BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
at
Santa Fe, New Mexico

Transcript of Hearing in

Case No. 608

Continued.

April 14, 1954

Regular Hearing.

ADA DEARNLEY & ASSOCIATES
COURT REPORTERS
ROOM 105-106, EL CORTEZ BLDG.
PHONES 7-9645 AND 5-9546
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

IN THE MATTER OF:

Application of the Commission upon its own motion for an order revising Rule 505, Paragraph 'b', of the Rules and Regulations pertaining to proportional factors used in allocating oil allowables.

Case No. 608 Continued.

- REGISTER -

NAME	REPRESENTING	LOCATION
George W. Selinger	Skelly Oil Company	Tulsa, Oklahoma
E. P. Keeler	Magnolia	Dallas, Texas
George Hirschfeld	N. M. O. & G.	Hobbs, New Mexico
E. H. Foster	Phillips "66"	Amarillo, Texas
D. M. Hankins	Phillips "66"	Odessa, Texas
Shofner Smith	Phillips "66"	Bartlesville, Okla.
Edward E. Kinney	Consultant	Artesia, New Mexico
W. J. Rogers	Sinclair	Midland, Texas
W. D. Girand, Jr.	Sinclair	Hobbs, New Mexico
S. J. Fraser	Sinclair	Tulsa, Oklahoma
J. N. Dunlavey	Skelly Oil Company	Hobbs, New Mexico
B. M. Keohane	Keohane Service	Roswell, New Mexico
Ralph L. Gray	Buffalo Oil Co.	Artesia, New Mexico
Jason Kellahin	Continental Oil Co.	Santa Fe, New Mexico
L. W. Folmar	The Texas Company	Fort Worth, Texas
V. F. Dullnig	The Texas Company	Midland, Texas
J. F. Addington, Jr.	American Republics Corp.	Midland, Texas

NAME	REPRESENTING	LOCATION
W. W. Mankin	The Texas Company	Fort Worth, Texas
E. J. Pierce	Mid-Cont. Pet. Corp.	Midland, Texas
D. L. Irion	Mid-Cont. Pet. Corp.	Hobbs, New Mexico
E. C. Arnold	N. M. O. C. C.	Aztec, New Mexico
A. W. Nestor	Shell Oil Company	Hobbs, New Mexico
W. E. Owen	Shell Oil Company	Hobbs, New Mexico
C. A. Hull	Shell Oil Company	Midland, Texas
R. C. Sears	Warren Pet. Corp.	Tulsa, Oklahoma
J. P. Johnson	Atlantic Refining Co.	Midland, Texas
J. H. Vickery	Atlantic Refining Co.	Midland, Texas
F. J. Forche	Sinclair	Tulsa, Oklahoma
J. D. Cooper	Skelly Oil Co.	Tulsa, Oklahoma
S. J. Stanley	O. C. C.	Hobbs, New Mexico
Max E. Curry	Skelly Oil Co.	Hobbs, New Mexico
John Yuronka	Texas Pacific Coal and Oil Co.	Hobbs, New Mexico
M. T. Smith	Shell Oil Company	Midland, Texas
W. G. Abbott	Amerada	Monument, New Mex.
Ray E. Seifert	Amerada	Midland, Texas
G. L. Shoemaker	Stanolind Oil Purch.Co.	Midland, Texas
Merle B. Rogers	El Paso Nat. Gas. Co.	Jal, New Mexico
C. S. Neel, Jr.	Humble Oil Co.	Midland, Texas
R. S. Dewey	Humble Oil Co.	Midland, Texas
Glenn Staley	N. M. Oil & Gas Comm.	Hobbs, New Mexico
L. A. Hanson	O. C. C.	Artesia, New Mex.
Ross Waddle	Magnolia	Dallas, Texas
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NAME	REPRESENTING	LOCATION
R. H. McKay	Western Nat. Gas. Co.	Midland, Texas
J. K. Smith	Stanolind Oil & Gas Co.	Fort Worth, Texas
Clarence Hinkle	Humble Oil Company	Roswell, New Mex.
Jack M. Campbell	Humble Oil Company	Roswell, New Mex.
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John A. Woodward	Amerada Pet. Corp.	Tulsa, Oklahoma
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Parker Wilson	Wilson Oil Company	
Raymond Lamb	Wilson Oil Company	
William Randolph	Continental Oil Co.	Hobbs, New Mexico
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Q. B. Davis	Aztec Oil & Gas.Co.	Dallas, Texas
A. S. Grenier	Southern Union Gas Co.	Dallas, Texas
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W. H. Everett	The Ohio Oil Company	Houston, Texas
J. O. Terrell Couch	The Ohio Oil Company	Houston, Texas
D. K. Spellman, Jr.	The Ohio Oil Company	Midland, Texas
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Geo. L. Zimmerman	Attorney	Lincoln County,N.M.
Paxton Howard	Atty. Shell Oil Co.	Midland, Texas

TRANSCRIPT OF PROCEEDINGS

MR. SPURRIER: Meeting will come to order please. The first and only case we have on the docket today is 608.

(Discussion off the record.)

MR. HOWARD: I was trying to figure out here, we have some big exhibits to put up and we planned on using the wall there with

the tape. I was wondering on this first exhibit if it might be better if we had that board over here so you could talk from the exhibit and point out what you have.

MR. SPURRIER: Go ahead.

MR. HOWARD: If the Commission please, Paxton Howard, appearing on behalf of Shell Oil Company. We have a considerable amount of testimony to put on this morning and a number of exhibits. Now, before putting on this testimony, I want to restate Shell's position as was stated at the last meeting, and that is that while we feel there are certain inequities in the present arrangement, we are not urging any change be made. And we come before the Commission this morning presenting our case not as initiating a change in the proration schedule for the depth factor in New Mexico, but merely showing or attempting to show to the Commission where the proposal that was made at the last meeting is not an adequate or a fair proposal, and showing the reasons why. And, also, we want to show to the Commission what we feel would be a fair proposal or a fair schedule, if the Commission is of the opinion that the present arrangement should be changed. But we do not in any sense want to be understood as coming here and urging that the change be made, that any change be made. In other words, this was brought up on the Commission's own motion and we are appearing in connection with it, we are not initiating it.

Now, I would like to have one witness sworn, Mr. Nestor.

A. W. NESTOR

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By MR. HOWARD:

Q For the record, state your name please.

A A. W. Nestor.

Q Where do you live?

A Hobbs, New Mexico

Q By whom are you employed?

A Shell Oil Company.

Q In what capacity?

A As Division Reservoir Engineer.

Q Have you ever appeared before the Commission as a witness?

A Yes, sir, I have.

MR. HOWARD: May his qualifications be accepted?

MR. SPURRIER: They will be.

Q Mr. Nestor, you were present at the meeting last month were you not, at which a proposal was made regarding a change in depth factors in the State of New Mexico?

A Yes, sir.

Q Prior to, and since that time, have you made a detailed study in connection with the proposal?

A Yes, sir, I have.

Q In your position with the Company, the Shell, do you have within your jurisdiction and use the figures and information in connection with production of the company and the industry in New Mexico?

A Yes, I do.

Q Now, at the meeting last month there was introduced certain cost figures for wells of varying depth range. You heard that testimony?

A Yes, sir, I did.

Q You have any comments to make on that, on the facts, factual data which was presented?

A Yes, sir.

Q Will you state to the record what that is.

A We have made a detailed study of the cost data submitted by all the operators in Case 608, and we have arrived at certain conclusions as to the data themselves.

We have found that over all there are certain grievous errors in the way the data have been submitted, and they appear in error on the tabulation which has been given to us. Now, we do not represent that this in any way reflects on the Commission in their selection of the wells or in the operators in their submission of the data. We do suggest, however, that a more detailed explanation of the arrangement and the exact factors to be considered in these cost data might have prevented some of the trouble which has arisen.

Our studies show that although all the figures supposedly are on the same basis and presumably include only well costs, the cost, the actual cost of drilling the well, that is the way we understood the problem as being stated, we find out in our conversations with other people that without realizing they have submitted data which are not completely relative in that respect. Certain of the costs which appear on the tabulation as being drilling costs are known to include pumping units and in at least one, and possibly more cases, tankage. Now, that is completely without the specifications, we think, with which the data were requested. We feel, therefore, that certain serious errors exist in the basic data and that before a reasonable study could be made, that all these factors should be deleted and all data should be on the same basis.

Q In other words, you consider that the data used is defective in that some cases, in some cases well cost, drilling costs only were used, and in other cases pumping units and tanks were included?

A Yes, sir.

Q In arriving at costs?

A That is correct.

Q And that in order to get fair data, that fairly represents the situation, it would be necessary that all data be furnished either including pumping units, or excluding pumping units?

A Yes, sir, that is correct.

Q So you consider that is a basic error in the information that was furnished. Do you have any other comment?

A Yes, sir, a further general comment on the well selected for the survey. We were given to understand, by the Commission staff, that the wells to be presented should be representative, and we have made quite a study of the data submitted by other companies and we find that that has not always been the case.

Now we think that there are two falacies in the way the data have been selected. We feel, first, that data from wells located only in representative pools for that depth should be selected. And we feel that, secondly, only representative wells from all the pools should be selected. We will have some detail testimony to explain just what we have seen along these lines.

Q You also heard the proposal, I believe, that a pay out on all wells be figured on the basis of 1.406 years?

A Yes, sir.

Q Do you agree with that theory?

A We agree with that theory only to the extent that it be possible to allocate all the costs of drilling a well to the actual drilling cost. And to simply consider the drilling cost, in many cases, is but a poor approximation of the actual cost.

Q Now, you have prepared, I believe, an exhibit giving your interpretation of what would be a proper interpretation of the factors that were presented at the last meeting?

A Yes, sir.

Q You have, I believe, attempted to take the data that was furnished and give to it what you considered to be a proper application, at the same time realizing that the data is basically defective?

A Yes, sir, that is correct.

Q In other words, you have worked out a cost curve on what you consider to be a fairer basis, using the same data that was used last month in the presentation of that curve?

A Yes, sir, that is correct.

Q And, also, figuring it out on the basis of the 1.406 years, such as was done last month, although you may not basically agree with that?

A That is correct.

Q You have taken the information that was furnished last month and attempted to give what you consider a fairer and better interpretation of it?

A Yes, sir.

MR. HOWARD: Would you mark this, please?

(Marked Shell's Exhibit No. 1, Case No. 608, for identification.)

Q Now there has been placed on the board what has been marked as Shell's Exhibit One. Would you state just what that is, please, generally?

A That is a graphic presentation of the cost data submitted by the operators and tabulated and submitted back to the operators by the Commission. It includes the same wells listed on the Commission schedule in all 140, and it includes two curves, the one shown there in green being the Commission interpretation of the best curve for cost through the range which they considered, and the red curve being Shell's interpretation of these basic data.

Q Was this Exhibit prepared by you, or under your supervision?

A Yes, sir, it was.

MR. HOWARD: I ask it be admitted please.

MR. SPURRIER: Without objection it will be admitted.

A There is one comment I think that is appropriate here at this time, this again is in no way a reflection on anyone concerned, but with such a long spread of depth intervals we feel that a far better statistical study could have been made if the number of wells had been increased markedly. In that case, wells that differed from the median by quite a bit, would not have had as much weight as they now have, the theory being the more pieces of data you have, they tend to average out.

We feel, at the very least, possibly all the costs for all the wells drilled last year might have been included; and to do an even better job, possibly all the costs for the past several years, since the way the drilling splits up from year to year might prevent getting an accurate picture of the cost in one particular depth range but might be very representative in any other depth range. We

could be way off in one range.

I think that comment is applicable before we start off. We want to point out before we begin, the analysis, unfortunately we feel we are working with a faulty set of data by reason of the things we explained, there are not enough pieces of data, and some of the data might have been rejected or possibly had not been asked for, unless we were going to get all the figures for the wells drilled last year.

Q Now, Mr. Nestor, would you, referring now to Exhibit One, would you take up by the different depth ranges and explain to the Commission the differences that you consider to exist as regard the cost data, and how you felt it proper to correct those mistakes?

A Yes, sir. We will attempt to analyze, by thousand foot brackets, generally, the individual data submitted, with our comments on the things that we have been able to learn about those data. I would point out, we have been severely handicapped in preparing our case in this matter in not knowing exactly which wells were being considered, and it was a very tedious and time consuming process to eliminate the wells which were not being considered and find, particularly in critical areas, the exact wells being represented on the curve.

The reason we felt that was necessary was, to make an understandable study, we felt that these wells that did not appear to conform required detailed study to determine why they didn't conform with what might have been expected for well cost at that depth. And with that in mind we have been able to go into those areas where we feel the data are most severely distorted and attempt to explain why, in our opinion, these distortions result.

I think possibly the best thing, if people would like to follow me here, would be for them to refer to their schedule of wells. I think it would be simpler for me to refer to the wells from the Commission schedule here and try to analyze what we feel may be wrong with them.

Beginning with the 1000 to 2000 group as indicated on the curve, those data have a good locus and there seems to be no reason to suspect that these are anything but highly desirable data for inclusion.

This group down here, the next group, moving on to 2 to 3,000 foot range, by strict statistical procedure these two pieces of data spread rather badly and in good procedure had we had more points, probably both of those points would have been excluded and they probably should be excluded. However, we have left them in there since they are the only points representing the range and we feel actually in this case, it probably is pure happenstance, the two points tend to balance out and seem to fit a reasonable line connecting this locus of points over here. And in a similar locus, the general locus of points in the next range, so that actually these data possibly might be thrown out had more data been available. We have chosen to leave the data in in our study.

Moving on, I would refer you to wells 8, 9, and 14 in the 3 to 4,000 foot range. Now, a study of those data there indicates that there are some unusually high costs present in one or another of the three categories, of drilling costs, material costs or special services. Well Number 8, for instance, at a depth of 3550 feet, shows a drilling cost of $36,000, whereas, Well Number 11, which was drilled more than 200 feet deeper, shows a drilling cost

of $17,000. Now someone may indicate that if you look over from Well Number 8 you will see there are no special services indicated. We feel that that is one of the deficiencies of the data, in that again, here is a case where an operator has not submitted data on the same basis as the majority of operators, or certainly as certain other operators, because the way we understood the special services cost, it was to include such things as mud and cementing and transportation, not connected with moving in rig equipment and so on, and it is virtually impossible to drill a well without some of these things. We felt possibly those costs belonged in there. All we can assume is that whatever costs there were in that range actually have been transferred into this first column.

But I would point out that the average of costs in that bracket seems to be something less than $10,000 in this range for special services as there are only three wells listed that have a cost in excess of $10,000, or four, excuse me, but a number more, possibly, three, four or six of them were quite a bit less, and several without any, so the average is something less than $10,000. So if you were to subtract the $10,000 from the drilling costs in column one, we would still have a discrepancy in the figures, of maybe $5,000 or $8,000. Someone may say that is calling it pretty close; it isn't calling it close when you consider the average cost we are dealing with may be in the neighborhood of $35,000. So that we point out that we feel that these data, such data as this are inadmissable.

Then the next, Well Number 9 again reflects very high data. And consequently we also have omitted it from the study. We might point out the same things persist here in this case. The disparity is even greater inasmuch as the special services figure is in excess

of $15,000 which appears extremely high, and the drilling cost is still some $14,000 higher than for Well Number 11. Clearly something is wrong, we don't know, we don't know what well it is. Had we known the well we could have gone in the well file and come up with a detailed answer with the fact it was a representative well.

Then the next well in that group is Number 14. And if you will notice, there, it has an extremely high material cost. We don't know what that involves, but it involves something unusual. Our understanding was material costs should probably include the cost of the casing and the tubing and the well head equipment. I presume, without definition, other operators have submitted their data on maybe an equivalent basis, and maybe a different basis, but obviously there is no reason why that figure should be almost twice as high as the average figure for other wells in that group. Consequently, we know there is something wrong. We are unable to tell you what it is. Had someone looked more carefully, that well should also have been omitted.

Moving on now to Well Number 18, this is a well on the other side of the fence. This well has a drilling cost of only $15,000 which is the lowest listed. It has extremely low material costs and it has reasonably low special services. We don't know why that is because we don't know what well it is either, but we have chosen to omit it as being too low. We feel the deviation of that well from an average curve that might be drawn through there is so great to render it unusual for a statistical analysis.

Moving on then to the next range, we feel that the scattering of points is quite good in there and an average line drawn through these points only, might show that the scattering is fairly normal.

They appear some lower than these up here, of course that is significant. Since we are speaking of average wells, if we are trying to set up a proration scheme to apply to the southeast part of the state and make it fit all the drilled wells and the wells yet to be drilled, we want to speak only of average wells. We can't speak of odd wells that cost a lot of money or too little. We want to speak of the average wells in that depth range whether drilled last year or not.

There is one piece of logic here that, in speaking of an average well, it is impossible to drill an average well at a depth of say 4300 or 4400 feet, cheaper than you can drill a well at any depth shallower than that. We have you pass the shallow depth, you have already incurred that much cost. Your curve must always rise, it can't have humps in it like that, not when we are speaking of averages. Of course, if some of the data came from particular pools which happened to be developed last year, they could throw kinks in the curve. There is no logical reasoning, in speaking of the southeast part of the state down there, that we should have any of these humping and fall backs in the curve.

Moving on then to the 5000 to 6000 foot range, we feel that this is possibly the most serious interval in the whole curve. We have gone into some considerable study here and we will now analyze the various wells drilled. I might point out that the Commission has already recognized the differences of the data in this range. They have recognized it to the extent they have already thrown out three of the wells. We have gone into it much further and have discovered that these seven wells which lie along this line all were drilled in the Monument-Blinebry Pool.

Now, there might be some argument for including these even in a survey supposed to consist only of representative wells simply based on the reasoning that quite a few of the wells drilled in this depth range last year were drilled in the Monument-Blinebry Pool. But, unfortunately, we think that is out-weighed by the fact a relatively small percentage of the wells in that depth range in the state are completed at a 5000 to 6000 range in the Monument-Blinebry Pool, which numbers about 18.2 percent of the total number of wells that are in that pool, and yet the Commission, I think largely due to the fact there was more drilling there last year, selected seven out of 10 points in that depth range, a sampling of 70 percent, to represent only 18 percent of the wells. That might not have been so severe had it not been for the fact the Monument-Blinebry is probably the toughest pool in the State of New Mexico, certainly in the southeast area, to drill at that depth range. We have recently had a serious fire down there and it is interesting to note that in this very difficult area, two of the wells included in this list of seven are on that same lease. They are on the Santa Clara-Barbara Lease. We feel, a more representative sampling, would not have included wells in this known difficult area. They are not representative of the conditions in the southeast part of the state.

Now to support that, let me point out a couple of wells represented up here in the same depth range were drilled in the Terry-Blinebry Pool, a distance of maybe six or eight miles overland, the geological province is not changed, but the gas problem, the shallow high pressure gas problem certainly has changed, and you see how low the cost of those wells are. They are not extremely low, there are more lower cost in this depth range, but it points up, we have an

extreme sampling from the Monument-Blinebry Pool. Now the Commission chose to eliminate three; we have gone a step further, and eliminated five in preparing the average curve. I will come back and explain the statistical approach.

