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BEFORE THE OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF COLORADO

26-26

IN THE MATTER OF THE PROMULGATION OF)
FIELD RULES TO GOVERN THE SPACING AND)
DENSITY OF OIL AND GAS WELLS IN THE)
ADENA FIELD, MORGAN COUNTY, COLORADO.)

CAUSE NO. 26

PURSUANT TO NOTICE to all parties in interest, the
above-entitled matter came duly on for hearing at the State
Capitol, Denver, Colorado, at the hour of 10:02 o'clock a.m.,
December 20, 1955.

BEFORE:

Mr. H. C. Bretschneider, Commissioner
Mr. F. M. Van Tuyl, Commissioner
Mr. W. A. Dillon, Commissioner

APPEARANCES:

Messrs. Ted Stockmar and W. T. Butler, Attorneys
at law, for the Pure Oil Company;
Frederic L. Kirgis, Esq., Denver, Colorado, for
Petroleum Inc.;
R. I. Williams, Esq., appearing for Lion Oil Company;
A. J. Jersin, Denver, Colorado, Deputy Director;
Sam Freeman, Esq., Denver, Colorado, for the Oil
and Gas Conservation Commission.

ORIGINAL

C O N T E N T S

<u>WITNESSES:</u>	<u>DIRECT</u>	<u>CROSS</u>	<u>REDIRECT</u>	<u>RECROSS</u>
<u>For the Pure Oil Company:</u>				
William L. Horner	16			
John R. Weyler	37	58	60	60
<u>For Petroleum Inc.:</u>				
Herman H. Kaveler	66			
<u>For the Pure Oil Company:</u>				
L. A. Ogden	73			

COMMISSIONER BRETSCHNEIDER: We are now in a position to proceed with Cause No. 26, which is the Adena unitization and field rules hearing. Mr. Stockmar, are you prepared to proceed?

MR. STOCKMAR: Yes, sir. Ted Stockmar, representing the Pure Oil Company as the proposed operator of the "J" sand Adena unit area, Morgan County, Colorado.

Gentlemen, the Adena "J" sand unit area under consideration consists of approximately 13,760 acres in Townships 1 and 2 North, 57 and 58 West, Morgan County. It has been divided for a number of reasons into approximately eighty-one separate tracts, as you will find shown on the map attached to the proposed unit agreement, which has previously been submitted for your inspection. There is a great diversity of oversight of the leasehold and royalty interests in these tracts. Our records show that there are 375 royalty owners and 90 owners of working interests involved in this field.

As a little history, the "J" sand gas was discovered by the Falcon Seaboard Drilling Company in May of 1953 in its No. 1 Snodgrass well. It is located in Section 20, 1 North, 57 West. The "J" sand oil was discovered by Mr. Tomberlin's Cochran No. 1 in Section 12, 1 North, 58 West in November of 1953. I refer

you to the map we have put up of the generalized picture of the field.

There are now thirteen gas wells and 166 oil wells completed in the "J" sand in the field. The field has been completely developed on the 40-acre spacing for oil and 160-acre spacing for gas permitted by the Commission.

With the discovery of the gas and oil reservoir, it early became apparent that there existed a problem as to what to do with the gas and about the gas; so cooperative efforts were started quite early in 1954 with respect to the studies of the economics of a gas plant, and determination of whether or not the reservoir could be unitized and developed as a unit. A series of operator's meetings were held in those early days and as a result it was determined to engage an independent petroleum consultant, the Core Laboratories, Inc. of Dallas to make extensive studies of the reservoirs. The Core Laboratory people were engaged by all of the operators in the field, and subscriptions were taken on the basis of a per well amount, and each and every operator in the entire field contributed his pro rata share of having the work done by Core Laboratory.

Further expenditures have been underwritten by most of the parties with respect to the legal work, title work

and so forth that has gone into the creation of the proposed unit area. We believe that these efforts have brought us to this point of asking for approval of the unit agreement in a remarkably short period of time.

That portion of the field which is included in our application for approval of the unit agreement is not all of the field, and if you will refer-- Do you have copies of the application which we submitted?

COMMISSIONER BRETSCHNEIDER: Yes, sir.

MR. STOCKMAR: If you will refer to Exhibit A attached thereto you will find that we have shown in the heavy blue lines the outer boundaries of the unit area. We have shown by a cross-hatch four tracts within those outer boundaries which are not to be included within the proposed unit area because the operator has not committed his interests. There are, in addition, three tracts lying on the southwest corner of the field which were not admitted to the unit on the basis of the vote of operators to exclude them.

For the record, and as a comparison with the map of the Adena field shown as an exhibit to the unit agreement, I would like to state that tracts numbered 7, 14, 32, 62, 63, 81 and 83 are not covered by the application for inclusion within the unit area now proposed. Efforts to

include these seven tracts to date have been unsuccessful.

COMMISSIONER BRETSCHNEIDER: Are they owned by one operator?

MR. STOCKMAR: Four of the tracts are owned by a common group of parties operated by Petroleum, Inc. Those are the four tracts which you will find on Exhibit A to our application as included within the outer boundaries of the unit area. The other three tracts I think are owned variously, two by Lion and one by Pure. The parties have not to date been able to agree upon the admission of these tracts to the unit; they are non-productive tracts.

COMMISSIONER BRETSCHNEIDER: The Lion and Pure, the parties to the unit agreement--these tracts have not been accepted because the parties will not agree, is that the reason?

MR. STOCKMAR: No, the entire tracts have been; they are available for admission to the unit; but, they are non-productive, and under the existing form of the unit agreement, since the thing did not become automatically effective on November 1st, tracts are admitted presently only upon vote of eighty-five percent of the operators, and those tracts at a recent meeting were not voted in.

COMMISSIONER BRETSCHNEIDER: All right.

MR. STOCKMAR: Of the total working interest

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owners in the unit area which we have proposed, our records show that more than ninety-nine percent have committed their interests to the unit agreement. Of the outstanding small fraction, only one party has declined to sign the agreement. The other three are among the missing. They have not even leased their interests. We simply don't know who they are or where they are. They are a very small interest, and we are completely satisfied that we have effective control of the property in the interim until they are found.

As to the same lands, 96.17 percent of the royalty owners have executed the unit agreement, and we have great hopes that an additional two and one-half percent of the entire unit area will be added today or tomorrow, giving us nearly ninety-nine percent of the royalty owners in the area. I think that is very remarkable cooperation among those in the area which we are outlining. More than 450 people have signed the unit agreement to date. It is our position that these 450 people have agreed upon several things:

First, that substantially greater production of oil and gas can be achieved from the "J" sand in the Adena field by maintaining existing pressure, possibly increasing pressure by fluid injection. In any event, having the

opportunity of producing the field selectively, producing from the most efficient gas-oil ratio on wells and so forth will substantially increase oil recovery.

Secondly, they are agreed that either injection operations or selective production operations could not have been achieved without unitization, because of the lease boundary lines and so forth. They are satisfied that the field could be more economically operated and thus extend the economic life of the field, resulting in greater recovery of oil.

We intend to show by witnesses the basis for the agreement of those parties so that we may have a proper record before this Commission in support of what we are seeking here today. As a matter of interest, the bottom hole pressure tests taken in the field indicate that there has been a drop of approximately 224 pounds reservoir pressure on a weighted average across the field in slightly over two years of production. It is estimated that by January 1st 1956 there will have been produced from the field approximately 9,670,000 barrels of oil. We have no figures on gas presently; very little, if any, of the gas-cap gas has been produced, and none through gas-cap wells. That is an engineering conclusion which I should

not have made, that no gas-cap well has been producing as such. We will let the engineers worry about how much gas-cap gas has been produced.

COMMISSIONER BRETSCHNEIDER: I think we know that, don't we?

MR. STOCKMAR: I think we have the statistics, yes, sir.

COMMISSIONER BRETSCHNEIDER: I mean by that, during the time since 1943 when the first order was issued there have been orders now and then to restrict the production of gas from the gas wells?

MR. STOCKMAR: Yes, sir. Looking at the unit agreement, it is--and half of our appearance here today is to have you approve it as an agreement, so we want to be satisfied that you understand what it contains---

COMMISSIONER BRETSCHNEIDER: I might say at that point that the Commission has carefully read your unit agreement as submitted to us before, and we have studied it and we like it very much; but, we are very glad to have you explain it, because some of us may not understand it; but, I think we generally understand what it is.

MR. STOCKMAR: I will try to hit the highlights of it as such, and if you have any questions we will go into a legal committee meeting here and try to answer it.

You will briefly note that the production from the entire unit area as allocated to the respective tracts on the basis of a formula which is not set forth in detail here, but which is reflected by the schedule of percentages attached as Exhibit B to the unit agreement.

COMMISSIONER BRETSCHNEIDER: Are you going to explain the basis upon which you arrived at those percentages?

MR. STOCKMAR: Yes, sir, we will have witnesses do that and demonstrate the formula to you.

COMMISSIONER BRETSCHNEIDER: All right.

MR. STOCKMAR: Let me just say now that you find that the participation is divided into two segments: Column 1, reflecting the division of interests between tracts during the production of the remaining part of the primary production reserve, which it has been agreed arbitrarily will be produced from the field. The second column, which is a slightly different formula, is the basis of allocating production during the secondary period, or after the agreed upon primary oil has been produced. We will go into detail as to how those tables were arrived at, and we will also submit a revised Exhibit B, because this has been based on total unitization, and we now have a revised Exhibit B to reflect unitization of the tracts we are submitting or proposing to be unitized today.

You have noted that the unit is to be operated by the Pure Oil Company as unit operator. It acts for the operators through the medium of an operator's committee. We believe that adequate provision has been made to protect the rights of any royalty owner who has joined in the unit, and of any royalty owner who has not joined in the unit.

