STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO
23 November 1982

EXAMINER HEARING

IN THE MATTER OF:

The application of Four Corners Gas Producers Association for designation of a tight formation, Rio Arriba and Sandoval counties, New Mexico.

CASE 7746

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division:

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For the Applicant:

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APPEARANCES

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E X H I B I T S

MR. STAMETS: We'll call next Case 7746.

MR. PEARCE: That case is on the application of Four Corners Gas Producers Association for designation of a tight formation, Rio Arriba and Sandoval Counties, New Mexico.

MR. CARR: May it please the Examiner, my name is William F. Carr, with the law firm Campbell, Byrd, and Black, P. A., of Santa Fe, appearing on behalf of Four Corners Gas Producers Association.

I have one witness who needs to be sworn.

MR. STAMETS: Any other appearances?

MR. PADILLA: Mr. Examiner, Ernest L. Padilla on behalf of Turner Production Company, Dallas, Texas.

I have no witnesses.

MR. STAMETS: Any others?

(Witness sworn.)

KEVIN McCORD

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your full name and place of residence?

A. Kevin McCord, Farmington, New Mexico.

Q. Mr. McCord, by whom are you employed?

A. I am a consultant acting for the Four Corners Gas Producers Association.

Q. And in what capacity have you been employed?

A. As a petroleum engineer to present this report.

Q. Have you previously testified before this Commission or one of its examiners and had your credentials as a petroleum engineer accepted and made a matter of record?

A. I have.

Q. Are you familiar with the application of Four Corners Gas Producers Association in this case?

A. Yes, I am.

Q. Are you familiar with the subject area?

A. I am.

MR. CARR: Are the witness' qualifications acceptable?

MR. STAMETS: They are.

Q. Mr. McCord, what is Four Corners seeking with this application?

A. The Four Corners Gas Producers Association is applying for portions of the Ballard Pictured Cliffs and South Blanco Pictured Cliffs Gas Pool to be designated as a tight formation under Section 7 of the Natural Gas Policy Act of 1978.

The proposed Five Lakes Canyon Tight Gas Area is located in the southeastern portion of the San Juan Basin. The area is located in Rio Arriba and Sandoval Counties, approximately forty miles southeast of the town of Bloomfield in northwestern New Mexico.

Q. Have you prepared certain exhibits for introduction in this case?

A. Yes, I have.

Q. Have these exhibits previously been submitted to the Oil Conservation Division and Minerals Management Service, as required by Oil Conservation Commission rules?

A. Yes, they have.

Q. Will you please refer to what has been marked for identification as Exhibit Number One, explain what this is and what it shows?

A. Exhibit Number One displays the proposed Five Lakes Canyon Tight Gas Area map on a map showing the

Pictured Cliffs formation wells in the San Juan Basin.

The Five Lakes Canyon Tight Gas Area includes approximately 234,240 acres.

Q. Generally, how does the Pictured Cliffs formation in this proposed area qualify for designation as a tight formation?

A. The Pictured Cliffs formation in this Five Lakes Canyon Area meets the criteria established in Section 107 of the Natural Gas Policy Act of 1978, in that the estimated average in situ gas permeability throughout the pay section is expected to be 0.1 millidarcy or less; the stabilized gas production rates without stimulation at atmospheric pressure of these gas wells are not expected to exceed the maximum allowable production rate of 79 Mcf of gas per day for an average depth of 2685 feet to the top of the Pictured Cliffs formation in this area, and no well drilled to the Pictured Cliffs formation in this area is expected to produce more than 5 barrels of crude oil per day prior to stimulation.

Q. Will you review to Exhibit Number Two and review this for the Examiner?

A. Exhibit Number Two -- it's in your folder there -- Exhibit Number Two is a Pictured Cliffs formation completion and production map of the proposed Five Lakes

Canyon Tight Gas Area. The production figures presented for each producing well are initial potential, date of initial potential, natural gas production for 1981, and January 1, 1982, cumulative production of gas for the well.