We have left two wells in there, that is, -- probably, you could handle it two ways, we might have dropped all of them out and considered the Monument-Blinebry as a special problem. It would be more reasonable to do that than to distort the whole picture of the whole range by including the faulty data. We have no objection to that, but to shape the state curve with inclusion of these data that are not representative of but the one area, we feel is not the best procedure. We have left two in there, which gives a sampling of two out of five, or 40 percent. That is just twice what it would be entitled to in the way of sampling if you didn't exclude all of them, since that is more than twice as many as the wells in that pool represent to the total of the wells in that depth range in the southeast part of the state.

Moving on to the 6000 to 7000 range we run into a very similar situation. It struck us immediately that this was an area where something also was seriously wrong since although we had no experience in drilling there last year, we have completed, as many operators know, a great number of wells in this 6000 to 7000 foot range in the Drinkard Area. And we might point out that a great percentage of the wells completed in this range are also in the Drinkard Area.

After careful checking, we arrived at the fact that these five points here, with the focus considerably above what might be expected as normal, disregarding an average line through several ranges

here, all five of those wells were drilled in the Lovington-Paddock Pool. That is also a very difficult area, and we understand it was pointed out to the Commission when the data was submitted by at least one company, that one of the wells which they sent in here was the costliest well they drilled in that area. We feel possibly the Commission on it's own motion, understanding that, when the rest of us really had no access to that piece of information, might have chosen to exclude that originally; could have saved me a lot of trouble if they had.

At any rate, we went to the trouble then to investigate all the wells that we could get data on in that range and we found the spread ran down to approximately $84,000 in this very field and yet all the points selected for the study were above $100,000. So, we feel that just by unfortunate selection of the data there we are probably getting a fairly distorted picture. There are certain things about the drilling in that area that make it difficult. Witness the fact you are able to drill wells to depths considerably greater out here for comparable or lesser cost; the average for wells drilled 700 or 800 feet deeper out here is no higher than the average for these wells here. There is something wrong. We feel maybe again a special study needs to be made of that condition, but don't include it in a representative condition when a great number of the wells in that Drinkard Area have no way near that cost. Probably it is another condition of shallow blow-outs and more drilling which requires more trips and extra bits.

Moving on generally from there in this 7000 to 8000 range, the data seem to have a fairly average spread with the exception of this figure here, and that is Well Number 65. And it doesn't take but a

second to see that that well cannot be representative of anything but a lot of hard luck for someone and, therefore, it should not be included. The well was drilled to 775 feet and the drilling cost was $139,000. Let me point out other wells in that range drilled to as deep as 8285 feet did not exceed $102,000, so there is an extra $37,000 over, and less than $100,000 actually as an average. Obviously such a point represents an unusual occurrence. We don't know what it was. Some slips may have fallen in the whole, someone may have dropped a pair of chain togs in, but someone had a lot of trouble.

Moving on then to Well Number 72. Again that well shows an exhorbitantly high drilling cost, 71 and 72 both are extremely high and, however, we do notice that 71 is drilled some several hundred feet deeper. We chose not to drop it out. Actually, it would be closer statistical approach had we had more data. Such a well would have been eliminated also in preparing a percentage curve, 71 happened to fall in, which wells 70 and 72 did not; 72 thrown out because the drilling cost of $144,000 at a depth of the only 8650 feet, which was extremely high.

Moving on into the 9000 to 10,000 foot range, Wells Number 85 and 88, they are these two wells up here. Obviously the same thing that pertained over here pertains here. They couldn't belong in the average. They spread so far from the norm you know you are not speaking of a representative well. You are speaking of a well that had an extreme amount of difficulty, and witness the fact while on this first page here those wells in that range were averaging a drilling cost in the neighborhood of $100,000 or maybe $110,000, Number 85 had a drilling cost of $215,000, just double what the others

were experiencing. Well Number 88, I can't imagine what has happened there unless somebody slipped a decimal point in that one. The special services run to $82,000, the drilling cost is out of line by maybe $40,000, so again there is a net error of probably 70 or 80 percent deviation from the average shown by the general scattering of points down there. So, both of these wells are likewise excluded.

Moving in the 10 to 11 range, Well Number 103. Again, a glance at the drilling cost should suffice to clear up the fact that well is not admissable inasmuch as the two wells drilled immediately beneath it, 104 and 105 were drilled for roughly half the cost, 103, $114,000.00, approximately and 104 being $108,000 and 105 being $104,000, so again that figure is enough out of line, Well 103, to cause it to be cast out of the averages. That is this well at this point.

Now in the 11 to 12 range, this is a more or less average spread of points. We must realize as we get higher, and spend more money, of necessity the points are going to spread more so that on a percentage basis these are more reasonable. Actually, if you got to throwing points out you would throw more points out on the low side than the high side. I don't know why that is, I think most of these wells were drilled in the East Caprock area and I think it is probably development technique.

I understand again one of the companys pointed out of the four wells they submitted, two were the cheapest they had yet drilled there, and two other wells were about average. So we have included a scattering of low and average wells without including any of the relatively higher priced wells that were high, but not

extremely high priced.

In the 12 to 13,000 foot range, Well Number 131, again has an exhorbitant drilling cost as near as we can tell. It appears to spread far too much from what might be expected at that depth and we have likewise cast it out. Note that regardless of the curve you see here, either the Commission's suggested curve or my own, the rest of these things group pretty well on either side, so if you started dropping out extra wells it would probably balance out rather closely. We feel, and our experience has shown these costs seem to be some lower than we might have expected at that depth, but we are not able to design any reason for it, so we simply used the data we have presented here and worked with them.

Now in this range, these two well costs again appear quite low for what might be considered as normal expense at that depth. We have so few costs it is very difficult, and I might say, virtually impossible for the Commission to make a good finding there and we have no argument with what is there. We have used their data. We understand the Buffalo will give testimony to state they believe costs are somewhat in excess of more than $400,000 in the area they drilled. It might be, the spread and difficulty in drilling conditions might be such you would find that variation out there. On a percentage basis, the average in percentage of $350,000, a 20 percent spread would add another $70,000, so we might expect to have that much variation in data and I think it would be extremely difficult to actually predict accurately, with these few pieces of data and early wells, just where the locus of points for that depth range might be. We have no criticism of those, we think they are low and feel it impossible to do, and consequently we have no argument.

MR. SPURRIER: We will take a short recess.

(Recess.)

MR. HOWARD: If the Commission please, Mr. Nestor will continue with his testimony, being the same Mr. Nestor who was on the stand at the time of the recess, for the record..

MR. SPURRIER: Very well.

A Continuing with the cost data curve, having analyzed these wells in a logical manner to try to discover why there was something wrong with them and thus to eliminate them from the over-all averaging, in order to get a more accurate result, since the main deviation of any curve with all these points spreading all over the place would have been very minute and probably would have had little value, we then resorted to a statistical practice of drawing from the origin down here a 30 percent deviation curve, from what appeared to be an average curve in that general region. Now, obviously, you must be very careful with such a thing because if you had a place like this where the, you think the data are badly out of line, --

MR. SPURRIER: (Interrupting) Can you give one of these well numbers so it will be on the record?

A I am going to give all of them so it will be a matter of record. In the case of Well Numbers 41, 37, 35, 40, and 38, if we put too much weight on that group of wells we might result in throwing the curve so high that we might tend to discard the data which are probably more representative of the average conditions in that range. So that in order to prevent that we have chosen to extend an average line through five ranges to consider the center range for sampling, feeling that was a fair way to analyze these figures.

Obviously, at the beginning, since you spent no money there

would be no percentage deviation; as you get out here to the place where the average line might cross $10,000, if you are on 30 percent deviation, we would have had to cast out any well outside of the limits of 7000 to 13,000, as being either too low priced or too high priced, to be truly representative; by simply going up to where the curve crossed $100,000, we would cast out any well that had a deviation of more than $30,000 on either side of the curve since that would represent 30 percent of $100,000. In casting these data out we came up with the wells which I have previously discussed.

I will number these wells so they will be a matter of record. They are Wells 8, 9, 14, 18, 35, 37, 38, 40, 41, 54, 55, 57, 65, 72, 85, 88, 103, and 131. A total of 18 wells. Now I would like to explain the way these wells fell out. At first glance we notice that 17 of the wells were on one side of the curve and one well on the other side. That 17 were on the high side and one on the low side. That may sound like a deviation from a statistical approach, since in pure statistics, if you were dropping a bunch of rivets on the knife edge, they ought to split 50-50 on either side, and you throw out the ones that deviate too much. They ought to split 50-50. This is a different problem; this is the logic we follow. We reason for every depth range there is a minimum drilling cost line. That goes possibly somewhere along the cheapest well drilled in that range. I think that that is a completely reasonable hypothesis, since, obviously, to drill any deeper you must continue to spend money and these wells shown here probably represent the well that had absolutely no trouble from the start to finish.

Then proceeding from there and say, now that is the minimum cost line, that is a point beyond which you couldn't lower your

cost any more under present footage and day-work costs, tubular goods cost, cement, and service costs of all sorts. On the other hand, however, there is absolutely no limit to how high the wells can cost. They can deviate 200 or 300 percent from the average simply as to the amount of trouble that you have. There is a low minimum, but there is no high maximum. Since an operator could have a very severe fishing job, clean it up and immediately the same day get into another severe fishing job which could cost him almost another week and still be in a shallow well. There is no maximum limit for the cost in any range, but there is some reasonable minimum limit.

Proceeding a step further from there, we reason that if we are operating fairly prudently, all the operators in the state, we should be able to drill within 40 percent of that minimum line. Now, that is simply mathematics there of, if your average line is at 100 percent of the actual cost in a range and the minimum cost line is established at 70 percent, then there is a difference of 30 percent, but if you measure from the minimum side of the line, that 30 percent represents 40 percent plus of the 70. So that we feel that as much as we are learning about the drilling operations in the state after all these years of recent development, that we certainly ought to be able to operate within 40-odd percent of minimum cost. Then that satisfied me there was a logical reason why more points didn't fall out on the lower side of the curve.

Proceeding from that we then took the 122 wells and made a number of mathematical approaches. I have not learned how the Commission curve was drawn. I don't know whether mathematics were considered in that curve or not. But we reason that there probably is some mathematical expression that will approximate reasonably

well the cost of drilling in this isolated part of a geologic province, relatively small geologic area. Working with that assumption we have studied what we consider the most likely possibilities of curve fitting. We might state that, in beginning, that aside from a glance at the obvious general shape of the curve, we might remember back to the statements that we have often heard that "drilling increases roughly as the square of the depth". I think that is something that people generally have uttered and often wondered if that is about right or not. Actually our studies indicate it is not completely accurate, but the idea is good; instead of being a simple squared relationship it is an equation in exponential form.

We went to the trouble, then, of testing various exponential forms for these 122 points and the curve we present here as the line beginning at the origin, moving through the entire range and colored in red as being the mathematical expression which best says by means of lowest mean square deviation the 122 points which remained after casting out the points by the 30 percent deviation method. Simply, so that the record will show what that equation is, I might warn it may sound complex, but actually it is a simple form which can be worked out easily on a slide rule. You can also do it with exponential tables, but the equation of this red line expressing the costs versus depth relationship is as follows:

The cost of a well at any depth is equal to $31,900 times "E", which is the exponential to the triple zero 17135 times "D" power, in which "D" is the depth in feet, minus a second term of $31,900 over "E" to an "H" squared, "X" squared exponent. Now in this form the "H" squared is equal to 3.19692 times ten to the ninth, and the "X" squared is converted to a depth relationship, and the "X" term

is expressed as 3.727 times 10 to the minus ninth, times "D", which again is the depth in feet, that term squared.

Simply as a matter of the record, so that people might check what we have done to see it is valid over the entire range, I can assure you we have tested it and it will, any point you calculate, will fall within plotting accuracy on this red line.

Q Mr. Nestor, now as a result of the casting out of the wells that you named and the application of the formula that you have announced, you have prepared what is designated as the red line on Exhibit 1, is that right?

A Yes, sir.

Q Which shows a comparison of cost compared with the green line, which was the Commission curve presented at the last meeting?

A Yes, sir.

Q Now, do you have any comment to make as regards the method of the averaging of the cost from zero to 5,000 feet as shown on the green line as presented last month?

A Yes, sir. We have studied that in some detail at the time that that was presented by the Commission, we were hard pressed to find a logical reason for going through those steps. And, I must further state that after another month of looking at it, we still find no logical reason for doing it in that manner. I will state my understanding of what has been done by the Commission and my reasons for believing that we might approach the matter in a more equitable way.

It will be noted, I think by all, that our curve handles the zero to 3000 foot area which was not expressed by the Commission curve. We have a reason for doing that. We feel that it is a

good expression since it does average out very neatly the points in that area, which appear to be valid data with the exception of the exorbitant spread there. But as I recall it, the Commission averaged all the wells in the zero to 5,000 foot bracket by cost and by depth, and came up with a figure which appears in the record, but the average depth of all those wells as I recall it, was 3,601 feet. That might have been a starting place for ranging a cost and pay-out study. But for some reason which I still do not clearly understand, the Commission then averaged out all the wells in the 3000 to 4000 foot range and found again a cost figure, which appears in the record, and they plotted at the average depth, which I recall was 3,612 feet. And they did a similar thing in the 4000 to 5000 foot range, and again plotted another point at the average depth and cost for that range. So much was fine. But the line of logic which led to drawing a line between those two points and then saying that the average cost should be considered at 4,000 feet, to me is just a bit astounding.

It was explained to us that the reason that was done was because none of the wells below 3,000 feet or, correct me, only one of the wells selected by the Commission below 3,000 depth could make it's allowable. Well, I can see then why the Commission would not possibly want to consider this area down here. But I can't see why they couldn't simply have started in the 3,000 to 3,000 foot bracket since what went on before that has nothing to do with what goes on after that.

I might point out further that chance might have been such that we would have had a cluster of wells drilled at 4,995 feet, all those wells being capable of producing their present allowable, the

top allowable, and it might so have happened that none of the wells shallower than that would have produced their top allowable. We wonder then if they would, the only place you could start then would be 4,995 feet. It didn't happen that way, but we shudder to think it might have if the data, by that line of logic, had fallen out that way. We feel that a much more reasonable and equitable approach must be made to this problem if we are to keep from destroying the equities rather than instating them or adjusting them.

Now, there are several ways we could do this, solve this problem, one of which being, obviously, that if we wanted to be fair we could start up here since both curves coincide up there. No one could quibble over the cost of that depth.

Q At what point?

A Center of the 10,000 to 11,000 foot depth range. That would be a logical starting point, based on the data, since the two curves which represent two lines of thinking.

Now we do not argue that this red curve of ours is the solution to the problem because, unfortunately, we were forced to work with data which we still consider to be highly faulty, because of the reasons we have explained. Not that there is any intent of any member of the Commission or operator to submit data other than within the intent of the call of the hearing, but rather because of certain things which we have attempted to show. But in investigating a bit further we decided that also the curves submitted both by Shell and the Commission coincide at 3500 feet.

Now, we feel that this is a good starting place for setting up a cost analysis by depth. The reason being, first, we have no quarrel between the two systems as to the cost at that point. We

can have no quarrel below that since we, I think, have made the only reasonable representation through the area from zero to 3,000 feet. There are variations in the greater depths. I will point out, if it has not been noticed by all, that this curve prepared by Shell is always lower or equivalent to that presented by the Commission, irrespective of depth. In this range where we are highly concerned about the costs and also out in the deep ranges where we actually think that we must be careful to keep the factors such they will encourage development. But we point that out that we don't consider the curve and shoot up in an area where someone might want us to, to be under the curve. We have one curve and it happens, with the exception of the 3,000 to 3500 foot interval which does play no part in the over-all, our curve always being underneath the Commission curve.

Now, there also is considerable solid reason for considering the center of the 3,000 to 4,000 foot depth range as a logical, reasonable and equitable starting point. I might point out now that of some 7,000 odd wells producing in the state during the months of November, December of 1953, and January of 1954, 3,287 wells lie in the 3,000 to 4,000 foot range. Since that is such a large percentage, relatively, of the wells in the state, we thought it reasonable to begin there since obviously if we want to adjust production over all it is simpler to start at the heart of the problem than it would be down in the zero to 1,000 foot group where there are relatively few wells, only 218 in the state, or in the 13,000 to 14,000 foot depth range where they are only four producing wells in the southeast part of the state.

So with that line of reasoning, and the fact that there are

more wells in the zero to 3,000 foot interval, the intervals by thousand being zero to 1,000 218 wells; one to two thousand feet, 519 wells; two to three thousand feet, 517 wells; I am adding this in my head, it looks to me like that is 1,254 wells. In the four to five thousand foot range, which is on the deeper side of this average bracket; there are only 884 wells. So, if anything, the locus of a point in space would tend to shift from the center of the bracket, which might be expected to be the average of three to four thousand foot to something lower than that. That would involve investigating the total depths of every well drilled in the zero to 5,000 foot range, and we have not had time to do that. But based on pure logic, it would appear to us a fair and equitable starting place might be 3,500 feet.

With that in mind, we have gone to the, through the same manipulation of data employed by the Commission to establish what the pay-out of wells would be based on the red cost curve, which we simply offer as being possibly a better representation with all the factors being considered. We don't say it is the best, because unfortunately we think a great deal more data would cast a lot more light on the subject, but we have gone stepwise, using the Commission price per barrel of $2.69 and a net of 875 or seven-eights, and disregarding any lifting cost or other figures, since generally speaking they would tend to be fairly relative, we have gone through the calculations and we will now present our next Exhibit.

MR. HOWARD: Will you mark this Exhibit 2?

(Marked Shell's Exhibit No. 2, Case 608, for identification.)

MR. HOWARD: Now, Mr. Nestor, there has been placed on the board what has been marked as Shell's Exhibit 2. State briefly

what that represents.

A We compare on this exhibit the variations in depth factors and pay-out time based on the two cost curves and were considering the change in the starting point from 3500 in the Shell case to 4,000 in the Commission case.

The columns are headed Depth Range 5,000 of feet the Present Adaptation Factor is listed for each thousand foot interval, then we have listed the Commission's Proposed Plan with the setup that all wells should pay out in 1.406 years, we have listed then from the Commission curve the average cost at the various depth ranges being unable, of course, to obtain any cost in the zero to 3,000 foot range where the curve was not extended, and the only variation of our factors with those in the record, is that we have not rounded them off where in the record they will appear as rounded off. The factor from 3,000 to 4,000 being listed here as .82 which is the exact division, and in the record I believe it is rounded off to point eight; and the next factor being 1.27 here and being rounded off to 1.25.

Q Now this Exhibit represents a comparison of the Commission's costs and their factor, and Shell's, what they consider adjusted cost and their factor?

A Yes, sir.

Q Based on the data furnished by the Commission and on their same plan of pay-out in 1.406 years?

A Yes, sir.

Q In other words, this is just taking the information that was presented last month and this represents your interpretation of what would be a proper interpretation of it, is that correct?

