CITIES SERVICE OIL COMPANY

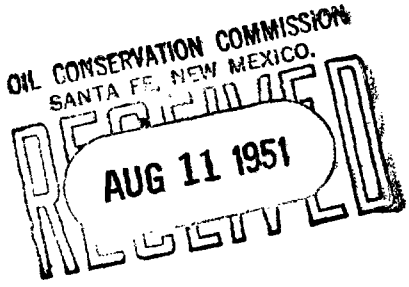
Producers-Refiners-Marketers Of Petroleum Products

D. D. BODIE, Superintendent
Oil Production Division
West Texas & New Mexico

Drawer G
Hobbs, New Mexico

Case 274

August 9, 1951



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

Dear Dick:

Re: Cities Service Oil Company's State "S" No. 4

You will recall at the hearing on Case 274, Cities Service's application to dually complete it's State "S" No. 4 and State "S" No. 3, evidence was introduced by opponent's witnesses to show that the Connell sand was below the casing point in our well No. 4 and that we therefore were producing the Connell sand along with the Ellenburger. Cities Service witnesses could not identify any part of the formation below the casing seat as Connell sand but did express our willingness to correct the situation if convinced we were mistaken or were so ordered by the Commission. You have since been requested by one operator in the field to issue an order for the wells repair. Our Geologists are still of the opinion that the controversial formation is Pre-Simpson in age as attested to by the attached copy of our Mr. Patterson's memorandum of July 26.

However, since our application for multiple completion was denied, it will be necessary for us to drill another well in the SW NW of Section 6, and in order that there will be no question as to the proper completion of well No. 4, we are herewith submitting Forms C101-Application to drill State "S" No. 6 to the Ellenburger, and Forms C102-Repair well No. 4 by plugging off the Ellenburger to 8070' and converting it into a McKee well.

Inasmuch as both of these applications cover routine operations, I do not suppose it will be necessary to hold a hearing. I will appreciate having your approval to our proposal at your earliest convenience as we wish to move the rig now drilling well No. 5 direct to the No. 6 location as soon as No. 5 is finished.

Yours very truly,

D. D. Bodie
Supt. of Oil Production

DDB:nms

Attachments

COPY

Notegram

Date July 26, 1951

For Mr. Frank T. Clark Room Bartlesville, Oklahoma

From L. E. Patterson Room Midland, Texas

Re: Controversy as to age of the sandy zone below casing point our State #4-S, Lea County, New Mexico.

The attached cross-sections have been prepared to establish on a regional basis our opinion that the sandy zone on top of which casing was set in our State #4-S is of Pre-Simpson age. As you know, this sandy zone was referred to at the New Mexico Commission hearing as "Connell" sand of Simpson age.

The route of these cross-sections is shown on the right margin in each case. Section 1 commences with Texas #33 Connell in the Jordan Pool, Ector County, which is the type section for the Connell Sand. This section was routed through the Phillips #1-J TXL and Phillips #2 Baish in order to show complete Ellenburger sections on which we have insoluble residue data to sub-divide the Ellenburger into what is generally considered to be the Cambrian age material in the Lower Ellenburger, and the Ordovician age material above that point. The logs on Section 1 are lined up with the top of the Simpson formation as the datum point. In addition to the electric logs we have plotted in color scheme indicated on the Section, the material logged in our sample logs for the portion of the hole critical to this study.

It seems to be very obvious that the Simpson is an over-lapping formation as it approaches the Eunice high, and that the decrease in thickness is without any doubt due to pinch-out of older members and not to thinning of individual members of the formation. This is obvious in following the well developed McKee and Waddell sand zones as well as the upper most limestone section and the underlying shale section above the McKee Sand in the Simpson section. On Cross-section 1 I have indicated this over-lap by tracing the course of the principal sand body in the McKee zone and the Waddell sand to it's pinch-out somewhere south of the Stanolind test in Section 15-24S-37E. The Connell sand probably pinches out south and east of the Richardson and Bass #1 Wallace in Winkler County. I believe this Section demonstrates beyond any reasonable doubt that the Connell sand is not present within many miles of the Eunice up-lift and that to that extent the New Mexico hearing was erroneous. As I mentioned to you on the 'phone, I felt that we could prove that the sand in question in our #4-S State was not Connell in age, and I also advised you that it would be considerably more difficult, if not impossible, to prove that this zone is not Simpson.