Part of our reason for applying for your approval here is to obtain the blessing of the Statute with respect to Anti-Trust violations, and so forth. You will note that the agreement contains no provision for restriction of trade or anything that would lead toward that, or for cooperative marketing of the unitized substances, each party having the right to take his own oil and sell it on his own market. Likewise, there has been no arrangement made for cooperative refining or anything else. As to the gas plant which has been built and is in operation, it is an entirely independent facility owned by parties who are members of the present unit, and parties who are not. There is no direct connection between the unitization and the gas plant.

We have the usual provisions that production on any part of the unit area will extend the terms of the leases wherever located, and be considered production from

those leases. Any operator who is a party to the unit may designate a representative on the Operating Committee through the prescribed voting procedure; the Operating Committee controls the activities of the unit operator.

Because there is a shifting from column 1 to column 2 at some time in the future, provision is also made for an adjustment on the basis of inventory of the tangible investments in the unit, so that a change in actual ownership will occur at that time. In the meantime, however, the parties will pay their proportionate share of operation, development costs, on the basis of the percentage; after the changeover the payment will be made on the basis of the revised percentage.

Under your rules and regulations there is an indication that you would like to have filed an executed copy of the agreement. We are here offering to file with you, if you wish them, fully executed copies of all of the agreements. There would be several truckloads. We intend to furnish you with a conformed copy showing a complete listing of all operating and royalty owners who have executed the agreement. This is being assembled presently.

The agreement is such--and it has been recorded properly in the local county--it is such that all parties in interest will be on notice of the terms and provisions

and bound by it, so that there is no escape feature, as such.

COMMISSIONER BRETSCHNEIDER: It has been recorded, did you say?

MR. STOCKMAR: The unit agreement has been recorded. The arrangements have been made to record all of the joinders made by interested parties promptly upon your approval of the unit agreement.

You will note that provision has been made for the enlargement of the unit area. This means that we are not closing the door today on our efforts to achieve total unitization. There is a basis for admission of additional tracts, either as parties change their views with respect to joinder or, as conceivably could happen, additional discoveries be made as part of the common source of supply.

The arrangement for enlargement of the unit or the addition of these tracts is such that the basis of admission is to be determined by the operating parties upon vote. I might say for the record that presently and for a reasonable period of time after today any royalty owner could join the unit and participate on the basis of the schedules established in the unit agreement as written. The same privilege is extended to any working interest owner--we might as well 'fess right up to it; Petroleum, Inc. and all

the people that it represents. Now, we cannot say at this time how long that offer will be left open; but, that is available to this moment and will be available for sometime hereafter. As far as our efforts to bring the thing to total unitization, they will continue without respect to the basis that might be achieved.

One of the reasons that we have sought your approval of the agreement, other than to escape the violation of the Anti-Trust statute, is to give additional assurance to the State of Colorado, which is a royalty owner under several tracts in the field, and to give small operators and royalty owners the assurance that an independent body, the Commission, has reviewed the agreement, has reviewed the formula, and finds it fair and equitable. Now, in our own judgment the discussion of the agreement by all of these parties is evidence and very strong evidence of the fairness of the allocation and the appropriateness of the unit agreement.

We are also presenting the unit to you, because it is obvious that additional field rules will be required. The present field rules will expire January 1st; something must be done. There has been a great change in the approach toward handling it, or there will be upon unitization, and

new field rules are required which will protect the unit areas against the people who are not in it, and vice-versa.

COMMISSIONER BRETSCHNEIDER: You have prepared field rules that you would like to have approved?

MR. STOCKMAR: We have a rough draft of a form which we can submit. We have discussed that with parties outside of the unit area. I believe we are in substantial agreement as to the language to be used therein. I want to make it clear that from the unit's viewpoint the time has been so short since we have known what the unit area was going to be, that no opportunity has been made to study in detail this unit area and to determine the next step, the next course of action with respect to injection of water, or whatever is to be done. Likewise, we have not been able to study completely appropriate field rules, and we are suggesting this more or less agreed-to provision as an interim set of rules pending further study of more appropriate field rules. By suggesting these we are not subscribing necessarily to the content of them. I do not know what the other parties' position might be with respect to their permanency, but ours is that it is a simple modification permitting selective production to extend until we have studied the unit area.

Now, in support of the factors which went into

determining the formula and creation of the unit agreement, I would like to call as our first witness Mr. Horner, vice-president of Core Laboratories, Inc. of Dallas.

COMMISSIONER BRETSCHNEIDER: Are there any others that you would like to have testify?

MR. STOCKMAR: I would also like to have Mr. Weyler sworn in.

COMMISSIONER BRETSCHNEIDER: I would like to have you present all of your witnesses that you are going to use.

MR. STOCKMAR: These are the only two that we presently plan to use.

(Mr. William L. Horner and Mr. John R. Weyler were duly sworn as witnesses by Commissioner Bretschneider.)

MR. STOCKMAR: Before I bring Mr. Horner into the picture, I should keep my promise to you to attempt to answer any questions which you may still have concerning the unit agreement, with the exception of the formula arrangement, which we will develop now.

COMMISSIONER BRETSCHNEIDER: You mean you would like to ask---

MR. STOCKMAR: I would like to ask the Commission and the staff if there are any questions they would like to ask, with respect to the language of the unit agreement.

COMMISSIONER BRETSCHNEIDER: As far as I know we

haven't any questions. Do you have any questions, Mr. Jersin?

MR. JERSIN: No, I have no questions.

COMMISSIONER BRETSCHNEIDER: We have studied it over very carefully and realize that you have been working on it for a long time with a lot of experts and so on; therefore, we believe that it is a very fine agreement and covers all points that we could think of, and I am sure you probably have thought of everything that would affect an operation.

MR. STOCKMAR: That would be inconceivable, sir.

COMMISSIONER BRETSCHNEIDER: You will find out later, perhaps.

WILLIAM L. HORNER

called as a witness on behalf of the Pure Oil Company, being first duly sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Horner, will you state your full name for the record?

A William L. Horner.

Q Would you also state your occupation and company affiliation, please?

A Yes, I am a petroleum engineer. I am manager of

the engineering and consulting department of Core Laboratories, Inc., and vice-president of the company.

Q What is the general business of the Core Laboratories, and particularly your department, sir?

A Service and the measurements of oil reservoirs throughout the world for practically all of the oil companies, and in the determination of reservoir performance, evaluation, and other engineering and consulting assignments as may be presented to us.

MR. STOCKMAR: Gentlemen, I see no need to go into too much detail on Mr. Horner's qualifications.

COMMISSIONER BRETSCHNEIDER: Oh, no, that isn't necessary.

MR. STOCKMAR: If there is no objection, we will accept him as an expert witness.

COMMISSIONER BRETSCHNEIDER: Yes.

Q Mr. Horner, you are acquainted with the Adena field "J" sand reservoir?

A Yes, sir.

MR. STOCKMAR: Gentlemen, I have placed before each of you--and additional copies are available for your permanent use--copies of an engineering report prepared by Core Laboratories under the supervision and direction of Mr. Horner; is that correct, sir?

A Yes, sir.

MR. STOCKMAR: The report is dated October 8th 1954. Now, this is the report; you have also an appendix attached to it which I would like to submit as Exhibit 1, but for a limited purpose. This is the report which resulted from the engagement of Core Lab by all of the operators to study the reservoir extensively, to find out what it consisted of, and to report thereon to the operators. Now, this report as such is not the basis of the unitization. Information contained in it and opinions contained in it have carried forward and have been incorporated into the thinking of the operators. For that reason there are isolated parts of this that I would like to now present for the record, and I do not mean by introducing this as an exhibit to submit Mr. Horner to cross examination on the entire thing. It will serve as a useful reference for future hearings on the same matter. For that reason we are submitting the entire thing.

COMMISSIONER BRETSCHNEIDER: Thank you.

MR. STOCKMAR: Now, in making any determination of the recoverable oil in a reservoir, which is one of the first things that Mr. Horner undertook to do here, some decision had to be reached with respect to the mineral or limiting permeability of the sandstone, below which it was considered that only negligible quantities of oil would be

recovered.

Q Now, Mr. Horner, what is the limiting permeability factor which in your opinion is applicable to the "J" sand reservoir area; and will you give us your--briefly some reasons for your selection of that figure?

A The permeability measurement of 2.5 or two and a half millidarcies of the core samples of the reservoir rock from the field obtained in numerous wells--well over 100 well cores were analyzed, and determinations were made of the permeability of these rock samples. That is a measurement of the ability of the rock sample, the reservoir rock, to transmit fluid or to permit fluid movement under a given pressure and fluid situation. We determined that anything less than 2.5 millidarcies would be non-pay, non-reservoir material, and 2.6 millidarcies or greater would be pay material or real oil reservoir. That was determined by a series of methodical tests anticipating that the operators might wish to use those determinations for consideration of pressure maintenance or unitization. We determined, for instance, there were several wells, eight dry holes in the field. The field consists of wells of various productive capacities, and some of them were just too tight to produce, and eight of those were tested, shown on page B-9 of this report, and were checked as to permeability

of the rock samples to see if that could explain why the wells were dry when they indicated that they might be worth testing. It was found that a very small amount of the flow capacity was really available when the permeability got below 2.6 millidarcies. At two and a half or less, why, you began to get dry holes.

Then investigating all of the samples statistically by ranges, we found that there is insufficient oil saturation to indicate that you have a real oil pay in samples below 2.5 millidarcies. That is shown on page B-10. A very extensive study was made to compile that brief table. It shows that whereas there were very few samples in the field with no oil saturation--above 2.6 millidarcies there were a few--there were 27 out of some 3,500 samples in the field--but, there were 66 samples with permeabilities less than 2.5 millidarcies that were oil saturated--were not oil saturated. That meant that the 2.5 millidarcies point was substantiated or helped to be determined at that point.

Q Mr. Horner, did you also discover that the interstitial water, or the connate water as it is sometimes called, increases rapidly as permeabilities decrease?