A That is correct. We have then made the same calculation but using the cost data obtained from the red curve and have come up with proportional factors based on a unit of 40 barrels per day which is the same approach used by the Commission, I believe, and we have listed those factors here.

I would like to point out at this time that we do not subscribe in any way to this approach. We have indicated by our cross examination last month that we think that certain other factors, other than the direct drilling cost associated with the well, must be considered whether they are expressed exactly in dollars or not, must not be the only criterion. We must resort to some logic and we will make an effort to explain some of the logic we think should be considered in this problem.

However, for those who are located at some distance and may be interested in seeing what these factors are, let me read them. I will point out first of all that we have not lumped the zero to 5,000 foot range, since it is our opinion that that is the range where most of the inequities in the present system lie. We intend to make a thorough recommendation for modifying the proration system in such a manner that these equities will be introduced possibly for the first time.

Now, at this point it might be well to mention that we think that there is a considerable change in the situation from the one existing in 1945. The Commission in their presentation last month indicated that they followed in the footsteps of the committee established for Case 62 which was heard May 14, 1945. While we have no quarrel with this procedure, since it may have appeared to them to be the best, we suggest that there are startling differences in

in the over-all situation which have appeared in the intervening nine years.

As of the date of the hearing May 14, 1945, there were 4,186 wells producing in the State of New Mexico. Of those wells, 4,180 were in the zero to 5,000 foot range, the remaining six, being in ranges deeper than 5,000 feet. We submit that the logic at that time of all the people involved, not individuals but probably the companies and the small operators and anyone else who was represented, the logic probably followed the line of thought that we have a major oil industry here in the zero to 5,000 foot range, which we did. Below 5,000 feet the following six wells were producing.

Humble-Federal-Leonard B-1 in the Dublin-Ellenberger Pool completed in October 1944 in the interval 11,850 to 11,950 feet, plugged back from the total depth of 12,535 feet; in the Drinkard-Yesso Pool, three wells; Gulf Vivian 1, completed in October 1944 as a discovery well; Gulf Andrew 1 and Gulf Gothman 1, the fifth well was the discovery well of the Paddock Pool, Gulf Paddock 1; the sixth well was the discovery well of the Skaggs deep pool now known as the Cass Pool. Continental Skaggs B-23-2, which was completed in the interval 7,665 to 7,730 after being plugged back to a total depth of 10,464 feet.

Now we feel that at that time these few scattered wells did not necessarily portend that we were going to have a major oil industry in the 5,000 to 14,000 or 15,000 or 16,000 foot range. It was impossible for anyone from any company, regardless of his opinions as to what should be done, to have as clear an impression of what might happen in the next nine years as we who come along nine years later are able to see.

We find that today we have approximately 7,115 producing wells in the state. The number of shallow wells has increased fron 4,180 to 5,481, an increase of 1301 wells. During the same period of time, however, the wells deeper than 5,000 feet have increased from six to 1634 wells. Not only has the percentage gone completely out of sight, that is of 6 to 1634, but we think it is noteworthy that more wells have been completed deeper than 5,000 feet in the nine-year period we are talking of, than have been completed shallower than 5,000 feet.

Q Mr. Nestor, has that tendency toward the drilling of the deeper wells continued down through the past years?

A Yes, sir, it has.

MR. HOWARD: Mark this Exhibit 3, please.

(Marked Shell's Exhibit No. 3, Case No. 608, for identification.)

Q I will hand you what is marked Shell Exhibit 3 and ask you to state what it is please.

A This Exhibit is a summary of all the wells drilled in southeast New Mexico during the year 1953 as available from our scout records, which are considered as complete, but are subject to errors due only to clerical help.

In that exhibit we have separated the development wells from the exploration wells. We have also segregated the total wells drilled into depth ranges from zero to 5,000 feet by 1000 foot intervals, from 5,000 to 9,000 feet by 1,000 foot and 9,000 to 15,000 feet by 1,000 foot intervals. We have then listed the number of wells drilled in each one thousand foot bracket from zero to 15,000 feet. We have then taken, in those ranges where the Commission curve was established, the cost from the Commission curve -- we could take it from either cruve but we took it from the Commission curve since they

reflect a higher expenditure through this area and some higher through here -- and thought possibly if there is a showing that more wells are being completed in here at greater total cost, then maybe some thought should be given the increasing the amount of allowable to go into the 5,000 to 9,000 foot range.

Q Mr. Nestor, just for the benefit of those here who do not have copies of this just read the totals, will you, not breaking by 1,000 but just the totals?

A For the zero to 5,000 foot range the gross aggregate which was obtained by multiplying the number of wells in each depth range by the cost at mid-point of that depth range, we find that a total of 278 wells were drilled from zero to 5,000 feet at a total cost of $10,529,000, those being the development wells. In the same interval a total of 60 exploration wells were drilled at a total cost of $1,560,200. In the interval from 5,000 to 9,000 feet where we have some disparity in the curves, and which the Commission has indicated is an interval where they are concerned, the total of 165 wells were drilled in the development class at a cost of $19,024,000.00. Thirty-one exploration wells were drilled at a cost of $3,415,500. Then in the deeper than 9,000, which ranges all the way to 15,000, one well being drilled in that range, a total of 226 wells were drilled at a total cost of $47,364,000; and 52 exploratory ventures were drilled at a cost of $13,515,000.

Now let me point out that these exploratory costs, the total on this Exhibit No. 3 reflect only the cost from the green curve here. We all know that those costs are substantially higher and we would point out that were nearly as many wells, 52 as compared to 60, drilled deeper than 9,000 feet, in the search for oil, than

there were in the range from zero to 5,000 feet, and that the relative cost for exploration wells was in excess of thirteen and a half million, whereas, the cost of the exploration wells in the zero to 5,000 range was slightly over one and a half million and the 5,000 to 9,000 foot range slightly under three and a half million. So in the range where we were concerned, we find that four times as much money was spent last year alone, if you assume that the costs on the Commission's curve are correct. In the development wells some ten million dollars, ten and a half million dollars was spent in the zero to 5,000 foot range, almost twice as much, being slightly more than 19,000,000 in the 5,000 to 9,000. But in the 9,000 to 15,000 foot range this number increases to 47,360,000.

Now, it represents more than four and a half times the money spent in the zero to 5,000 foot range, and it represents approximately two and a half times the money spent in the 5,000 to 9,000 foot range.

Q This exhibit was prepared under your direction, was it?

MR. HOWARD: I ask it be admitted please.

MR. SPURRIER: Without objection it will be admitted.

MR. HOWARD: If the Commission please, if I didn't ask for the admission of Exhibit 2, I ask that at this time.

MR. SPURRIER: I don't know if you did do it or not, but without objection it will be admitted. Let's take a recess.

(Recess.)

MR. SPURRIER: Mr. Howard.

MR. HOWARD: Yes.

MR. SPURRIER: Are you ready?

MR. HOWARD: Yes, sir.

(Marked Shell's Exhibit No. 4, Case No. 608, for identification.)

Q I hand you what has been marked Shell's Exhibit 4 and ask you to state what it is.

A This exhibit shows the breakdown of the wells drilled in southeast New Mexico as of March 30, 1954.

Q That was prepared under your direction, was it?

A Yes, sir.

MR. HOWARD: I ask it be admitted please.

MR. SPURRIER: Without objection it will be admitted.

Q Just give your totals off of that for the benefit of those who do not have copies.

A This exhibit has been prepared in a manner similar to the previous exhibit listed as Exhibit Three in which we broke down the number of wells drilled by thousand foot intervals and then grouped them from zero to 5,000 feet, from five to nine thousand feet and from nine in this case, to fourteen thousand feet. The depth we have used here is the projected depth as reported to the scouts, and these data represent all the wells reported in the scout check with the four-county area of southeast New Mexico.

The total of development and exploration -- we have not made an attempt to break these wells down in the zero to 5,000 foot range -- is 33 wells, and again based on the green curve which represents the Commission cost, except for the place where it was necessary to supply cost from the red curve in the range from zero to 3,000 feet, we see a total of 33 wells drilled at a cost of $1,154,000. In the 5,000 to 9,000 foot range a total of 20 wells drilled at a cost of $2,904,300. From 9,000 to 14,000 feet, and we feel this is quite

significant, a total of 38 wells at a cost of $9,015,900. At the same time we see 38 wells drilling deeper than 9,000 feet at a cost in excess of nine million as compared with only 33 drilling between zero to 5,000 feet at a cost of about $1,150,000, a ratio of about 8 to 1 on cost, and even more wells drilled below nine than the zero to 5,000. The 5,000 to 9,000 foot range we had a total of 20 wells at about $2,100,000 as compared with 38 wells below 9,000 feet at a cost of $9,100,000, so that is about four and a half times as high. Twice as many wells, roughly, at approximately four and a half times as much capital being invested.

Q Now, from the information on the number of wells drilled and drilling since 1945, it would be your conclusion then that the tendency in New Mexico is toward drilling deeper than 5,000 feet?

A Definitely.

Q And that is a distinct change from the situation that existed in 1945 when the present set-up of factors were established?

A Yes, sir.

Q Now, I want to ask you one thing, you stated that, first your exhibit, your curve on Exhibit One and your comparison of cost, of factors on Exhibit Two are purely on the basis of well costs, are they not? A Yes, sir, they are.

Q You mentioned that it was your opinion that there were other factors that should be considered in arriving at the allowable factors? A Yes, sir.

Q Now, would you state what you consider those factors to be?

A I think we might start out with these previous Exhibits Three and Four, and attempt to show that definitely the trend in the state is to spend more money in the deeper than 5,000 ranges,

and a great deal more money in the deeper than 9,000 foot range.

One of the Commission witnesses last month testified that in his opinion most of the undiscovered reserves in the state were probably at depths exceeding 9,000 feet. We heartily agree with this. We feel it is almost a certainty that the major undeveloped and undiscovered reserves will lie in the ranges below 9,000 feet that will catch most of the Wolf Camp Pools we may hope to discover, and the deeper Pennsylvania and Devonian Pools.

We might go into some analysis of the results of wells drilled, but actually they are more or less comparative through the ranges as regards the successes and failures. So we feel that that wouldn't necessarily add to the whole picture. Actually, certainly the detail study of the reserves added to the state in this range will show more than for either of the other ranges.

Q In this range, which range do you mean?

A Excuse me, in the 9,000 to 14,000 or 15,000 foot range as compared with the zero to 5,000 and 5,000 to 9,000 foot ranges. That is the place where the major reserves were discovered last year and that is the place where most of us are looking today to add major reserves; not just outstep drilling around a pool, but the major reserves.

Q Now, is it your feeling that there should be given an incentive to operators to explore for and develop that deeper and more costly drilling?

A We definitely feel that if the Commission considers it is part of their duty to foster the development of probably the most valuable natural resource now known in the state, and that resource is agreed by the members of the Commission and ourselves as probably

lying below 9,000 feet, then definitely if we are to find the oil we have to look where it is. All the wells that we drill up here, if the oil is down here, are not going to help, and consequently the Commission, it appears to us as being their duty to develop these natural resources, would certainly want to consider an arrangement of proportional factors that will encourage the development of these very costly wells.

Q Is it not also true that in encouraging the drilling of these very deep wells there may also be shallow discoveries made in the course of the drilling?

A That is one thing, of course, that follows, is that the deep well going to 14,000 feet tests all of the shallow prospects on the way, so it does everything these wells can do; contrariwise, the shallow well does not test any of the deeper horizons and the best that can happen is that sometimes a shallow pool will reflect a deep seated structure.

Q In addition to actual well cost, are there other costs you think were considered in connection with getting an allowable factor?

A Yes.

Q What other costs?

A We think of prime importance are the geophysical costs which are spent in an area to develop the undiscovered oil pools.

Q Would you mark this as Exhibit 5 please.

(Marked Shell's Exhibit No. 5, Case No. 608, for identification.)

Q Now, I hand you what has been marked as Shell's Exhibit Five and ask you to state what that is, please, and where that information was obtained.

A This Exhibit summarizes two things as observed by Shell Oil Company. This breaks down by one thousand foot depth ranges, the drilling during the years successively from 1945 through 1953, each column showing the total in depth ranges of the wells present as of January in the year stated, from January 1945 to January 1954, these, of course, being from our production records. We have the total wells at the end of the column representing 13,000 to 14,000 feet and we have a column showing the increase by year. To the right of that we have a breakdown, geophysical time and cost by crew months, from the years 1938 through 1953. In those geophysical costs we have made a further breakdown into seismic crew months, gravity crew months, and magnetic crew months, and we have listed, where they were available, the cost. The costs in the period 1938 through 1944 were not available to us, but it may be seen that they were relatively small for our company and as far as we are concerned they are almost negligible. The years from 1945 through 1953 represent the major amounts of geophysical expense during that period.

Now, I might point out that the money that we show here is the exact cost chargeable to geophysics only, this includes none of the geologists in the Midland office, Houston or anywhere else. This cost is chargeable only to the operating parties in the field in southeast New Mexico.

Q Now, without reading all the figures, just generally what does this exhibit show as regards the Shell Company's experience?

A It shows our experience by years as related both production-wise and geophysical crew month wise. During the years 1944, 1945 we had no wells drilled to a depth greater than 5,000 feet in the State of New Mexico.

Prior to that time we had done relatively little geophysical work in the state. During the year of 1945, we initiated what for us was a relatively heavy campaign geophysically, which we show 14 and a half seismic crew months, five gravity crew months, and 11 magnetic crew months, at a total expense for that year of $259,132.28. Now, we think it is significant that immediately following that year, as of January 1947, we had three wells in the 5,000 to 6,000 range, one in the 6,000 to 7,000 and one in the 7,000 to 8,000 for a total of five. Our first wells in the range.

Moving on through the record, which is self explanatory, we see that the costs have remained high over the intervening period of years, reaching a peak in the year of 1952 when we had 38 seismic crew months, four and three-quarters gravity crew months, at a cost of about $890,000. In the year following we notice, or in the year of 1952 actually, we had a total increase of 41 wells in the state deeper than 5,000 feet. Of those wells, five were in the 9,000 to 10,000 foot range, one in the 10 to 11 and six in the 11 to 12, and one in the 12 to 13. These wells represented all our wells then existing at a depth greater than 10,000 feet, and they tie in directly to this extremely high geophysical cost going on at that time.

Then in January 1954 we find a total of 129 wells, or an increase of 18 during the year of which seven were in the 11 to 12,000 class, three were in the 10 to 11, and six were in the 9 to 10. During the year 1953 our geophysical cost was approximately $623,000. Our total listed cost for the period 1945 through 1953 -- well, it may not be large for certain companies and may be quite a bit more for other companies -- was $3,989,129.86.

Q Now, the general picture shown by this Exhibit Five then, is from your own company's experience, as to deeper drilling development the geophysical cost increased rapidly, is that correct?

A Yes, sir.

MR. HOWARD: We ask Exhibit Five be admitted, please.

MR. SPURRIER: Without objection it will be admitted.

Q Now, the costs that are shown for the year 1953, geophysical costs in the amount of $622,922.60 represents both reconnaissance and detail work, does it not?

A Yes, sir, it does.

Q Now, is there any way in which you can break that down to apply it to specific areas?

A As was indicated last month, we have made every effort to break this down in as reasonable a manner as possible. We have found it very difficult as most people expected it would be, and as we knew too it would be, to find the best way of doing this. I think possibly we might point out a couple of examples simply as a relative matter to the problem.

In the East Caprock Area, where we have drilled two wells both of which are producers, we find that our detail work represented forty-seven miles of continuous profiling and based on the current costs that would figure to $25,229.60.

This in no way represents the preliminary reconnaissance work which enabled us to do the detail work. We have not found any suitable way to allocate certain amounts of that reconnaissance costs to the detail work for any one pool, but we know that the reconnaissance surveying costs about $1,073 a section, or $1.68 per acre, and that is in excess of the detail costs which we have listed.

This figure, I might add, was broken down to the two wells in the East Caprock area, shows an increase of cost of those wells of $12,600.00. Now, that is better than five percent of the total wells, cost of the wells, and is a substantial figure. It is only a relative figure which we introduced to indicate how these factors, in what order they might vary. We do not state they will constantly be the same.

I might point out another example in the Bagley area. We did one hundred miles of work and we had a cost there of $53,680. We drilled one pole there and got a gas well which has been shut in from time of completion, so that if we allocated all the cost of that work to that well we would increase it $54,000. That might be fine for that well, but you can see if you dab them all over the place that way we would have a distorted picture.

We agree that is possibly not the best way to do it because it would vary widely from company to company and it would depend a great deal on where the people decided to spend their geophysical money. We submit this simply as an indication of the geophysical cost factor of drilling these deep wells.

Now, we have already pointed out that the geophysical expense was tied in largely with the deep drilling, not with the shallow drilling, since it is a coral area. For shallow work, it is possibly cheaper to drill the holes and define accurately the structure rather than do the seismic work and drill the best well on the structure, and consequently that procedure was followed. Someone might say, of course, that result in dry holes; the seismic is no guarantee against dry holes, it enables us better to drill the first well over a known structure.

Q Now, your allocation in your example there of some $12,000 for each of these Caprock wells, that was purely the detail work attributable to those wells?

A Yes, sir.

Q It did not in any way take into consideration reconnaissance of the area?

A It would not.

Q Which would be an additional factor?

A Yes, sir.

MR. HOWARD: Will you mark this Five-A please?

(Marked Shell's Exhibit No. 5-A, Case No. 608, for identification.)

Q Now, I hand you what has been marked as Shell's Exhibit 5-A and ask you to state what that is please, and where the information was obtained.

A This is a listing of competitors' seismic activity during the years 1942 through 1953. We feel this is the best representation we can make of the competitors' position, as we have no way of knowing how much money they are spending. We could apply the same costs we have, but we might introduce a further report. We think, however, that the figures are completely relative and will speak for themselves. We again have broken the analysis down by year and crew months and these data are available from the scout reports on seismic activity which are available to all people.

Q For the benefit of those who do not have copies, read off those figures for the different months, please.

A I will read first the year then the crew months. 1942, 12; 1943, 13; 1944, 21; 1945, 46; 1946, 72; 1947, 109; 1948, 130;

1949, 150; 1950, 292; 1951, 339; 1952, 470; 1953, 370.

MR. HOWARD: I ask that this be admitted please.

MR. SPURRIER: Without objection it will be admitted.

Q Now, Mr. Nestor, from this information then, does it logically follow that the industry's experience has been the same as Shell's in that the geophysical work has increased materially in proportion to deep drilling?

A Yes, sir, I think very definitely that is the case.

Q Now, is it your opinion that in arriving at a proper factor in connection with the different depth wells, these geophysical costs are a proper element to consider?

A Yes, sir, we think they are equally as important, if not the same in magnitude, as the drilling cost.

Q As the actual drilling cost?

A Yes, sir.

Q Is there any other factor such as the risk involved that would be proper to consider?

A Again we run up against considerable difficulty in establishing an accurate relationship of the risk factor. However, we feel again, resorting to logic will indicate to all those present that we know certain things about the presently developed pools in the State of New Mexico.