My next approach to this problem is a study of what appears to happen to the upper Ellenburger section as the Eunice high is approached. There is, of course, a gradual decrease in Ellenburger thickness north from the Keystone Pool in Winkler County, but a very abrupt further thinning at the Eunice up-lift. On Section 1 I have drawn a violet line which corresponds approximately with the top of the Ellenburger dolomite section, and a line in blue somewhat higher, which corresponds roughly with what has been called Joins. You will note that I have made this blue line wavy beyond the Phillips #1-J TXL to indicate my conception of the position of the major unconformity along which Simpson beds over-lap. You will note the presence of a considerable amount of limestone beneath this unconformity and above dolomite throughout the section and in the Magnolia #1 May the whole section above granite which we have logged is limestone rather than dolomite.

Some geologists who have studied this Ellenburger problem believe that in the area of the Eunice high that only the oldest Ellenburger of Cambrian age was ever deposited across that high. Others feel that the major up-lift probably occurred at or near the end of Ellenburger time and the thin section remaining was left from a period of erosion

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which removed all the younger Ellenburger material which may have been deposited in the area. Regardless of which conception one may favor, there definitely was a very long period of erosion involved which left the top of the present Ellenburger material exposed to aeration and undoubtedly ground water action for a very long period. It is my feeling that the zone between the dolomite and the blue line is material actually Ellenburger in age, and that by reason of the long weathering endured this calcareous material was never converted to a dolomite, or if originally deposited as dolomite it was chemically transformed during this period of weathering to a limestone.

As far as the question of it being Joins is concerned, I am not yet convinced that the so-called Joins is not more appropriately a part of Ellenburger than of Simpson, but regardless of that, I do not believe this is Joins material unless Joins should turn out to be a unit which crosses time lines, because if Joins is either very late Ellenburger in age or is very early Simpson in age, I do not believe it could be present along this unconformity near the Eunice up-lift.

There is of course considerable sand logged in this post-dolomite section, which I account for in two ways. First, Simpson sand and shale caves very badly and most wells have to change bits when they reach the top of limestone or dolomite sections below the Simpson permitting a very large amount of cave material to accumulate in cuttings at that point. Secondly, we know that the Cambrian portion of the Ellenburger contains a great deal of sand in present out-cropping areas which represent positive areas for a long time. Since the Eunice high has been a positive area for a very long time I think it is logical to expect a larger amount of sand in the Ellenburger section in it's vicinity then in the basinward areas. Accordingly, I do not feel that the presence of sand in this section can be considered proof of the Simpson age of this zone.

At well #12 in Cross-section 1 I arrived at these conclusions: First, that the Simpson formation over-lap to the extent that all members below and including the Waddell sand are not present, and that a portion of the so-called McLish is also cut out. Two, that the top of the Ellenburger is probably at approximately 8695' and most certainly no lower than 8725', and third, that the predominance of limestone in the Ellenburger section is probably due to the process of weathering to which this thin section was subjected for a very long period of time.

Cross-section #2

Cross-section #2 was prepared to carry with close control the information arrived at in Cross-section #1 through the area of the Eunice high to include the log on the well in question and to present further evidence on tow wells somewhat to the north of the Eunice high. The datum on which these logs were lined up is the top of what I regard as definitely Pre-Simpson beds. You will note that above that line I have shown a wavy blue line which corresponds with the top of a presistant zone of a high resistivity which is present throughout this area. I am prone to regard the blue line as base of the Simpson and the top of the Pre-Simpson, although the evidence of that correlation is not conclusive. You will observe that Continental #2 Warren "B-29" shows further evidence of Simpson over-lap, with material very little older than the McKee sand. In the case of the Stanolind #1 State "U", #14 in this section, Vanderpool has identified the portion of this section, which he called Ellenburger, as entirely Cambrian in age.

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On the basis of this Section, the casing point in our State #4-S would be at the top of Pre-Simpson beds, or somewhat below that point depending on whether the blue line is taken to represent the top of Pre-Simpson material.