A Yes, there was so much water in the sands of low permeability that there was a very small amount of hydrocarbon

storage space; there just wasn't any oil space.

Q We recognize that the determination of this factor must be somewhat arbitrary; it must be so to make it possible to make an evaluation, work it out on an average across the field. In your judgment from the statistical and individual studies that you have made is 2.5 millidarcies a reasonable limiting permeability in determining the recoverable reserves in the "J" sand unit area?

A Yes, we consider that to be, as a result of these exhaustive studies, a reasonable and fair cut-off point. Cut-off points are usually determined in the field, and that was the one we selected here.

Q Thank you, sir. Now, another item of extreme importance is the determination of the separation of the distinction between the oil zone and the gas cap as such. We have prepared this structural map which shows the outlines of the field itself. The lightly shaded green area is the area which is productive of oil only. The pink area is productive of gas only. It has here an overlapping of the gas cap over the oil zone, which wells could be productive of either. We have an exaggerated cross-section on the bottom which shows the oil-water contact at this particular line of cross-section here (indicating). It shows the section of oil-bearing sand. It shows the gas cap with

the zone of overlap. Now, it is extremely important in evaluating the reservoir to determine where the gas-oil contact is, the division between the two. Now, Mr. Horner, your work here shows that you settled on a gas-oil contact of 1063 feet below the datum of sea level which you used. Would you very briefly give us the basis of your thinking in arriving at that evaluation?

A Yes; there were fourteen wells that were cored right through that gas-oil contact, and each of those took the sand that had permeability in excess of 2.5 millidarcies. That would be what we would call net sand, and it was determined from those samples which depths in each well was oil sand and which depth was gas sand. Comparing that on each of those fourteen wells as shown on Table B-3 of the report, we found that there was very, very little variation, unusually good correlation at a depth of about minus 1062. That's 1062 feet below sea level; oil sand and gas sand were delineated, and that is the gas-oil contact. Now, that is in that foot; so the next foot mark below there, or 1063, was adopted. This was an unusually accurate determination and unusually good correlation. We felt that that was one of the strong determinations of the studies of core analyses.

Q Was this result confirmed by reference to drill

stem tests and so forth; in other words, actual production figures?

A Yes, examination was made of all the drill stem tests in the field as shown in Table B-4 to try to see actually what the wells produced at those levels below sea level, and the gas-oil contact information of 1063 subsea was confirmed. Wells above that level were substantially gas, and below that they were substantially oil.

MR. STOCKMAR: Thank you, sir. Gentlemen, attached to Exhibit 1 is an appendix which is a compilation of core analyses and so forth, made not only by Core Lab, but by other companies. It was the basis for determination of the porosity of the reservoir; in other words, the amount of actual pore space available in the rock for the storage of reservoir fluids. Since there apparently is present in rock water also, it becomes important, does it not, Mr. Horner, to determine the amount of the water which is present with the reservoir fluid before you can find a recoverable oil in place?

A Yes, very important. The oil content is found in the pore spaces not comprised by water, so we can't make a direct determination of how much oil is in places underground, we have to make sort of an indirect determination by measuring the total pore space and subtracting from that that pore

space portion that is occupied by water.

Q Thank you. We have prepared a little folder of small scale exhibits that will be presented here (handing documents to the Commission). I would like now to introduce as Exhibit No. 2 the connate water curves that are reflected there.

Mr. Horner, to speed things along, let me lead you into some of these questions. As I understand this connate water situation, the percentage of connate water which will exist in any particular level of the reservoir bears some direct relationship to the permeability of the rock at that particular place in the reservoir, and also some relationship to its elevation above the water table as such. Now, is Exhibit 2 a composite family of curves which will permit you to find connate water if you know the permeability of a sample and its elevation above the water table?

A Yes. That is an exhibit that we have prepared to show that.

MR. STOCKMAR: Now, is there any question about the purpose of this exhibit? It was used extensively by the operators at a later time. Now, this is in addition to the laboratory report, because this is a more greatly detailed family of curves than will appear in the report

itself.

Q (By Mr. Stockmar) Now, very briefly, Mr. Horner, will you give us the basis for your creation of these curves?

A Yes. The laboratories' methods that constitute the basis for this determination--the laboratory method briefly consists of taking a piece of rock, loading it with water, and letting the water be pulled out of it by capillary drainage; that is, by letting it run down to seek its level under conditions to simulate occurrence of water when water settles in the formation in the field, for instance, and these laboratory tests were made at different pressures. The higher the pressure forcing the water out of the rock, why, the less water that remained in the rock, and if you didn't have very much pressure on the rock it remained full of water. We found that that pressure could be related to the height above water table, just like feet of hydrostatic head in an artesian well is added to the pressure. It's that simple; and the direct measurement of the water content at the same time noting the pressure.

Q And these curves were constructed on the basis of actual tests of samples of the "J" sand in the Adena field?

A Oh, yes, made under widely accepted, and we think

they represented very representative methods.

Q Let me call your attention to figure C-6 appearing in your engineering report, Exhibit 1. Is this a similar determination for finding connate water in the gas cap zone of the field?

A Yes, in that case we made the relationship without taking into account the difference in height above water table, because that was far enough above water table so that the only variable there to be considered was the permeability of the rock. In the tighter rock with the finer pores we would find the pores more loaded with water, and the coarser pores drained down to less water.

Q Mr. Horner, another important factor in evaluating a reservoir is to determine the relationship between a barrel of fluid in the reservoir and a barrel of oil in the lease tank--those barrels are commonly called stock tank barrels--and the relationship or the ratio between the reservoir barrels and the stock tank barrels is called the formation volume factor. Now, as I understand it, that formation volume factor can vary substantially, depending upon the conditions that you hope to achieve with respect to the stock tank barrel of oil; but, with respect to the conditions in the "J" sand field at the time you made these determinations, and under the conditions of separation at

the well head that were then occurring, what was your determination of the reservoir volume factor for oil?

A We determined the reservoir volume factor to be 1.361. That meant one and a third, approximately, barrels of reservoir oil after being reduced in temperature to stock tank or surface tank temperature, and letting the gas boil out of it, and it fell down to a volume of one barrel; one and a third barrels in the reservoir to one barrel ready for sale.

Q Under those same conditions how much of a volume of gas would boil out of one barrel of reservoir oil?

A About a third of a barrel.

Q How about in terms of cubic feet?

A In cubic feet measured at the surface, 526 cubic feet under the conditions of separation in the field.

Q Now, is that figure that we can refer to as the solution gas-oil ratio?

A Yes, sir.

Q For the then existing conditions of operation in the field?

A Yes, sir.

MR. STOCKMAR: I would like to present to the Commission Exhibit No. 3.

Q Without any additional further comment, Mr. Horner,

except will you explain what each of the two graphs represent?

A It represents the variations in formation volume factor and also in gas-oil ratio as the reservoir would be reduced in pressure due to decline and depletion of its energy, as the pressure declines the oil in the formation contains less gas, and that is reflected by this curve.

Q In other words, as the underlying reservoir pressure changes, decreases, the formation volume factor will also change?

A It will also change.

Q The solution gas-oil ratio will also change?

A Yes, sir.

Q From this chart we can make determinations of those two factors?

A Yes, sir, as it decreases.

Q Mr. Horner, at page E-4 of your engineering report you showed that in your opinion on the basis of the then information, approximately 183,787,000 barrels of reservoir oil in the "J" sand common source of supply. This was equivalent, as I understand it, to 135,038,000 stock tank barrels, plus 71 billion cubic feet of gas at standard conditions. On page E-7 you have shown that in addition to the gas in solution in the oil, there is

approximately 40 billion cubic feet of gas in the gas cap. Now, we won't go into the details of your computation of those figures. The problem presented to the operators is to determine the method of getting the largest fraction of that oil out of the ground. That's what we call recoverable oil. Now, changing over to page I-9 we find your opinion there that under competitive production and operating under the existing rules established by this Commission that there will be possible a recovery of 29.9 percent of the oil in place, or on your figures, slightly over 40 million barrels. Now, will you briefly give us the basis of your arriving at 29.9 percent as recovery factor under competitive but restricted production conditions as they now exist?

A I first tried to determine how would that oil be recoverable from the wells in the field under present methods. Would it have a water drive or would it be expelled by gas from the gas cap, or would it be expelled by expansion of the gas in solution in the oil. We determined that the water drive would be negligible for the purposes of this determination on the field as a whole. We determined that the gas cap would have an effect of mixed values and in general it would be of negligible value. It might as well have not been there at all under the present methods of operation, because it would tend to leak away from

the field, from the upper wells, the first wells to be contacted, and I think the gas-oil ratio history of the field has been indicating that. We took the indications available to us at that time as that basis; then we assumed that, of course, if the gas cap didn't give us much benefit we should discount the harmful effects that it might have as it moves in along the top of the sand and interferes with the production of oil; and mainly the calculations were based on gas expansion out of solution in the oil in the oil column.

Q Those calculations were made in the normal standard methods in so far as there are such things?

A Yes, with slight modifications for this gas gap, of course, but they were made on what we call standard gas expansion determinations. They are familiar to most engineers, and for that determination we used measurable fluid characteristics. We measured it in the laboratories. We measured liquid characteristics--measured reservoir rock characteristics, excuse me, because of the abundance of core analysis data available, and special measurements on the core samples that were made to determine the relative permeabilities, and an abundance of field information; so we had unusually good background information to make these calculations.

Q Thank you, sir. Now---

COMMISSIONER BRETSCHNEIDER: What is the gas-oil ratio now; do you have that?

THE WITNESS: No, sir.

MR. STOCKMAR: As you know, sir, it will vary from well to well.

COMMISSIONER BRETSCHNEIDER: Yes; there is an average, isn't there? Never mind answering that now. You are going to have that come up later, won't you?

MR. STOCKMAR: I doubt if we will go into much detail, however we can find that if you like.