I would like to consider the major pools discovered in the shallow ranges and then compare them with the one major pool yet discovered in the deep. The break for a major pool being 100 million barrel recoverable reserves as the best estimate of the industry. In the zero to 5,000 range these major pools consist of the Hobbs Pool, with a probable ultimate, approaching, or maybe exceeding 200

million barrels. The Eunice-Monument Pool area with a probable total recoverable ultimate in the neighborhood of 400 million barrels, and the Vacuum Pool area with a probable recoverable ultimate in the neighborhood of 180 to 200 million barrels.

Contrast this with the only major pool yet discovered in the deep to my knowledge, that being the Denton Pool, with a probable recoverable in the vicinity of 100 to 120 million barrels. It is but a step further to study the outlines on the maps of these pools and of all the pools in the various depth ranges and to see the pools in the shallow permian in the State of New Mexico are generally characterized by general structures, relatively low dip per mile. This means several things. It means that the area of development in the center of the pool is relatively large and that the relationship of the dry holes to the perimeter of that area will be relatively small.

We will point out, of course, to understand the problem, the worst possible situation in the finding of a pool is to have a single well pool which is surrounded by eight dry holes, with four direct and four diagonal offsets. As that pool increases in size the relationship of a dry hole to a producer becomes smaller. In that case it was eight to one. As you get a relatively large number of wells in the bottom of the pool the number of dry holes around the edges will come some larger, but they come larger in a lenial function, where the area becomes larger as a scarce function. Therefore, that relationship decreases.

On the other hand, consider the deeper pools, even the Denton Pool is not a large pool in area, having as it will probably be developed, something in the neighborhood of, oh, one hundred wells,

to the Devonian pay, as compared with something approaching a thousand barrels in the, or a thousand wells in the Eunice-Monument Pool, and some 250 in the Hobbs Pool. Just a pure relationship. But examine, if you will, the other deep pools and you will find that generally speaking the deep pools in the Pennsylvania and Devonian Reservoir tend to be so-called geological pimples, small bumps and have a relatively high percentage of dry holes drilled to the finder.

Now, the reason for that is that, generally speaking, the deep pools have increased dip, much higher rate of dip per mile than the shallow pool. That doesn't appear too unreasonable since those formations which at one time were relatively level at the time of deposition, or evaporation have been worked on for longer geologic periods and greater and greater warping has resulted with the increased dips. Obviously the deeper pools are subjected to all the mountain makers and diastrophies that all the shallow pools are subjected to, but the shallow pools attach only that after the beds were deposited. Therefore, the shallow pools tend generally to have a more general rate of dip, and to be larger in size.

Now, there is something else that enters there as a factor because of this reason. It is often possible to define fairly well the small pools, or excuse me, the shallow pools with the so-called small well, The well that wasn't a dry hole, will at best, will possibly break even, but at least you get some money back out of it and maybe you don't have to make the next step out to give you the real producer; but in the deeper pools there is a much greater risk of stepping out of the oil field as we say it, and running completely out of the pay and running completely into water. That, of course, is characteristic simply because of the greater rate of dip there is.

We consider complete logic to answer that and, however, we do agree that it is virtually next to impossible to assign a dollar value to such a risk.

Now, there is another factor of risk which we think enters in, that one of the risk involved in any well, the drilling of the well, is the possible loss of the hole or of the drilling equipment. We have had some unfortunate examples of that recently and we have, all of us, probably at one time or another experienced lost hole trouble. Now, just a consideration of the drilling time alone, obviously, if you drill on a well for 150 days, which is not exceptional for a well in this very deep range as compared to a shallow well, say the Bowers Pool which you can drill in 14 days or maybe 11, we drill them in a week actually, that there is just, you are over the hole just that much longer. There is just that many more opportunities for human failure or equipment failure to cause the loss of that hole, you lose everything you have in the hole to that time. You wind up with a junk hole and if you have any money left you skid over and start over again. We feel definitely that is a factor.

Again, it is just something relative and logical, it is something difficult to explain in dollars and cents, but again, it is logical to assume if you are over a hole something in the neighborhood of twenty weeks, there is greater danger of human error or failure of equipment, failure resulting in the loss of that hole than if you are only over it for a period of less than two weeks.

Q So these factors that you have discussed are, in your opinion, factors that should be considered in addition to actual well costs in arriving at the depth factors to be given the wells, is that correct?

A Yes, sir, they are.

Q And since they are factors which occur in connection with the deeper drilling they should be considered by the Commission along with well costs in arriving at an allowable factor?

A We think that if the Commission is going to have the equity which they desire in setting up a proration scheme, logic demands some consideration be given to these in a relative way.

Q Have you prepared a suggested form of Exhibit, or an Exhibit showing the suggestion as to how equity could be obtained between the different depth factors?

A Yes, sir, I have.

Q Now, as a predicate to putting that on, however, and as supporting information for the extension of your curve on Exhibit One, breaking down by thousand foot intervals below 5,000 feet, it is necessary, is it not, in order to have the proper depth range on the various shallow fields in the state?

A Yes, sir, it would be necessary to do that.

MR. HOWARD: Would you makr that as Shell's Exhibit 5-B please?

MR. SPURRIER: Mr. Howard, let's recess until 1:30.

Afternoon Session

MR. SPURRIER: Meeting will come to order, please, Mr. Howard.

MR. HOWARD: If the Commission please, before we go on the record....

(Discussion off the record.)

MR. HOWARD: Now, on the record. State for the record your name, please.

A A. W. Nestor.

Q You are the same A. W. Nestor who was testifying before the noon recess? A Yes, sir.

Q Mr. Nester, I hand you what has been marked Shell's Exhibit 5B and ask you to state, please, what that is.

A This Exhibit is a tabulation of the discovery wells for all pools shallower than 5,000 feet. We list the following column headings: Depth Range, the Pool, the Discovery Well, the month and year of the discovery, the Top of the Producing Interval in that Well and the Total Depth, and the plug back, if such was stated in the records. For simplicity, we have arranged the pools alphabetically in the one thousand foot ranges.

Q Where was that information obtained?

A The information was obtained by thorough research of the files in the Commission offices at Hobbs and atArtesia, as well as in the United States Geological Survey files in both these cities.

MR. HOWARD: I ask this Exhibit be admitted, please.

MR. SPURRIER: Without objection it will be admitted.

Q Now, Mr. Nestor, have you prepared an exhibit showing pay out against depth based on proportional factor as recommended by

Shell Oil Company? A Yes, sir, I have.

MR. HOWARD: Mark this please as Shell's Exhibit Six.

(Marked Shell's Exhibit Number Six Case No. 608, for identification.)

Q Now, referring to Shell's Exhibit Six, state just generally what that represents.

A The curve is a plot of the pay-out time in years against depth based on the proportional factor as recommended by Shell Oil Company.

Q Was this prepared by you or under your supervision?

A Yes, sir.

MR. HOWARD: I ask it be admitted, please.

MR. SPURRIER: Without objection it will be admitted.

Q Proceed to explain what the exhibit shows.

A What we have done here, as we explained before, we did not fully agree with the system suggested by the Commission of arranging all wells to pay out at the same time. What we have done is make a sliding time pay-out scale to cover only, in a relative manner, the extra costs attended to the deep drilling, which we have represented in our testimony this morning as being very real, although difficult to measure accurately well by well.

The plan of this curve was to have the slowest pay-out in the shallowest ranges where the over-all risk and other factors mentioned, the geophysical would have less bearing than any other ranges. I would point out that the answer we have here as you will see, is very moderate. The original plan was set up in this way, I arranged it so, neglecting the zero to 1,000 foot bracket inasmuch as we will be on a minimum allowable in that bracket, and started with the bracket up here.

Q At what point?

A For the, representing the 1,000 to 2,000 foot range, giving it the highest time of pay-out, dropping from there one one-hundredth of a year per thousand feet of depth. So that that means the way I originally set it up--, the understanding being of course, I am using the same calculation approach as we used up here, but each thousand feet of depth, instead of setting them equal always to, say, some constant like 1.406 or any other constant, I decreased the constant as we went deeper one one-hundredth of a year, which would be 3.6 days, or roughly half a week, until we got to 7,500 feet,which would represent the center point of the 7 ,000 or 8,000 foot range.

From thence onward I cut down that time by two-hundredths of a year per thousand feet of depth. Now, that two-hundredths obviously is roughly a week, since we have 52; 52 would be 1.104 weeks. What we gain actually, what the well in the deeper ranges would be gaining under the system, we propose, an accelerated pay-out over a week, over the 3,000 foot bracket in the part of the curve below 8,000 feet, whereas, above that the change was more gradual.

I am sure people wonder why the curve wiggles. The reason for that is, you can see it is fairly regular out here on the end well, in rounding off the barrels we have observed in making the calculation that a barrel of oil per day for 365 days a year at $2.69 a barrel, and 85 interest, was equal to $8,000. Eleven cents that is what other people would get to multiply it out, in rounding off barrels where the well costs are relatively low,you distort the picture if you round off say three-tenths of a barrel to put it on

an even barrel basis. Consequently, these pay-outs are shorter than was intended. It is the only answer you can come up with in a rounding.

We could have shown the exact curve had we gone to hundredths of barrels. Of course, we won't prorate that way. We thought it more practical to give you a recommendation, show exactly how that recommendation would plot out as to time.

I direct everyone's attention to the fact that the highest pay-out which again is only because of the rounding, occurs in the 3,000 to 4,000 foot ranges. One one-hundredth of a year higher than in the previous ranges, whereas, it had been intended they would tilt like this in roudning, dropped down, whereas, at the other end of the scale in the 13,000 to 14,000 foot range that pay-out has declined from 1.32 years to 1.17 years.

Now, I am sure that there is some confusion in everyone's mind as to how I used the same data the Commission did and they made them all come out on 1.4 years and mine come out in everything less than that. Well, the answer, I think, to that is that the Commission stated their case and we have graphed it here on the basis of the forty-barrel unit.

Q Just a minute, you graphed it where?

A On Exhibit Two, excuse me, on Exhibit Two under the factors, those factors are based on a forty-barrel unit. As Mr. Macey pointed out last month, in order to maintain the daily outlet for southeast New Mexico, it would probably be possible to increase that factor by one or more barrels. Actually the data that we have indicates that it would increase on this basis one barrel, from forty to forty-one, to give the same outlet that we had prevailing during the average

month November, December 1953 and January 1954.

Now, this set of factors will give us a set of allowables which will give as nearly as possible the same daily outlet as we had during the average month of that three-month period. That is the way they are set up. So we feel that possibly that explains in some fashion why all of these are somewhat lower, since we are going to be able to give them a little more oil, and had this proposal outlined in Exhibit Two been presented last month by the Commission, had it taken into account there would be extra oil laid over to allocate back to the other ranges, that would lower the curve and their curve would run somewhere through the middle of the curve shown on our Exhibit Six.

Q Now, have you prepared an exhibit taking the factors that you have shown on Exhibit Seven and interpreted over into factors and pay-out time in years on the Shell recommendation?

A Yes, sir, I have.

MR. HOWARD: Would you mark that Exhibit Seven, please.

(Marked Shell's Exhibit No. 7, Case No. 608, for identification)

MR. HOWARD: And would you mark that Exhibit Eight?

(Marked Shell's Exhibit No. 8, Case No. 608, for identification.)

Q Now, I hand you,-- or rather first, better put it up on the board. Now, referring to Shell's Exhibit No. Seven, state generally what that is, please.

A That shows the Shell recommended plan of the sliding time pay-out as explained on this pay-out versus depth, which is our Exhibit Six, and converts the factors obtained therein on the basis of the same forty-barrel unit as used in the previous cases. Now--

Q (Interrupting) This was prepared by you, or under your direction? A Yes, sir.

MR. HOWARD: I ask it be admitted, please.

MR. SPURRIER: Without objection, it will be admitted.

Q At this time I hand you Shell's Exhibit Eight which I think you intended to use in connection with this, state what that is please.

A This exhibit is an analysis of the production data for the three-month period November 1953 and through January 1954.

Q That was prepared by you, or under your direction?

A Yes, sir.

MR. HOWARD: I ask it be admitted, please.

MR. SPURRIER: Without objection, it will be admitted.

Q Okay, will you proceed now to explain your Exhibits Seven and Eight please?

A I believe I will refer first to our Number Eight as it is necessary to have a knowledge of it to understand the complete workings of what we have done in this Exhibit Seven.

This we feel is highly important, for all to understand, since this is what we are all interested in. It represents the juggling of oil from one zone to another, and this is the part where the money is transferred from one place to another and where we are all interested. So, let me explain it in some detail, although I don't want to go through the whole exhibit.

We have it listed by depth range and particular total wells which are broken down then into top allowable wells, the number of those wells, and the percent of that number to the total wells, the penalized wells, number and percent, the marginal wells, the number

and percent, and the remarks column.

Now, we have obtained this exhibit by process of studying every well listed as producing in southeast New Mexico, separately, for this three-month period, in an effort to establish what each well is capable of producing. Obviously, there are certain limits as to how far our knowledge can extend. For instance, we come up with the fact that operator A has in a certain depth range so many top allowable wells. Of course, those wells are top allowable based only on the prevailing allowable factor and adjustment for that depth range now in effect. We are forced in making an extension of these data when we increase the depth allowable in that bracket since we have not the detailed test information in any well, to assume that if we increase it, say five barrels, that all of the wells formerly listed as top allowable will be able to produce the increased allowable. We realize that obviously that won't necessarily be true and in practice we would hardly expect all the wells, particularly where a change in allowable is substantially upward, as we have in one of the depth ranges, we would not expect all those wells to make the increased allowable. But we feel the error thus introduced will be relatively small and consequently not have any over-all effect on the validity of the data.

The reason we did this was so we could be in a position to recommend accurately to the Commission the effect of some allowable proposals which we would make, and it enabled us by trial and error, to find out just what the basic unit should be in our new proposal in order to give the daily outlet comparable to the one prevailing the average period of November through January just past.

The interesting figures we think are these. In the depth

range from zero to 1,000 feet the total wells listed were 218. Of those 218 wells, 216 were marginal wells, or 99.1 percent, and of the 218, only four wells have demonstrated the ability, in this three-month period, to make over ten barrels a day.

In the 1,000 to 2,000 range, the total number of wells is 519, of which 516 or 99.4 percent are marginal. And of this 519 wells, only 46 wells, or less than 10 percent can make over ten barrels a day.

In the 2,000 to 3,000 range there are 517 wells, of which 494 or 99.6 percent were marginal. And in that group only 38 wells have demonstrated the ability to produce over 20 barrels per day.

In the 3,000 to 4,000 foot range, total number of wells is 3,287. Now, this is the first time when penalized wells appear. The top allowable wells in that range are 551, or 16.8 percent, the penalized wells number 204 or 6.2 percent, about one in sixteen, and the marginal wells are 2,532, or 77.0 percent. And in the 3,000 to 4,000 foot range, only 663 wells make over 30 barrels per day.

In the 4,000 to 5,000 foot range, total number of wells is 884, of which 407 or 46 percent were top allowable; 53, or 6 percent are penalized and 424 or 48 percent are marginal. Now, in this range, 498 wells of the 884 have the ability to produce over 30 barrels per day. Now this is the range where we felt one of the great inequities in the old scheme lie and we propose to adjust that inequity.

In the 5,000 to 6,000 foot range, 169 total wells of which 37, or 21.9 percent are top allowable; 42 or 24.9 percent are penalized and 90, or 53.2 percent are marginal; and in that range 42

of the 169, roughly 25 percent make over 40 barrels per day.

In the 6,000 to 7,000 foot range, 580 total wells, of which 64, or 11 percent are top allowable, 201 largely in the Drinkard Field or 34.7 percent are penalized and 315 or 54.3 percent are marginal and in this group 90 wells make over 60 barrels per day.

In the 7,000 to 8,000 foot range 253 total wells of which 83 or 32.8 percent are top allowable, 71 or 28.1 are penalized, and 99 or 39.1 percent are marginal, and in this classification 90 wells make over 80 barrels per day, 90 of 253.

In the 8,000 to 9,000 foot range a total of 69 wells of which 48 or 69.6 percent are top allowable, only one or 1.4 percent is penalized and there are 20 marginal wells, representing 29 percent of the total. And in this 8,000 to 9,000 foot range, only 19 wells make under 100 barrels per day.

In the 9,000 to 10,000 foot range a total of 289 of which 154 or 53.3 percent are top allowable, five or 1.7 percent are penalized and 130 or 45 percent are marginal. And in this grouping 95 wells make under 100 barrels per day.

In the 10,000 to 11,000 foot range, 74 total wells of which 54 are top allowable representing 73 percent, there are no penalized, 20 marginal representing 27 percent and in this grouping, out of the 74 only 17 wells make under 160 barrels per day.

In the 11,000 to 12,000 foot range, 128 total wells of which 107 or 83.6 percent are top allowable. There are no penalized and there are 21 marginal, representing 16.4 percent. And in this group, out of the 128, 13 wells or 10 percent make under 180 barrels per day.

In the 12,000 to 13,000 foot range, 27 total wells of which

14 or 51.9 percent are top allowable and 13 or 48.1 percent are marginal and in this classification, 8 of the 27 make under 240 barrels per day.

In the 13,000 to 14,000 foot bracket there are four total wells of which 3, or 75 percent are top allowable and one, or 25 percent is marginal. And the one well makes under 320 barrels per day, of course, being the top allowable.

Now, we had some over-all figures here which show there is a total of 7,018 wells which we have analyzed separately for three separate months by comparing the actual production statistics as published by the New Mexico Oil and Gas Engineering Committee with the allowable granted that well as published in the Commission allowable schedule. The top allowable wells in all represent only 1,550, or 22.1 percent and the marginal wells represent 4,891 or 69.7 percent.

Now, the reason for this exhaustive study was to find out what happens when you start moving oil from one of these depth ranges, say in the very deep, the 13,000 to 14,000 and the 12,000 to 13,000 into some other depth range. Are the wells in that depth range capable of making a substantial increased allowable, otherwise if they are not, we would simply keep pushing the unit up in an attempt to keep our daily outlet equivalent and giving it to the wells which have demonstrated they can't make additional oil and taking it away from the wells that could make it. And finally we keep pushing the basic unit and cutting down out here and lose all our proration. There wouldn't be much proration if that thing were carried to extremes.

Actually, in practice we don't know where the new factors

would take us. But we suggest that that is one of the dangers of allocating in this range from zero to 5,000 feet, worrying about keeping allowables high, when by thousand foot depth brackets, 99.1 percent in the zero to 1,000 are marginal, 99.4 in the 1,000 to 2,000, 95.6 in the 2,000 to 3,000, and 7 percent in the 3,000 to 4,000.

Now, on the 4,000 to 5,000 it is about 48 percent, so we are geting up to a more reasonable assortment of wells showing the ability to produce the allowable. Now, having considered these data, we then converted a problem into an IBM problem to solve for the allowable arrangement which would give us the same outlet as prevailing during the months November through January. And in so doing we have come up with these factors listed in the first column of Exhibit 7:

In the zero to 1,000 foot range the factor based on a 40 barrel unit which--still on the 40 barrel unit basis, we will actually transfer that in a minute, this makes these factors completely relative to the factors shown on Exhibit Two, when we solve, when the Commission did their work and when we compared it with our cost data.