My conclusions as result of Cross-section #2 are, first, that the Ellenburger section, which is present around the Eunice high, is Cambrian in age. Second, that the Ellenburger age material contains considerable sand as well as a presistant limestone section. Third, that the presistant sand, whose resistivity is much higher than any Simpson sand, at the top of which casing was set in our State #4-S, is a Cambrian sandstone much older than any Simpson sand present in this area.

COPY

Notegram

Date July 27, 1951

For Mr. Frank T. Clark Room Bartlesville, Oklahoma

From L. E. Patterson Room Midland, Texas

Re: Conference with Mr. R. L. Boss relative to casing point in our State #4-S, Lea County N.M.

On Friday, July 20th, I made a trip to Roswell, New Mexico and conferred with Mr. R. L. Boss, Gulf's Senior Geologist in New Mexico, relative to the problem of the casing point in our #4-S State. Mr. Boss has worked in New Mexico for a period of 15 years with Gulf, and probably has had as much detailed experience in this area as any man in the area. He is evidently very highly regarded by the New Mexico Oil Conservation Commission. As I previously advised you, Mr. Bodie felt that if he could be convinced of our correlations, we would have no further difficulty with this well.

The information in the attached memorandum was gone over in considerable detail with Mr. Boss and explained on the cross-sections. Mr. Boss stated that he had not attempted to correlate the New Mexico Simpson section into the Texas #33 Connell, or to any other standard section, and he was prepared to admit that probably the sand in question was not actually Connell. As had been anticipated, however, he was not prepared to concede that this zone was Pre-Simpson in age. His primary reason, as given to me, was that they had cored this particular zone in the Gulf #8 Carson "C", Section 28-21S-37E, a well which is approximately 1/2 mile northeast of the Magnolia #17 Carson, shown on Cross-section #2. He showed me the core description on this section and it recorded green shale as having been recovered both above and below this zone.

Mr. Boss further informed me of a fact of which I was not previously aware, that several wells in this area have been completed to include the McKee sand zone, and this particular zone has one reservoir which has been recognized by the Commission as Simpson. Mr. Boss advised me that his company would have to oppose in principal the classifying of this zone as Ellenburger on the basis of this core information and the established practice in the field, and while he was impressed with our position, he could not agree to accept it as proof of the Ellenburger age of this horizon.

As result of this conference, I concluded first that since the burden of proof of the Ellenburger age of this horizon would be on us rather than the burden of proof of it's Simpson age being on other people, that our position would be extremely difficult in a hearing before the Commission, for as I previously had advised you, I doubted that it would be possible to actually prove the Ellenburger age of this zone.

While I am not prepared to concede that the presence of green shale in this zone is proof of the Simpson age of the horizon, at the same time I am of the opinion that the type of geological advice available to the Commission would be more impressed by such a core record than by our cross-sections, and I further believe that the geologists of other operators would generally side against us for the reason that if this zone could be established to have an Ellenburger age, the correction and remedial work which would be involved in the wells which now produce therefrom, as well as the prospect for the necessity of drilling additional holes, would as a practical matter over shadow any technical geological evidence which we could present.

After this conference, I returned by way of Hobbs and conferred with Mr. Bodie in this matter. He advised me that it would be necessary to move in a rig to squeeze off the Simpson perforations as the result of the finding of the Commission on our application for a permit for dual completion, and that there would be little, if any, more expense involved in plugging this hole back.

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It is therefore recommended that the State #4-S be plugged back to 8070', and that it be there completed as a Simpson producer from both the McKee sand, through perforations, and this questionable zone in open hole, and that a twin well be drilled and completed in what general field practice concedes to be Ellenburger without any doubt. This twin well would of course be in lieu of the twin which we would necessarily have to drill as a Simpson producer if the action recommended above were not taken on the State #4-S. It is further recommended that this twin hole be cored from the top of the McKee sand to the top of the Ellenburger, in order that we may have additional information on the McKee sand zone and on the many sand stringers below that zone in what we know to be Simpson, as well as on the sandy zone involved in this controversy. It is further recommended that a drill-stem test be run on this questionable zone if it shows oil in order to determine out this oil compares with the Simpson oil above and with the Ellenburger oil below.

The above recommendations have been discussed with Mr. Bodie and he is in complete agreement with them.