COMMISSIONER BRETSCHNEIDER: Never mind; we can look that up.

Q Mr. Horner, on page I-12 of your report you make a prediction there as to what the recovery factor could be if we had total unitization of the entire field; but did not concern ourselves with pressure maintenance as such, limiting the work of the unit to selective production only; that is, taking the daily production from the most efficient wells. Now, you have shown there a recovery factor of 37.3 percent of the oil in place on your figures, meaning a production of over 50 million barrels, an increase of over ten million barrels over operations under the present arrangement. Now, will you briefly explain why merely

selecting production from efficient wells without any other attempt to maintain pressure, permits us to achieve such a substantial increase in ultimate recovery?

A The main reason is that the gas cap would be given an opportunity to do the work of displacing oil that it wouldn't be able to do under the present competitive method of operation where the gas could leak out of the first wells that it happened to contact. So that while a large part of the oil then from the field would be displaced with gas driving it out and giving a higher efficiency than would be obtained otherwise. Then the remainder of the oil would be recovered by blowdown or a gas expansion type, which we had previously estimated would recover 29.9 percent; so part of the life of the field it would be operated at a higher efficiency than this thirty-seven percent, and part of it at a lower efficiency. It averages thirty-seven percent. We thought that there was adequate data available for that type of calculation to be made, and it was based on what is called the frontal drive calculation.

Q Thank you, Mr. Horner. At page I-24 you have after several pages of discussing a possible water injection program, you have given there your estimate that the recovery factor under unitization with selective production and with pressure maintenance through the injection of water,

you have given as your opinion that fifty percent of the original oil in place, or 67 million barrels could be recovered. Now, I realize that this figure here is based upon the proposed injection plan, or the plan proposed by you, which may not now be possible without total unitization. Is it nonetheless your opinion that the "J" sand in the condition we find it in the Adena field will permit water injection, and that water injection will aid in the increase and ultimate recovery of oil?

A Yes.

Q Speaking of the total of the sand itself without respect to the unit area and so forth presently?

A Yes; this sand is ideally suited for recovery of maximum oil by water drive; water injection has to be applied to get it.

Q Well, speaking again of the total field, even without that injection, it apparently is your opinion, is it not, that substantial increase in recovery can be made by selective production only?

A Yes, substantial increase in production by selective production only; and greater production if the water injection can be applied.

Q Because of conflicting ownership and lease boundary line problems, is it your opinion that complete or

substantially complete unitization of the Adena field is necessary to accomplish these results?

A Yes, it is.

Q Is the area which we are proposing to be unitized here of such substantial size that these measures for increasing recovery can be applied without respect to the fact that certain tracts are not committed to the unit agreement?

A Yes, it is adequate. I would like to comment; I would like to qualify that, however.

Q Don't scare me, but go ahead.

A Well, these outstanding tracts, as we pointed out in the report, any outstanding tract would somewhat hamper the operation towards obtaining the full, maximum benefits of the program provision. In this case I believe these outstanding tracts, the presence of these outstanding tracts, depending on the rules adopted to a large extent, would hamper the operation of the unit, but I don't think they would at all defeat the program. Just how much they would hamper the unit I haven't been able to calculate, but it could be done.

Q But, you say it will not defeat the putting forth to some degree of the plans of selective production and pressure maintenance that may be proposed?

A Yes, to a very substantial degree a very large percentage of the gains can be realized without those tracts being in or out.

Q Well then, the proposal or the approval and adoption of this unit agreement would be in the public interest and would serve to permit the production of increased ultimate recovery from this field?

A Oh, yes, I don't think you could do it without it.

MR. STOCKMAR: Gentlemen, this concludes our work with Mr. Horner. These are the factors which among others were considered in arriving at the formula. We would like to submit him now for your questioning and for cross examination if there is any, and then we will proceed with Mr. Weyler to wrap up the formula.

COMMISSIONER BRETSCHNEIDER: Is there anything you have to ask him?

COMMISSIONER VAN TUYL: No, sir.

COMMISSIONER BRETSCHNEIDER: Any questions?

MR. JERSIN: No questions.

COMMISSIONER BRETSCHNEIDER: I haven't any questions to ask him; it is a very complete statement.

MR. KIRGIS: Frederic L. Kirgis, K-i-r-g-i-s, representing Petroleum, Inc. Ted, have you offered these exhibits in evidence as yet?

MR. STOCKMAR: I have offered them; I have heard no response.

MR. KIRGIS: I would like to state this, that we have no objection to the exhibits which have been offered for the purpose for which we understand them to be offered, which is in support of the request of approval for this unit agreement. We also have no cross examination of the witness in so far as his testimony goes to the support of this unit agreement.

We do, however, wish to state for the record that we would reserve the right at any time in the future when other questions may be before this Commission and where reference might be made to the record presented at this time, to disagree with it or to examine in connection with it, and that that would go not only to the matter of testimony but also to the matter of exhibits, if reference is made to them at a future time for any other purpose.

MR. STOCKMAR: It is a perfectly proper reservation; we have no objection to that.

COMMISSIONER BRETSCHNEIDER: Is there anyone else objecting to the submission of these exhibits? (No response) Is there anyone else who would like to cross examine the witness? If not, we will accept the exhibits that have been proposed and proceed with the next witness.

MR. STOCKMAR: Thank you, sir.

(Witness excused.)

MR. STOCKMAR: I would like to call Mr. John Weyler, please.

JOHN R. WEYLER

called as a witness on behalf of the Pure Oil Company, being first duly sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR. STOCKMAR:

Q Will you state your full name and professional affiliation for the record, please, Mr. Weyler?

A All right; my full name is John Richardson Weyler. I am employed by the Pure Oil Company in the capacity of senior production engineer, Tulsa, Oklahoma.

COMMISSIONER BRETSCHNEIDER: If there is no objection, we will accept him as an expert witness.

Q Mr. Weyler, you have employed by the Pure Oil Company throughout the programming and the development and operation of the Adena field?

A Yes, sir, I have.

Q And you have been a member of the Joint Geological and Engineering Committee composed--or at least open to every operator in the field during all or most of

that period?

A Yes, sir.

Q You were present here during Mr. Horner's testimony?

A Yes.

Q You have studied and reviewed the Core Lab report?

A Yes, I have read it and used it in detail with the Engineering and Geological Committee.

Q Now, with respect to the matters that Mr. Horner developed for us here, is it my understanding that not only you but the members of the Joint Engineering and Operating Committee adopted as fundamental basic facts for the utilization in preparing the allocation formula the items which Mr. Horner has testified to previously?

A Yes, we did.

Q Now, as I understand the thing from the historical viewpoint, after Core Lab had presented this report, it then became apparent to the operators that pressure maintenance could be accomplished economically and feasibly and that a study of unitization should be launched to determine the proper basis of allocating field production. As I understand the thing, again historically, Mr. Weyler, the operating parties through their representatives at these meetings agreed that the foundation or the primary basis

for allocating the oil and gas in the "J" sand should be on the basis of the value of recoverable reserved underlying the respective tracts. Now, is that your recollection, sir?

A Yes, that first was brought to play in the first meeting, which was November 4th 1954, of the Joint Geological and Engineering Committee, which was delegated by the operators to work up some fair, equitable workable unitization formula for the unitization of the Adena "J" sand pool, and that group felt at that time that the best possible formula would be the value of recoverable hydrocarbons under each tract in the field.

Q Then your procedure was two-fold: First to make a determination of the hydrocarbon content of the various tracts; and secondly, to fix a value for the hydrocarbons under the respective tracts?

A That's right.

Q Now, you have testified that you utilized some of the basic factors as a result of the Core Lab work. It would appear that the next, or that one of the first steps that would have to be taken would be the picking of the top and the bottom of the effective "J" sand reservoir. You have testified that you used the known gas-oil contact. Give us briefly the basis for picking the top and the bottom

of the "J" sand reservoir.

A We had a considerable amount of core analyses in the field. I am just guessing now, but I believe there were approximately eighty-five percent of the wells in the Adena "J" sand that were cored, and as much as possible we used the core analysis of each well to determine the top and bottom of pay; but, if that was not possible, if a company had drilled in a few feet before they started the core analysis, or started coring, or they didn't drill the full section or core the full section, we used electric logs and micrologs in picking the top and bottom of pay.

Q Well then, instead of taking some average for gas-oil, or for water table, something like that, your committee, the committee of which you were a member, made a foot-by-foot analysis of every core in every well, and where information was missing, all available information was utilized to determine the net effective footage of each well individually, correct?

A Yes, sir, that's correct.

Q And you applied the limiting permeability factor derived by Core Lab and eliminated all footage which had permeabilities of less than 2.5 millidarcies?

A Less than 2.6 millidarcies. We did not include any permeability that was 2.5 or less.

XXX

Q On that basis then you achieved the total rock section, in effect, that existed in each well, and contained what you would call recoverable oil?

A Not exactly recoverable oil. At that time we determined original oil and gas in place. The total original volume of oil and gas in place, that was our first step.

Q All right, sir; and as to a division between gas and--the oil zone and the gas cap you applied the minus 1063 gas-oil contact level determined by Core Lab?

A Yes, sir, we found in our studies that the 1063 pick made by Core Laboratories was as accurate as could possibly be determined. We corroborated that footage.

Q On the basis of that foot-by-foot appraisal of every well and on the basis of all information, you, I gather, determined the porosities from actual core analyses where available?

A Correct.

Q You determined the permeabilities in the same fashion?

A Right.

Q You actually measured the height above the water level in each well?

A Yes.

Q Underlain by water?

A Yes.

Q You utilized what we have presented here as Exhibit No. 2 to determine the connate water saturation?

A Yes, sir, in each foot.

Q In each foot?

A Yes.

Q Now, from those composite calculations you were able to calculate the unit volume of hydrocarbons that existed in each foot, and by applying an acreage factor you could state that in terms of so many barrels of hydrocarbon per acre foot, is that correct, sir?