They show that the zero to 1,000 foot range would get a factor on 40 of .07. That would give that range an allowable of 2.8 barrels per day. We have decided to set up what we feel is a reasonable minimum allowable for the various depth brackets. We have decided that should be established from zero to 2,000 at 10 barrels per day.

Now, referring back to the statistics we have just mentioned, but four of the 218 wells in that zero to 1,000 foot bracket could

make over 10 barrels per day, so the only wells you would be affecting would be four out of 218. I submit no matter what we do, when we change these allowables around, we are going to have to trample on some toes, you can't do it, if you move from one place to another, someone's going to get hurt and someone's going to gain.

We submit the people who are going to get hurt in this case and we are sorry anyone has to, but these people have had the best situation for the past nine years of anyone in the whole picture. Now, let me point out further that in restricting them to 10 barrels per day they still have the ability if the well will make it, for .37 hundredths of a year for 37 hundredths of a year which would be less than five months. If their well will make ten barrels per month for that time it is paid out, they are just that much better off still, than anyone else and they are still gaining a proportional return on their money after pay-out.

Now, of course, that is significant in that apparently we are making quite a change, but in effect, we see that over-all will affect only the four present wells and also in affect this fellow will still have the best deal in the zero to 1,000 foot range as far as pay-out and proportional return on his investments are concerned.

Moving on through the other ranges, these factors, it might be simpler unless you want to get all sets of them, not to copy the ones I have in this first schedule since I have gone through and divided these by .675 and the second one to come up with the factors which we recommend for the new allowable setup. I will read them and give people who want them a chance to get them.

The factor from 1,000 to 2,000 will be .27 based on the 40

barrel unit and pay-out time will be 1.31 years.

From 2,000 to 3,000 factor .54, pay-out time 1.31 years.

From 3,000 to 4,000 factor .875, pay-out time would be 1.32 years.

From 4,000 to 5,000 factor 1.25 and a pay-out time 1.30 years.

From 5,000 to 6,000 factor 1.65, pay-out time 1.30 years.

From 6,000 to 7,000 factor 2.08, the pay-out time 1.29 years.

From 7,000 to 8,000 factor 2.56, the pay-out time 1.29 years.

Again the rounding is causing these figures not to vary exactly in the order we had intended. From 9,000 to 10,000, 3.78-- did I skip one-- from 8,000 to 9,000 factor 3.12 pay-out time, 1.26 years.

From 9,000 to 10,000, 3.78 factor and pay-out time 1.25 years.

From 10,000 to 11,000 factor 4.57, pay-out time 1.23 years.

From 11,000 to 12,000, 5.50 pay-out time 1.21 years.

From 12,000 to 13,000 factor 6.63 pay-out 1.19 years and 13,000 to 14,000 7.99 factor and a pay-out time of 1.17 years. Those are the same factors which result in this pay-out time.

Q As shown on Exhibit?

A As shown on Exhibit Six. Let me take one more step before I come back and clear up what might have been a misimpression on the Exhibit Number Two. The recommended plan then by Shell is based on a unit of 35 barrels per day per 40 acres for wells in the 3,000 to 4,000 foot range. This would compare in our present system to the unit which we established for the zero to 5,000 foot range.

Now, adjusting these so that that basic unit will have a factor of 1.00, we simply divide all these by .875 and come up with a new set of factors. These are the ones we recommend. I think I will skip the depth range and go slowly enough as I read them and you can copy them down.

Beginning from zero to 1,000 factor .08 the allowable, 10 barrels, which is the minimum for the zero to 2,000 foot range. Next, .31 and 11 barrels, .62 and 22 barrels, 1.00 and 35 barrels, this being our basis for 3,000 to 4,000 foot range, and 1.42 or 50 barrels in 4,000 to 5,000 foot range.

Now, this is significant, it was brought out and we thoroughly agree, that the wells which suffered the greatest discrimination under the present plan were not necessarily in the deep brackets. We thought there was possibly some discrimination occurred in the 4,000 to 5,000 foot range. Now, this, the affect of changing these allowable factors, is largely transferring oil from the 3,000 to 4,000 foot range which have had a very favorable situation, more favorable than practically anything else except the shallower, of course, than the 3,000 foot range and giving it largely to the 4,000 to 5,000 foot range which has had a longer pay-out period than any other.

Now, in actual practice the transfer represents roughly 3,000 barrels per day from the 4,000 foot range that will be going out, and roughly 4,165 barrels per day gained in the 4,000 to 5,000 foot range. Now, all that does is just put both of those on a par, they will now pay out almost in the same time based on this sliding time. They are within one week of each other. Now that is a place where we feel a good deal of the adjustment was necessary. Most

of the other adjustments by depth brackets are not large, but I will cite the ones that are over 500 barrels a day from any range.

The 6,000 to 7,000 foot range will gain approximately 1,250 barrels per day, the 7,000 to 8,000 foot range gains approximately 853 barrels a day and the 11,000 to 12,000 will lose approximately 749 barrels per day. Now, all this is after the adjustments which we have gone into in som e detail, have taken place. I will continue on. In the next bracket which should be the 5,000 to 6,000, the new factor will be 1.88 allowable 66 barrels per day. Next 2.38 and 83 barrels per day. Next, 2.92 and 102 barrels per day. Next 3.57 and 125 barrels per day. Next, 4.32 or 151 barrels per day. I point out that is exactly equivalent to the allowable now prevailing in that range. Next, 5.22 or 183 barrels per day. Next, 6.29 or 220 barrels per day. Next 7.58 or 265 barrels per day, and finally 9.13 or 320 barrels per day which again for the 13,000 to 14,000 foot range is exactly the allowable now prevailing.

Obviously, the range through here changes relatively little. But the chief adjustment is made up in this area where certain people had the most favorable situation, which was actually unfair to the other operators, and giving the oil that comes from these people favorably situated to the people who were discriminated against the most, in the 4,000 to 5,000 foot bracket.

MR. HOWARD: Will you mark that Shell's Exhibit Nine?

(Marked Shell's Exhibit Number Nine, Case No. 608, for identification.)

A In order to make it simpler for people to compare, if they do not have all the figures available I will read to you the factors, not the factors this time, but the present allowable in barrels per day by the various groups.

Prevailing, of course, from zero to 5,000 is 40; next 54; then 71, 94, from 8,000 to 9,000, 120; 9,000 to 10,000, 151; 10,000 to 11,000, 187; 11,000 to 12,000, 227; 12,000 to 13,000, 270; and 13,000 to 14,000, 320 barrels per day.

Now, using the basis suggested by the Commission last time, if the basis were broken in-to thousand foot brackets, the allowables would be, since they gave no cost below 3,000 feet, will begin from 3,000 to 4,000 where the factor is .82 and the allowable would be 32 barrels per day. Then next,at 1.27 the allowable is 50; then beginning from 5,000 to 6,000 it would be 68, 86, 104, 122, 140, 160, 190, 232, and 286, from 13,000 to 14,000.

Now, you may then compare--actually, I will give you this, then you will have the complete picture. This is our study based on our cost data using the same approach of equal pay-out for the Commission; understand we do not advocate that, but we wanted to calculate to see the over-all effect. Those allowables broken down now by thousand foot ranges from zero to 1,000.

Again, we would have factor .07, but the minimum allowable there instead of being 2.8 would be 10. In the next range it would also be 10, 10.4, which we would round to the nearest whole number. 2,000 to 3,000 foot range would be 20 barrels per day; 3,000 to 4,000, 33; 4,000 to 5,000, 46; and going down from 5,000 to 6,000, 61; 76; 93; 112; 134; 160; 190; 225; and 267. Now, I think everyone is in position to compare the exact figures there and that will make it simpler for analysis.

Q Now, Mr. Nestor, I refer you to what is marked Shell's Exhibit Nine and ask you to state what that is please, generally.

A This Exhibit is a plot of the present allowable picture as

shown by the blue line, heavy blue line stepping up and plotted as a bar graph. Since the allowables do not change except at the thousand foot brackets, we plotted as averaging out throughout the entire bracket, then the Shell proposed allowable, which we just presented, being the red curve and the minimum allowable being the green curve.

Now, let me explain; the minimum allowable is very simple. We set it up so it would be 10 barrels per day from zero to 2,000, 20 barrels per day from 2,000 to 4,000; 30 from 4,000 to 6,000 and increasing 10 barrels for each 2,000 feet all the way. Now, obviously that gives very little protection out here.

Q Out where?

A Excuse me, out in the very deep ranges. The problem we see of the minimum allowable is to formulate a system whereby market demand will not result in a premature abandonment of wells simply due to lack of an allowable. Now we submit that no well shallower than 2,000 feet will be abandoned on prevailing crude prices if it is still capable of producing 10 barrels per day, so if we set a minimum allowable at that range no one in this room, I believe, can make a statement that it will result in a premature abandonment of the well in that range. We feel, moving through the other ranges, no well shallower than 4,000 foot would be abandoned, in the 2,000 to 4,000 foot range, would be abandoned if it had an allowable of 20 barrels a day, since a great many wells in that range make considerably less than that today and are not being abandoned.

Again, you reach the conclusion that out here someone says you don't give much protection out there.

Q Out where?

A In the deeper ranges. We are of the opinion that if we ever get to that shape where we had to cut back the allowable to that level, the oil business has pretty well gone to pot anyway, so maybe we better get in uranium.

Q Your 9,000 to 10,000 and 13,000 to 14,000, your red lines?

A In the 9,000 to 10,000 foot range and 13,000 to 14,000 foot range as we indicated on, I guess it is Exhibit Number 8, the previous one, no, it was Number 7, Exhibit Number 7, the allowable is exactly as prevailing today. The allowable 9,000 to 10,000 and 13,000 to 14,000. You can see there is very minor variation in the allowables we propose in these ranges from those now prevailing that we have a moderate increase in the wells from, I should say, 7,000 to 9,000 feet. And a marked increase in the 4,000 to 6,000 foot range. The 4,000 to 5,000 and 5,000 to 6,000 and the 6,000 to 7,000, also.

Now, we personally, as we have indicated this morning, do not necessarily hold that this is a true picture of what should happen in here, since--

Q (Interrupting) Where is that?

A In the, particularly, in the 5,000 to 6,000 and 6,000 to 7,000 foot ranges. That being because we questioned the over-all value of the cost data in those ranges and, consequently if those data are incorrect, then our proposal based only on those data would also be incorrect in the same order. But, we feel that other than in those ranges running from 5,000 to 7,000 feet that this is a reasonable and equitable distribution of the daily outlet now available to the southeast portion of New Mexico.

Q Distribution on the basis that you have shown in your recommended plan would maintain the present outlet?

A Yes, sir, it will--

Q (Interrupting) And allocate the oil to the--

A (Continuing)--Within one percent.

Q And would allocate the oil to the wells that could make it?

A Yes, sir. Now, this analysis we made of the wells was not purely on an allowable basis since many wells are nominated for 40 barrels per day which actually in practice they may make only five or twelve, or twenty-three or some figure substantially less than that.

We went to the trouble to isolate each well and determine whether or not it could make the allowable as demonstrated over three-months period, the idea being certain wells will fluctuate maybe several barrels in any one month and make it up on the next two or following month. In that way we have attempted to analyze and we now feel we know what each well in the state could do at that time and that we feel is the best yardstick that was available to us since there were no production figures available at the time of the study after January 1954.

Q Let me ask you again for the record, as I understand it you are not at this time urging a change by the Commission in their factor schedule?

A No, sir, that is not our idea.

Q Your only purpose in presenting the information is that if the Commission is going to make a change you consider that the Shell recommendation would be a fair and equitable basis of change?

A Yes, sir.

Q That is correct? A That is correct.

Q Do you have anything else?

A I believe that is all, Mr. Howard.

MR. HOWARD: I believe that is all, sir.

MR. SPURRIER: Take a recess.

(Recess)

MR. SPURRIER: Mr. Howard.

MR. HOWARD: If the Commission please, that concludes Mr. Nestor's testimony, we have no other witnesses.

MR. SPURRIER: Anyone have a question of Mr. Nestor? Mr. Macey.

CROSS EXAMINATION

By: MR. MACEY:

Q Mr. Nestor, I would like to know first of all, you said that the information as to the tabulation of the wells was not accessible to you as to which wells the Commission used in making this study, is that correct?

A Yes, sir. What I meant by that, Bill, was that when I left here after speaking with you I had no reason to believe, I mean it had not occurred to me that the data might show these severe, what we consider, deficiencies, and once I got away from here I didn't, since you had not made the wells available, I questioned whether it was right for me to come to you and ask for those data. Rather than that we went through the laborious task of trying to isolate the wells by exact depth and to do that we tabulated every well completed in the state last year, and by working it down by depth range we were able to discover where the most critical wells were drilled and who drilled them. I wasn't reflecting the data

was withheld, it was simply a matter of timing. I got away from here before I realized I needed to know that.

Q Mr. Nestor, didyou go over the exhibits that we introduced?

A Yes, sir.

Q Well, we have got an exhibit here, Number One, introduced that has the name and location of every single well in this.

A I guess I didn't see that one when I asked for the record, I guess I didn't get one of those.

Q Actually there were two copies in there.

A I see. Well, that is unfortunate, it would have saved some time.

MR. MACEY: That is all I have right now.

MR. SPURRIER: Anyone else? You mean to tell me Mr. Nestor talked all that time and nobody's going to question him?

By: MR. LAMB:

Q Mr. Nestor, did I get an impression from you, you thought there were inequities in the present system we now have?

A Yes, sir.

Q That they do exist? A Yes, sir.

Q Possibly in the 5,000 to 9,000 bracket as being too low and the 9,000 and above as too high and 4,000 to 5,000 as too low?

A Definitely in the 4,000 to 5,000 I think that the quality of the data in the 4,000 to 5,000 foot range is such that we could say almost unequivically that those, that there is an inequity existing in that range.

I am not wholly convinced, since I feel that not enough representative data have been available officially by the Commission.

We attempted to work with the Commission data since we felt it would be unfair to go on our own and introduce data from other people since we would subject them to criticism for having selected data which happened to fit our ideas of the thing. So we chose not to do that, feeling rather that maybe the Commission, if they felt further study were necessary, would request and disseminate again the data which we think ought to be added to the study, but pending receipt of those data, I am not wholly convinced exactly what should happen the, let's say, the 5,000 to 8,000 foot range.

Actually, I think there is probably little possibility of change in the 9,000 foot, most of the data we had indicated that that is the place where the curve, no matter how you study the thing, the curves seemed to approach each other in the 9,000 foot range. But from 5,000 to 8,000 I would rather reserve my opinion as to what might happen if we had better data, but the data we used, do indicate that we should add some oil in those ranges and we have so recommended.

Q In your mind, I believe you stated the information was faulty, I believe that was the word you used?

A I may have.

Q With this in your mind, using faulty data, wouldn't it be a little risky to make calculations and recommendations? Would you not possibly develop more inequities than you solve?

A We were informed by the Commission last month that they didn't intend to carry this hearing over. We assumed that that meant we were going to work with the data available, that we wanted to try to analyze in the best manner possible the data they had made available to everyone and not cause a delay, when we requested

new information. Therefore, we have made this, we represent it as the best study we were able to make from an equitable standpoint of the data presented by the Commission.

Q At the last hearing I got the impression that an exact formula for the calculation of geophysical cost into the development proposition figures would be presented here.

A I don't believe the record will show that we said we would give an exact formula, we can refer to the record.

Q In other words, you don't have it?

A We certainly do not, we have so testified.

Q In your company's operation, Mr. Nestor, can you tell me what you consider the economic limit of your production?

A As far as we are concerned when a well ceases to make money by continued operation, that to us is the economic limit.

Q You have a number of barrels per day production average, do you not, somewhere?

A No, I wouldn't say that because I think there are a number of factors which would determine such things as the amount of gas you might be able to produce from a fairly small capacity well, if you had substantial gas sales, and since this is concerned largely with the oil rather than with the gas, then, of course, you couldn't make an over-all statement, I feel.

Q Well, supposing you had a lease of an average number, say eight wells. At what limit would you have to break your operation if that were an isolated lease?

A In what depth range?

Q Well, say 5,000 foot range.

A Would the wells be on the pump?

Q Probably.

A Well, anything I say here, of course, would be in the nature of a guess. We analyze our costs by statistical method to find out whether or not we are making any money. We have all the leases coded and the field locations coded and we are able to arrive at an exact answer to such a problem; whereas, I am being asked to make just a guess and I wouldn't know except that I would guess it to be in the neighborhood of three to five barrels per well, maybe per day.

Q That is considering--

A (Interrupting) That of course, when you say isolated, how isolated is it, is it twenty miles from anywhere or fifty miles from anywhere.

Q Now, I gather that in various range depths you have given a point zero one year decrease in the pay-out period, and another range depth which is greater, at .02 years.

A Correct.

Q Those being in the greater depths?

A Yes, sir.

Q Would it be that you think the greater depths need some advantage in pay-out?

A We have testified at length as to our reasons for that, Mr. Lamb, they are the extra incentive to develop the undiscovered reserves which we feel are yet to be found. The factor of the geophysical costs, which we have attempted to show is tied into this expanse of deeper drilling activity in the state and the risk factor, was explained as our basis.

Q Don't you think that the exploratory drilling since 1945

down to the present in the greater brackets, the greater depth brackets, must have given some operators an incentive?

A I don't know what you mean by that.

Q In other words, the allowable condition which exists, the great number of wells which have been drilled since 1945 doesn't that indicate that there is an incentive there already?

A Yes, I would say that it does.

Q What will your proposed factor shallower than 5,000 feet do to the incentive of drilling at that depth?

A The way I see it, Mr. Lamb, that is the place we are talking equities and if you want to be equitable, that is where the revisions must be made. Now, the substantial showing that we have made here, the data speak for themselves. I am not here to debate that, but it is clear that wells in the 4,000 and shallower ranges have had a very beneficial picture as regards pay-out and income after pay-out. Now, we much consider that we are not speaking only of the wells which were drilled last year, we are speaking of all the wells in the state. And, consequently, we feel that if that is the place where the inequity has been, that is the place to go and correct it.

Q If there had been a great inequity in the shallower than 5,000 foot bracket, it is surprising to me that a great number of operators would not have taken advantage of that great range depth.

A I don't understand what you said, ask it again.

Q If the great advantage exists shallower than 5,000 feet, would it not be surprising that more operators would not have drilled in that depth range?

A Our argument to that is we feel that most of the pools in

that range have been discovered and consequently it is more important to foster the development of the places not yet discovered.

Q In a recent publication there has been a reserve statement as to the proven reserves in the State of New Mexico. Do you happen to have that figure? A No, sir, I do not.

Q I think it was filed with the Commission, seven hundred and sixty million barrels of oil, and the greater percentage of that is lesser than 5,000 feet.

A I think I indicate that in my testimony, Mr. Lamb.

By: MR. WILSON: Mr. Wilson: Parker Wilson.