Exhibit Number Two also presents completion and production data from some wells surrounding the proposed tight gas area.

The Five Lakes Canyon Tight Gas Area is bounded to the southwest by the sparsely drilled portion of the Basin and to the northeast by the extensively developed South Blanco Pictured Cliffs Field. Included within the proposed area is a moderately developed southeastern extension of the Ballard Pictured Cliffs Field.

The Five Lakes Canyon Tight Gas Area contains 466 Pictured Cliffs formation gas wells, 94 of which are abandoned in the Pictured Cliffs at this time. The average depth to the top of the Pictured Cliffs formation is 2685 feet. A list of operator, well names, and production figures for the Pictured Cliffs wells in the Five Lakes Canyon Area is presented as Exhibit Number Three.

Q. Will you generally describe the geology of the Pictured Cliffs formation in the proposed area?

A. The Pictured Cliffs formation is a marine, clay field sandstone, whose source was to the southwest. The formation was deposited as near shore bars aligned northwest-southeast with each sand body becoming progressively younger from the southwest to the northeast by the regressive Late Cretaceous sea. The form of gas entrapment in the Five Lakes Canyon Tight Gas Area is stratigraphic. Sediments within this area are seaward deposits of the Ballard Pictured Cliffs Field rather than landward deposits of the South Blanco Pictured Cliffs Field. Sample examination indicates the Pictured Cliffs in this area is predominantly siltstone rather than sandstone, which, with clay filling, is the contributing factor to the low permeability found in the Five Lakes Canyon Tight Gas Area.

The sand deposition within a tight gas area is more limited than it is in the South Blanco Field. The near shore bars within the proposed area are extremely lenticular, ribbon-like deposits with a very limited southwest-northeast areal extent, as evidenced by the Ballard Pictured Cliffs Field.

This compares to the better developed, more blanket-like deposits of the South Blanco Field.

The ribbon-like nature of the sands within the proposed area result in linear well development with limited numbers of better producing wells being drilled on the near shore bar crests where the sand is best developed.

These could be referred to as sweet spots.

Once off the bar crest, the sands become siltier and more clay-filled, with drastic -- which drastically reduces the effective permeability.

Q. Will you now refer to Exhibit Number Four and identify this and explain what it shows?

A. Exhibit Number Four is a type log of the Pictured Cliffs formation in the Five Lakes Canyon Tight Gas Area. This well is the John Schalk Cinco Diablos No. 6 Well, and is located in Township 23 North, Range 4 West, Section 14, in the northwest quarter.

The top of the Pictured Cliffs formation on this type log is 3046 feet and is overlain by a 7-foot coal bed.

The base of the Pictured Cliffs is at 3141 feet and is underlain by the Lewis Shale.

This type log is representative of the Pictured Cliffs formation in the Ballard Pictured Cliffs Pool. Some of the wells in the vicinity of this type log have exhibited better than average producing characteristics in the remainder of the area; therefor, wells in the remaining portion of the Five Lakes Canyon Area would be expected to have the same or poorer log characteristics than this type log.

Q. Mr. McCord, will you now review for Mr.

Stamets Exhibits Five and Six?

A. Exhibit Number Five presents cross section A-A', which shows Pictured Cliffs development in the tight gas area in a general north/south direction, while Exhibit Number Six is a log cross section B-B', which shows Pictured Cliffs development in a general west-to-east direction in the area.

The log reference datum shown on these cross sections is the Pictured Cliffs formation. The cross sections illustrate the Pictured Cliffs formation to be a continuous, lithologic unit throughout the Five Lakes Canyon Tight Gas Area. Both cross sections indicate that the good, productive sands from this formation are not continuous throughout the area. This lenticular sand development makes drilling in this area considerably risky.

Q. Have you been able to obtain stabilized unstimulated gas production rates for the area?

A. Yes, I have. Obtaining stabilized unstimulated gas production rates for Pictured Cliffs wells is not a standard procedure used by companies when completing their wells in the San Juan Basin. Past experience has shown that these low permeability Pictured Cliffs wells must be stimulated to obtain commercial production.