A That is correct.

Q For convenience and uniformity you spoke of barrels of oil and barrels of gas as well, did you not?

A Yes.

Q I wanted to make that clear, because some of our exhibits speak in terms of barrels of gas, which is not a common phrase.

A We chose a barrel. We needed some unit volume, so we took as a unit volume a barrel of space. We could have chosen any unit volume, but we chose a common barrel so that all of our in place volumes, both gas and oil, are in units of one barrel of space.



26-26

Q Then as I understand it, having made that determination of barrels, reservoir barrels per acre foot for each foot of every well, you added those up for each and every well and arrived at a grand total for each well?

A That is right.

Q And that those figures were then plotted separately for gas and for oil on something that you might call an isopach. We are a little uncertain of the Latin involved here, but it is a measurement of the thickness of the reservoir, acre feet of reservoir barrels. Are those the figures shown beside each well plotted on here (indicating diagram)?

A Yes, sir.

Q These represent as to Exhibit 5 as we have marked it, the reservoir barrels per acre feet of oil found in that particular well?

A The reservoir barrels per acre represented by that well, that point alone.

Q Excuse me; we have added them to remove the acre foot situation. Now, these figures by standard procedures were contoured to give you these lines, and as I understand the contours it means that any point on this line would presumably have under it land which contained, for example, 40,000 barrels per acre of reservoir space.

A Yes, sir.

Q And on the same basis and using the same unit of volume, Exhibit 6 was prepared for the gas zone separately and you have here a reflection of the barrels per acre of reservoir space represented in the gas cap.

A Occupied by gas, that is right.

Q Occupied by gas and only gas.

MR. STOCKMAR: We would like to present Exhibit 4, which is just for reference.

COMMISSIONER BRETSCHNEIDER: We will accept these exhibits that you are using now and have used before.

MR. STOCKMAR: Exhibits 5 and 6 provide the basis for determining the quantity of oil and gas which underlies each particular tract.

Q Now, Mr. Weyler, as I understand it, if you planimeter, or in some other fashion measure the area contained in each tract and also contained within the contour lines, you can determine the relative percentage of the total gas or oil, as it might be, that underlies a particular tract.

A That is right; by planimentering, contouring and then planimentering, we determine the total volume of original oil and gas underlying each property.

Q Well, on the assumption that a barrel of oil is

worth substantially more than a barrel of gas, having achieved the volumes involved here, I gather your next step was to determine the relative values of oil and gas, since your operating committee had agreed to divide the rest up on the basis of the value of the hydrocarbon content under each tract.

A That is right.

Q Now, without going into any substantial detail at all, did you on the basis of all available information make agreeable determinations of the value of each reservoir barrel in place and of each reservoir barrel of gas in place?

A Yes, we did.

MR. KIRGIS: Might I inquire, Mr. Stockmar, you used the word "agreeable" in that question. I am not sure what that meant.

MR. STOCKMAR: Mr. Weyler, although an employee of the Pure Oil Company, really served during that period as a member of a committee. When I say "agreeable" I am presuming that that was the agreed program.

MR. KIRGIS: Of the committee.

MR. STOCKMAR: Of the committee.

MR. KIRGIS: You are not saying it is generally agreeable or necessarily agreeable to all operators in the

field?

MR. STOCKMAR: We might explore that. I had assumed the determination of value, the relative value of oil and gas, was generally agreed to by the Operating Committee.

THE WITNESS: I will expound on that a little bit. After we had the volume of oil and gas under each tract in barrels, we needed to determine the value of a barrel of oil and a barrel of gas, which we set about to do, and through all of the information we had at hand, using the latest prices that we had for gas, oil, and the components, such as propane, butane and gasoline, and using the primary recovery factor of 29.9 percent of the oil, and using an abandonment pressure of 100 pounds to determine the recovery factor of gas in the gas cap, we could then determine what a barrel of oil and a barrel of gas would be worth as recovered on the surface.

MR. JERSIN: By "we," Mr. Weyler, do you mean the sub-committee of the Operating Committee?

THE WITNESS: The Adena Joint Engineering and Geological Committee made this determination, and after these calculations were made were in complete agreement that we had explored every factor that we had at hand, and had values that we placed on oil and gas that have yet to

be disputed.

MR. JERSIN: Can you give us a list of the names of operators that were represented on this engineering committee?

THE WITNESS: Yes; of course, the determination of values was done more by the engineering representatives than the geological representatives that were on the joint committee, although it was a joint committee effort.

Q (By Mr. Stockmar) Who were the members of the joint committee?

A Of the joint committee, everybody who could put a member on were asked to place a member on the committee, is they so desired; but, the companies that did the bulk of the work and were represented at practically every meeting were the representatives from the Pure Oil Company, Petroleum, Inc., Lion Oil Company, British-American Oil Producing Company and Seaboard Drilling Company, and at various times representatives of U.S.S.R.&M., Shell Oil, and other joined with us.

Q The thought seems to have been injected here that this determination was not harmonious at the time. I want to clarify that, because as I understand it, the questions of the determination of the values have not been disputed to this date, and all of the parties that have executed the unit

agreement have certainly subscribed to it, and as I understand it the committee was co-chairmanned by the man from Petroleum, Inc., so I want to remove any possible implication that there was any vigorous contest over this approach.

Having separately determined the values of the oil and gas underlying each tract, those were then added together, Mr. Weyler, to give the total value of hydrocarbons under each of the several tracts?

A The value of a barrel of oil was multiplied times the total barrels of oil in place under each tract, and the value of a barrel of gas space was multiplied times the total number of barrels of gas under each tract to determine the value of each property.

Q All right, sir. Then, having the total value of the hydrocarbons under each tract, the ratio was derived of the value of the hydrocarbons in that tract to the total hydrocarbons in the field, and the result gave a participating factor which is reflected in column two of Exhibit B to the unit agreement?

A That is correct.

Q Then as an appraisal of the figures which appear there, column two is sheerly and simply a measurement of

the value of the hydrocarbons determined to underlie each of the respective tracts?

A Recoverable hydrocarbons.

Q Yes, sir, all right; now, the question that obviously comes up is, why is column two different from column one? Now, as I understand it, Mr. Weyler, and you correct me if I am wrong, at the time the formula reflected by column two was devised the parties met to discuss it, and there was a feeling then that some operators felt that some weight should be given to other factors as well as recoverable hydrocarbons, and that there was some movement for injecting into the picture some factor which would be a measure of the current daily production, and so forth.

A That is right; the decision to present this first formula via recoverable hydrocarbons to the operators was made by the Engineering and Geological Committee, and the operators waited until we had the percentages worked out and the formula devised before any of this work was presented to them formally, and it was then that certain operators felt that other factors could be brought into this unitization formula.

Q Well, these questions were resolved, as I understand it, by agreement of all interested parties to weight the allocations of the primary production reserve by adding, or

by giving one-third credit to the daily production as reflected by the March, 1955 production statistics, and giving two-thirds weight to the value of determinations that you had previously made, that that would apply to oil only, that gas values would be left untouched. I would like to call your attention to Exhibit 7 which is set forth in the booklet, and I would like to submit it. It is the algebra of arriving at column one and column two in the unit agreement.

I don't think we need to go into any detail beyond questions that you might have as to the allocation of oil in the primary period. You can see that there is a two-thirds weighting of the ratio of tract value to total field value, and a one-third weighting of tract production during March--to total field production during March.

Now, that explains the difference between column one and column two as set up in the unit agreement. Is there any question at this juncture on the part of the Commission as to the meaning of this formula that we have set forth on Exhibit 7?

MR. JERSIN: Yes, Mr. Stockmar. I would like to get it very definitely clear in my mind as to how these formulas were arrived at. Was the Engineering and

Geological Committee joining in recommending this formula for adoption by the Operator's Committee?

THE WITNESS: The Joint Committee recommended what you will see under secondary period participation percentages. That is what the Joint Committee recommended to the operators. The operators later revised this and for a period which we call the period of Primary Production Reserve, modified the formula as presented to them originally by the engineers and geologists, and two-phased it by injecting in a certain amount the percentage of production from each tract in relationship to the total production based on March, 1955 production. Now, it doesn't look very clear here, I will admit, but during the period of primary production for oil zone tracts only, we gave two-thirds weight to the engineering formula that was submitted, and one-third weight to the percentage of production from that tract in relationship to the whole, and did not change the percentage of any gas tract. The gas tracts had no production. We felt that we could not penalize the gas people who up to that time had not even had a market for lack of production, so that adjustment was made among tracts that were in the oil section only.

MR. JERSIN: I believe that is all.

MR. STOCKMAR: Does that clear up your question

on that, Mr. Jersin?

MR. JERSIN: Yes, it does; thank you.

MR. STOCKMAR: Any further question on the formula or the primary period, this two-phase situation?

COMMISSIONER BRETSCHNEIDER: Mr. Jersin, do we understand the two-thirds one-third basis?

MR. JERSIN: I believe they explained it briefly, Mr. Bretschneider, yes, I do.

MR. STOCKMAR: Well, let's proceed then. We have done this at rather great length to provide you the basis of dividing up the purpose of the whole thing, which is the oil and gas in the ground.

Now, under the statute we also have the burden of exhibiting to you our belief that the prevention of waste will be accomplished and that ultimate recovery of oil and gas from the pool will be substantially increased. I would like to call your attention to Exhibit 8, which we now submit, and I ask Mr. Weyler to explain that briefly. We have a large-scale copy of that for your convenience here (indicating diagram).

THE WITNESS: All right; Exhibit 8 is a reflection of approximately what we expect can be produced in barrels of oil from the Adena "J" sand pool after January 1st 1956 by various methods of operation. The column on the

left, approximately 32 million barrels is remaining to be produced if no unitization was ever attempted or culminated, and we just carried on under the present rules and produced each of these independently.