LEP:dr
cc: Mr. A. E. Dietert
Fort Worth, Texas

OIL CONSERVATION COMMISSION

SANTA FE, NEW MEXICO

August 15, 1951

COPY

Mr. D. D. Bodie
Cities Service Oil Company
Drawer G
Hobbs, New Mexico

Dear Mr. Bodie:

This is in reply to your letter of August 9, in which you refer to Cities Service Oil Company's State #4, which was a subject of a recent hearing.

We agree that the enclosed applications do cover routine operations and the forms have been forwarded to Mr. Yarbrough at Hobbs with my recommendation for approval.

Very truly yours,

R. R. SPURRIER,
Secretary-Director

RRS/ir

SM-35P (7-43)

SHELL OIL COMPANY

THIS LETTER IS FROM OUR
FIELD OFFICE

AT Hobbs, New Mexico
P. O. Box 1457
June 5, 1951

Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico.

Subject: New Mexico Oil Conservation Commission Cases 274 and 275.

Attention: Mr. R.R. Spurrier

Gentlemen:

We enclose one (1) copy of statement forwarded to the Court Reporter to be included in the official records in Cases Nos. 274 and 275. This enclosure is in line with discussions at the conclusion of the Commission hearing in Santa Fe on May 23, 1951 .

Yours very truly,

C. R. Bickel
Division Manager

Attachment (1)

Box 1457
Hobbs, New Mexico

June 4, 1951

Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case Numbers 274 and 275 - Applications of Cities Service Oil Company and Tide Water Associated Oil Company to dually complete wells in the Hare and Brunson Pools or in the alternative to transfer allowable between wells in said pools and thereby effect 80 acre spacing

Gentlemen:

These applications were made on the basis of conservation of steel and not on the basis that the granting of them would help this Commission in the performance of its duties to conserve oil and gas and to protect correlative rights. Both Cities Service's Mr. Adams and Tide Water's Mr. Holloway stated at the hearings in March, 1951, with reference to these applications (then Case Numbers 260 and 261) that the applications were based on the conservation of steel and both admitted that the granting of them would not in any way prevent the waste of oil and gas. The only argument that was made with reference to the protection of correlative rights was that their companies did not have enough steel with which to drill all required development and offset wells and to conduct a desired exploration program and that therefore they might be delayed for some time in drilling all their wells in the Hare and Brunson Pools. Obviously such argument is not valid. The steel shortage is applicable to all alike just as are individual fluctuations in cash positions. Clearly this Commission would not consider that it should grant exceptions to practices established in the interest of conservation of oil and gas and the protection of correlative rights because an operator was short of money or credit or chose to put his efforts in another field. Correlative rights as used in the Commission's Rules and Regulations means the equal opportunity afforded to each owner of property in a pool to produce without waste his just and equitable share of the oil or gas or both in the pool and does not require that he be placed on an exceptional basis because he wishes to use his resources in some other area.

Heretofore, this Commission has abolished all transfers of allowable (see Order No. 850, The Oil Conservation Commission, State of New Mexico Rules and Regulations, December 9, 1949, effective January 1, 1950) and has never allowed oil-oil dual completions. Apparently, both those positions were taken because it considered that transfers of allowable and oil-oil dual completions

were not sound from the viewpoint of oil and gas conservation and the protection of correlative rights. We think that the recommendations of the Petroleum Administration for Defense for wider spacing and wider use of dual completions in the interest of conservation of steel were not requests that the Conservation Commission depart from practices which were established in the interest of the performance of their duties. Certainly, a commission should not at the request of anyone, even PAD, do anything that would adversely affect the conservation of oil and gas or the protection of correlative rights, things which that commission has the duty to oversee. At most, such a commission should go no farther than to follow PAD's recommendation where no waste of oil or gas will result therefrom and no correlative rights will be invaded thereby.