Q Mr. Nestor, would you give me a guess as to how much the cost of drilling wells to the 5,000 foot depth has increased since 1945?

A I could not give you a guess. We have not made a study since that was not within the scope of the hearing. We have analyzed some data over those periods, but I could not give you any factors to indicate what the difference might be relatively.

Q We have some figures that indicate it would be double, that joint cost today with, are double what they were in 1945.

A I would say our data would not indicate that.

Q Not that much? A Not nearly that much.

Q But a substantial increase?

A Not anywhere in that order. I am speaking from the figures I have looked at and I know that is not reasonable from our experience. It may be something you have observed.

Q In any event, the deeper wells, I would say at the 11,000 to 12,000 foot level, the cost of drilling them has gone down considerably, is that right?

A Yes, if you consider the fact that the only wells drilled, of course, at first were exploratory wells, but remember, we have to pay for those too.

Q I mean generally, country-wide, the technological improvements have been mainly toward the benefit of the deeper wells, isn't that a fact?

A Well, I don't know that that would be true. It might be in some particular part of the country, yes, I think they are. For instance, the chert bit has possibly helped a great deal, and the jet bit. The jet bit also works in the shallow hole, of course.

Q Until you advocate the allowable below 5,000 feet be decreased, the factor be decreased, and the factor for the deeper be increased.

A Very definitely, since the cost data submitted by the people in that period indicated while their costs may have risen, they have not risen disportionately to the rest of the scale.

MR. SPURRIER: Anyone else?

MR. KEOHANE: B. M. Keohane.

By: MR. KEOHANE:

Q You were advocating the figuring of the cost of the shooting into the cost of the wells. Would you also want to take into consideration the cost of the acreage acquisition?

A No, sir, since we figure over all that a certain amount of acreage obviously happened to lay over a shallow pool thought to be very rich, or over a deep pool thought to be very rich, should average out. Pure wildcat, I presume the cost would be relatively the same.

Q You talked about the East Caprock wells, you had $25,000 worth of shooting and I believe $25,000 worth of lease acquisition

on those two wells.

A That is correct, but we have not thrown that cost in at all.

Q It should be figured if you are going to figure the shooting.

A No, I don't agree. That is open for discussion, however, but that was outside the scope.

MR. KEOHANE: That is all I had.

MR. SPURRIER: Anyone else?

By: MR. MACEY:

Q Mr. Nestor, I believe I am correct in saying that you recommended a ten barrel per day allowable, to wells from zero to 1,000 feet, as a minimum. And under your proposed 35 barrel per day unit allowable your zero to your 1,000 to 2,000 bracket would get 11 barrels a day? A Yes, sir.

Q Have you taken into consideration the fact that a great many of the pools in the bracket from zero to 2,000 feet are drilled in some instances on 10 acre spacing, and that the operators have invested four times what you estimated?

A The fact that you didn't introduce any data in the study to cover that, of course, made it difficult for us to come up with any other answer. We don't submit this is the only solution to the problem. We submit had more data been available we would have been able to make a better study; I agree to that extent.

Q You mean we should have listed that and told you those wells were developed on 10 acre spacing at the time of the hearing?

A No, more data given in the hearing, and if that were a factor, that is something the Commission would have to study, whether or not the spacing pattern must be altered in the shallower pools and what should be done to preserve the equities in those cases.

Actually we have an established, we feel that if a man drills one well on a 40 he can pay it out as far as anyone else who drills a well on a 40; if he chooses to drill two wells on the 40 it becomes a problem as to whether or not he is entitled to pay out both of those wells faster than anybody else in the state. It may be that is true. If so, I presume that will be considered.

By: MR. SMITH:

Q Mr. Nestor, one or two questions if you please. As I understand it, all your data based both upon your recommendation and upon your prior analysis has been upon data which was submitted to the Commission and in turn submitted back to the operator?

A Yes, sir.

Q In making your selection you eliminated certain wells because of weighting and errors? A Yes.

Q Going into the matter, I would like to know if you have a recommendation as to the manner or method whereby a more careful sampling could have been acquired by the Commission?

A Mr. Smith, I think along those lines that sampling technique is a very advanced part of statistical analysis and it is the most demanding part of it. Consequently, we feel the best sample is all of the cost. It would be far simpler to analyze this problem with all the wells drilled, of which costs were available over the last ten years, than it was to analyze with the data we had.

Q In other words, one year's period may have an additional weighted factor which may not have been mentioned, which is, if you, if that particular year should have very few discoveries of new fields and, thus, a relatively slower amount of development wells coming about by reason of that fact, that in that event it would be

a fairer sample to have taken, say a three-year period which would be more representative of the development in a particular field, having in mind of course, the fact that as you go into a field and drill wells and learn more about the faulting and the various problems you have in drilling the wells, you can cheapen the cost of those particular wells? A That is correct.

Q Your recommendation, then, as I gather then,--of course, the ideal situation would have been to take the last nine or ten years, all of the costs and worked a pure arithmetical average?

A Or then go through and try to isolate those wells which obviously were the result of poor practice, or have had unfortunate conditions which befall all of us.

Q In view of the relatively small samples taken, the use of a strict arithmetic average would be bound to lead to error, in various brackets? A Yes, it would.

Q It would be better, more preferable to do as you did in this case which, I assume, was a modified version of the method?

A That is right.

Q Have you given consideration with respect to the media to go through?

A Of course, we considered that, and considered everything and felt it reasonable to retain as much of the data as we felt were reasonably relative of that portion of the data which were submitted to us.

MR. SMITH: Thank you.

MR. SPURRIER: Anyone else?

By: MR. MACEY:

Q Mr. Nestor, you quoted some figures on the number of pro-

ducing wells, I believe they were producing wells which were producing as of the beginning of 1945 in the zero to 5,000 depth range and below 5,000 I believe it was below 5,000, and--

A Yes, sir.

Q What was the zero to 5,000? A 4,180.

Q 41 what? A 4180.

Q Now, do you have the breakdown as it occurred during your study, I don't know what date you used, but you used the total of about 7100 though? A I see.

Q I have something here, is it 7115 total?

A That is correct. And there are also added to that 78 so-called distillate wells which are largely dual completions, for a total of 7193. That was as of April 1st, 1954 taken from the official proration schedules. We realize, of course, they also lag some in new completions. That is only an approximate figure, but the best we have.

Q You drew a conclusion from those figures that there has been more deep wells drilled since 1945 than shallow wells?

A Yes.

Q Now, you are comparing producing wells in 1945, some of which had been in production for 18 or 20 years?

A Correct. Well, wait a minute, no I just compared the producing wells, I think that were drilled in the interim, did I not? I may have mis-stated it.

Q I wanted to clarify that. I wanted to find out if you definitely established the fact that there were more deep wells drilled than shallow wells and if so, how you established it using producing wells, because there certainly have been a flock of wells

plugged since 1945.

A I see, the net gain would be a net gain in both, net gain and net loss in both the groups, and I have not taken that into account. So whatever variation would enter there, would effect these figures.

Q Your statement that there were more may not be correct, isn't that true?

A On that basis it may not be, I could better state it, appearing in the proration schedule.

Q I want to find out from you how you can drill a well too cheaply? A Too what?

A You said you could drill a well too cheap. Now, how can you drill a well too cheap?

A Someone told me,--you mean the well we threw out?

Q I don't know which one you threw out, you said you could drill a well too cheap. I see how you can drill a well and cost you too much, but I can't understand how you can drill a well as relatively cheap.

A Well, Mr. Macey, all I can say to that is I found so many warped and twisted pieces of data in there I was afraid some error had been made, and in making a pure statistical approach I thought it would be fair to all to drop the low well out. Actually it would have indicated the cost of the average well in that range was lower than we used and resulted in cutting further the 3,000 to 4,000 foot bracket. But we eliminated that well because of the fear that possibly some part of the cost had inadvertently been omitted since the grouping of the rest of the wells was reasonable and that would appear unreasonable. Someone told me today as far as he knows

that well,--I can't tell you who it was, I don't recall but as far as he knows those costs were accurate, in which case the well cost is accurate.

Q I believe it was a well, if I am not mistaken. I can't remember the number of it, I think it was the Texaco-Link Well, if I am not mistaken.

A Probably was.

Q I can't remember which one you referred to.

A If we had complete well reports on all the wells and knew that all the costs were broken down exactly the same by all the operators and tabulated across the page so much for cementing, so much for mud, so much for coring, so much for drill stem testing, I would not have been forced to make that decision. But without those figures, and run into the fact that certain of the costs, even though you had warned the people as I remember, not to include artificial lift or tankage, that inadvertently, without any malice, those figures had been submitted including those costs. And that was part of my concern. I just didn't know. Had it been my own company I could have tracked it down to find out exactly why we do, find out we drilled it five days faster than any other well in the pool. Your question is then, it couldn't be too cheap, it was just the best well drilled.

Q Have you made any effort to attempt to superimpose the present allowable curve on your curve that compares the recommendations that the Commission made and the curve that shows your recommendations, have you made any attempt to put that down?

A No, sir, we have not.

Q You have any idea what it might look like?

A No. I have an idea I could tell you what the allowables

would run, possibly, for the same outlet, I mean I could calculate them here if that would be of value.

Q No, I think that is all right. I would like to ask you if you have any wells that are producing, say in the zero to 3,000 bracket?

A Do we have any wells in that bracket?

Q Yes, sir.

A Just a second, I can tell you, Mr. Macey. Our figures indicate that our first producing wells are located in the 3,000 to 4,000 foot bracket.

Q All right, then, you couldn't hardly know from your company's standpoint what the economic limit would be on a well anywhere in the zero to 3,000 foot bracket except by guessing?

A Mr. Macey, I think that is a bit naive statement to make in as much as we operate in many states where we do have the shallow wells. I have experience in the State of Texas which has operated from our division, and we do have shallow wells in the other states, too, and I can say only that in general, no one in here will abandon a well at 10 barrels per day in that range. I don't believe anyone will challenge that.

Q All right now, you stick by the strict theory that when a well is on a lease, assuming that the economic limit of that well is five barrels per day, that well drops below five barrels a day, you just abandon that well, is that right?

A Normally we do not immediately. Generally we study to see if there are work-over prospects to improve the productivity and so on.

Q You obviously, then, must allow the other wells in the lease

to make up the slack for that one, don't you?

A To make up the slack?

Q Well, if you are losing money on that particular well on that lease, you must operate in the lease at a profit. Now, I am not going into the point whether you could work the well over economically or not, we will get to that in a minute, what I am getting at is you may not have all the wells on a lease that are economical to operate as a single well, but you continue to operate that well, don't you?

A Well, we don't if we can recognize an uneconomic unit. Obviously we don't operate at a loss anyplace deliberately, not deliberately, I don't say we don't through inability to know the exact facts to such a thing. As soon as any prudent operator found out it was costing him money to operate B-27, he is going to stop operating, if he is satisfied there is no further trend of action which will enable him to make that a money making proposition for him again.

Q Now, if you had a well which was on the economic limit the decision which you would recommend to your company as to whether you would work that over or hydrofract the well, any kind of remedial work would depend on the kind of allowable you could produce out of that well? A Correct.

Q Don't you think the tendency for remedial work lies greater with the low allowable? A Would you repeat that?

Q Don't you think that the tendency toward remedial work lies in the wells with a low volume, low income?

A Yes.

Q Therefore, doesn't it stand to reason that if you are going

to work over a well, you have got to have some incentive and an allowable to work that thing over?

A All right, Mr. Macey, consider this. Do you suppose--I will ask this question, pose it, and answer it. Do you suppose the cost of working over that well is going to exceed the cost of drilling another well to that depth? If it does not, then you are not entitled to any more incentive in that range. If it does we probably ought to drill another well or forget about it.

Q Well, all I know is this, Mr. Nestor, that down in southeast New Mexico we have got a lot of wells with very small allowables. They are small allowables because the wells can't make any more, they are marginal wells. And I know that unless some facilities are afforded those operators to produce on some other lease, or some other property even, and allow them to make some money to flush production at say 40 barrels or 35 barrels allowable, then they are not going to work those wells over and they are going to abandon those wells. Now, you may not, your company may not operate that way, but I believe that a lot of operators do and I believe that if they were here today they would bear me out on every word I said.

A Well, a prudent operator, it seems to me, if he can work over the well at less than the well cost,--now we have been talking about the shallow wells. Let's remember the deeper wells get into the same stage. We have a very unfortunate situation happen to one of our wells in the Echo Pool recently where we just managed to junk and abandon a very expensive property that just cost us one hundred odd thousand dollars, Mr. Macey. It doesn't just happen in the shallow ranges and we had taken what we feel were the normal precautions, but we had extremely bad luck and lost a lot more money.

It will take quite a while for anyone in the shallow ranges to equal the cost of the deep well, and we were working in an attempt to make a better producer, and we had--

Q (Interrupting) That is part of the risk factor.

A Yes, it is, we feel.

Q Do you have any definite recommendations as to how this project could be continued, abandoned or something done with it?

A Well, I suppose if you asked everyone in the room everyone would have a good idea how to do it, and I don't suppose mine would be any better than anyone else's, but I believe a more reasonable answer could be evolved where we consider all of the data available from all the companies and make every effort to define exact limits of certain companies and have everyone break down their costs in that pattern so we will know what is a representative figure, and what is one which just, as I say, represents a very unfortunate thing, which we are not trying to consider in setting allowables, or a very prudent operator, and I presume we could all qualify for that.

And we had such a study, since there have been a great number of wells, almost half the wells now producing in the state have been drilled since 1945. We have increased from some 4180 to 7100 so if we were to go back that far I think we might be able to arrive at a more reasonable picture, and I think every effort for it should be made by study and consultation before asking for the information from the operators to pin down just what we are going to define as a drilling cost and as equipment cost and as special service cost. I mean define there, and actually, I think it would be better if we submitted, further broke them down in the special services to

logging and mud, cementing costs and so on.

That would be my recommendation. But I realize that one man probably is not in position--I have studied this problem at great length and I certainly have learned some of the things that would tend to make this study better. That is no reflection on the people who have contributed thus far, either their ideas or data, but unfortunately I think what we have is not adequate to give a good answer, so the decision as to whether or not we go ahead, I think, rests with the Commission. But I would make those recommendations and I think we ought to go back to at least the post-war period when, probably cost date,--we I know have our detail cost data in good shape back to 1946 and would be happy to go through the whole thing again if necessary to come up with the equitable solution.

Q Well, one thing on that point you brought up, has there been a big or small increase in costs since 1947 or '48 to the present, in 1953?

A Has there been a big increase? Speaking from our own data, I would say generally speaking there has not been as much of a change in cost as I expected. I don't know what others expected, but I have looked at a great number of wells and I have not seen that great increase. Of course in studying those wells I studied wells from nearby pools, whether in New Mexico or not, simply to gain enough information to make a logical approach to our problem here.

Q Now, from your own information, from your own recollection back in 1948 you drilled quite a few wells down in the Drinkard Pool? A Yes, sir.

Q Do you, offhand, know approximately how much those wells cost in 1946?

A Yes, sir, I do. We have the company's curve hidden there. I believe the figures I noted by way of comparison, I will just take a group of wells drilled in late 1947 on our Argo and Argo A leases in the Drinkard Pool and the costs of these four wells were respectively: $79,684.43; $79,242.94; $91,931.87; $78,933.69. And I can see here that the average depth of those wells was approximately 6600 and say 35 feet.

Now, we also drilled in late 1952, our Andrews One, I believe--yes, in the Drinkard Pool, and we completed that well at 6613 feet in September of '52 for $97,000. Drilled our Taylor-Glenn Six to a total depth of 6707 for a completed cost of $90,600, so actually two of the wells were substantially the same as the highest well and the others were some ten to $12,000 higher than, or they were some ten to $12,000 higher on the average than the other four wells I mentioned. That relationship is something I have not analyzed.

I might add we also drilled our Brazelle Number 8, completed it in October of that year, of 1952, at 6513 feet at a cost of $74,100. So it is actually lower than all of the four wells that I cited before.

Q That was a cheap one? A Yes, it was, I agree.

Q All right, now, if you use that same data, say at eight or nine year periods, and you compared drilling costs in 1946 and '47 with the drilling cost now, you are going to end up with a pretty big spread of figures, aren't you?

A Well, Mr. Macey, it occurs to me this way, that we would have

logic in how we do the thing. Of course, it might be as we studied the problem we would make individual studies year by year and attempt to correlate from them. I don't know, I strongly suggest an attempt be made, if you desire to go ahead. We do not agree that the drilling costs have increased as sharply as some people feel. I admit I was somewhat surprised myself, and I think it is a bit foolish to consider the deep costs are plummeting, getting cheaper every day. That is not true. I assure you of that. And, also, we have considerable information to which we have not really gone into to show a number of the wells selected were actually cheaper than might be the average for certain people in those deep ranges, but we chose not to make any comment on that.

If we go into a further study all those data will be available. I will tell you it is going to be a severe problem to do this. It is an important matter; if it merits attention, I think we ought to give it all we can.

Q You mentioned a risk factor in losing wells. Do you know how many wells were lost during the year 1953 in southeast New Mexico?

A No, sir, I don't.

Q Well, I think there were some, but I don't know which ones they were. They may have had flared them, but they didn't end up--

A (Interrupting) No, wait a minute, now you mean in drilling operation?

Q That is what you were talking about.

A Well, sure. But I mean if you, it is just a matter of logic whether there were any or not. Let's be logical about the thing. If a certain,-- we are all in agreement wells have been lost in that manner and let's not just talk about 1953, since we are treating

all the wells drilled from the discovery of the first well drilled in the State of New Mexico. We are regulating it's allowable too, so let's consider the facts for all the wells and actually I think more largely we were speaking in the risks of drilling the dry holes rather than losing a well, that being a secondary possibility.

Q You cited the fact that we would, first and everything else, you were talking about losing wells, and I didn't realize you were including that, or making that a separate issue under the risk factor. I realize you have a risk factor whenever you put a hole in the ground. I wonder if you could name me where that was a very significant item in consideration on any kind of study?

A Possibly that risk factor is not today serious as structural legislation. The deeper pools are smaller, I think you agree to that. Anyone who has made a cursory study, even of the size of the pools in the state will have seen that.

Q Have you made any tabulation to the approximate over all cost of seismograph figures in the state?

A For all companies?

Q Using your figures? A No, I have not.

Q How much does it cost your company to operate seismograph crew for a month?

A A crew month? We do not have that figure available, Mr. Macey, we have the total figures which represent the---we made a breakdown rather than on that basis instead, on the cost of continuous profiling and the cost of reconnsissance; we don't have the breakdown that you would like. We could relate it I believe to total crew months and total cost. You might try that since we do have those two figures available.

MR. SPURRIER: We will take a ten minute recess.

(Recess)

MR. SPURRIER: Did you have something, Mr. Nestor?

A Yes, sir. In answer to Mr. Macey's previous questions, the first answer I would submit is the one as to the cost of a crew month of geophysical work and we find that approximately $35,000 to $36,000 for the work that we are doing in New Mexico now.

Now, in answer to a previous question as to whether or not any wells had been lost in the state, I have had a chance to call to mind a well which we did lose last year that was drilled at great depth, that being Pacific Royalty Number 2 in the Denton Area. We were forced to abandon that well at a depth approximating 11,000 feet, and plug it back to a Wolf Camp producer. We then went back in and drilled an unnecessary hole to the Devonian which was dry. Now that, as far as we are concerned, we drilled two wells there where we might have only drilled one. Again we lost considerable money. So that is in answer to your question as to whether any wells were lost in this risk factor, that is one; when you talk about those wells at that depth, they run in the neighborhood of $300 odd thousand dollars, particularly when you have trouble, and we had lots of it.

MR. SPURRIER: Anyone else have a question of Mr. Nestor?

MR. WADDLE: Ross Waddle representing Magnolia.

By: MR. WADDLE:

Q Mr. Nestor, on the data that was gathered by the Commission, some of the wells called for were company drilled and some of them were contract drilling. There is one way you look at it in the sense that the actual direct cost as reflected by the company's books

would be lower on a company drilled well for the reason that the contractor's profit is not in there and the fact that you are self-insured and don't have those insurance premiums that are high for that drilling contractor, is that right?

A Yes, sir, that would be true of any such wells.

Q Therefore, in any study you might work out that would be a factor to consider when you gather in your data. We had that problem in furnishing the data to the Commission as requested for Magnolia. We see those wells which we drilled were considerably lower than the contracted wells at the same depth, side by side.

A I think that would be an excellent recommendation for any group to go and consider this thing any further.

MR. SPURRIER: Anyone else? Mr. Lamb.

By: MR. LAMB:

Q Mr. Nestor, I gather from your testimony that you would think it would be advisable to have two million dollars invested in one hole should be returned to the operator faster than two million dollars spent in several shallower holes.

A I suppose if you want to twist the thing completely you might state it that way.

Q Now, how many wells did your company drill shallower than 4,000 feet this last year?

A Shallower than 4,000 feet?

Q Yes.

A My records show, Mr. Lamb, --was that 4,000?

Q 4,000.

A That we drilled one gas well in the 2,000 to 3,000 foot range, that we drilled one oil well in the 3,000 to 4,000 foot range and

another gas well in the 3,000 to 4,000 foot range.

MR. LAMB: If the Commission please, if it would be of any interest or value to them, I have, I could betalked out of my file on the 1945 drilling costs, this figure by the 1945 Committee, if it is of any interest.

MR. SPURRIER: Is there objection to Mr. Lamb's offer of the 1945 information upon which this original curve was compiled?

MR. SMITH: I would like for it to be better identified as to the source and nature and how it happens to be in Mr. Lamb's possession.

MR. SPURRIER: Well, Mr. Lamb, for your information, was at that time chairman of that committee.

MR. LAMB: Secretary, Mr. Spurrier.

MR. SPURRIER: Secretary.

MR. LAMB: It is just a tabulation from my file of the drilling costs, if it is of any value, it is available.

MR. SPURRIER: Without objection, it is admitted.

MR. HOWARD: Is that the information the Committee had before it at that time in 1945?

MR. LAMB: Yes, sir.

MR. SPURRIER: Anyone else have a question of Mr. Nestor?

By: MR. MACEY:

Q Considering the curve which you have recommended and the curve which the Commission staff recommended, is there any great difference below the 5,000 foot point between those two curves?

A I can speak of one outstanding difference, in that you didn't carry your curve below 3,000 feet.

Q That isn't the question I asked you, below 5,000 feet.

A You mean deeper than 5,000 feet?

Q Deeper than 5,000 feet.

A I understand, yes, I would say there are considerable differences there, Mr. Macey, from a percentage standpoint. I refer you to the relative costof a well drilled atabout 6,250 feet. Your curve would indicate a cost of $100,000 there. My curve indicates the cost ought to be about $88,000. Now, that is a flat difference of 12 percent right at that point.

Q Isn't it a fact though the reason, did you throw any wells out of that? A We certainly have.

Q Isn't that the reason why it is lower?

A Had the truth been known about the wells in that thing we feel they wouldn't have been as high. I could give you testimony except they are not my wells, and I don't prefer to enter them in this record. There were a substantial number of wells drilled in this same pool at much lesser cost down to $84,000, to be exact. Also, some of the wells that you have included in there have pumping units. I have that on the statement of the companies who submitted them.

Q All right then, this curve, this red curve that you have drawn here is not necessarily completely limited to the wells that you used in that bracket, minus the ones that you threw out. Did you use somebody else's information?

A No, there are, there is no consideration of those. If the true information had been given, we think, if all the facts were known, the curve would more nearly approximate the red line even than your curve would have. We just feel that way.

We don't have all the figures either, but we do have a group

of figures submitted by the same companies who submitted these to date. Those were high cost wells and that, at least in one case, one of them included tankage and a pumping unit. That is why they are high; such things as that. Another one was announced to you as having been the most expensive well drilled by that company in that pool, yet you choose to include it. We think it would have been more relative had that well been ignored, possibly.

I might add the red curve is our plot by lease squares of the 122 wells which we have cited as being considered.

MR. SPURRIER: Anyone else? No further questions, the witness may be excused. You have another witness?

MR. HOWARD: That is all I have.

MR. SPURRIER: Anyone have any further testimony to present in this case? Statement or testimony.

MR. SMITH: We have about five minutes worth of testimony. I would like to have Mr. Hiltz sworn, please.

(Witness sworn)

MR. SMITH: I might make a preliminary statement at the outset, I should like to state we are in agreement with Shell wfrom the standpoint that we consider the former factors satisfactory, I mean the former setup used, and that we are also in agreement with their analysis, perhaps the data collected may be faulty, from a Stanolind standpoint.

My purpose in profering testimony at this time is to see if we can't show a slightly different method of approach to the matter, which in this particular instance tends to support the former factors that have been in effect. I have in mind, of course, that the essence of Shell's testimony has been to result in leaving the former

factors dangling with inference being they may be arbitrary. I think the testimony we are getting ready to offer may serve to demonstrate the original factors may be distorted.

R O B E R T G. H I L T Z

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By: MR. SMITH:

Q Mr. Hiltz, have you made an analysis of the cost of certain wells drilled during the years 1951, '52 and '53 in the southeast New Mexico area?

A Yes, sir, I have had available to me data on all wells drilled by Stanolind Oil and Gas Company or participated in by Stanolind during the years 1951, '52 and '53. I have at this time a tabulation of all the wells drilled by Stanolind during that period.

MR. SMITH: I would like to have this marked as Stanolind's Exhibit One.

(Marked Stanolind's Exhibit No. 1, Case No. 608, for identification.)

A I should like to remark further this tabulation does include all wells drilled in and participated in by Stanolind and no attempt has been made whatsoever to distinguish between wells, eliminate any or omit any for any purpose. However, they are confined strictly to development wells. There are no wildcats or exploratory wells included.

Q And these are all of the wells of Stanolind and those which Stanolind participated in? A Yes, that is correct.

Q Now, have you taken the data and plotted it on to a chart?

A Yes, sir, in a manner similar to that employed by the Commission and Shell. I have prepared a graph in which the cost of each of these wells has been plotted as a function of depth. Indicated on this graph are the Stanolind wells by a blue dot. The blue circles indicated on this graph are simply the average cost determined at the average depth of each bracket for all of the Stanolind wells. The manner employed in determining those averages was identical to that employed by the Commission. In addition to the Stanolind data, certain data were also made available to us by Atlantic Refining Company, that data has been placed on the same graph with red dots.

Q You have a separate exhibit with the Atlantic data on it?

A Yes, sir, I do.

MR. SMITH: I would like to have that marked as Stanolind's Exhibit Three.

(Marked Stanolind's Exhibits three & four, Case No. 608, for identification.)

A Data furnished by Atlantic on a total of 22 wells and they have been also included on our plot of cost versus depth.

Q Have you had occasion to compare the data acquired in this manner with the factors, present factors and the proration formula and also the factors proposed by the Commission at the last hearing?

A Yes, I have. Our objective in analyzing these data in this fashion was principally this. It was our thought that the sampling by the Commission was not necessarily representative of the average cost in each depth bracket. We felt that there may have been too few samples which were representative of a longer period of time of development of the field. It was our objective to take a different set of data and analyze them in a manner identical to the Commission

and determine whether or not we would arrive at similar factors.

Therefore, we took our cost versus depth graph and prepared a best correlation curve through the average values for each depth and from this curve, in a manner identical to that employed by the Commission, we calculated new depth allocation factors, and we have prepared a chart or graph showing these factors as calculated from our data and that of Atlantic as compared with the data or the factors calculated from the data submitted to the Commission in this case, and also compared to the present factors.

Q Now, Mr. Hiltz, will you refer to Stanolind's Exhibit Four and explain the functions of these three curves that appear thereon?

A The green curve shown here is simply a plot of the factors as they now exist. The blue curve here are the factors which have been proposed by the Commission on the basis of 140 wells, which were analyzed in this case. The yellow curve here is the curve which has been calculated from the additional 98 wells of Stanolind, and the 20 wells, 22 wells which were made available to us by Atlantic. From our analysis of these data and calculation of these additional factors we arrived at a curve substantially different from that determined by the Commission and one that conforms very closely to the present factors.

So we concluded the data presented to the Commission may not be representative of the wells in all depth brackets. And a different sampling, using the same technique of factor determination tends to confirm the fact the present factor should remain in effect.

Q As I understand, the data that was acquired to prepare the yellow curve through here were on all of the wells during a certain

period of years that Stanolind and another company and Atlantic had drilled? A Yes, sir.

Q Not discrimination, but a pure arithmetical average?

A That is correct.

Q Is that somewhat similar to the suggested type of approach Mr. Nestor made awhile ago, except he extended his to include all the companies for a longer period of years?

A Yes, sir, and I feel for the number of wells involved, it might be more substantial.

Q You acquired the data from Atlantic at a date after you plotted the curves of the earlier data you received. I will ask you whether or not in acquiring that data did they by any chance fall on or close to the projected curve based on the date you already acquired?

A Their data were principally a range from 9,000 to 10,000 and 12,000 to 13,000 feet. In the 9,000 to 10,000 foot bracket their data coincided closely with ours and the point fell close to our curve. In the 12,000 to 13,000 foot bracket we had relatively very little data, but the average of their costs in that depth bracket fell exactly on what an extravasation of our curve would have indicated.

Q Do you have any further comments to make with reference to your study in this matter?

A My only further comment would be to recommmend to the Commission, that based on these data, that the present factors be continued in effect.

Q Thank you, Mr. Hiltz.

MR. SMITH: I would like to offer in evidence Stanolind's

Exhibits One, Two and Four.

MR. SPURRIER: Without objection, admitted. Anyone have a question of Mr. Hiltz?

CROSS EXAMINATION

By: MR. LAMB:

Q Have you, Mr. Hiltz, did your company drill any wells less than 5,000 feet last year?

A Mr. Lamb, I seem to have misplaced the tabulation that has that data on it. I will be glad to furnish--

Q (Interrupting) Can you give me from your curve, the average cost of a 12,500 foot well?

A Just one minute. I can answer your first question now. Zero to 5,000 feet, Stanolind drilled one well less than 5,000 feet in the year, 1951, In 1952--

Q (Interrupting) Do you have the depth of that '51? If you have, may I have it please?

A It was 4,405 feet. 1952 we drilled no wells less than 5,000 feet. 1953 I believe there are 6, 1953.

Q Possibly in the 4,000 to 5,000 foot bracket?

A Two of the wells were less than 4,000 feet at approximately 3,775 feet.

Q Thank you. Now, on the, from the curve, what the estimated cost of the wells was in the $12,500.00?

A 12,500 feet, $335,000.

Q Do you happen to have the 13,500 there?

A No, sir, I have not tabulated my curve beyond approximately 12,800 feet, due to a lack of data at higher intervals.

Q I believe 35 was 12,000, I was comparing it with the 19-- $335,000 figure was for 12,500 feet.

A That is correct.

Q The figure for 1945 was $396,000?

A I can't attest to that.

MR. SPURRIER: Anyone else have a question of Mr. Hiltz? Mr. Macey.

By: MR. MACEY:

Q You think that your data is representative?

A I think my data is certainly representative of all the wells that Stanolind drilled and participated in, and I feel the date supplied me by Atlantic is equally representative of their experience.

Q You got one well here, Atlantic's in the 12,000 to 13,000 bracket, cost more to drill than one that was drilled at 14,100 feet. You think that well is representative?

A It may not be representative of the average, it was a well that was considered in preparation of the curve; elimination of the well would not have affect on the attitude of the curve, however.

Q You don't think it would?

A It would shift it a little perhaps, but it would not alter it in any great degree.

Q It so happens in some of the wells which Mr. Nestor threw out of his consideration, some of them were your wells that you have got on here.

A Well, as we explained in our testimony earlier, we made no attempt to discriminate. However, I feel in any field you are certainly likely to encounter differences that are normal operating problems in a field, and you can't discard those wells simply because

their cost may have been a little bit higher.

MR. SMITH: I might explain, Mr. Macey, the difference is in the difference in sampling. The method you go by to arrive at your averages. In other words, the inclusion of one of the wells, Mr. Macey had, would have no significance as contrast with the testimony of Mr. Nestor.

MR. SPURRIER: Anyone else have a question of Mr. Hiltz? If not, the witness may be excused.

(Witness excused.)

MR. SPURRIER: Does anyone have further testimony to introduce? Mr. Woodward and Mr. Christie.

R. S. CHRISTIE

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

By: MR. WOODWARD:

MR. WOODWARD: Mr. Woodward representing Amerada. Before we begin, I would like to say that it is difficult for anyone to fill the presentation of this case without sounding redundant or a little anticlimactic.

I think at this point it should be recognized that whatever differences of opinion may exist, that both the Commission and the industry owes Shell, and particularly Mr. Nestor, a vote of appreciation for the thorough and able study for whatever light it can throw on this problem. I am not making that in the form of a motion, but an observation.

MR. SPURRIER: I think the Commission agrees with you, John.

MR. WOODWARD: Stating Amerada's position in something of a preliminary statement, as we view this case, it's proper scope is

the determination of what relative share of total allowable production should be assigned to wells of varying depth in any given proration period. It is obviously not the same thing as determining what set of relationships to pay-out the respective development costs within the same time.

At the 1945 hearing in this matter. The Commission adopted equal pay-out of the development costs as it's sole criteria, and with the data available to it at that time fixed the present depth factors on the basis of equal pay-out. By accident or design, we could not know which, those factors have worked reasonably well in practice while the present factors do not contemplate a number of important considerations and are not entirely equitable to the deep operators of the deep wells.

We know from experience we can arrive, under the present factors, and therefore consider them satisfactory for all practical purposes. However, if consideration is to be given changing the present depth factor, then we do not think equal pay-out of certain development costs should again be adopted as the sole criteria.

We are therefore offering some testimony which largely confirms that which has been given by Shell on the basis of our independent study and experience, which bears on these other considerations we believe are relevant to the underlying, or fundamental problem in Case 608, which is again the relative share of total allowable which should be assigned to wells of varying depths and not necessarily what set of relationships will allow them to pay out in equal time. Calling Mr. Christie now.

Q Will you state your name, please?

A R. S. Christie.

Q Where do you live, Mr. Christy?

A Tulsa, Oklahoma.

Q By whom are you employed and in what capacity?

A Amerada Petroleum Corporation, as petroleum engineer.

Q What experience have you had in south east New Mexico's production of oil?

A Well, I have had experience in southeastern New Mexico since discovery of the Hobbs field about 19, from 1929 to the present.

MR. WOODWARD: We submit Mr. Christie as an expert witness. Are his qualifications acceptable?

M.R SPURRIER: They are.

Q Mr. Christie, have you analyzed the data and testimony presented by the Commission in 608?

A Yes, I have to a limited extent.

Q Aside from the wells selected by the Commission, have you any observations on the approach employed by the Commission in making it's study?

A Yes, I think it is somewhat misleading to determine pay-out in the manner used by the Commission. To be more realistic, other factors should be considered.

To cite our own experience, we find the average price to be $2.76 against the Commission's $2.69, I believe, which is a little bit higher. That our average lifting cost in this area to be 27¢ a barrel, taxes 17¢, and a royalty 34¢, and using an average exploration cost of $1.01, we find we end up with a net of 97¢ per barrel. On this basis, then, the average pay-out is extended from

1.4 years which was determined by the Commission's analysis to 3.88 years, which is a considerable difference when you take into account all the other factors, or at least some of the other factors.

I might add that I used this exploration cost of $1.01 that I found in an article by Mr. H. J. Strut, who is an economist, and youhave probably read some of his articles. In his article, Petroleum Engineer" of May, 1953, "Chargeable Oil Finding Cost Up 49 percent," he says as follows:

"The facts indicate that the combined cost per barrel of oil produced in 1952 for exploration development and lifting oil to the surface, averaged about $2.35, against an average market price for crude of $2.56. Preliminary figures indicate that for every net barrel of crude oil produced last year, the industry spent $1.01 for exploration, 58 cents for development and about 75 cents for lifting."

Now, I have used that $1.01 for exploration, which of course, might be considerably different than our own figures, but it is the best figure I could arrive at without detailed analysis of all our costs, and then using our own figures for the lifting cost, taxes and royalty and so forth.

Q Mr. Christie, whether you used pay-out on the basis of a net 97¢ or a gross $2.76 or $2.69, the relationships on the pay-out period with deeper or shallow wells is not affected, if you use the same figure for your relative pay-out periods?

A Will you state that question again?

Q Does the testimony you have just given concerning the 97¢ net which is available toward liquidating development cost, and the

$2.76 per barrel gross figure, regardless of which figure you use so long as you applied it consistantly over wells of all depths, you are going to come out with the same relationships between the wells in the pay-out periods?

A That is right, the relative.

Q Your purpose in bringing it up is to correct any impression in the record these wells are actually paying out in 1.4 years?

A That is correct.

Q What factors, Mr. Christie, if any, not heretofore considered by the Commission itself, do you feel are relevant to this problem in addition to development cost?

A This has been covered rather thoroughly by Shell, but I think in a little different manner, the way I have it analyzed that is the risk factor.

Our analysis shows the risk of getting a producing well at greater depth is much greater. The following analysis bears this out, taking the area from the Hobbs Field south, through the Penrose-Skelly Field appears dry holes to producers for wells about 5,000 feet is 2.56 percent. Now, that was taking the producing well from the proration schedule and counting the dry holes from a development map around those areas. For this same area, 3.24 percent of the wells below 5,000 feet were dry holes and those were considered to be development wells, but turned out to be dry. The majority of these wells were between 5,000 and 8,000 feet. Now, that is in the same area that I quoted the 2.56 percent for the wells above 5,000 feet.

Now, if you take all the wells in Lea County below 9,000

feet, the average is 16½ percent dry holes. And as Mr. Nestor pointed out this morning, the smaller the field, why the larger the percent, and if you eliminate the Denton Field and the Saunders Field from this group, then the average increases to 23½ percent, which includes the majority of the deep structured fields.

Therefore, generally, the smaller and deeper the field, the greater percent of dry holes. The highest we know of being 83 percent. Then I would like to cite one specific example. There are several. Perhaps to cite as an example in the Knowles Field, I believe was 35 percent, we had 7 producers and 4 dry holes, Considering the cost of producing wells and dry holes, the average cost of the producing wells is $425,991. Whereas, your cost based on your analysis for an average depth of 12,500 which is the depth in the Knowles Field is $280,000. Therefore, if you add the cost of the dry holes which have to be paid for as well as the producers, you have a difference of almost $426,000 as against $280,000 for this one, particular field.

Likewise, the Hightower-Pennsylvanian and the Devonian averaged $243,785.00 and $327,093.00 respectively, on the Commission's analysis,--pardon me, for our analysis as compared to the Commission's analysis of $169,900 and $194,000 for depth of 9500 and 10,500 respectively.

Q It seems plausible a risk factor should be included in the depth factor in some manner. Any other factors you think the Commission should also consider in this matter?

A Well, this of course has also been brought out, I think it is worth repeating. At the present time the total state allowable

is approximately 10 percent over the actual production. The Commission's proposed depth factors reduces the allowable on wells from 9,000 to 14,000 feet and increases the allowable from 5,000 to 9,000 feet, and I think it was point out it would probably increase the wells from zero to 5,000, too, because of an increase in the unit factor to take care of the state allowable.

By this plan, if the present state allowable is maintained, it would be necessary to raise the allowables on the wells from zero to 5,000. Our analysis indicates that 73.7 percent of the wells between 9,000, 14,000 are non-marginal; that 25.14 percent of the wells from 5,000 to 9,000 feet are non-marginal; and that 28 and 4/10ths percent of the zero to 5,000 foot wells are non-marginal.

Therefore, it is evidenced by taking the allowable from the deeper wells and assigning it to the wells of shallower depths having a larger number of marginal wells will tend to further unbalance the production between the allocated and unallocated wells.

MR. WOODWARD: At this time we would like to introduce into evidence a statistical study that was prepared by a General Rules and Regulations Committee appointed by the Oklahoma Corporation Commission which illustrates graphically what happens to effective proration control, when a substantial portion of the wells in the state are virtually unallocated by reason of the fact that the allowables figured are far above what the wells can actually make.

In any event, we will put this on the board if it is so requested, otherwise if not we would just like to submit it in the record as Amerada's Exhibit One.

MR. SPURRIER: Without objection it will be admitted. Does

anyone have a question of Mr. Christie? You have something further?

MR. WOODWARD: We have one further matter.

Q That involves any recommendations you may have in this matter, Mr. Christie?

A Upon analysis of some of these other factors other than the well cost, it appears to us that the deeper wells are being discriminated against. We find the reduction in allowable on the wells from 9,000 to 14,000 feet represents approximately 4.3 percent. We believe this percent is not too high to be considered as a risk factor. As a matter of fact, it is too low; however, we would be satisfied with such a risk factor.

In other words, by not taking this 4.3 percent off we think that would be in some measure make up for a risk factor which is undoubtedly much higher than that. This is another way of saying we are in favor of no change in the present depth factors. We point out some of the other factors to show it is not fair to the industry, we believe, to indicate the average pay-out time as 1.4 years, whereas, the actual pay-out time is probably nearer 4 years, based on our over-all cost.

Q Mr. Christie, if there are inequities in the present system, do you think they are of a magnitude that would justify the expense of a vast statistical study in order to arrive at correct depth factors or an adequate consideration of all of the cost factors which you have discussed, and risk factors?

A Well, it was surprising to me that the statistical analysis that Shell made came out reasonably close to the present factors, with the exception of depth brackets below 5,000 feet, I should say from zero to 5,000 feet, and it would be my guess that if you analyzed

a large number of wells, you still come up with some factors that vary very little from the present depth factor.

Q In other words, you do not think it worthwhile--

A I think--

Q (Interrupting) If you retain the present depth factor?

A Of course, I think if the Commission is not satisfied with the present depth factor that then it would be worthwhile to go into the matter more thoroughly and get a larger represented number of wells and analyze it further.

Q You feel then it would be essential if they go into the matter further to examine a great deal more data than they did before? A Yes, I do.

MR. WOODWARD: That is all we have.

MR. SPURRIER: Anyone have a question of Mr. Christie? If not Mr. Christie may be excused.

(Witness excused.)

MR. SPURRIER: Does anyone have anything further in the case? Mr. Kinney.

MR. KINNEY: Mr. Spurrier, I represent a group of independents in Artesia who desire a statement be sworn into the record.

MR. SPURRIER: A sworn statement?

MR. KINNEY: Yes, sir.

E D W A R D K I N N E Y

having first been duly sworn, testified as follows:

MR. KINNEY: If the Commission please, my name is Edward Kinney from, consultant from Artesia. I have testified before the Commission before. I wonder if my qualifications are accepted?

MR. SPURRIER: They are.

MR. KINNEY: I will read this. "We, the undersigned, have made a careful study of the Commission's well costs, payouts, and proportional depth factors for computing the oil allowable. We find some inequities in regard to the length of time required for a "payout" under the present system.

It is our opinion that the length of "payout" should be essentially equal or uniform. We, therefore, commend the Commission and its staff for reviewing the question and attempting to resolve the inequalities. However, we deem the present proration plan for wells shallower than 5000 feet to be fully satisfactory and not to require adjusting.

The majority of New Mexico's production to date has come from the pools at depths less than 5000 feet.

The small business enterprise has been the cornerstone of the nation's growth. Small business enterprises can only operate in the depth ranges to 5000 feet. To this group belong the wildcatters who have been responsible for many discoveries. Reducing the allowable for the 0-5000 foot depth range would seriously curtail wildcatting. It would be ill-advised to tamper with the energy, industry, and livelihood of the operators in this group.

The "payout" time for a 3500 foot well is 1.247 years - just slightly under the average 1.406 years which figure the Commission calculated for all depths over 5000 feet. The "payout" time for a 4500 foot well is 1.503 years - over the average 1.406 years. In the group of wells from 0-3000 feet deep, it is true that top allowable wells with 36 gravity oil would "payout" quickly, but

these are seldom found in New Mexico. In this depth range, exclusive of the southern tip of the Central Basin platform where some fields straddle the 3000 foot mark, we are looking at only 39 top allowable wells so that the present proration volume is not an important factor. The incentive and assistance of present proration practice for a small operator is of far greater consequence than the reallocation of a few barrels of oil.

Further, we deem a "minimum" top unit allowable as an essential portion of our proration rules and regulations. The old rules provided a "minimum" of 30 BOPD for wells under 5,000 feet and provided a formula for allocation of production in the depths over 5000 feet whenever the "normal" top unit allowable fell below 30 BOPD. For some reason this provision was deleted from the revised rules and regulations. A formula is not needed now inasmuch as the present proration derives from the top unit allowable.

We submit that a new paragraph be added to rule 505 permitting any well, capable of so-doing, to produce a minimum of 30 BOPD in the event that the "normal" top unit allowable set by the Commission in any period is less than said figure."

This signed by Edward E. Kinney, Carper Drilling Company, Incorporated, by Marshall Rowley, Vice President Kincaid and Watson Drilling Company, by Jim Watson, Partner, Paton Brothers by H. R. Paton, Robert E. McKee, Incorporated, by J. R. Lund, Manager of the Oil Division, V. S. Welch, Independent Oil Producer, Jerry Curtis, Ralph Nix, Resler Oil Company by Vilas P. Sheldon, Yates Brothers Oil Company by John A. Yates, T. J. Sively, Martin Yates the Third, Harvey E. Yates and Barney Cockburn by C. J. Barnes.

MR. SPURRIER: Anyone have a question of Mr. Kinney? If not you may be excused.

(Witness excused.)

MR. SPURRIER: Anyone else have anything to represent?

MR. EVERETT: My name is W. H. Everett representing Ohio Oil Company. The oil wells operated by my company in New Mexico have a total allowable in excess of 5,000 barrels per day for the month of March, 1954. Because of our interest we wanted to state for the record and for the benefit of the Commission and anyone else who is interested, our position in connection with the proposed change in Rule 505, Paragraph B, pertaining to proportional factors used in allocating oil allowables.

First, we have been producing oil under the present rules since its adoption. Without now admitting that well cost is a proper basis for allocation, we believe that the present rule has operated fairly and justly in its statewide application.

Second, the undisputed testimony of the record in this case is that future discoveries and development of oil in New Mexico will be principally from depths below 5,000 feet. It would definitely discourage exploration and development if you were to adopt this new proposal or any other proposed change which would operate to take allowance away from deeper wells and give them to wells of lesser depth.

Third, it is our firm belief the present rule is generally, if not almost unanimously acceptable and satisfactory to the industry on a state-wide basis and that no change should be made therein. Moreover no change should be considered at any time unless and until it has been conclusively proved beyond question that the present

rule is manifestly unjust and inequitable to state-wide basis. Certainly no necessity for change has been shown or indicated by any of the testimony or evidence in the case.

Fourth, the statutes of the State of New Mexico and the rules of this Commission recognize minimum allowables for special situations under specific circumstances and approved. Those circumstances and special requests for change can and should be handled by the Commission under those statutes and rules for particular wells or fields, rather than by the proposed departure in change in a rule, state-wide in scope, tested and proved by time and experience. We suggest and urge you to leave the present rule as it is.

MR. SPURRIER: Anyone else? Mr. Gray.

MR. GRAY: I have a copy of this statement I will leave with you here. Ralph Gray, Buffalo Oil Company. Buffalo Oil Company regarding Case Number 608. "The Buffalo Oil Company wishes to make a statement regarding Case # 608 where consideration is being given to revising depth factors used in allocating oil allowables.

We are primarily a shallow well operator and at the present time 94.5% of our wells in New Mexico are above 5000' deep. However, we have 4.1% in the range of 5000 to 6000' and 1.4% in the range 13,000 to 14,000'. So, we do have a knowledge of operating conditions and costs for shallow wells, as well as extremely deep wells.

With reference to the proportional factors now proposed by the Commission for the depth bracket of 13,000 to 14,000' it has previously been testified that only two wells costs were considered to represent this bracket and both of these are in one pool. We

believe that the pool used is one of extremely low cost for this depth, and that future development in this bracket will show that average well costs will be substantially greater. In the Maljamar-Devonian Pool which is below 13,554', the cost for the discovery well was $524,135.51, not including battery or geophysical exploration cost. More than two years later, the second Devonian test is being drilled in this area and drilling has progressed far enough at this time to make a fairly accurate prediction of final well cost, barring any unusual difficulties." I will add at this point the well drilling at 12,700 feet, at this time. "It is estimated that the second well cost will reach $495,787. These costs are substantially higher than costs reported to the Commission in this bracket, chiefly due to drilling conditions being more difficult in the Maljamar area, and also due to a much greater number of possible pay zones. This requires that a large amount of coring, drill stem testing, and logging be performed in order to assure that no pays will be overlooked and to allow an accurate evaluation of pays existing.

The Commission has made a comparison of what it considers as representative well costs for the various depth brackets and has proposed new factors which it believes would allow equal well payouts. These estimates disregarded several factors that would tend to change payouts. No consideration was given to operating cost, taxes, or to cost incurred in geophysical exploration. All of these factors may be much greater for deep wells than for the shallow wells. It is our opinion that the actual average well payouts will be substantially different than calculated by the Commission and that

greater differences will exist for the deeper wells.

If the independents are to participate in deeper drilling in the State, then it becomes evident that higher allowables are needed for the deep brackets to insure a more favorable payout.

We believe that curtailment of allowables on wells below 10,000' to the extent as proposed by the Commission will tend to discourage operators from drilling deeper tests and in so doing will be a detriment to the State.

The Buffalo Oil Company accordingly urges the Commission to retain the present depth factors. Signed by H. G. Ellis, Vice President in charge of Production."

I might add to this statement a little explanation of the cost for drilling those 13,500 foot wells. We don't contend that those costs will be representative of an average field development well down the line. We hope that we can reduce those costs substantially below thefigures on the first two wells.

However, it does illustrate how high some of these well costs can go and I think that in considering the payouts we are going to have to consider the bad wells right along with the cheapest wells. We like to look at a curve and say, well, we will take the average of that curve and use that, but still we do have these excessive costs that come in and the companies have to be paid.

Now, in addition, we have other factors that come into deeper wells. For instance, we have a condition there where we have a very high pressure oil pay at slightly above 12,000 feet, in the Maljamar Field, and this pressure is considerably higher than the Devonian pressure which is 13,500 feet. Therefore, we are forced to set in some cases what would be an extra string of easing to case off that

upper high pressure stuff so that the Devonian could be penetrated without danger of losing circulation and a subsequent blow out. So, all those factors tend to make your drilling costs for deeper wells increase over the normal run of expenditures. Thank you.

MR. SPURRIER: Mr. Vickery.

MR. VICKERY: J. H. Vickery with Atlantic. Atlantic's Drilling experience in New Mexico has been confined for the last three years primarily to the Denton Wolf Camp and Devonian Pools. Our average cost of $147,000 drilling to the Wolf Camp Formation compares favorably with the average of the cost selected by the Commission for the 9,000, 10,000 foot range.

However, Atlantic's cost for drilling on the Denton-Devonian averages $344,195 which is higher than the Commission's average for the 11,000, 12,000 foot range, which this field is listed, to the proration schedule. It is also higher than the 12,000,13000 foot range, which more nearly represents the depth from which this field produces.

From our experience, Atlantic has concluded the present established proportional depth factors are reasonably equitable, and we recommend the continued use of these factors by the Commission.

MR. SPURRIER: Mr. Walker.

MR. WALKER: Walker with Gulf. First, I would like to state for Gulf, we favor the retention of the present factors. So, we can have our position clear, I would like to state here that on according to our account, the 1945 shows on the March schedule, according to my count there is 3,741 wells of less than 5,000 feet in depth which Gulf has 368; so we are not primarily a,-- and by the way, we have 573 wells listed, total,-- so we are not primarily a

deep well operator, although we think the future will be in that range. We would recommend retention of the present factors.

However, if the Commission determines a change is necessary, we would ask that they use sufficient typical cost data to give a true representation of the average cost for each depth interval. Also, recommend this reconsideration or re-analysis and reassignment of allowable factors not be restricted to those depths greater than 5,000 feet, but 1,000 incriments for all depth brackets should be determined for each interval.

MR. SPURRIER: Mr. Keeler.

MR. KEELER: Magnolia Petroleum Company has no objections to the depth bracket factors now in effect and is not advocating any change in these factors. We are certainly not in favor of changing these factors on the basis of well cost data now in the hands of the Commission, since we doubt that these costs are truly representative.

If new depth bracket factors should be adopted, we are in favor of departing from a strict well payout basis, so as to give some additional allowable to deep wells because of the additional risk and additional geophysical expense involved in deep wells. We are also in favor of additional depth brackets in the zero to 5,000 foot range in order to provide for more uniform payout for shallow wells. Magnolia's recommendations could be summarized as follows:

One, retain the present depth bracket allowable factors.

Two, if it is decided an amendment of these factors is necessary, additional well cost data on a uniform basis should be obtained on all wells completed at least during the past two years.

Three, due consideration should be given to the additional risk and additional geophysical expense involved in deep wells when the final well cost curve is plotted.

Four, zero to 5,000 foot bracket should be converted to several smaller brackets, possibly on a 1,000 foot basis.

Five, any depth bracket factors adopted should not be considered the final word as to allowables assigned individual reservoirs, but should be subject to change on a reservoir basis after notice and hearing in accordance with individual reservoirs ability to produce oil without causing underground waste.

MR. SPURRIER: Mr. Lyon.

MR. LYON: V. T. Lyon, Continental Oil Company. Referring to Mr. Gray's statement, Continental drilled both wells which the Commission listed as being representative of the cost in the 13,000 to 14,000 foot bracket. We recognize and, I am sure that everyone here recognizes, that two wells do not present a very good basis to determine our factor to be used for that bracket, although it is the best that we have right now.

We would like to urge the Commission to consider Buffalo's cause, for whatever value it may be, in helping them to determine what factor should be in this bracket.

MR. SPURRIER: Mr. Rogers.

MR. ROGERS: W. J. Rogers, Sinclair Oil and Gas Company. Sinclair being an operator in New Mexico on both shallow and deep wells is satisfied with the present depth factors, and we urge the Commission to leave these present depth factors unchanged. If, however, the Commission feels that a change is necessary, we recommend that the Shell plan be adopted.

MR. ROY SEARS: Roy Sears, Warren Petroleum Company. I would like to present this general comment that represents our ideas on the matter.

We urge you, the Commission, to maintain the present allocation of production on the present depth basis. This request is based on the completion of cost as well as lifting cost on the various depth wells. Drilling cost and hazards are much greater in the deeper development, an operators should be permitted the allowables commensurate with this to insure continued exploration and development with the State of New Mexico.

MR. SPURRIER: Judge Foster.

MR. FOSTER: We want to endorse everything that Shell said and we don't think they will make any changes.

MR. SPURRIER: Mr. Selinger.

MR. LYON: May I make a further statement, we feel we were extremely fortunate in drilling those two wells at low cost that we did, and we feel that we will be unable to match that low cost in future drilling.

MR. SELINGER: In behalf of Skelly, we wish to urge the Commission to continue the present depth bracket, Our company has wells which we have drilled since the, prior to the 1945 adoption of the depth bracket, and since the 1945 depth bracket adoption we have drilled in every depth classification down to slightly below 12,000 feet. We have approximately 100 wells below so-called deep wells. We, last year, drilled 19 wells above the 5,000 feet classification. It is very apparent that from the encouragement of the present depth bracket all operators have drilled a great many deep

wells, and operators are continuing to drill in the so-called shallow classifications. Therefore, we believe that the historical background is self-evident that the plan as now utilized by the Commission is a satisfactory one.

We wish to point out that nobody in the industry has recommended any change from the present plan. We don't know how this whole thing came about, but it looks very well to me that the Commission could dismiss the whole application and go on its way on the present plan. We feel that any change from the present allocation formula depth bracket would of necessity bring about a disturbance of equities. Everybody here has indicated that the equitable situation is satisfactory to them from a practical standpoint. I see no reason why the Commission should attempt to correct some equities which in turn will create an additional set of inequities.

In passing, without going into too much detail, also I want to point out to the Commission that there is something greater in consideration than just the depth bracket allocation. There are other factors that would have to be considered and it is very apparent to me that you are going to disturb the development program which has been in existence in this state since 1935, and we would like to see no disturbance of the development program, that has been approximately twenty years, and we would hate to see any disturbance in present equities from the 1945 program. And we would like to urge the Commission to deny all proposed plans including the one by their own staff.

MR. SPURRIER: Anyone else? If there is no further comment in the case, I don't know what I will recommend to the Commission

on this, but we will take it under advisement.

STATE OF NEW MEXICO)
: ss.
COUNTY OF BERNALILLO)

I, MARIANNA MEIER, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 28th day of April, 1954.

Marianna Meier
Notary Public, Court Reporter

My Commission expires:
April 8, 1956.