The middle column is a reflection of what we expect to be produced after January 1st 1956. I would like to say here that these unitization figures were for total field unitization. The possible effect of certain tracts being out will undoubtedly somewhat reduce these values; but, we do not yet know just how much, but the middle column is the recovery we would expect if the total field was unitized and just selective production operation is carried out; in other words, no pressure maintenance, just producing the oil out of the lowest ratio wells away from the gas cap and took the maximum amount of advantage of a gas front pushing oil down structure.

In the third column is what we would expect the total field unitization after the first of the year, and soon after as soon as possible some type of pressure maintenance program initiated to further increase the recoverable oil, so you can see that the difference between column three and column one is approximately two to one.

These figures are on the basis of recovery factors as determined by Core Laboratories, and as far as those

recovery factors were applied to the amount of oil and gas originally in place as determined by the Joint Engineering and Geological Committee, and present production to January 1st subtracted, so they are a reflection of what we feel would be remaining reserves in the field under the various methods of operation.

Q Now, Mr. Weyler, you have indicated that those are figures based on total unitization?

A That is correct.

Q You have also stated that some decrease in those figures will result in the absence of total unitization, but that you have not yet any basis for calculating that?

A No.

Q Is it your opinion that we have a substantially large enough area in the proposed unitization so that selective production can be beneficially applied, and that water injection can be beneficially achieved?

A Well, I would say that there is no question at all about the fact that we will have increased recoveries due to a selective production type of operation in the unit that we are proposing today. The possibility of an effective water flood may be subject to some question; it could possibly be worked out and we hope it can; but, that as we feel now is seriously hampered by the lack of

certain tracts in the field adjoining the unit.

Q But, the area that we are proposing is large enough to justify its being developed and operated from this point forward as a unit?

A That is right.

Q Now, with respect to prevention of waste, which the statute says we must not do if we are to be permitted to unitize, you have made this showing with respect to the increase in ultimate recovery. Does unitization protect the correlative rights of the owners of parties within the unit area?

A Yes, it does.

Q Is that particularly true as to the owners of wells in the gas cap area?

A Yes, that is true, it does.

Q In the absence of unitization has the time now come or possibly passed when those people would be permitted to produce gas from the gas cap?

A Yes.

Q In fact, they have been very patient, is that not the case, Mr. Weyler?

A That is true.

Q Would the production of gas from the gas cap which did not aid in the production of oil be the most efficient

utilization of the energy contained in that gas?

A Yes, we have attempted---

Q Let me restate that question, Mr. Weyler. Would the production of gas from wells completed in the gas cap only permit the most effective utilization of the energy in the gas-cap gas?

A No, it would not; it would decrease the pressure in the reservoir and remove that gas from the gas cap and seriously reduce the volume of oil that could be recovered out of the field.

Q But, under unitization and selective production we can shut in not only gas cap wells, but high gas-oil ratio wells, is that not true, sir?

A That is right.

Q And produce the reservoir at a lower average gas-oil ratio?

A That's right.

Q Will that also without respect to fluid injection, will that also serve to slow down the rate of pressure decline?

A Yes, it will.

Q Will it not also keep gas in the reservoir for future use?

A Yes.

Q Will having the entire area subject to one scheme of operation permit the scheduling of gas deliveries to the gas plant in such a fashion that there will be no excess delivery and consequent flaring of gas at the gas plant?

A Yes, it should simplify that problem. We will reduce the volume of gas being produced in the field somewhat, and be able to control the plant deliveries to a better degree.

Q Well then, finally, Mr. Weyler, is it your opinion that the adoption and approval of the unit agreement and the adoption and approval of the plans of development operation pursuant to its terms are in the public interest and will aid in conserving the oil and gas in the reservoir and ought to be approved and adopted by this Commission?

A Yes, I do.

MR. STOCKMAR: At this juncture I would like to introduce as Exhibit 9 the copy of the unit agreement in its present form which has been submitted to you. I would like to introduce--and these are not in the folders; we have just received them--as Exhibit 10, a copy of the revision of the Exhibit B which is attached, which takes into account the deletion of the seven tracts shown on that map, and tabulated on that exhibit; but not now proposed to be

included in the unit. May we have one of these documents marked as Exhibit 10?

(Exhibit 10 was marked for identification.)

MR. STOCKMAR: Are there any questions to be asked Mr. Weyler by the Commission?

COMMISSIONER BRETSCHNEIDER: First we will admit all of the exhibits which you have presented from one to ten.

MR. STOCKMAR: Thank you, sir.

COMMISSIONER BRETSCHNEIDER: If there is no objection from anyone---

MR. KIRGIS: Mr. Chairman, may it be understood that my statement that I made at the conclusion of the testimony of the prior witness will be applicable to these additional exhibits also?

COMMISSIONER BRETSCHNEIDER: Yes. Have you any questions?

MR. JERSIN: No, not right now.

MR. STOCKMAR: I would like to submit Mr. Weyler for cross examination.

MR. KIRGIS: Members of the Commission, I have only a very few questions here and only on one point.

CROSS EXAMINATION

BY MR. KIRGIS:

Q As I understood the testimony, at one point it was

stated that this Joint Geological and Engineering Committee had an agreement on various factors, and I believe the question was asked whether that agreement went to the question of recoverable hydrocarbons. Is the answer to that question in the affirmative or the negative?

A In the affirmative.

Q Does that go to the matter of the recoverable hydrocarbons as allocated to separate tracts throughout the field?

A Yes, it does.

Q Is it your testimony that Petroleum Inc. agreed to the allocation of recoverable hydrocarbons to its leases?

A Yes.

MR. KIRGIS: That is all.

MR. STOCKMAR: I want this to be entirely clear in the record, Fred; if I may, by way of rebuttal here. It seems apparent from Petroleum Inc.'s non-joinder of the unit that it has not accepted the formula as such.

MR. KIRGIS: That is correct.

MR. STOCKMAR: Or that it has some other reason for not joining the unit. Mr. Weyler's testimony, as I recall framing the question to him, was that all of the operators in the field, including Petroleum, Inc., had agreed that the primary basis of determining the allocation

of production would be the value of the hydrocarbons in the respective tracts.

MR. KIRGIS: Yes.

MR. STOCKMAR: Now, to that extent---

MR. KIRGIS: That's right.

REDIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Weyler, is that what you testified to earlier?

A Yes; and when I said "yes" to your last question I referred to the determination of values and the general concept that the Joint Engineering and Geological Committee worked out in the first unitization formula.

RECROSS EXAMINATION

BY MR. KIRGIS:

Q If I may inquire again then, in those circumstances are you now taking a distinction between values, or oil in place on the one hand, and recoverable oil on the other?

A I have to answer that this way: that first we determined total oil and gas in place under each tract or lease. In the determination of values to be ascribed to this volume of oil and gas, we needed to use recovery factors, and I will say this, too, that the group felt that the value of the primary hydrocarbons should be used, and not any

secondary value, that everybody ought to unitize and receive benefits of unitization on the value of what they would receive under a primary production operation. So in the determination of these values to be applied to these volumes of oil and gas, we unanimously accepted the 29.9 recovery factor of oil which was to be applied to the volumes of oil under each lease.

Q But, that did not include, did it, an actual agreement that there was a certain amount of recoverable oil under each and every individual tract? That was a field-wide determination, was it not?

A In effect it was an agreement at that time. It couldn't be anything else since we had to multiply the two numbers together.

Q You are not answering my question. My question is this: whether or not that determination was merely a field-wide factor as distinguished from a determination of actual recoverable oil under individual tracts?

A That was a field-wide factor that we felt in this case we could apply to each tract in the field.

Q Now, when you say "we felt," who is "we"?

A The Engineering and Geological Committee.

Q And you say that is all members of that committee?

A Yes.

Q You are speaking for them all?

A To my knowledge there was no disagreement with that in the determination of our calculations.

MR. KIRGIS: No further questions.

MR. STOCKMAR: Gentlemen, I think that concludes our presentation of this with respect to the petition made by the Pure Oil Company as operator. I would like to again call your attention to what we are seeking.

We requested in behalf of Pure Oil Company and of all interested parties, (a) the adoption and approval of the unit agreement as being in the public interest for conservation, and as reasonably necessary to increase ultimate recovery and to prevent waste of oil and gas.

Now, that is one facet of what we are asking, and if our presentation has been sufficient, we hope that actual findings of fact and findings of law to that end will be made. Secondly, we are asking the adoption and approval of the further development and operation of the Adena "J" sand unit area, which is now composed of the tracts shown on Exhibit A attached to our application. We are asking for the further development and operation of those tracts as a single unit under the terms and provisions of the unit agreement, and in accordance with the applicable rules and orders which this Commission has in the past or

may hereafter make.

Now, that is stated in our application, but I wanted to call again to your attention the two facets. There is some distinction. I would also like to point out at this time that the unit agreement provides that the effective date of the development and operation of the land as a single unit will be as of the first day of the month following its approval by the Commission. We therefore ask that notwithstanding that you have thirty days in which to decide these matters, that it be determined within the month of December so that it may become effective as of the 1st of January.

Now, there are on the notice of today's hearing two other matters raised on the Commission's motion. One of them is with respect to the spacing under the existing spacing rules of the north half of the northeast quarter of Section 31, Township 1 North, 57 West. This particular eighty acres inadvertently, accidentally or otherwise--it is not clear at the present time--has never been spaced. It is, however, within the lands that we propose to you as the unit area, and ought to be brought within the description of the Adena field. Now, if there is no objection to the inclusion of that tract under the spacing orders established for the field, I would like to move that it be

included.

COMMISSIONER BRETSCHNEIDER: Is that in your request?

MR. STOCKMAR: No, it is on the notice, however, for consideration at this hearing.

COMMISSIONER BRETSCHNEIDER: Yes.

MR. STOCKMAR: I raise the point because it might probably be determined before the unit agreement is approved, so that upon approval it would include lands that had theretofore been included in the Adena field.