With reference to the proposed departures from the Commission's established practice, we think that Cities Service and Tide Water not only failed to show that those departures would help the Commission in the performance of its duties but, in addition, failed to show that the Commission would not be hindered thereby for the following reasons, to-wit:

RELATIVE TRANSFER OF ALLOWABLE

1. The applicants made no adequate showing that transfer of allowable would not result in waste of oil and gas. They offered no witness who knew anything concerning the Brunson and Hare reservoirs on a pool-wide basis and their histories or performances to date. Their witnesses stated that their information of the pools was based on the completion of the wells involved in these hearings and one or two other wells, the testing of those wells and that their applications were based on the shortage of steel and that they did not have any general information concerning either pool. Neither company indicated that it was interested enough in what might occur in the future to have studied the history of performance of any wells in the Brunson and Hare Fields although Cities Service has two producing wells in the Brunson Field (both of which are high gas oil ratio wells producing at a penalized allowable rate below 50 per cent of top allowable) and Tide Water has one producing well in the Brunson Field (not on the State S lease) which has a penalized allowable of 80 barrels of oil daily. Mr. Shackleford speaking for Tide Water stated he knew little about the pools involved, that he was interested only in the Tide Water wells and admitted he did not know how the dual completions would preserve correlative rights.

2. This Commission has heretofore reduced the allowable for the Brunson Pool from the regular unit allowable with deep well adaptation to a top well allowable of 90 barrels oil per day (see Order Numbers R-4 January 11, 1950 and R-30 September 29, 1950). Those orders were granted upon the application of Rowan Oil Company and the Commission found that such reduction in allowable should be granted to prevent waste and to conduct tests and gather data as to the characteristics of the reservoir. It was shown that the bottom

hole pressures in the Brunson Pool wells varied widely (see Shell Oil Company's Exhibits S-1 in the Tide Water Case and S-5 in the Cities Service Case) and thereby that the pool was not of uniform permeability and that undoubtedly there are local areas where production affects but little of the field generally. Under such facts, certainly there has been no showing that the per well allowable if doubled would not result in waste from water coning and gas migration and that the field-wide rules should be departed from.

3. If one well will adequately drain only 40 acres as the Commission has heretofore impliedly found in establishing the 40-acre spacing in the field, one well on 80 acres would fail to recover during any reasonable economic period an amount of oil from the reservoir equivalent to that which would be recovered by two wells thereon. Neither of applicants was willing to say that one well would drain 80 acres as efficiently as two wells.

4. Obviously a well producing at a rate greater than the surrounding wells will create pressure differentials and in the same length of time drain a greater area than the surrounding wells; cross line drainage will result therefrom and correlative rights thereby be affected. Cities Service's Mr. Adams testified that he favored dual completions rather than transfers of allowable because he considered transfers of allowable not as fair from the viewpoint of correlative rights.

5. Pressure-volume-temperature (P-V-T) data from a bottom hole sample obtained in Gulf King 16 in August, 1949 established a saturation pressure of 2774 psi absolute for Hare Pool crude. This sample was obtained at a pressure of 2834 psi absolute and accuracy of results should be high as the sampling pressure was above the saturation pressure.

The production curves submitted by Tide Water for the State S-5 well show that, at a flow rate of 243 barrels of oil daily from the McKee, the flowing bottom hole pressure was 2451 psi gauge (about 2466 psi absolute) or 308 psi below the saturation pressure. At the lower flow rate of 101 barrels of oil daily, the flowing bottom hole pressure in the McKee was 2707 psi gauge (about 2722 psi absolute) or only 52 psi below the saturation pressure. Even without a detailed knowledge of reservoir mechanics, it is evident from a simple application of Boyle's Law that during flow at the 243 barrel daily rate solution gas was liberated from each unit volume of reservoir fluid much faster than at the 101 barrel daily rate. Tide Water, therefore, is proposing a practice which would cause the formation of a secondary gas cap at a rate much greater than that which would occur with the production of oil at the regular 40-acre unit allowable rate with deep-well adaptation. As testified, this secondary gas cap is free to move about in the reservoir and will result ultimately in damage not only to Tide Water's wells but to wells operated by competitors who are producing in a more prudent manner. This violates the principle of correlative rights and is in direct opposition to the statements, unsupported by any data, that Tide Water made concerning the maintenance of correlative rights.

