time they are making it up at the rate of 10 barrels.

Q. Is there another large back allowable in the Vacuum Field?

A. There is.

Q. Will you state the approximate amount?

A. The amount is approximately one-half million barrels. The cause is the area is served by one pipe line, the Texas-New Mexico Pipe Line, and due to the size of the line serving this area and connected with the main trunk line, it is impossible for them to get out the full amount that is allocated to the Vacuum area. Therefore, they are taking approximately seventy-five per cent of the total amount.

Q. Are there some prospects of relief?

A. There are.

Q. Now, when these back allowables in large amounts are to be made up, should there be a limit on the rate at which they should be made up?

A. I think so, yes.

Q. What would you say the effect of making up the allowable without limiting it would be?

A. It would tend to upset the market conditions, as a general rule. The market is, say for a period of thirty days, distributed among all of the fields within an area and to suddenly throw upon the market, say, one-half million barrels, it would tend to upset the market for that area and for the nation as a whole.

Q. Wouldn't it tend to upset the production of oil in the pool, also?

A. Yes. I doubt very much whether the average operator would be in favor of producing a well in that manner.

Q. Would you say there should be a limit of, say, fifteen to twenty per cent of the regular allowable?

A. It would depend upon the number of wells within the area, because it would make a difference in the total amount.

Q. Are there any back allowables on the record?

A. [illegible] on the records. And surveys are being made at the present time by our office and the office of the Commission to determine just what these allowables are.

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Q. And what is the purpose of the survey?

A. The purpose of the survey is to drop from our records all shortages that in the opinion of the Commission are impossible to make up, as they just cloud the record.

Q. What is the practice of handling these back allowables in the matter of giving authority at the present time?

A. The producer is required to furnish a letter with enough additional copies to be furnished all parties concerned, setting out the cause of the shortage, the amount, the unit in which the shortage occurred, together with a request that the pipe line be given authority to produce this amount of shortage in excess of their current allowable. This is sent at the present time in five copies. One copy goes to the marketer or the purchaser of the oil, giving him authority to purchase this excess oil; one copy goes to the pipe line, giving authority to transport the excess; one copy goes to the producer, giving him authority to produce this excess oil. In this letter they must set out by the producing units the amount of shortage, the month in which it occurred, that is, set out the amount allocated to the unit, amount run and if over or short. The figures must correspond to the over and short figures of each month of the proration office and the Conservation Commission, and if the figures correspond to the figures as issued in the over and short statement, and in the opinion of the Proration Office and the Commission the shortage is legitimate, an order is given the pipe line - not an order, but permission - to purchase this amount of shortage.

Q. Does this letter state the reason for the shortage?

A. It does.

Q. And the order is approved by a representative of the Commission?

A. It is.

Q. And properly kept on file?

A. There is one copy in the files of the Proration Office, one copy in the files of the Commission office, besides a blue copy sent back to the operator himself and the purchaser and transporter.

Q. In the doing of corrective work, is there any limit at the present time on the amount of time that an operator may take in doing the work and still save the back allowable?

A. No, not at present.

Q. In your opinion, should there be a limit?

A. I think that it is a matter that should be left to the judgment of the men in the field who know all the conditions, because conditions would have a bearing on the length of time.

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...but this should be given attention?

...yes, sir.

Q. ...do you know any reason why any change should be made in the present procedure for handling these matters?

A. I, of course, am not familiar with any legal phase, but from the standpoint of a thorough check on the reasons for the shortage and the feasibility of making it up at the time made up, I can't see any reason for any change.

Q. Couldn't the back allowable, if you may call it that, be combined in some way with the current allowable and all included in one document?

A. That procedure is being followed in some of the states, and the members of the Commission talked about a coordination of that kind sometime ago and the matter is being considered now very seriously. I believe it can be done.

Q. Wouldn't it be more convenient for all concerned in one sheet?

A. It would make a much nicer record.

Q. Mr. Staley, there has been some delay in getting the final check on these shortages. Will you state just how the matter is handled and the reason for this delay? It has been for two months, at least, I believe.

A. Yes, it is about two months, and the reason for this delay is that at the end of each month the pipe lines make their corrections and furnish net pipe line figures to the operators as to the amount of oil being run in each connection. The operators in turn under the laws of the State of New Mexico furnish to the Oil Conservation Commission what is known as Form 104-A, Monthly Report of Proration, and the amount of oil run from each forty-acre unit is set out. This is a sworn statement furnished the Commission and the figures from the pipe line do not reach the office of the company until between the 12th and 15th of the month following in which the oil was run by the pipe line. Then the operator in turn ...on Form 104-A and by the time it reaches the Commission ...reaches our office it is approximately two months. ...course, we cannot make up our reports until all these ...are in.

...other words, if a man in the month of July should shut ...corrective work, you would not have the pipe lines' ...report until the end of the month?

...included in the proration schedule issued

...that a proper check may be made, ...from one and one-half to two months?

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BY GOVERNOR MILES: Being so unfamiliar with [illegible] now in the back allowable, is that not run during that month?

A. ~~It is the~~ amount, Governor, that has previously been allocated to a producing unit, but due to one or another cause it was not run, and then at a later date the [illegible] makes application to have it included, that is, he wants the right to run it in addition to the current allowable.

Q. For current allowable, for that period is it then much less?

A. That much more than the current allowable.

Q. For that period if one does not run the amount allowed, does the total amount run during that period [illegible] to more, or is it less?

A. Oh, I see what you mean. It is less. The total [illegible] is less.

MR. SETH: In your judgment, Mr. Staley, is it advisable as a prevention of waste to encourage corrective measures in wells by allowing them to save this so-called back allowable?

A. I think it is, for the reason that it doesn't seem reasonable to require a man to so produce his well that he must set a packer or do corrective work knowing that while that well is shut down he will never be able to get that production. I think that the operators should be encouraged from every standpoint to so produce their wells that the reserve supply, the gas energy, control of water, etc. be handled in the best manner possible. That has been the procedure in the past. In fact, that is the thing that caused the [illegible] up of back allowables in the beginning.

Q. In other words, you think they should be encouraged to do things that tend to increase ultimate production?

A. Yes, sir.

MR. ~~WORDEN:~~ Do any of you gentlemen present wish to ask any questions? Mr. Livingston?

MR. LIVINGSTON: I think Judge Seth covered the matter very thoroughly with the witness and I can't think of anything to be added to the interrogations.

MR. WILLIG OF THE TEXAS COMPANY: We think Form C-104-A is a very comprehensive form and we have had considerable experience in Texas with a maze of forms. There might be some additional information upon Form 104-A that would help the Commission in making up the back allowable. The form has a place on it to show whether or not a well was operated thirty days

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or thirty-one days or all the days in the month, [illegible] the operator should also be required to show the reason why the well was not producing. That could be used as a [illegible] for operators making application to make up back allowable. In other words, when a well is off, it should be indicated on the form. If that were done, whenever a well is off, it must be shown on the form and that would give the Commission a check at the time the well was off. I am just making this suggestion in the event the Commission requires information, because I believe it could be furnished on the form now in use. We would like to see the form now in use remain without any further additions.

MR. WORDEN: Mr. Staley is excused from the witness stand.

UPON EXAMINATION BY MR. SETH, Mr. O. D. Crites testified as follows:

Q. State your name, please.

A. O. D. Crites.

Q. And what company are you connected with?

A. Shell Oil Company.

Q. Do you buy oil in Lea County?

A. Yes, sir.

Q. You heard the testimony of Mr. Staley?

A. Yes, sir.

Q. Do you think a system along the lines of this testimony if adopted would meet all the requirements of purchasers and transporters of oil?

A. I think it would.

Q. Do you think it would meet the requirements of other companies?

A. I think so.

MR. ANDREAS: I think your company has already successfully been making up their back allowable?

A. At the present time we are taking it at the rate of ten barrels per well per day.

Q. How many connections?

A. Off-hand I don't know, but we estimate that-that will be about four thousand to five thousand barrels a day in wells that are making it.

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Q. That would be at the rate of about [illegible] barrels a month?

A. Yes, sir.

Q. That would merely be sixteen per cent of all accumulated shortage to be absorbed in one month?

A. Yes.

Q. With the companies absorbing the back allowable, do you think they might be able to take it up in ninety days?

A. I can't speak for the other companies. The back allowable on our shortage will take about ninety days.

MR. WORDEN: The witness is excused.

MR. HUBBARD OF THE Humble Oil & Rfg. Co.: Mr. Staley, you were asked the question of whether or not the back allowable could be included with the current allowable, and your answer was "yes", was it not?

MR. STALEY: I stated that the procedure was being followed by other states and they might be consolidated in the proration schedule which sets out the current allowable with the over and short statement for the previous month, that is, the over and short statement coming up at approximately the same time which has a lag of about two months, could be included on the same form setting out the amount of oil allocated to the connection for current allowable and the amount of oil that was run on the proration schedule two months prior and whether it was over or short - the shortage added to the amount of oil set out in the current allowable and the overage deducted. Now, a symbol could be used to indicate whether shortage was being allowed or not. Due to various reasons, the Commission might see fit not to allow it, and a symbol could be used to show anyone interested in the report whether the shortage was being allowed or not.

Q. You were also asked, were you not, if it would be convenient [illegible] and on one form which would make a better record, and you answered "yes"?

[illegible] you include on the schedule the total amount of the [illegible] or just previous shortage for certain

[illegible] we worked up a sample to see what it would [illegible] we should include a column for accummulative [illegible] should be done.

[illegible] that you would recommend that that

[illegible] Yes. I think there are a number of angles [illegible] and think after study by representatives [illegible] Conservation Commission so that [illegible] sheets, that it enter

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should make these changes.

to recommend that before a final
committee consisting of Mr. Crites,
and Mr. Livingston draw up a
submit it to the other purchasing
to the Commission for action.
Mr. Staley knows about getting
Washington, as Attorney for the
with these matters.

think it is an excellent suggestion, sir.

The committee can take this under advisement and
go into it and every person and company should
chance to see it before it is finally adopted.

Unless there is some objection to this sug-
think it should be adopted.

Mr. Kraus, I think you should be included on the

am sure if it is followed, it would be satis-
to the Atlantic.

think it will be agreeable with the Commission.
this time appoint these gentlemen as named by
Mr. Kraus on this committee. Does anyone else present
anything to offer, or any suggestions to make? We will
the committee as named to get together and work
plans. I think it would be a good suggestion
them to get together and make all your plans
how you want to handle it and then report to
Apparently that covers everything that
this time. I want to announce at this
meeting will be recessed and we will await
that committee at such time as they have
their problems. When they have notified
Commission, we in turn will notify you
giving you an opportunity to
that might arise.

to come before the hearing, the

that the above and fore-
constitute
shorthand notes
Commission
Boise, on

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