However, in preparation for this Five Lakes

Canyon Tight Gas study, Amerada Hess performed unstimulated natural gas production tests on eight wells scattered throughout the tight gas area. On Exhibit Number Two these wells are shown as orange squares, on Exhibit Two.

Exhibit Number Seven gives the location of these test wells and indicates that the average unstimulated natural gas production rate for the tight gas area is 16.5 Mcf of gas per day. This rate is well below the 79 Mcf of gas per day allowed for tight formation gas wells having an average depth of 2685 feet.

Not all of the natural production tests taken were used to calculate an average unstimulated natural production rate for the Five Lakes Canyon Tight Gas Area. Wells Nos. 8 and 3 were not considered to be representative tests for the tight gas area. Well No. 8, Amerada Hess' Jicarilla "C" No. 3 Well, is located in a localized high production area, which I referred to earlier as a sweet spot.

Exhibit Number Two shows the location of this well in Township 24 North, Range 5 West, Section 35, northwest northwest.

These sweet spots are generally near shore bar crests of the linear developed sand trends. They have very good sand development associated with them and tend to have very limited pockets of high porosity and permeability with some associated natural fracturing. All of these factors contribute to a very good well -- contribute to very good well producing characteristics in these limited areas.

A large problem with developing these sweet spots with further drilling, an operator might find -- may find these localized well developed lenticular sands are often not more than one or two locations wide. This is shown in the area of the Jicarilla "C" No. 3 Well on Exhibit Two. There are very good wells in this sweet spot area; however, drilled and abandoned locations appear only one drill site away.

Another problem with development drilling in sweet spots is that one well may adequately drain the limited areal extent of the well developed sand. The second well penetrating the sweet spot often has reduced reservoir pressure, which substantially reduces gas reserves for the second well. These two factors often make the drilling of the sweet spots risky, making the initial well very economical with the second well oftentimes uneconomical.

The Jicarilla "C" 3 had an unstimulated natural production test of 259 Mcf of gas per day, which is very good for a Pictured Cliffs well in this area. This very high production rate can only be attributed to a sweet spot and cannot be thought of as average for the area. For this reason, this high natural production rate was not used to calculate an average unstimulated natural production rate for the area.

The other well not used to average the unstimulated natural production test is Amerada Hess' Jicarilla "I" 10 Well, located in Township 23 North, 3 West, Section 2, northwest of the southwest. This well had an unstimulated natural production test of gas that was too small to measure. The well was subsequently abandoned. This well is not representative of the producing portion of this tight gas area; therefor, is not used in the averaging.

The remaining six producing wells have unstimulated natural production tests that seem reasonable for the area. The majority of these test wells, Wells 1, 3, 5, 6, 7, and 8, were open hole completions. These wells had 5-1/2 inch casing set at the top of the Pictured Cliffs formation and the pay zone was drilled with air. When total depth was reached, 24-hour production tests were taken to measure the unstimulated natural production from each well.

The remaining two wells, Wells 2 and 4, had casing set through the Pictured Cliffs pay interval. These wells were evacuated of fluid in the wellbore and perforated across the pay interval. The wells were then tested for 24 hours to obtain an unstimulated natural production test for each well.

The averaging of these unstimulated production tests results in a 16.5 Mcf of gas per day natural production rate for an average well in the Five Lakes Canyon Area. This 16-1/2 Mcf of gas per day unstimulated gas production rate is well below the 79 Mcf of gas per day rate allowed to qualify an area for tight formation gas prices at the average formation depth of 2685 feet.

Q. Mr. McCord, were you able to obtain stabilized unstimulated oil production rates?

A. No, I was not. The natural gas produced from the Pictured Cliffs formation in the Five Lakes Canyon Tight Gas Area is virtually dry gas. There has been very little oil and condensate reported for any of the wells now producing in the area. Some of these wells will have associated water production with the gas but condensate production is not common. These dry gas production figures indicate a well drilled in the Pictured Cliffs formation is not expected to produce without stimulation more than five barrels of crude oil per day.

Q. Would you generally describe the permeability in the Pictured Cliffs in the proposed area?

A. The Pictured Cliffs formation in the San Juan Basin is dependent on stimulation techniques to be commercially productive due to the low permeability of the reservoir rock. Exhibits Numbers Eight through Sixteen present core analysis data used to determine the average laboratory permeability to air for Pictured Cliffs formation pay zones in this area.

The exhibits contain the actual core analysis reports plus summary tables showing the analysis of cores taken from only the productive portion of the Pictured Cliffs formation for each well. The core intervals chosen for permeability averaging were determined by log examination of the interval cored for each well. Only cored intervals of sand which were perforated by the operator of the well were used for permeability averaging. ON wells which were not perforated a reasonable pay interval was chosen for the well and this cored interval was used for permeability averaging.

The average permeability value determined in Exhibits Eight through Sixteen are average laboratory determined permeability values.

The average in situ permeability of the formation is less than this laboratory determined value due to water saturation and net confining pressures found in the Pictured Cliffs reservoir.

Q. Will you now refer to Exhibit Seventeen, identify this and explain what it shows?

A. Exhibit Number Seventeen presents a technical paper entitled Effect of Overburden Pressure and Water Saturation on Gas Permeability of Tight Sandstone Cores, written by Thomas Ward of the U. S. Bureau of Mines. This paper presents relationships between laboratory determined permeability in cores and actual in situ permeability found in reservoirs.

Exhibit Number Eighteen explains how in situ permeability is calculated from the core analysis, using the technical paper presented.

Q. Will you now refer to Exhibit Nineteen and review this for Mr. Stamets?

A. Exhibit Nineteen is a summary of all laboratory core analysis results for the Five Lakes Canyon Tight Gas Area. Not all of the well which had core analysis available were used to obtain an average permeability for the tight gas area from core data.

Exhibit Number Nineteen shows that core data from Wells 1 through 4 was used to obtain the best permeability average for the tight gas area.

The core data from Well No. 5 was not used in this -- as this well is also located in a sweet spot area.

The higher average permeability value shown for this well is not considered normal for the area.

The core data from Wells 6 through 9 also was not used, as these wells have not produced from the Pictured Cliffs formation. These dry holes are also not indicative of the average producing well in the tight gas area.

The average laboratory permeability to air obtained for the Five Lakes Canyon Area from the four remaining cored wells is 0.047 millidarcy. An average in situ permeability value of 0.009 millidarcy was calculated from this average laboratory permeability value. The 0.009 millidarcy permeability value calculated from core data is well below the 0.10 millidarcy cutoff for tight gas reservoirs.

Q. Were other methods employed to determine permeability in the subject area?

A. Yes, they were.

Another method of determining reservoir permeability was performed, making use of the unstimulated natural production tests taken in the area. The average unstimulated gas flow rate of 16.5 Mcf of gas per day, along with other Pictured Cliffs reservoir data for the tight gas area, can be used in Darcy's Law to calculate a reservoir permeability. This Darcy's Law calculation is presented as Exhibit Number Twenty.

Darcy's Law calculations report an average reservoir permeability value of 0.04 millidarcy for the Five

Lakes Canyon Tight Gas Area. This permeability value compares to the 0.009 millidarcy permeability value determined by core analysis methods. Both of these values are well below the 0.10 millidarcy tight gas cutoff.

Q. Were build-up tests run?

A. Yes, they were. In attempt to obtain even more permeability data for this area, Amerada Hess conducted build-up tests in seven of the eight wells which had natural production tests performed on them. Unfortunately, these 7-day build-up tests, as is common with many build-up tests in tight formations, were not long enough to obtain accurate permeability data for the area. Both Horner analysis and tight curve analysis were studied in detail on this data and no precise permeability data for this area could be obtained. For this reason, no build-up analysis data is presented for the Five Lakes Canyon Tight Gas Area.

Q. Mr. McCord, what general conclusions can you reach conerning the permeability in the subject area?

A. From examination of the two sources of permeability data, the reservoir permeability value of 0.04 millidarcy, determined by Darcy's Law, is thought to be the best estimate of reservoir permeability for the Five Lakes Canyon Area because it involves actual formation flow characteristics and reservoir parameters to determine formation permeability. Therefor, the estimated average in situ gas permeability throughout the Pictured Cliffs formation pay section is expected to be 0.1 millidarcy or less in the Five Lakes Canyon Tight Gas Area.

Q I'd now like to direct your attention to fresh water protection in the proposed area and ask if you've reviewed existing State and Federal regulations concerning the protection of fresh water?

A Yes, I have. Existing State and Federal regulations will assure that development of the Pictured Cliffs formation will not adversely affect or impair any fresh water aquifers that are being used or expected to be used in the foreseeable future for the domestic or agricultural water supplies.

Regulations require that casing programs be designed to seal off potential water-bearing formations from oil and gas producing formations. These fresh water zones exist from the surface to the base of the Ojo Alamo formation.

The base of the Ojo Alamo averages 2445 feet in the proposed area. Most Pictured Cliffs wells drilled in the Five Lakes Canyon Area are drilled with natural mud that will not contaminate fresh water zones. Normal casing designs consist of 7-inch OD surface casing being set from the surface to a depth of 120 feet. Production casing normally used is 2-7/8ths inch OD and is set from surface to total depth.

The open hole completions mentioned earlier have 5-1/2 inch OD production casing set just above the Pictured Cliffs formation and the productive formation is drilled with air and left open to produce.

The surface casing is cemented in place by circulating cement to the surface, protecting the near-surface formations from downhole contamination.

The production casing is cemented from total depth to the surface or to a depth sufficient to cover the Ojo Alamo formation. This process protects the Pictured Cliffs and other shallow formations from contaminating the Ojo Alamo aquifer.

Therefor, all productive and fresh water zones are protected by both casing and cement.

Stimulation of the Pictured Cliffs formation involves varied fracture treatments, depending on the operator. Fracture treatments usually consist of one or two percent potassium chloride water-based fluid with sand, or a nitrogen-water foam base fluid and sand. Either treatment will not harm a fresh water aquifer.

Fresh water protection is assured during these fracture-stimulation treatments due to zone isolation caused by cementation. A distance of over 200 feet between the Pictured Cliffs formation and the Ojo Alamo fresh water aquifer is additional insurance that no existing fresh water zone will be contaminated by stimulation of Pictured Cliffs wells in the area.

Therefor, New Mexico and Federal regulations will protect any fresh water supply that may be affected by drilling, completing, and producing the Pictured Cliffs formation in the Five Lakes Canyon Tight Gas Area.

Q. Will you summarize the conclusions you've reached as a result of your study of the proposed area?

A. The evidence I've presented substantiates that for an average Pictured Cliffs Well depth of 2685 feet the stabilized production rate at atmospheric pressure of wells completed in the Pictured Cliffs formation without stimulation is not expected to exceed the maximum allowable rate of 79 Mcf of gas per day.

No well drilled into the Pictured Cliffs formation in the Five Lakes Canyon Area is expected to produce without stimulation more than five barrels of crude oil per day, and the estimated average in situ gas permeability throughout the Pictured Cliffs pay section is expected to be 0.1 millidarcy or less.

The proposed Five Lakes Canyon Tight Gas

Area meets all the specifications required, as stated, and should be designated a tight formation in the Pictured Cliffs formation under Section 107 of the Natural Gas Policy Act of 1978.

Q. Mr. McCord, will you identify what has been marked as Applicant's Exhibit Number Twenty-one?

A. Exhibit Number Twenty-one is prepared text to go along with this reservoir report.

Q. Were Exhibits One through Twenty-one prepared by you or under your direction and supervision?

A. Yes, they were.

MR. CARR: At this time, Mr. Stamets, we would offer into evidence Four Corners Exhibits One through Twenty-one.

MR. STAMETS: These exhibits will be admitted.

Q. Mr. McCord, in your opinion will granting this application be in the best interest of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes.

MR. CARR: Mr. Stamets, we have received several questions from the Minerals Management Service, and with your permission, at this time I will ask those for them.

MR. STAMETS: Please go ahead.

Q. Mr. McCord, in the report submitted with this application, it is stated that the form of gas entrapment is stratigraphic. Why then don't the boundaries to the south and west more closely parallel the general northwest/southeast stratigraphic trend of the Ballard Pictured Cliffs Field?

A. That's strictly a boundary determination. In talking this matter over with the Four Corners Gas Producers we decided on this area. It was not by any other means other than acreage position. It had nothing to do with geology.

Q. Why is the southwest corner of the Lindrith Unit, including all or parts of Sections 26 through 28 and 33 through 35 of 24 North, 3 West, excluded from the tight sands area?

A. Once again, this was a determination of the boundary of the area. Not enough interest was shown in the Lindrith Unit to include it in this area.

Q. Would the Four Corners Gas Producers Association provide the Minerals Management Service with structure and Isopach maps of the Pictured Cliffs formation in the proposed Five Lakes Canyon Tight Sands Area?

A. These maps could be prepared. We have not presented, or have not prepared these maps as yet. It would involve a great expense and I don't feel, personally, that would help any more than what we've seen right now. But if -- that could be done, if need be.

Q. And will you contact the Minerals Management Service concerning this request?

A. Yes, I will.

Q. Using the charts and the technical paper listed as Exhibit Seventeen, you came up with a reduction of 98 percent in laboratory permeability. Realizing that the laboratory permeabilities were to air and there will be a reduction in permeability due to overburden pressure, why do you expect that much of a reduction in the in situ permeability of these wells since they are at a shallower depth than those used to generate the charts?

A. Well, first of all, in reading through Exhibit Number Seventeen, most of the cores used to generate the charts, that I can see, were all at a deeper depth than what we're looking at. So I feel they are -- the charts used are very indicative of this type of area.

Also, the main factor used in determining the percentage reduction in the permeability from laboratory to in situ deals mainly with overburden pressure rather than depth. The overburdens calculated were up to an overburden pressure of 6000 psi. The overburden seen in this area in the Pictured Cliffs is in the neighborhood of 2000 psi; therefor, I think the charts used were well within the scope of this presentation and very indicative of the rock in this area.

MR. CARR: Mr. Stamets, that concludes our direct questions.

MR. STAMETS: Are there other questions of the witness?

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. McCord, how many sweet spots wells do you know of in this area?

A. Obviously that's a tough question to define. I've thought about that when establishing the boundaries for this area, and I definitely think the Amerada Well that I mentioned, and also the core analysis well that I mentioned, are sweet spots, and that from examining the wells around, and some of these wells have made over a Bcf of gas. For a shallow Pictured Cliffs Well that's quite a -- quite a good well.

Although the big problem with defining what is a sweet spot is the actual extent of the wells. When you go one drill spot away and you have a dry hole, it's pretty hard to establish what is a sweet spot other than wells already drilled, and most of the wells already drilled that I consider a sweet spot are in the general area of 24, 5, Sections 31, 32, 33, 34, and the northwest of 35. This is the general area I'm referring to as a sweet spot. Anyone going through there could make their own interpretation of which well's production is due to very good reservoir rock. It's just a personal opinion there. Most of the wells in that general area, though, I think are sweet spot wells.

I'd like to add that most of those wells are -- most spacing units are drilled up at this time and the effect of 107 pricing for that sweet spot area would be -- would be minimal, and that's the main reason I didn't try to exclude any of those wells.

Q. Based on your testimony, I would anticipate, then, that this area that is drilled up, the big area running from the southeast up to the northwest through the center of the proposed area, is -- is the crest of one of these sandstones, and the area where the drilling has previously taken place.

A. That is correct. Most of the future drilling involved, Mr. Stamets, of course, is going to be step-out drilling. I believe the real structures have been defined by drilling so many wells in this area.

There are a number of dry holes; most of them, some of them very recent, generally showing us that we've got a definite sand difference between very good wells and offset wells. So most of the major -- it appears most of the major crest drilling has already occurred and future drilling would involve step-out type of wells with somewhat less chance of success.

Q. If we go into 23, 3, and look at Section 22, 27, and 34, just looking at the initial potentials in there, those wells came on pretty well. Now, is that an area that -- that has good wells in it? I see one of them is marked as a shut-in gas well. Or is that an area that you believe still is a tight formation?

A. I believe, especially in Section 22, that you just referred to, the south half of that, of course, is undrilled, I definitely think that is an area that would need tight gas pricing to be economic.

There are some high initial potentials; of course, initial potentials are very, very misleading in that the wells don't produce near that type of amount when put on line pressure.

It is also evident from looking at some of the surrounding wells, especially the south half of 27, the north half of 34, we've got some high cumulative productions, but also, looking at the south half of 34, we haved a drilled and abandoned location and a well that was drilled in 1972 that's uneconomical; therefor, the actual defining of which is a sweet spot well and which is an uneconomical venture in the Pictured Cliffs is real hard to make.

Still, drilling in Section 27, say, an off-set well there, I would -- I would guess that -- that the chances of obtaining a well like the south part of Section 27 are not that great, and it's a risky business.

Q. Mr. McCord, on Exhibit Two, just to the south and east of the area we are talking about, there appear to be eleven or twelve wells that have been drilled in 1981 and '82. Can you tell me why that has occurred?

A. Okay. Those particular wells drilled in Section 36 I don't know about. The great majority of new wells drilled in this area are drilled -- are drilled due to Jicarilla demand. The great majority of this area is in the Jicarilla Reservation and as you know, many demand letters were sent out to operators to diligently develop their ac-reage.

The numbers I have, in 1982 out of these 466 wells, 31 of them were drilled in 1982, and I would -- I would guess that the great majority of those 31 were drilled due to Jicarilla demand. That is the main reason.

MR. STOGNER: Do you know if there was any wells drilled in '81 - '82 in the sweet spot areas, so-called?

A. In the sweet spot area I defined in 24, 5, I don't see any that I would consider sweet spot wells.

Now, I'm sure throughout the period of time that drilling has taken place, which, mainly it started in 1955 in this area, there have been many offset wells drilled to supposedly sweet spot wells, otherwise very good producers. Some of these wells, obviously, turned out to be good wells, also; other wells exhibited the problems I've talked about earlier, such as reservoir drainage and drilling a dry hole next to a very good producer.

This can be seen, like in 24, 5, Section 27, in the northwest quarter, there's a well that was drilled and abandoned in 1955. Three wells surrounding it have made 3/4 of a B -- excuse me, two have made 3/4 of a Bcf; the other made -- the other two, 1/2 a Bcf. Those are obviously economical wells, but we have a dry hole right next to it.

In Section 35 the Amerada well, which had the good unstimulated natural production test, one drill site away in the southeast of 26 we have a well that was drilled and abandoned in 1963.

So predicting how a well will do just by offsetting a sweet spot well is pretty tough.

It's certainly an uncertain area.

MR. STAMETS: Any other questions of the witness? He may be excused.

Mr. McCord, in light of the fact that we have so much drilling activity inside this area, we may have some additional questions following the hearing, in which case we'll be in touch, and we will add that additional information to the record in this case.

A. I'd be happy to supply it.

MR. STAMETS: Anything further in the case? Mr. Padilla?

MR. PADILLA: Mr. Examiner, Turner Production Company is here in support of this application.

MR. STAMETS: If there is nothing further, we'll take the case under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd C.S.R.