6. A productivity index test normally consists of a static build-up period of at least 48 hours to determine the maximum static bottom hole pressure followed by a flow period of such duration that the well will be flowed until stable and then gauged for 24 hours at the stable rate. If the productivity index is to be determined at varying flow rates, the first test is made at the lowest rate and succeeding tests at progressively higher rates in order that the well will be drawing down during the tests rather than building up. As admitted by Tide Water on the sheet tabulating Productivity Index Data for State S-5 the Ellenburger PI test was not conducted in a conventional manner. Actually there was no PI test since there was no shut-in period before the flow tests. Further, the test on the 1/2-inch choke, which should have followed the tests on the 1/4-inch and 3/8-inch chokes instead of preceding these tests, was apparently initiated the day following treatment with 10,000 gallons of acid before the well had settled to a stable flow rate. The tests on the 3/8-inch and 1/4-inch chokes are of such short duration that it is questionable that stable flow had been achieved even at the conclusion of the test. Also, it is difficult to see how the well could have been flowing for several days on a 1/2-inch choke between the acid treatment and the initiation of testing, when Tide Water's own data state that the well was treated on 4-16-51 and the testing period ended 4-19-51. Therefore, the data obtained during the Ellenburger flow test in Tide Water State S-5 is considered almost completely valueless as a measure of the ability of the well to produce.

The productivity index data submitted by Tide Water for the State S-4 well indicate again the failure to employ good testing technique as the tests were of such short duration as almost to preclude stable conditions and again the tests were made from the highest to the lowest flow rate instead of from the lowest to the highest.

7. P-V-T data from an analysis of a sample obtained in Penrose Federal Fee 1 in 1945 established a saturation pressure of 2918 psi absolute for Brunson Pool crude.

The production curves submitted by Tide Water for the State S-4 well show that, at a flow rate of 195 barrels of oil daily from the Ellenburger the flowing bottom hole pressure was 2619 psi gauge (about 2634 psi absolute) or 284 psi below the saturation pressure for Ellenburger crude in the Brunson Pool. At the lower flow rate of 81 barrels of oil daily, the flowing bottom hole pressure was 2659 psi gauge (about 2674 psi absolute) or 244 psi below the saturation pressure. As in the case of the McKee in State S-5 Tide Water is proposing the formation of a secondary gas cap at a rate greater than would occur if the well were produced at the 90 barrel daily allowable presently in effect. Again, this violates the principle of correlative rights which Tide Water states would be maintained.

8. The Brunson Pool is more than 80 per cent developed, the Hare Pool approximately 50 per cent developed and rules so long established should not be disregarded after development has progressed so far, for otherwise those who have followed the rules of the Commission are placed at a competitive disadvantage.

RELATIVE DUAL COMPLETIONS

It was admitted by applicants' witnesses that dual completions do not in any way assist the Commission in performance of its duties to prevent waste except in the instance where one of the pools would not justify development on its own merit. The most applicants could say was that dual completions are not any more conducive to waste than ordinary completions if properly watched and mechanical failures around packers are promptly remedied. On the other hand, Humble and Shell offered testimony to the effect and common sense makes such obvious even without testimony, that dual completions are conducive to waste in the following respects:

1. As admitted in sworn testimony by Mr. Massey, an engineer for Cities Service, annular flow (flow through the casing-tubing annulus) is not as efficient as flow through two-inch tubing. As oil is flowed to the surface by the energy of expanding gas, as the Hare reservoir has a solution gas type drive (see Tide Water data for Case 275), as the Brunson reservoir has a solution gas type drive with a partial water drive, as energy from solution gas is not replaced by nature in a solution gas type drive and, as annular flow is inefficient when compared with flow through tubing, the production of oil through the casing-tubing annulus from reservoirs having primarily solution gas type drive will cause the waste of irreplaceable gas energy, thus resulting in the loss of recoverable oil from the underground reservoir or reservoirs.

2. Workovers on dual completions are always more expensive than workovers on a single completion and the expense may become such that one of the horizons will be abandoned prematurely.

3. Packers deteriorate with age and exposure to various conditions and failures therein do occur and as a result thereof oil may be transferred from an efficient reservoir to a relatively inefficient one and thereby ultimately lost.