COMMISSIONER BRETSCHNEIDER: We can do that easily enough.

MR. STOCKMAR: It is a minor technicality.

The second matter called upon the Commission's own motion is the establishment of field rules to govern the operation of the unit area and the non-unitized area, side by side. I don't know whether you wish to adjourn on the other matters or to simply proceed. It seems to me that the question of field rules is dependent upon the determination as to whether or not the unit area is approved. We can, however, submit the proposed rules of the general agreement of the parties at this time.

COMMISSIONER BRETSCHNEIDER: How long will that take?

MR. STOCKMAR: Out of courtesy to Petroleum Inc. it may be that as to the unit, Petroleum Inc. will wish to put on some testimony and will not wish to have it involved with the field rules. They are two distinct matters, actually.

COMMISSIONER BRETSCHNEIDER: Yes, I understand they are, and I was going to ask whether or not, Mr. Kirgis, you would like to be heard now, or shall we go to lunch?

MR. KIRGIS: I can make just a very, very brief statement. If the Commission please, Petroleum Inc. has no objection to the approval of the unit as submitted to this Commission. Our only concern has been and is that our position be understood and that we not be committed to anything which may affect our relationship with the unit in the future, and it is our willingness, definite willingness, to explain to the Commission, if the Commission so desires, why Petroleum Inc. has not joined in the unit.

COMMISSIONER BRETSCHNEIDER: We would like to hear that.

MR. KIRGIS: Fine. In that connection I would like to call on Mr. Herman Kaveler, who can be sworn as a witness for testimony, or merely make a statement in explanation, if you wish, because we are not taking a position in anything. We are not providing or offering testimony as such; we are merely giving to the Commission

and to the interested parties an explanation as to why we have not joined.

COMMISSIONER BRETSCHNEIDER: I think that would be well to put in the record.

HERMAN H. KAVELER

called as a witness on behalf of Petroleum Inc., being first duly sworn according to law, upon his oath testified as follows:

DIRECT EXAMINATION

BY MR. KIRGIS:

Q Mr. Kaveler, will you merely present in statement form, if there be no objection to that, briefly the reasons why Petroleum Inc. has not joined in this unit?

A Yes; for the sake of brevity, Mr. Chairman and members of the Commission, I state the reasons for Petroleum's non-joinder as follows: Petroleum Inc. owns and operates four leases in this field which represent in recent months about 11.7 percent of the production of oil from the "J" sand. Now, these four leases are all more or less bunched in one locale on the structure, and they are all structurally low, and the Commission's attention may have already been drawn to the fact, as reflected by Exhibit 5--I hope there is no objection to my marking with a pencilled line Tract No. 7 diagonally, and with a pencilled line Tract No. 14

diagonally (marking on exhibit), the diagonal pencil line on Tract No. 62, and with a pencilled line diagonally, Tract No. 63, which represent the four tracts owned in part and operated by Petroleum Inc.

Now, those four tracts are located in possibly the best part of this field. They have a structural position. If one had an election in respect to acquiring an interest in this field, he would say, "Well, I choose to own property on the west side, because certainly the east side is gas cap and of little value." There is no water drive into this field, so that the extreme west flank of the leases will not be watered out in the early course of time.

The unit agreement that is tendered offers to Petroleum Inc. and its partners an initial interest of 8.04 percent. Petroleum Inc.'s four leases have been and are currently producing 11.7 percent of the field's production. It does not seem to be a matter of good business judgment for any one operator to suffer a reduction in share of the pool from 11.7 percent down to 8.04 percent, and ultimately to 6 percent. That is a matter of good business judgment, and would lead them to refuse to enter the unit. Furthermore, the formula that was proposed which takes into account only thickness in March, 1955 production, does not take into account that important intangible aspect

of this property, and that is structural position. For that reason, Petroleum Inc. is of the opinion that the 29.2 percent average recovery factor applied field-wide does not apply to their more favorably situated leases. Now, that goes simply to the question of the equity percentage. Petroleum Inc., having that frame of mind, further elected not to join the unit by reason of the fact that if it stayed out it would in no wise impair the operation of this unit for conservation purposes.

Petroleum Inc. is of the opinion that with all of the remaining properties formed under one lease with all the advantages that go with single lease ownership, that the Adena unit will be able to go ahead and accomplish the increased recovery that has been stated to the Commission today, so that staying out of the unit out of purely business considerations under circumstances whereby its action conservation will be impaired, Petroleum Inc. thinks that its future in this field is best taken care of by staying out of the present unit unless at some future time some understanding can be reached as between the then existing unit and the Petroleum Inc. to join its four leases. Now, I think this Commission should be particularly proud of all of the operators in the Adena field for the fine job that those operators have done under the jurisdiction of

this Commission in bringing about an early unitization of the field. It has been said, and with truth, that few fields in the United States have had more information gathered in respect to them. Few fields have been operated, if at all, with a higher degree of conservation. Petroleum Inc. has supported the move to gather the information, to study it, to bring about the unitization, contributed its share in the expense of gathering that, and thinks and would recommend to this Commission that the unit be approved as a step in the right direction. It only regrets that when it comes to finally allocating the equity that it did not get a fair share and must therefore decline to join.

COMMISSIONER BRETSCHNEIDER: Do you expect to operate under the field rules which may be adopted?

THE WITNESS: If the field rules as we understand them to be proposed are proposed, we expect to operate under them, yes, sir.

COMMISSIONER BRETSCHNEIDER: Then your operation would not differ to any degree particularly from the method used in operating the unit?

THE WITNESS: Well, Mr. Chairman, you take in a lot of territory. We will abide by the same field rules that the unit abides by when such field rules are promulgated

by this Commission, yes, sir.

COMMISSIONER BRETSCHNEIDER: All right.

MR. STOCKMAR: Gentlemen, I believe that maybe some discussion will arise out of the field rules even though we are in general agreement on them. I would like to ask for a recess. It may be that we would like to cross examine Mr. Kaveler, and it may be that we would not.

COMMISSIONER BRETSCHNEIDER: And then we will take up the field rules after lunch?

MR. STOCKMAR: Plus the right to ask a question or two of Mr. Kaveler if it is decided that it would be worth doing.

MR. KIRGIS: That is perfectly agreeable to us.

MR. STOCKMAR: Thank you, sir.

COMMISSIONER BRETSCHNEIDER: Let's adjourn then or have a recess until what time, 1:00 or 1:15?

MR. STOCKMAR: 1:15 is ample time.

COMMISSIONER BRETSCHNEIDER: All right; we will recess until 1:15.

(Recess taken from 12:10 a.m. to 1:15 p.m.)

COMMISSIONER BRETSCHNEIDER: Gentlemen, let's reconvene the hearing on the Adena problem.

Mr. Stockmar, for the Commission I would like to say that we appreciate very much your efforts and the

efforts of all the operators in preparing and presenting such a wonderful report on the Adena unit problem. We have few questions to ask, maybe one or two, because after going through all of the work which the Core Laboratory has gone through and all the data which has been presented here in such fine fashion, we feel that we need a little time to look it over and in all probability we can say now as a tentative statement that the Adena unit plan will be approved; but, we don't want to say so officially today. We don't know any reason now why it should not be approved.

MR. STOCKMAR: Thank you, sir. Did we make it entirely clear as to the great difference it would make to the operators to have it approved within the month of December?

COMMISSIONER BRETSCHNEIDER: Yes, sir, it will be done before the 1st of January, I think perhaps next week we will make the announcement, but we don't know any reason why it cannot be approved. I think Mr. Freeman would like to ask one question.

MR. FREEMAN: Mr. Kirgis, as counsel or as representing the Petroleum Inc., do you or do your clients have any objection to the unit as proposed?

MR. KIRGIS: We do not.

MR. FREEMAN: That is all, Mr. Chairman.

COMMISSIONER BRETSCHNEIDER: All right, gentlemen, then you may proceed now with the discussion, presentation of the rules.

MR. STOCKMAR: We have reserved the right to cross examine Mr. Kaveler. It occurred to us over lunch, though, that it was the Commission that had asked for an explanation of why Petroleum Inc. was not coming into the unit. We studied Mr. Kaveler's testimony and we understand exactly what he means, and if the Commission also does want to dispense with any cross examination--if you do not, then you might have some questions to ask of him.

COMMISSIONER BRETSCHNEIDER: No, we have no questions to ask of Mr. Kaveler. We understand the reason why they do not want to join the unit at this time.

MR. STOCKMAR: Well then, I think if we can proceed into the rules, I would like to ask that Mr. Ogden be briefly sworn in so that this can be testimony in the record in the presentation of proposed rules.

COMMISSIONER BRETSCHNEIDER: All right.

L. A. OGDEN

called as a witness on behalf of the Pure Oil Company,
being first duly sworn according to law, upon his oath
testified as follows:

DIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Ogden, will you state your full name for the
record, please?

A L. A. Ogden.

Q And your professional capacity?

A I am chief division production engineer for the
Pure Oil Company in Tulsa.

Q Are you not also the proposed representative of
the Pure Oil Company on the proposed committee of the proposed
unit?

A I believe that's right right, yes, sir.

COMMISSIONER BRETSCHNEIDER: If there is no
objection, Mr. Ogden will be accepted as an expert witness.

Q Mr. Ogden, as I understand the position of the
parties to the unit agreement, and the position that has
been taken by a number of operators over the last periods
of time, a series of temporary orders restricting the
production in the field have been granted from time to time
on a six-months basis or a four-months basis or two months,

and so forth, as a temporary situation to permit some control of production during the work on the injection program, and that all of the operators in the field have generally subscribed to the form of order as it now exists as being satisfactory in working along toward unitization.

A That is right.

Q And that in so far as you and the parties interested in the unit are concerned, the rules which we are now proposing are of the same nature, that they are for a temporary period pending a study of possible water injection and other means of operating and producing the unit area.

A That is correct.

Q And that you are not subscribing to these proposed rules as permanent field rules to control the Adena field.

A That is correct.

Q In your capacity as the representative of Pure Oil in behalf of the interested parties, may I ask that you read into the record the actual substantive portions of rules one through four that we are seeking for this temporary order.

A "Rule 1: that a maximum "J" sand production allowable for any one 40-acre tract located in the Adena field shall not within any one month exceed a daily average of 125 barrels of oil, of 150,000 cubic feet of gas,

whichever is produced first; provided that the operators and owners of wells may at any time or from time to time transfer in whole or in part the daily allowable attributed to any "J" sand well to other "J" sand well or wells on the same lease or within the Adena "J" sand unit area from which the daily allowable of the well may be more efficiently produced; provided, however, (a) as to any "J" sand well in the Adena "J" sand unit area which directly offsets a well not within such unit area, and as to any "J" sand well not within the unit area which directly offsets lands in the unit area, the daily allowable of such wells shall not be in excess of the well's daily allowable unless written waiver of objection by lease operator or unit operator of the offset well or lands is obtained.

"(b) That in transferring allowables, the lease operator or unit operator shall exercise due care in the protection of the correlative rights of persons who might be adversely affected by such transfer."

Q Mr. Ogden, may I interrupt; I believe that you misread one of the words in the second proviso when you said the daily allowable of a well shall not be in excess of the well's allowable, this referring to either a "J" sand well in the unit which offsets a well outside of the

unit, or to a well outside the unit which offsets the unit, "the daily production of such well shall not be in excess of the well's allowable." I think you inadvertently---

A That is line four; I will read that entire paragraph over. "(a) As to any "J" sand well in the Adena "J" sand unit area which directly offsets a well not within said unit area, and as to any "J" sand well not within the unit area which directly offsets lands in the unit area, the daily production of such well shall not be in excess of the well's daily allowable unless written waiver of objection by the lease operator or unit operator of the offset well or land is obtained." Is that correct now?

Q Thank you. Now, before you proceed, this rule one is the most material of the rules. It relates to tests and so forth. Now, before we proceed and lose sight of what has been said here, is there any question about the meaning of rule one and its application to wells within the unit area and to wells outside of the unit area?

MR. JERSIN: No, I have no question.

MR. KIRGIS: For the information of the Commission, Petroleum Inc. has no objection to that rule.

THE WITNESS: "Rule 2: that the operators and owners of wells producing from the "J" sand pool of the Dakota series of the Adena field, shall make gas-oil ratio tests of each producing well during each quarter beginning

with the months of January, April, July and October, and that such tests shall not be taken within fifteen days of the beginning or ending of each quarter. The results of such tests shall be reported to the Commission on or before the 20th day of the last month of each quarter, and the schedule shall be submitted to the Commission and to offset operators prior to testing, showing the wells and respective dates of tests and that the schedule of tests shall be submitted in a sufficient amount of time to allow the Commission or offset operators an opportunity to witness said test, and that such test shall be the basis for attributing the daily oil and gas allowable of each well for each month of the following quarter, except that no well shall be assigned a daily oil and gas allowable in excess of its daily capacity to produce; that the well shall be produced at or in excess of its daily rate for twenty-four hours immediately preceding the test period, and that the volume of gas measured shall be reported in units of cubic feet at a base pressure of 15.025 pounds per square inch absolute, and a base temperature of sixty degrees Fahrenheit, and that the test for gas-oil ratio shall be made and calculated in accordance with good engineering practice."

Q Proceed with Rule 3.

A "Rule 3: That no gas shall be allowed to be released directly or indirectly into the air on any lease, except for occasional emergencies or when otherwise authorized in writing by the Commission; and that all produced gas shall be metered within practical limits and such metered volume of gas shall be reported to the Commission."

"Rule 4: That the operators and owners of wells producing from the "J" sand pool of the Dakota series shall file with the Commission a monthly report of production by wells as required on Form OGCC-7A, covering the month next preceding the date of filing on or before the 20th day of each month."

"It is further ordered that"--- Is that as far as we need go?

MR. STOCKMAR: Yes, sir. Are there any questions on the remaining proposed rules?

COMMISSIONER BRETSCHNEIDER: Mr. Jersin, do you have any questions?

MR. JERSIN: No, the rules are very similar to the rules we have in effect in Adena right now except for some of the provisions on the production transfer, and I understand that Petroleum Inc. has absolutely no objections to those provisions in this proposed order.

MR. KIRGIS: That is correct; we have no objection to any of the four proposed rules as submitted.

Q (By Mr. Stockmar) Mr. Ogden, what is your recommendation to the Commission as to the period of time for which these rules should be in effect?

A I would suggest sixty days.

Q During that period it would be the intention of your company as the unit operator, if the unit is approved, to study a more permanent form of field rules to be applied to lands within the unit and outside of the unit, is that correct?

A That is correct; it would be the intention of our company, together with the operators, the other operators interested in the unit, to make such investigations.

MR. KIRGIS: May I inquire in that connection, are you proposing that they be specifically limited to a sixty-day period?

MR. STOCKMAR: That is the recommendation that Mr. Ogden has just made, yes, sir.

MR. KIRGIS: We would differ in that. Our recommendation would be that these rules be adopted as the rules for the field until changed upon application or order on motion of the Commission itself.

MR. FREEMAN: As a practical matter, Ted, any field rule is a temporary rule; you can always petition.

This way you are going to be limited to an exact time.

MR. STOCKMAR: Sam, as a practical matter, the matter has been limited in this connection for two years by the Commission, and the reason for it is to move along and keep the heat on the operators to get the right job done. We are simply acquiescing in suggesting that we continue to do that.

MR. FREEMAN: Won't they continue to do it whether it is a sixty-day rule or not?

MR. STOCKMAR: Yes, sir, but we are asking for the pressure of sixty days.

COMMISSIONER BRETSCHNEIDER: If you have it for sixty days we can call another hearing fifteen days before the sixty-day period is up, can we not?

MR. STOCKMAR: Yes, sir.

COMMISSIONER BRETSCHNEIDER: Why can't we adopt that plan?

MR. JERSIN: Putting a limitation in the order leads into quite a few problems with hearing rooms, scheduling of Commission attendance, and so on. If we can leave it to the discretion of the Commission as to when they might think a reasonable time to further investigate this matter, allow the Commission to select that date in approximately sixty days rather than have the order bind us

within a sixty-day period.

COMMISSIONER BRETSCHNEIDER: Yes, the sixty-days might fall on a Sunday. It might fall on a Sunday or Saturday.

MR. STOCKMAR: I don't think we have any objection to that. If you did not act we could feel perfectly free to seek a revision of the rules, if indicated. The thing we wish to make entirely clear in the record is that by acquiescing in what is in effect a continuance of existing rules, we are not subscribing to the rules as such for a permanent set of field rules. Much study must be made before we can come up with the answer to that.

COMMISSIONER BRETSCHNEIDER: You have a perfect right to call for a hearing at any time, and we are obligated to grant a hearing.

MR. STOCKMAR: On the understanding of our attitude with respect to these rules, why, Mr. Jersin's suggestion is very acceptable.

COMMISSIONER BRETSCHNEIDER: All right.

MR. FREEMAN: You have no objections to these rules in the interim period, do you, Ted?

MR. STOCKMAR: Oh, no, we expect to comply with every detail of them.

MR. FREEMAN: Do you, Mr. Kirgis?

MR. KIRGIS: We do not; we like the rules and I think we will like them as a permanent thing.

MR. FREEMAN: But, you will respect their right to request a change?

MR. KIRGIS: Correct.

COMMISSIONER BRETSCHNEIDER: Is that all you have to say concerning the rules?

MR. STOCKMAR: Yes, sir, except that we suggest that they be made effective as of the first of the year so that there is no gap in the period of time; the present rules expire then.

COMMISSIONER BRETSCHNEIDER: Well, in all probability we will approve the rules and the unit agreement at the same time, which will be a long time before the first of the year.

MR. STOCKMAR: That concludes our case.

COMMISSIONER BRETSCHNEIDER: Is there any appearance from anyone else on the rules?

MR. WILLIAMS: R. I. Williams of Lion Oil Company, a division of Montesanto Chemical Company. I would like to say that we are in complete agreement with the Pure Oil Company's statements. We have signed the agreement and we request your approval of our unit and the rules.

COMMISSIONER BRETSCHNEIDER: Thank you very much.

If that is all then, gentlemen, we can adjourn the meeting; and I would like to say again that everyone on the Commission appreciates very much the wonderful work that has been done in forming the Adena unit. It has been two years since the program was started, according to my schedule here of the first order issued, I think, in January, 1954, and it has been a progressive program by a number of orders issued from time to time on one basis or another, and I am sure that everyone here and the Commission particularly is pleased to have now reached a milepost in its work by having an opportunity to approve the first unit plan under the jurisdiction of the Commission.

As you know, there are several unitized fields in Colorado, about seven or eight I think, the important ones being Wilson Creek and Hamilton Dome and a few others that you may know, but all of those were unitized under United States Geological Survey supervision, and if you will look at the record of all of those unit plans you will find that the operations there have been very beneficial not only to the operators but to the State of Colorado and to all the royalty interests and everyone else interested. It has been a great conservation of oil in Colorado by those unit plans, and I hope that hereafter operators in other areas, particularly in the northeast part of Colorado, will

take the Adena plan as an example to follow in their work.

Thank you very much, gentlemen. The Commission hearing on this order is now adjourned.

(Whereupon the hearing in Cause No. 26 adjourned at 1:42 o'clock p.m., December 20, 1955.)

C E R T I F I C A T E

I, Keith Watson, do hereby certify that the foregoing pages, numbered 1 through 84, constitute a true, complete and correct transcript of my stenotype notes of the proceedings had in the foregoing matter, and that the same were thereafter reduced to typewriting under my direction.

To all of which I certify this 22 day of December, A. D. 1956.



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