4. At some time during the life of the Brunson and Hare Fields it seems probable that both horizons will be on artificial lift at the same time. Equipment now available for simultaneous artificial lifting of both zones in a dually completed well was shown by the testimony of applicants to be in the experimental stage of development. If such does not work out, probably one zone would have to be prematurely abandoned. As explained by Mr. Massey, the system used for dual pumping in the Shafter Lake Field in Texas would not be legal in New Mexico. Mr. Massey stated he thought that

one zone was pumped for approximately ten days while the second zone was unproduced; this process was reversed and the second zone was pumped for a similar period while the first zone was unproduced. New Mexico rules do not permit daily production at a rate exceeding one hundred twenty five per cent of the daily allowable assigned the well. As many wells, not capable of flowing production, can be pumped at the allowable rate, the system explained by Mr. Massey would result in a constant loss of production.

That both zones will ultimately require artificial lifting is an established fact. Although the Brunson Pool was discovered as recently as September 1945, the January 1951 Engineering Report of the New Mexico Oil and Gas Engineering Committee shows that 17 of the 93 producing wells listed in the Brunson Pool, over 18 per cent, are being artificially lifted or the installation of lifting equipment is pending in a well or wells reported dead. It is noteworthy that 18 of the 93 Brunson wells, 19.4 per cent, produced more than 2.5 per cent water during January 1951. Of these 18, one-third produced from 2.5 to 10 per cent water, one-third produced from 10 to 50 per cent water, and one-third produced from 75 to 100 per cent water. Ten of the 18 wells producing water are now on artificial lift.

Further, the Hare Pool, which was discovered in July 1947, had one well on artificial lift and preparations were being made to install lifting equipment in a second well. This would represent over six per cent of the 31 wells in the field.

5. It is interesting to note that all five companies having both McKee and Ellenburger wells on the same 40-acre drilling unit elected to drill twin wells in order to establish the most efficient drainage pattern. In the Hare Pool 20 of the 31 producers, 65 per cent, have been drilled as twin wells to Brunson Pool producers, six wells were salvaged from Ellenburger failures, four were not drilled below the McKee probably because the Ellenburger was indicated as too deep to produce and one well was recompleted after the Ellenburger was depleted. A plat showing the location of all McKee and Ellenburger wells in the Hare and Brunson Pools has been entered as Exhibit S-5 in Case 274 and Exhibit S-1 in Case 275.

It does not appear likely that these five companies (Continental, Gulf, Magnolia, Ohio and Shell), who might be considered as prudent operators, would have drilled twin wells if each operator did not consider such a program as more efficient from the standpoint of preventing waste and maintaining correlative rights.

6. Tide Water inserted into the record a number of statements regarding dual completions in the State of Texas but failed to point out that the Texas Railroad Commission, unlike the Oil Conservation Commission of the State of New Mexico, has many engineers and technical employees to act as a

policing group in checking packer tests on dually completed wells thereby protecting the correlative rights of offset operators. We do not feel that it is the duty of an oil company to police the actions of a competitor in such cases.

RELATIVE THE MANNER OF COMPLETION EMPLOYED IN CITIES SERVICE STATE S-4

It should be apparent to the Commission from testimony and Exhibits S-1 through S-4 submitted by Shell Oil Company, testimony and exhibits submitted by Ohio Oil Company, testimony offered by the Gulf Oil Corporation, testimony offered by the Humble Oil and Refining Company and the geologic cross-section submitted by Tide Water Associated Oil Company that Cities Service Oil Company has inadvertently completed their State S-4 well in such a manner as to have a sand member of the lower Simpson Series (production from which has been included in the Hare Pool) and the Ellenburger dolomite (production from which is included in the Brunson Pool) open in the same bore-hole below the casing shoe thus permitting commingling of fluids from both pools prior to sale and also violating the integrity of each pool thereby endangering greatly the correlative rights of nearby operators. Since the hearings in Santa Fe Shell has had the opportunity to analyze drill cuttings from the producing interval in State S-4. Results of this study support our electrical log interpretation. Accordingly, Shell respectfully requests that the Commission immediately orders the Cities Service to cease production from the lower Simpson sand and Ellenburger dolomite sections in their State S-4 well until such time as Cities Service has repaired this well so as to exclude production from one or the other of these horizons in the open hole or until Cities Service has established in a show cause hearing that it has the right to commingle the fluids from these two horizons in the same bore hole.

Yours very truly,

for C. R. Bickel
Division Manager

DMT:

cc: