CASE NO.

2697

APPLICATION,

TRANSCRIPTS,

SMALL EXHIBITS,

ETC.

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

EXAMINER HEARING

IN THE MATTER OF:

Application of OXOCO Production Corporation for designation of a tight formation, San Juan County, New Mexico. CASE 7697

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: W. Perry Pearce, Esq.
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For the Applicant: William F. Carr, Esq.
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I N D E X

E X H I B I T S

MR. STAMETS: We'll call now Case Number 7697.

MR. PEARCE: That is on the application of OXOCO Production Corporation for designation of a tight formation, San Juan County, 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 OXOCO.

I have two witnesses who need to be sworn.

MR. STAMETS: Are there any other appearances in this case?

I'd like to have both witnesses stand and be sworn, please.

(Witnesses sworn.)

MR. CARR: We will first call Mr. Speer.

WILLIAM R. SPEER

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, please?

A. My name is William R. Speer.

Q. Where do you reside?

A. I'm from Farmington, New Mexico.

Q. By whom are you employed?

A. I'm a self-employed consulting geologist.

Q. Have you been employed by OXOCO in regard to Case 7697?

A. Yes, I have.

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

A. Yes, I have.

Q. Are you familiar with the application filed in this case on behalf of OXOCO?

A. Yes, I am.

Q. Are you familiar with the area for which a tight gas formation designation is being sought?

A. Yes.

MR. CARR: At this time we would tender Mr. Speer as an expert witness in petroleum geology.

MR. STAMETS: He is considered qualified.

Q. Mr. Speer, will you briefly state what OXOCO is seeking with this application?

A. Yes. OXOCO is applying for an area in San Juan County to be designated as a tight formation under Section 107 of the NGPA.

The proposed Rattlesnake Canyon-Mesaverde Tight Gas Formation Area is located in north central San Juan County, adjacent to the Colorado state line. It is on the southwestern flank of the structural San Juan Basin, near the western end of its synclinal axis.

The recommended area includes the following acreage: In Township 32 North, Range 8 West, New Mexico Prime Meridian, all of Section 8, 17, 18, 19, and 20, consisting of approximately 3229 acres.

Q. Mr. Speer, I believe this figure 3229 acres differs somewhat from the original estimate of the acreage in this proposed area, is that correct?

A. That's correct.

Q. What was the cause of this error?

A. It's my understanding that in preparing the application OXOCO utilized planimetering of their base map to obtain this original application acreage, and it was later determined from observing the general Land Office survey and plat that because of the irregular sections along the

northern edge and the western edge of that township and range, 32 North, 8 West, the irregularity of those sections resulted in a total acreage of 3229, rather than the application number.

Q. Mr. Speer, have you prepared certain exhibits for introduction in this case?

A. I have not prepared the exhibits. The staff of OXOCO in the Houston office prepared the exhibits.

Q. Have you reviewed each of the exhibits and can you testify from your own knowledge as to the accuracy of the exhibits?

A. Yes, I did review these exhibits and am able to testify as to their accuracy.

Q. Were these exhibits submitted to the Mineral Management Service and the Oil Conservation Division with a statement of the meaning and purpose of each, as required by Oil Conservation Division rules?

A. It's my understanding that they were.

Q. Will you now refer to what has been marked for identification as OXOCO Exhibit Number One, identify this for Mr. Stamets and explain what it shows?

A. Exhibit Number One is a map showing the general area of the application with all of the well locations shown, and it shows the application area by stippled outline.

It also shows by a dashed line in the southwest quadrant of the map an outline of a previously approved tight gas area for the Mesaverde, issued in Order Number R-6888.

It shows production data beside each well. Such data including the cumulative production of the well through the end of 1981. It shows the initial potential of the well. It shows the completion date of that well.

It also shows the geologic structure on the top of the Green Marker bed, which is here selected as the top of the Mesaverde formation. This marker bed is approximately 350 feet above the top of the Cliff House sandstone member of the Mesaverde and is a persistent formational boundary which is -- can be picked consistently on the electric logs of all wells within the mapped area.

The structure contours show regional northeastward dip, generally at less than 1/2 degree, toward a small, closed low, located in Sections 8, 16, and 17. Regionally this structural low is near the synclinal axis delineating the bottom of the San Juan Basin.

Q. Mr. Speer, I would direct your attention to Section 7, which is the northern portion of the exhibit, on the northern boundary, and direct your attention to the well that is marked with the -- it says OXOCO No. 3. Would

you -- there is apparently an error in the well symbol on that well. Would you review that for Mr. Stamets?

A. That is correct. There are three drafting errors on this map that we would point out.

In the case of that well referred to by Mr. Carr, the OXOCO No. 3 Well is a Dakota test, which should have had the symbol of a square around it rather than the Mesaverde symbol that is shown.

Immediately south of that in Section 18, the OXOCO No. 2 Well is shown as a Dakota test, which it was originally scheduled for, but it was subsequently completed at a shallower depth in the Gallup formation.

MR. STAMETS: That's Well No. 2?

A. No. 2 in Section 18.

MR. STAMETS: And so it did not penetrate?

A. The Dakota. It is a Gallup production well.

And there is also an additional well not shown on here in Section 16 in the southwest southwest quarter, a Dakota test well drilled by Southern Union, which is a Dakota/Gallup -- yes, a Dakota/Gallup dual producer.

Q. Now, Mr. Speer, I'd direct your attention to what has been marked as Exhibit Two-A. Before you explain that, I'd like to call to the Examiner's attention that

this exhibit is different from the exhibit that we submitted fourteen days ago. There are a number of changes on it and so I think it would be useful to only refer to Exhibit Two-A and we will not offer Exhibit A which was previously submitted.

Mr. Speer, will you refer to this and explain to Mr. Stamets what it shows?

A. Exhibit Two-A is a revised copy of the gamma ray induction log of the OXOCO No. 3 Trail Canyon Well, located in the southeast quarter of Section 7, Township 32 North, Range 8 West, which is selected as the type log for the Mesaverde formation in the application area.

The revision from the original Exhibit Two, which was submitted with the original application, was necessary because the formational tops and the intervals shown to be perforated were incorrect, and this particular exhibit has been corrected to indicate the correct formational tops and the correct perforated intervals in this well.

This exhibit shows that the tops of the three conventional members of the Mesaverde, as follows: The Cliff House sandstone is located at a depth of 5650 feet; the Menefee at 5701 feet; and the Point Lookout sandstone at 5960.

The vertical limits of the Blanco Mesa-

verde Pool have been defined by the New Mexico Oil Conservation Division as extending from the Huerfanito Bentonite bed in the Lewis shale to a point 500 feet below the top of the Point Lookout sandstone member. The Huerfanito Bentonite, located at a depth of 4460 on the type log, is a marker bed approximately 1800 feet above the Mesaverde, which here is picked on the Green Marker at 5267 feet depth.

The more conventional top of the Mesaverde is at the top of the Cliff House member, but because the Cliff House is less well defined on the electric logs in this area, the Green Marker has been used for illustration purposes on both the structural contour map and the cross -- as a cross sectional datum.

The Cliff House and the Point Lookout members normally are the main producing zones in the field, but in the Rattlesnake Canyon area the Point Lookout is considered the primary producer, with the more discontinuous sands of the Menefee contributing substantially where they are developed.

The Cliff House sandstone, averaging about 50 feet in thickness, is less well developed as a reservoir bed, having porosity which has been estimated by log interpretation to range from less than four percent to as high as fifteen percent.

The Menefee ranges in thickness from 2300

to 20 -- I'm sorry, ranges in thickness from 230 feet to 290 feet, with porosity values of less than three percent to as high as seventeen percent.

The main Point Lookout sand is from 150 to 200 feet thick with occasional significant sandstone bed developments in the basal transition zone with the underlying Mancos Shale, which is as much as 500 feet below its top.

Q. Will you now refer to Exhibit Number Three? Before you review this exhibit, there are a couple of minor drafting matters that need to be called to the Examiner's attention. Would you do that at this time, please?

A. Yes. In the case of Exhibit Number Three, in the columns between the well logs depicted is shown the perforated interval, the gross perforated interval.

In the case of the Phillips well, where it shows perforated interval to be 5460 to 5962, and in the case of the Pacific Northwest well --

Q. Do you want to stop just a second? Let's go off the record just a minute.

(Thereupon a discussion was had off the record.)

A. Exhibit Number Three is a northeast/south-

west electric log cross section across the application area, encompassing the wells which are shown on Exhibit One by the cross section trace A-A'. The datum is the Green Marker bed. The top of the Mesaverde is here defined, and the section illustrates the stratigraphic continuity of the Cliff House and Point Lookout members across the proposed tight gas sand area. The general lenticularity and discontinuity of the various Menefee sandstones can also be seen.

Q. Would you describe for Mr. Stamets the general characteristics of each of the primary members of the Mesaverde?

A. In describing the geology of the formational members included in this application, the lowermost Point Lookout sandstone member contains -- consists of a series of near shore and shoreline sands deposited during a period of regression or retreat of the late Cretaceous seas across this area, retreating to the northeast.

The maximum sand build-ups occur during periods of shoreline stillstands or pauses during the overall regressionary period and the resultant sandstones generally exhibit better porosity and permeabilities as a result of the winnowing action of the seas having removed some of the finer clastic components of these shoreline sands.

The lithology of the Point Lookout is

a light gray, tight, fine to very fine grained, subangular, quartz sand, with calcareous cementation and a varying amount of clay in its matrix. It has very poor, visible porosity.

The Menefee member represents the non-marine coastal plain and swamp deposits being deposited immediately adjacent to the Point Lookout shoreline during its northeastward regression and the subsequent southwestward transgression of the seas which laid down the Cliff House member.

The beds of the Menefee formation contain fluvial channel sands, siltstones, and shales, as well as thin coals and carbonaceous shales, all lenticular and discontinuous as is typical of beds deposited in a fluvian environment.

The lithology and reservoir quality of the sandstones in the Menefee are very similar to those of the Cliff House and the Point Lookout; however, with a correspondingly higher clay content. Their continuity and areal extent is much more limited due to their original mode of deposition.

The Cliff House member of the Mesaverde, like the Point Lookout, normally consists of widespread shoreline sandstones which were deposited during subsequent advance of the late Cretaceous seas to the southwest. It also

normally exhibits sand build-ups and clean-ups during periods of stillstand during that transgression; however, it appears that the Cliff House sandstones in the application area are very poorly developed, as can be seen on the log cross section. This may possibly be a result of a comparatively rapid transgression of the shoreline in the Rattlesnake Canyon area.

Within the approximately 50 feet of gross interval of Cliff House shown on the cross section, only about 10 to 15 feet is considered to be as a potential gas pay by our log interpretation.

On the type well shown on Exhibit Two the Cliff House interval perforated was 8 feet in thickness.

Within the 230 to 280 feet of gross interval of the Menefee formation in the Rattlesnake Canyon area there are normally two to four individual sandstones having gas potential. Total pay section is indicated by log interpretation is perforated intervals has a range from approximately 35 to 65 feet.

Again on the type well, which has unusually thick Menefee sands, 48 feet of the Menefee is perforated.

From a regional standpoint the Menefee is much thinner in this area when compared with the more productive areas of the basin to the south. The Menefee is near the northeasternmost extent of its deposition as it was limited

by the subsequent southwestward regression of the late Cretaceous Lewis Sea, and this position probably unfavorably affects the reservoir quality of the sands deposited in both the Menefee and the Cliff House stratigraphic intervals.

The Point Lookout sandstone is considered to be the primary pay zone in the Rattlesnake Canyon area. The sands generally average higher in apparent porosity, as interpreted by logs which are principally the density logs. It generally has a massive, thick-bedded sand at its top, which ranges up to 110 feet in thickness.

In individual wells in the area from 55 to 108 feet of the Point Lookout have been perforated. In the type well, the OXOCO No. 3, 72 feet of the Point Lookout were perforated and are considered to be effective pay.

Q. How would you characterize the risk involved in drilling a well in this proposed area?

A. Relatively high by comparison.

Q. Do you have anything further to add to your testimony?

A. I think not.

MR. CARR: At this time, Mr. Stamets, we would offer into evidence OXOCO's Exhibits One, Two-A, and Three.

MR. STAMETS: These exhibits will be ad-

mitted.

MR. CARR: I have nothing further of Mr. Speer on direct.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Speer, Exhibit Two-A depicts a log in the area, and I presume it's the type log, on the OXOCO Trail Canyon No. 3. Now you mentioned two different tops for the Mesaverde, one is the Oil Conservation Division top, related to the Huerfanito Bentonite marker, and then the other, related to the Green Marker.

Now what interval is being sought by OXOCO for approval of a tight formation?

A. It is my understanding that the application is for the area that has been designated for the stratigraphic interval that has been designated previously by the Division.

Q. So you're looking for the Division interval --

A. Described interval.

Q. -- as opposed, say, from the top of the Green Marker.

A. Which would -- which would be from the

Huerfanito Bentonite to 500 feet below the base of the Point Lookout.

Q. All right. And in fact the type log does not penetrate that entire interval.

A. I'm afraid that it did and it was the one that was utilized. The reason that the OXOCO 3 was used as the type log is that it is the Dakota test that did penetrate below this but unfortunately illustration prepared by OXOCO did not show all the way to the -- it only shows approximately 260 feet below the base of the Point Lookout.

Q. I'm sure OXOCO can supply us sufficient additional copies after the hearing of the entire interval.

A. I'm sure they'd be happy to.

Q. Okay. Referring back to Exhibit Number One, now I'd just kind of like to go through this section by section to be certain that I know exactly which sections have a Mesaverde well.

If we begin and just take them in numerical order, Section 7 has a well which has penetrated the Dakota but is not completed in the Dakota?

A. No, it is. It is a dual completion in the Dakota and Mesaverde.

Q. Okay, and Section 8 is a Mesaverde single?

A. That is correct.

Q. Section 17 is a Mesaverde single?

A. Correct.

Q. Section 18 is a Gallup well.

A. That's correct, it is.

Q. Which did not penetrate the Mesaverde.

A. No, it did penetrate the Mesaverde but is productive from the Gallup, below the Mesaverde.

Q. In Section 19 we have a Mesaverde well.

A. That's right.

Q. And in Section 20 we have a Mesaverde well.

A. Correct.

Q. So every section, then, has at least one well, or has only one well, and every section has a well which has penetrated the Mesaverde.

A. That's correct.

Q. Of those,one, two, three, four, five are productive.

A. Five, yes.

Q. And just -- well, with the rules as they are relative to the Mesaverde, each standard section should have four wells on it to be fully developed.

A. Four Mesaverde wells.

Q. Right, and I would assume that in the

two short sections, Section 7 and 8, perhaps only two wells in each section would be sufficient to develop it.

A. I believe that is correct.

Q. So what we have is a situation where we have sixteen, seventeen, eighteen, twenty possible wellsites. Of those, only six have been drilled and only five are productive.

A. That's correct.

Q. Would you label that as heavy development, moderate development, or light development?

A. I believe that would be considered light development.

With reference to Exhibit One, I might also point out that the cross section was designed to encompass one of the Mesaverde wells in the previously defined tight gas area, the Koch Well in Section 25 of 32, 9, for reference purposes.

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

MR. CARR: Just a minute. please.

REDIRECT EXAMINATION

BY MR. CARR:

Q. Mr. Speer, I believe, if you'll look at

the wells in Section 7 and Section 8, would you tell us when these wells were completed?

A. The -- the map indicates that the OXOCO No. 1 Well in Section 8 was completed in February of 1980, and the No. 3 Well in Section 7 was completed in August of this year.

Q. Now, directing your attention to the No. 3 Well, was that well drilled in anticipation of the 107 price?

A. I assume that it was.

Q. At the time this well was drilled was there some confusion as to whether or not this area had been included in a designation for a tight formation by FERC?

A. Yes, it was.

Q. And it was only after a readvertisement of FERC that OXOCO learned that this area was not being recommended for tight formation.

A. That's correct.

Q. Thank you.

RECROSS EXAMINATION

BY MR. STAMETS:

Q. In that regard, then, you have in the area wells drilled in 1955, '57, '54. What about the Mesaverde well in Section 8? What's the age of that, 1980?

MR. CARR: Uh-huh.

Q. The one in 18 is '81 and the one in Section 7 is an '82 well.

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

MR. CARR: At this time I'd call Mr. McCord.

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. Would you state your full name for the record, please?

A. Kevin McCord.

Q. Where do you reside?

A. Farmington, New Mexico.

Q. By whom are you employed?

A. I'm a self-employed petroleum engineer.

Q. Have you been employed by OXOCO in connection with this case?

A. Yes, I have.

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

A. Yes, I have.

Q. Are you familiar with the application filed in this case on behalf of OXOCO?

A. I am.

Q. Are you familiar with the area which is being proposed for designation as a tight formation?

A. Yes, I am.

Q. Mr. McCord, I'd first like to ask you some questions concerning fresh water protection, and ask you in your opinion if production of gas from the proposed area will impair the fresh water supply?

A. I do not believe it will impair any fresh water supply. Both State and Federal regulations assure that drilling the Mesaverde formation will not adversely affect any fresh water aquifers in the proposed tight formation area. Regulations require that casing programs be designed to seal off potential water-bearing formations, thus separating them from oil and gas-bearing formations. Potential fresh water formations exist down to the base of the Ojo Alamo formation, which averages 2220 feet in this area.

Q. Mr. McCord, will you now refer to what

has been marked for identification as OXOCO Exhibit Number Four and review this exhibit for the Examiner?

A. Exhibit Number Four illustrates a typical casing program for OXOCO's wells in the area. A 14-3/4 inch hole is drilled to approximately 300 feet and 10-3/4 inch casing cemented in place with cement circulated to the surface.

A 9-7/8ths inch hole is drilled to approximately 4000 feet and 7-5/8ths inch casing set with cement, again being circulated to the surface.

A 6-3/4 inch hole is gas drilled to total depth and 5-1/2 inch casing set and cemented with enough cement to extend up into the 7-5/8ths inch casing.

If cement doesn't reach the 7-5/8ths inch casing a temperature survey is run to determine the top of the cement.

You'll note here in Exhibit Number Four, in the Trail Canyon No. 3 Well, the cement didn't reach the 7-5/8ths inch casing. Therefor, a temperature survey was run and showed the top of the cement to be 4162 feet in this well.

This exhibit shows that is over 3400 feet between the base of the Ojo Alamo and the intervals normally perforated; therefor, the chance of frac fluid or gas being communicated with fresh water is extremely remote.

In the event that they are communicated, OXOCO would squeeze the channel or perform whatever remedial work that would be required to isolate the intervals.

Q. Would you review for Mr. Stamets the drilling precautions employed by OXOCO in drilling wells in the area?

A. The upper 4000 feet of the well is drilled with natural mud, which will not contaminate fresh water zones. The lower 2500 feet is drilled with gas, which represents little invasion of drilling fluids in a newly drilled formation.

During completion operations each productive zone is broken down with approximately 500 gallons of 7-1/2 percent KCl acid prior to frac. This small amount of acid will do little to contaminate an extensive aquifer, even in the unlikely event it did communicate with a fresh water zone.

Frac fluid consists of jelled fresh water with approximately two percent KCl added. Again, this fluid would do little to contaminate an extensive aquifer.

The good cementing practices and the casing design is such that any fresh water interval is protected by cement and at least one string of casing. Circu-

lating cement to the surface on the first two casing strings insures a good cement job. This, along with the long interval between any fresh water zones and the producing formation, makes it unlikely that fluids from the productive zones will come in contact with fresh water.

Q. In your opinion will compliance with State and Federal regulations insure that the development will not adversely affect or impair any fresh water aquifers during fracturing or disposal operations which OXOCO now uses or expects to use in the foreseeable future?

A. Yes.

Q. Is it your testimony that proposed development of this area will not adversely affect domestic or agricultural water supplies?

A. Yes.

Q. Now I'd like to ask you several questions concerning wells in the area, and initially would ask you to refer back to Exhibit Number One and ask you to briefly review for the Examiner the cumulative production data shown thereon.

A. Exhibit One is a structure map of the tight formation area, showing wells already in the area and many of the surrounding wells.

The map shows that to the south the cum-

ulative gas production has been more than in the tight sand area. The exhibit also notes the Koch tight gas application to the southwest, which is already approved by FERC. Analysis of the Koch tight gas area well data shows that this has exhibited better well performance than in the OXOCO area.

Well data --

Q. Well, at this point I'd like you to identify the -- jump out of order, Mr. McCord.

A. Yes.

Q. Go to Exhibit Number Six and review that for Mr. Stamets, please.

A. Exhibit Number Six lists the OXOCO operated wells in the tight formation area.

The first well, drilled in 1979, was the Trail Canyon No. 1; the second well in 1981 was the Trail Canyon No. 2; and the third well, the Trail Canyon No. 3 was drilled in 1982. All of these wells were drilled with gas through the Mesaverde, which provided a continuous natural production test.

The Trail Canyon No. 3 was the only OXOCO well with a measurable show of gas while drilling.

The Trail Canyon No. 1 and No. 2 produced gas at rates too small to measure prior to stimulation.

The Trail Canyon No. 3 produced Mesaverde

gas in a pitot tube test at a rate of about 12 Mcf of gas per day.

Q. Now will you go back to Exhibit Number Five and review this for the Examiner?

A. Exhibit Number Five presents well data for several tight gas application area wells not operated by OXOCO. These wells were drilled prior to 1960 and all were stimulated. No pre-stimulation rates were reported for these wells on this exhibit; however, we have found more information on Northwest Pipeline's San Juan 32-8 Unit No. 5-20 Well which is located in Section 20 of 32, 8, in the northwest of the southwest. On this exhibit it's listed as the 5-20 Well, on the area map as the No. 9 Well.

This well was perforated in four different stages. After each stage natural production tests were taken for each zone after they were perforated, all of them indicating gas too small to measure. Therefor, there is a pre-stimulated natural production rate of gas too small to measure on one of these outside operated wells.

The post-stimulation rates range from a low of 1163 Mcf of gas per day to a high of 2104 Mcf of gas per day AOF. The short term post-stimulation flow rate should not be considered as representative of a well's long term ability to produce. These producing rates historically

show a rapid decline following the initial potential.

Q. Mr. McCord, what is the limitation imposed by the Oil Conservation Division on gas produced from wells at the depth of the wells in this area, and I'm talking about the minimum stabilized production rate against atmospheric pressure prior to stimulation?

A. That is 163 Mcf of gas per day for an average depth to the top of the Mesaverde of 5268 feet in this area, and that refers to the Green Marker.

Q. In your opinion will any wells in the area produce close to this authorized amount?

A. In my opinion they won't be anywhere close to it.

Q. How much oil is being produced from the subject area?

A. None of the older wells is capable of producing anywhere near the five barrel per day maximum oil allowable. At no time during the drilling of any of the OXOCO Wells was any oil or condensate noticed in any amount, nor is any expected to be encountered. Furthermore, none of the wells in the surrounding sections has ever produced oil in any appreciable amount.

Q. Have you made permeability calculations for the proposed area?

A. Yes, they were made by OXOCO.

Q. Would you review these, please?

A. In a tight reservoir, such as the Mesaverde, in this tight formation area, it is difficult to establish pre-stimulation permeability. In a tight reservoir the pressure build-up takes too long to allow an accurate measure of reservoir pressure. Therefor, no build-up analysis was taken in this area. None of the wells were cored; therefor, adjusted or measured core permeabilities cannot be used to determine permeability.

The most convincing data available is the fact that the massive sands will not produce at sustained rates prior to stimulation and will not maintain high rates after stimulation.

The one measurable pre-stimulation flow rate available, from the OXOCO Trail Canyon No. 3 Well, was used to calculate permeability using Darcy's Law. It was assumed that the 12 Mcf of gas per day reported pre-stimulation rate at the base of the Point Lookout sandstone was a stabilized rate and the flowing wellhead pressure at or near atmospheric pressure. A net pay of 126 feet based on the perforations which were chosen from the best developed sands in the Mesaverde was assigned to the well.

Exhibit Number Seven presents the calcu-

lations used to determine permeability based on the pre-stimulation test rate. The results show a permeability of 0.006 millidarcy.

You might note on Exhibit Number Seven, this exhibit was changed from an "H" of 89 feet to an "H" of 126 feet due to the perforated interval mistakes on the Trail Canyon No. 3 Well that we noted earlier. The change in "H" changes the calculated permeability from 0.0088 presented to 0.006 millidarcy.

MR. STAMETS: Are you presenting an exhibit that shows that?

MR. CARR: Yes, that's Exhibit Number Seven.

Exhibit Number Seven, Mr. Stamets, if you will go to the -- if you'll go to the line indicated "H".

MR. STAMETS: Uh-huh.

MR. CARR: First letter is "H", instead of 89 feet it should read 126 feet.

MR. STAMETS: Do you have one that goes in here that says that?

MR. CARR: We could give you -- yes, we could supplement one or there are three figures that need to be changed on this, and however you prefer.

MR. STAMETS: Okay, then 89 becomes 126.

MR. CARR: Yes, sir.

MR. STAMETS: What's the next correction?

MR. CARR: At the bottom of the page where the formula is set out, K equals, and there's the equation there, the bottom line, it's 703 times 89, that should be 703 times 126.

MR. STAMETS: Okay.

MR. CARR: And that will change the result to the bottom would be after that K equals .00624 millidarcy.

MR. STAMETS: Okay, We do want a corrected copy to be substituted.

MR. CARR: Okay, that will be fine. Just Exhibit Seven, or would you like the other exhibits also that we previously had corrections on?

MR. STAMETS: Why don't we get corrected copies on everything and then we can discuss with FERC which they want?

MR. CARR: Okay, we'll do that.

MR. PEARCE: And since we have the testimony in the record about the corrections, if they could be clearly marked as revised, or whatever.

MR. CARR: We will underscore the corrected material on each one.

MR. PEARCE: Great.

A. In Exhibit Number Seven, this 0.006 millidarcy is well below the allowable limit of 0.1 millidarcy for tight gas purposes.

Exhibit Number Seven-A presents the calculations used to determine the permeability in the adjacent Koch Rattlesnake Canyon Tight Gas Area, which has been a previously approved for tight gas pricing. This average permeability of 0.0208 millidarcy is even lower than the average permeability, or excuse me, is higher than the average permeability for our Trail Canyon Tight Gas Area; therefor, the average permeability for our area is even lower than the approved area.

Q. Mr. McCord, will you now refer to Exhibit Number Eight and identify this for Mr. Stamets?

A. Exhibit Eight is an area map showing OXOCO's Rattlesnake Canyon Tight Gas Area in respect to other wells in the San Juan Basin.

Q. Will you now summarize your conclusions for Mr. Stamets?

A. The Mesaverde formation in the proposed area meets the guidelines necessary to qualify the area for tight formation designation. These are:

The in situ permeability is less than 0.1 millidarcy; the stabilized gas production rate is less

than the 163 Mcf of gas per day allowed for wells completed from 5000 to 5500 feet deep; no well will produce more than five barrels of oil per day, and fresh water sands in the area will not -- will be adequately protected during drilling, completion, and production operations.

Q. Has this area been approved for infill drilling?

A. Yes, it has.

Q. And that was by Order 1670-T, dated November 14, 1974?

A. Correct.

Q. Are there any infill wells drilled in the proposed area?

A. There are not.

Q. Is the price authorized by Section 107 of the NGPA necessary to provide reasonable incentive for production of natural gas from the subject area due to the extraordinary risks and costs associated with such production?

A. In my opinion they are.

Q. In your opinion will granting the application result in the production of gas that otherwise will not be produced?

A. Yes.

Q. In your opinion will granting this appli-

cation be in the best interest of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes.

MR. CARR: At this time, Mr. Stamets, we would offer into evidence Exhibits Four, Five, Six, Seven, Seven-A, and Eight.

MR. STAMETS: These exhibits will be admitted.

MR. CARR: That concludes our direct examination of Mr. McCord.

There was, however, one question that the Minerals Management Service asked us to direct to Mr. McCord and we would like to do that at this time.

MR. STAMETS: Fine.

Q. Mr. McCord, other than the apparent reason of OXOCO in not being lessee, why were Sections 9, 16, and 21, adjacent to the requested area, not included in the application of OXOCO?

A. Strictly for that reason, because OXOCO is not the lessee for these other sections.

In OXOCO's study, these other sections were not even considered; therefor, we do not try and state that they do qualify or do not qualify for tight gas. We just wished that they were not included in our application.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. McCord, could you refer back to Exhibit Six, please?

On the Trail Canyon No. 1 and No. 2, by what method was the gas measured in and out during the drilling process?

A. On the Trail Canyon No. 1, first of all, I assume both of these were pitot tube tests. I have been advised that there was a mud logger on the Trail Canyon No. 1 and this mud logging unit showed no appreciable shows of gas in the Mesaverde also.

Q. I understood that the wells were drilled with gas.

A. That is correct; no appreciable additions due to the drilling through the Mesaverde.

Q. Was the Mesaverde zone drilled with gas?

A. Yes, it was.

Q. How would a mud logger know if there was any additional gas?

A. Pardon me, it was drilled with air.

Q. Okay, what kind of equipment did the mud

logger have to measure what was coming from the well?

MR. McCORD: Bill, can you help me with that?

MR. SPEER: Perhaps I could answer that question. I was not on the well but I am aware of what practice was used.

The mud logger was put on the well primarily to check the mud drilled interval down to -- to and through the Pictured Cliffs formation, and then for some reason that I'm not aware of, they left the hydrocarbon mud logging unit on during the period that they air drilled below the casing, intermediate casing, through the Mesaverde.

I've examined that mud log and actually it was an air log, in effect, I guess you might say. They apparently tapped into the flow line or the Blooey line, the line that the natural gas being -- or the air being used as a circulating medium was vented to the air, much as they do with a mud system, and there were indications of natural gas in the air stream, return air stream. Naturally, they were very high scale, but surprisingly enough they were not much indication of gas until we got to the basal part of the Menefee and then I believe the mud log showed as high readings as 500 units of methane.

But at no point did the loggers indicate

measurable gas, which I would assume they would have made a reading on had there been natural gas.

MR. STAMETS: I got lost there. I thought you said that the mud log did indicate that there was gas in the Mesaverde.

A. Yes, it did indicate shows of gas and I would assume, as I said, there were no measureable amounts of gas. By measureable I mean in excess of the Mcf that we're speaking of in this tight formation hearing.

Had there been any indication of gas I assume they would have attempted to measure that gas, measureable quantities of gas.

MR. STAMETS: Well, that certainly doesn't square with what it says on Six, where it says no gas measured, but now I would assume that to be no gas indicated as opposed to no gas measured.

A. I think the best thing to have there on Six, rather than no gas measured while drilling, is a too small to measure, would be more accurate.

MR. STAMETS: Who was on the drilling of the well?

MR. SPEER: I can answer that question. Some representative of Keppinger Associates was watching the well on behalf of OXOCO.

MR. STAMETS: How about the well drilled in 1981?

MR. SPEER: I was on that well, Mr. Stamets.

MR. STAMETS: Good.

MR. SPEER: And I did measure the -- by a pitot tube and monometer measurement, the -- any gas flow, both at the base of the Mesa -- of the Menefee and the base of the POint Lookout, and we did this by closing the rams on the drill pipe, shutting off the air flow, and running a one-hour test to check and see if there was any natural flow of gas into the wellbore and through a two-inch bleed-off line. There was too small to measure through a one-inch swedge line in that two-inch bleed-off line, and that would mean that although we had gas, we had less than 44 Mcf, and that was at the base of the Point Lookout, but there was too small to measure.

I concur with Mr. McCord's statement that actually on Exhibit Number Six, that that probably should read too small to measure rather than no gas measured.

MR. STAMETS: That could stand some correction, as well, then, when you're submitting these other amended exhibits.

Q. Moving on to Well No. 3, how, when, and

where was the 12 Mcf measured?

MR. SPEER: May I refer to the daily summary of -- the Daily Drilling Summary from that well, I think, sets it out exactly. Pardon me a moment.

I'm referring to the Daily Drilling Summary submitted to OXOCO on the OXOCO No. 3 Trail Canyon Well, dated May 29th, 1982.

Gauged open hole at 5940 feet (base of Menefee formation) by shutting off air, closing rams on drill pipe and venting through two-inch bleed-off line. Had inflammable gas too small to measure with pressure gauge and pitot tube.

Gauged again at 6176 (base of Point Lookout sandstones) through one-inch line with pitot tube and water monometer and had 12 Mcf per day rate of inflammable gas at 5, 15, 30, and 45 minutes of test.

MR. STAMETS: What interval was open to the atmosphere at that point?

MR. SPEER: That would have been from the depth of 6145 back up to the intermediate casing depth, which was somewhere in the vicinity of 4000 feet, intermediate casing being set well into the Lewis Shale.

MR. STAMETS: So 6 --

A Actual depth, 3896.

MR. STAMETS: Okay, so that would be essentially the entire Mesaverde interval?

MR. SPEER: That's correct.

MR. STAMETS: Okay. There's some confusion on Exhibit Six, I believe, relative to this test. It's got a spud date on there and completion interval and it certainly would be helpful to have it a little bit clearer as to when that test was taken, what the conditions were, that it wasn't in fact a drill stem test, what was open, and so on, how it was measured.

All right, I believe we have exhausted Exhibit Six.

Q. Moving on to Exhibit Seven, where I believe you said that the calculations were made by OXOCO, have you redone the calculations?

A. Yes, sir, I have. They are correct.

Q. Okay, you agree as amended with every parameter that went into these calculations?

A. That is correct. I went through each one in detail and I concur with their findings. The only problem we had, of course, was the perforated interval, the original one showing -- the original Exhibit Seven showing 89 feet, and that has been changed to 126 feet. That, in turn, changes the permeability calculations.

Q. I believe you indicated that you estimated relative to Exhibit Seven that the 12 Mcf per day was a stabilized rate. Would that tend to make the permeability better or poorer than, say, if the stabilized rate came out less?

A. Okay, that is correct. If one assumed that was not a stabilized rate, you would expect that number to be even less, which in turn would -- that is directly proportionate to the permeability, so it would make the permeability less, also.

MR. STAMETS: Are there other questions of Mr. McCord or Mr. Speer? If not, they may be excused.

Of course, Mr. Carr, you're aware of the system that we may come up with some additional questions during --

MR. CARR: That's right.

MR. STAMETS: -- the course of reviewing material. The Federal Energy Regulatory Commission may have some additional questions.

So even though we will be taking this case under advisement, we will be looking at the corrected exhibits submitted and any supplemental information which may be required by this office or FERC --

MR. CARR: That's right, we understand that.

MR. STAMETS: If there is nothing further in this case, the case will be taken under advisement, and the hearing is adjourned.

(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 CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 7697, heard by me on 9-28, 1982.

Richard L. Stamets, Examiner
Oil Conservation Division

SALLY BOYD, C.S.R.
Box 193-B
Santa Fe, New Mexico 87501
Phone (505) 455-7409

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

December 1, 1982

Mr. William F. Carr
Campbell, Byrd & Black
Attorneys at Law
Post Office Box 2208
Santa Fe, New Mexico

Re: CASE NO. 7897
ORDER NO. R-7146

Applicant:

Oxoco Production Corporation

Dear Sir:

Enclosed herewith are two copies of the above-referenced Division order recently entered in the subject case.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCD x
Artesia OCD x
Aztec OCD x

Other _____

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 7697
Order No. R-7146

APPLICATION OF OXOCO PRODUCTION CORPORATION FOR DESIGNATION OF A TIGHT FORMATION, SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on September 29, 1982, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 30th day of November, 1982, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Oxoco Production Corporation, requests that the Division in accordance with Section 107 of the Natural Gas Policy Act, and 18 C.F.R. §271.703 recommend to the Federal Energy Regulatory Commission that the Mesaverde formation underlying the following lands situated in San Juan County, New Mexico, hereinafter referred to as the Mesaverde formation, be designated as a tight formation in said Federal Energy Regulatory Commission's regulations:

TOWNSHIP 32 NORTH, RANGE 8 WEST, NMPM
Sections 7 and 8: All
Sections 17 through 20: All

Containing a total of 3,229 acres, more or less.

(3) That the Mesaverde formation underlies all of the above-described lands; that the formation consists of marine and non-marine deposits about 2000 feet thick, composed of light gray very fine to fine grained sands well cemented, often argillaceous matrix, with poor visible porosity and numerous coals, silts, and shales; and that the top of such formations found at an average depth of 4460 feet below the surface of the area set forth in Finding No. (2) above.

(4) That the type section for the Mesaverde formation for the proposed tight formation designation is found at a depth of approximately 4460 feet to 6460 feet on the Gamma Ray Neutron Log from the Oxoco Trail Canyon Well No. 3 located in Unit I of Section 7, Township 32 North, Range 8 West, San Juan County, New Mexico.

(5) That five wells have been completed in the Mesaverde formation within the proposed area none of which produced measurable quantities of natural gas prior to stimulation.

(6) That the Mesaverde formation underlying the above-described lands has been penetrated by one other well, which did not produce natural gas from the Mesaverde formation.

(7) That based on an analysis of available data from existing wells within the proposed area and utilizing generally and customarily accepted petroleum engineering techniques and measurements:

(a) the estimated average in situ gas permeability throughout the pay section of the Mesaverde formation is expected to be 0.1 millidarcy or less; and

(b) the stabilized production rate, against atmospheric pressure of wells completed for production in the Mesaverde formation, without stimulation, is not expected to exceed production levels determined by reference to well depth, as found in the table set out in 18 C.F.R. §271.703(2)(B) of the regulations; and

(c) no well drilled into the Mesaverde formation is expected to produce, without stimulation, more than five barrels of crude oil per day.

(8) That within the Blanco-Mesaverde Pool are large areas of extensive development and large areas of very limited development.

(9) That the Mesaverde formation has been approved for infill drilling which permits the subject area to be developed with one Mesaverde well on each quarter section or 160-acre tract.

(10) That the area for which a tight formation designation is herein sought is one of limited development comprised of approximately 10 320-acre proration units of which 5 are developed by a single well all of which are producers.

(11) That no proration unit within the proposed area contains an infill well.

(12) That the evidence presented in this case demonstrated that the application of incentive pricing is reasonably necessary to stimulate further development of the proposed tight formation underlying the area described in Paragraph 2 hereof.

(13) That within the proposed area there is a recognized aquifer being the Ojo Alamo, found at an average depth of 2250 feet or approximately, 3400 feet above the Mesaverde formation.

(14) That existing State of New Mexico and Federal Regulations relating to casing and cementing of wells will assure that development of the Mesaverde formation will not adversely affect the said aquifer.

(15) That the Mesaverde formation should be recommended to the Federal Energy Regulatory Commission for designation as a tight formation.

IT IS THEREFORE ORDERED:

(1) That it be and hereby is recommended to the Federal Energy Regulatory Commission pursuant to Section 107 of the Natural Gas Policy Act of 1978, and 18 C.F.R. §271.703 of the regulations that the Mesaverde formation underlying the following described lands in San Juan County, New Mexico, be designated as a tight formation:

TOWNSHIP 32 NORTH, RANGE 8 WEST, NMPM
Sections 7 and 8: All
Sections 17 through 20: All

Containing a total of 3,229 acres, more or less.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

JOE D. RAMEY
Director

S E A L

fd/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

January 12, 1983

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

Mr. Howard Kilchrist
Federal Energy Regulatory Commission
Department of Energy
825 North Capitol Street, N.E.
Washington, D. C. 20426

Re: Tight Formation Designation
on the Application of Oxoco
Production Corporation,
Case 7697, OCD Order R-7146

Dear Mr. Kilchrist:

Enclosed please find two copies of the Recommendation and exhibits of the New Mexico Oil Conservation Division for designation of certain portions of the Mesaverde formation in San Juan County, New Mexico, as a tight formation.

You will note that the concurrence of the U. S. Department of Interior, Bureau of Land Management, seeks the inclusion of certain additional lands. Our review of the record of proceedings before the Division indicates that although it might have been possible for the applicant to have included the additional sections suggested by the BLM, that it did not make such a request. Since all of the testimony was intended to justify the designation of the area applied for, we are unable to support the requested extension.

Therefore, we are including the recommendation of the BLM for designation as a tight formation of the Mesaverde formation underlying certain lands not included in Order No. R-7146.

Sincerely,

W. PERRY PEARCE
General Counsel

WPP/dr

enc.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

NGPA SECTION 107 TIGHT FORMATION RECOMMENDATION	)	Docket No._____
STATE OF NEW MEXICO OIL CONSERVATION DIVISION OF THE ENERGY AND MINERALS DEPARTMENT	)	

RECOMMENDATION FOR TIGHT FORMATION DESIGNATION UNDER SECTION 107 OF THE NGPA.

Oxoco Production Corporation, pursuant to Section 107 of the Natural Gas Policy Act, 18 CFR §271.703 of the FERC regulations, and the Special Rules and Procedures for Tight Formation Designations under Section 107 of the Natural Gas Policy Act of 1978 of the Oil Conservation Division, petitioned the Oil Conservation Division for tight formation designation of a portion of the Mesaverde formation in San Juan County, New Mexico.

After notice and hearing on the application of Oxoco Production Corporation, the Oil Conservation Division hereby recommends that that portion of the Mesaverde formation which is described in Exhibit A (being Oil Conservation Division Order No. R-7146) attached hereto and incorporated by reference, be designated a tight formation. Additionally, the Oil Conservation Division, submits herewith Exhibits B, a copy of the exhibits presented to the Division, and C, a copy of a letter evidencing the concurrence of the Bureau of Land Management, attached hereto and incorporated herein by reference, which are supporting data required under 18 CFR §271.703(c)(3) of the FERC regulations, respectively.

Respectfully submitted,

W. PERRY PEARCE
Attorney for the
Oil Conservation Division

VERIFICATION

STATE OF NEW MEXICO)
)ss.
COUNTY OF SANTA FE)

W. PERRY PEARCE, being first duly sworn, on oath, states that he is an attorney for the Oil Conservation Division of the Energy and Minerals Department of the State of New Mexico; that he has executed the foregoing document with full power and authority to do so; and that the matters and facts set forth therein are true to the best of his information, knowledge and belief.

W. PERRY PEARCE

Subscribed and sworn to before me, this_____day of January, 1983.

NOTARY PUBLIC

My Commission Expires:

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing Recommendation on Oxoco Production Corporation in accordance with the requirements of Section 1.17 of the Rules of Practice and Procedure.

Dated this_____day of January, 1983.

W. PERRY PEARCE

IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

505 Marquette, NW, Suite 315
Albuquerque, New Mexico 87102

1106 (-3

Mr. W. Perry Pearce
Oil Conservation Division
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Pearce:

This jurisdictional agency concurs in the recommendation of the State of New Mexico, Case No. 7697, Order No. R-7146, dated November 30, 1982, that the Mesaverde formation underlying the described lands in the subject order in San Juan County, New Mexico, be designated as a Section 107 tight formation.

We also recommend that sections, 9, 16 and 21, T. 32 N., R. 8 W., N. M. P. M., be included in the designated area based upon the structure map (Exhibit 1) showing that the geologic structure extends into that area. The lands were not included because of ownership decisions and not technical advice. These lands logically qualify for the designation as the criteria has been met by the entire structure in this area. We therefore do not believe that they should be left out of the designation.

It is requested that this concurrence and recommendation be included with the recommendation submitted to the Federal Energy Regulatory Commission.

Sincerely yours,

James W. Shelton

FOR Gene F. Daniel
Deputy Minerals Manager
Oil and Gas

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

December 29, 1982

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

Mr. Gene Daniel
Minerals Management Service/Bureau
of Land Management
U. S. Department of Interior
505 Marquette, N.W.
Room 815
Albuquerque, New Mexico 87102

Re: Tight Formation
Recommendation, OCD
Case No. 7697, Order
No. R-7146

Dear Mr. Daniel:

Enclosed please find a copy of the New Mexico Oil Conservation Division Order No. R-7146. This order was issued in response to the application of Oxoco Corporation in Case No. 7697 for recommendation of certain portions of the Mesaverde formation within the State of New Mexico for designation as a tight formation under the provisions of Section 107 of the Natural Gas Policy Act of 1978.

Prior to forwarding this recommendation to the Federal Energy Regulatory Commission for their consideration, I will await your advising the Division on whether or not the Department of Interior concurs in such recommendation.

Thank you for your attention to this matter.

Sincerely,

W. PERRY PEARCE
General Counsel

WPP/dr
enc.

CAMPBELL, BYRD & BLACK, P.A.
LAWYERS

JACK M. CAMPBELL
HARL D. BYRD
BRUCE D. BLACK
MICHAEL B. CAMPBELL
WILLIAM F. CARR
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JEFFERSON PLACE
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October 8, 1982

Mr. R.L. Stamets
Hearing Examiner
Oil Conservation Division
New Mexico Department of Energy
& Minerals
Post Office Box 2088
Santa Fe, New Mexico 87501

HAND DELIVERED

Re: Case No. 7697: Application of Oxoco Production Corp. for Designation of a Tight Formation, San Juan County, New Mexico

Dear Mr. Stamets:

Pursuant to your request, I am enclosing three complete sets of exhibits in the above-referenced case. These exhibits have been revised to conform with the testimony presented at the hearing on September 29, 1982.

We will deliver to your office two copies of the transcript of hearing for forwarding to FERC as soon as we receive them from Mrs. Boyd.

If I can be of any further assistance to you concerning this matter, please advise.

Very truly yours,

William F. Carr

WFC:jh
w/enc.
cc: Mr. Randy Calhoun

OCT - 8 1982

CAMPBELL, BYRD & BLACK, P.A.
LAWYERS

JACK M. CAMPBELL
MARK D. BYRD
BRUCE D. BLACK
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SEP 14 1982

September 14, 1982

Mr. Joe D. Ramey, Director
Oil Conservation Division
New Mexico Department of Energy
& Minerals
Post Office Box 2088
Santa Fe, New Mexico 87501

HAND DELIVERED

Re: Case 7697: In the Matter of the Application of Oxoco Production Corporation for Designation of a Tight Formation, San Juan County, New Mexico

Dear Mr. Ramey:

Enclosed is a complete set of all exhibits which applicant proposes to offer into evidence at the hearing on the above-referenced application together with a statement of the meaning and purpose of each. The enclosed material has been delivered to the Mineral Management Service in Albuquerque, New Mexico on this date.

Very truly yours,

William F. Carr

WFC:jh
w/enc.

OXOCO PRODUCTION CORP.

Application For Tight Formation Designation
Rattlesnake Canyon Area
San Juan County, New Mexico

Conformed to
Hearing before Examiner
Richard L. Stamets
September 29, 1982

OXOCO PRODUCTION
CORP.

RATTLESNAKE CANYON TIGHT FORMATION AREA

The recommended Rattlesnake Canyon Mesaverde tight gas formation area is located in north-central San Juan County, adjacent to the Colorado state line on the southwest flank of the San Juan Basin. The proposed area includes the following lands:

T32N - R8W, Sections 7, 8, 17, 18, 19, 20, consisting of 3,229 acres, more or less.

Exhibit No. 1 is a structure map of the Mesa Verde top, which is referred to in the exhibit as the "Green Marker." This marker lies approximately 350' above the top of the Cliff House member of the Mesaverde, and is persistent across the mapped area. The map shows the regional dip to the northeast at generally less than 1/2° across the proposed area.

Exhibit No. 2 is a type log of the Mesaverde formation in this area and shows the three members of the formation, the Cliff House, Menefee, and Point Lookout. The vertical limits of the Blanco Mesaverde gas pool in this area have been defined by the New Mexico Oil Conservation Division to be from the Huefanito Bentonite in the Lewis shale to a point 500' below the top of the Point Lookout member. The Huefanito Bentonite is a marker approximately 800' uphole from the top of the Mesa Verde, which is at an average depth of 5268' in the application area. The Cliff House and Point Lookout members are considered to be the main producing zones in the field, but the less continuous sands of the Menefee also contribute to the overall production of the Mesaverde. In the proposed tight gas sand area, the Cliff House averages only about 50' thick and the porosity ranges from less than 4% to 15%. The Menefee in this area ranges from 230' to 290' thick and porosity varies from less than 3% to 17%. The main Point Lookout sands are about 150' - 200' thick in this area although significant stringers of sand may be found as

low as 300' below the top of the member. The porosity of the Point Lookout in the type well ranges from 3% to 17% and is considered typical of the area. The average porosity for the sands of all three members is about 8%.

Exhibit No. 3 is a northeast-southwest stratigraphic cross-section through the area. It shows the continuity of the Cliff House and Point Lookout sands across the area. It also shows the irregularity of the sands in the Menefee.

The Point Lookout consists of nearshore or shoreline sands deposited during an overall regression of the Mancos Sea. The sand buildups represent periods of stillstand during the regression. The sands have been described as: light gray, very fine to fine grained, well cemented, often an argillaceous matrix, with poor visible porosity.

The Menefee represents a period of non-marine deposition during a period of semi-tropical temperature and marshy lowlands of the Mesaverde time. Environments of deposition include coalforming swamps and coastal plain deposits. Numerous coals, silts, shales, and channel sands can be observed in a typical Menefee section. Reservoir quality often is similar to that of the Cliff House and Point Lookout sands, but the continuity and predictability of these Menefee sands is poor. Binocular description of the sands is not appreciably different than that of the Point Lookout.

The Cliff House consists of widespread shoreline sands deposited during transgression of the Lewis Sea. The sand buildups represent stillstands during that transgression. Again, binocular description of these sands is very similar to that of the Point Lookout and Menefee members.

The Cliff House in the proposed area is nearly to the point where it has pinched out completely, and within the 50' interval only about 15' is potentially productive. The gross interval (230' - 280') of the Menefee contains only an average of two to three benches of potentially productive sand whereas to the south wells have a Menefee section of 1000' or more with several productive intervals. The Point Lookout

in this area is also near its seaward productive limit. Overall, the area is near the productive limit of the various members of the Mesaverde. With relatively few objective zones in this area, the risk of drilling an uneconomic well is considerably greater than even a few miles to the south.

FRESH WATER PROTECTION

State and federal regulations assure that development drilling to the Mesaverde formation will not adversely affect any fresh water aquifers in the proposed tight formation area. Regulations require that casing programs be designed to seal off potential water bearing formations thus separating them from oil and gas bearing formations. Potential fresh water formations exist down to the base of the Ojo Alamo formation.

Exhibit No. 4 illustrates a typical casing program for OXOCO's wells in the area. A 14 3/4 inch hole is drilled to approximately 300 feet and 10 3/4 inch casing cemented in place with cement circulated to the surface. An 9 7/8 inch hole is drilled to approximately 4000' feet and 7 5/8 inch casing set with cement again being circulated to the surface. A 6 3/4 inch hole is gas drilled to total depth and 5 1/2 inch casing set and cemented with enough cement to extend up into the 7 5/8 inch casing. A temperature survey is run to determine the top of the cement. The exhibit shows that it is 3400 feet between the base of the Ojo Alamo and the intervals normally perforated, therefore the chance of a frac fluid or gas being communicated with fresh water is extremely remote. In the event that they are communicated, OXOCO would squeeze the channel or perform whatever remedial work that would be required to isolate the intervals.

The upper 3500 feet of the well is drilled with natural mud which will not contaminate fresh water zones. During completion operations, each zone is broken down with approximately 500 gallons of 7 1/2 percent acid prior to frac. This small amount of acid will do little to contaminate an extensive aquifer, even in the unlikely event it did communicate with a fresh water zone. Frac fluid consists of fresh water with approximately two percent KCl added. Again this fluid

would do little to contaminate an extensive aquifer.

The good cementing practices and the casing design is such that any fresh water interval is protected by cement and at least one string of casing. Circulating cement to surface on the first two casing strings insures a good cement job. This along with the long interval between any fresh water zone and the producing formation makes it unlikely that fluids from the productive zones will come in contact with fresh water.

WELL DATA

Exhibit No. 1 is a structure map of the tight formation and many of the surrounding wells. The map shows that to the south the cumulative gas production has been more than in the tight sand area.

Well data for several tight gas application area wells not operated by OXOCO are shown on Exhibit No. 5. These wells were drilled prior to 1960 and all were stimulated. One pre-stimulation rate was reported as too small to measure. Post-stimulation rates range from a low of 1163 MCFPD to a high of 2104 MCFPD AOF. The short-term post-stimulation flow rates should not be considered as representative of a well's long-term ability to produce. Producing rates show a rapid decline following the initial potential.

It can be positively stated that none of the area wells are capable of producing anywhere near the five barrel-per-day maximum allowable. At no time during the drilling of any of the OXOCO wells was any oil noticed in any amount, nor is any expected to be encountered. Furthermore, none of the wells in the surrounding sections has ever produced oil in any appreciable amount.

Exhibit No. 6 lists the OXOCO operated wells in the tight formation area. The first well was drilled in 1979, the second in 1981, and the

third in 1982.

The only OXOCO operated well to produce gas in a measurable quantity prior to stimulation was Trail Canyon No. 3. All of the OXOCO operated wells were drilled through the Mesa Verde with gas, which provided a continuous natural production test. Trail Canyon No. 1 and No. 2 produced gas at rates too small to measure prior to stimulation. The Trail Canyon #3 produced Mesaverde gas (the open hole interval from 3,896' to 6,176' was tested) in the test at a rate of 12 MCFPD. It is not expected, then, that any of the wells will produce close to the pre-stimulation limit of 163 MCFPD for the average depth of 5,268' to the top of the Mesa Verde.

PERMEABILITY CALCULATIONS

In a tight reservoir such as the Mesaverde in the tight formation area, it is difficult to establish prestimulation permeability. In a tight reservoir, the pressure build-up takes too long to allow an accurate measure of reservoir pressure. Therefore, no build-up analysis was taken in this area. None of the wells were cored, therefore adjusted or measured core permeabilities cannot be used to determine permeability. The most convincing data available is the fact that the massive sands will not produce at sustained rates prior to stimulation and will not maintain high rates after stimulation.

The one measureable prestimulation flow rate available, from OXOCO Trail Canyon No. 3, was used to calculate permeability using Darcy's Law. It was assumed that the 12 MCFPD reported prestimulation rate at the base of the Point Lookout sandstone was a stabilized rate and the flowing wellhead pressure was at, or near atmospheric pressure. A net

pay of 126 feet, based on perforations which were chosen from the best developed sands in the Mesa Verde, was assigned to the well.

Exhibit No. 7 presents the calculations used to determine permeability based on the prestimulation test rate. The results show a permeability of .0062 Md. This is well below the allowable limit of .1 Md. Exhibit No. 7A presents the calculations used to determine the permeability in the Koch Rattlesnake Canyon tight gas area, an adjacent area which was previously approved for tight gas pricing.

Exhibit No. 8 is an area map showing the location of the recommended area.

CONCLUSIONS

The Mesaverde formation in the proposed area meets the guidelines necessary to qualify the area for tight formation designation. These are:

1. The in situ permeability is less than 0.1 Md.
2. The stabilized prestimulation gas production rate is less than the 188 MCFPD maximum permitted for wells completed from 5500 to 6000 feet deep, and less than the 163 MCFPD for wells completed from 5000 to 5500 feet deep.
3. No well will produce more than five barrels of oil per day.
4. Fresh water sands in the area will be adequately protected during drilling, completion and production operations.

OXOCO PRODUCTION CORP.

NUMBER, NAME AND PURPOSE

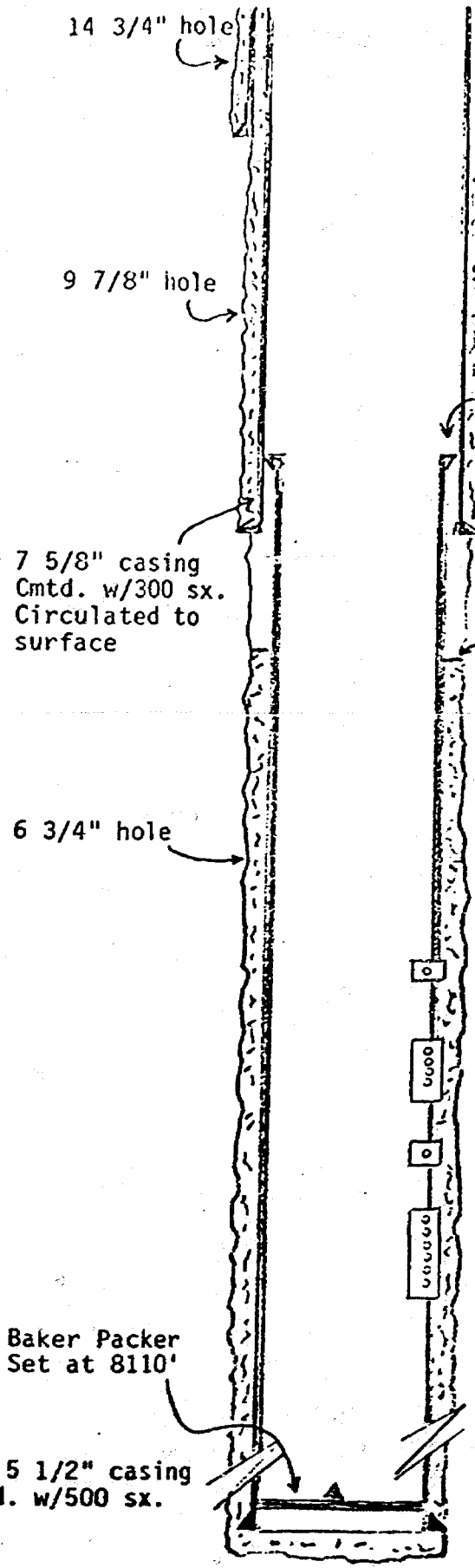
OF EACH EXHIBIT

RATTLESNAKE CANYON TIGHT FORMATION AREA

SAN JUAN COUNTY, NEW MEXICO

EXHIBIT NUMBER	EXHIBIT NAME	PURPOSE OF EXHIBIT
1(Conformed)	Structure and Cumulative Production Map	Show structure and production in the Tight Formation Area
2(Conformed)	Type Log	Show log characteristics and depth of Mesaverde Formation
3(Conformed)	Cross Section A-A'	Show Mesaverde Formation development in a northeast/southwest direction
4(Conformed)	Schematic of Trail Canyon Well No. 3	Show casing and cementing procedures to protect fresh water zones
5(Conformed)	Wells not operated by OXOCO	Show spud date, pre-stimulation rate, type of stimulation and post-stimulation rate of area wells not operated by OXOCO
6(Conformed)	Flow rates and fracturing information, OXOCO operated wells	Show spud date, pre-stimulation rate, type of stimulation and post-stimulation rate of wells operated by OXOCO
7(Conformed)	Calculated permeability based on well test from OXOCO Trail Canyon No. 3	Show calculated permeability from pre-stimulation test
7A	Calculated permeability based on well test from Koch Gardner No. 1	Show calculated permeability from a pre-stimulation test of a well in an adjacent previously approved tight gas area
8	Area Map	Show position of Rattlesnake Canyon relative to other fields in area

EXHIBIT #4 (CONFORMED)
OXOCO Production Corp. No. 3 Trail Canyon
Sec. 7, T32N, R8W
San Juan Co., New Mexico



10 3/4" surface casing set @ 323' w/265 sx. Circulated to surface

Base of Ojo Alamo @ 2220'

5 1/2" casing hung at 3700'

7 5/8" casing set at 3896'

TOC 4162 for 5 1/2" casing

(Not to scale)

Perfs 5671-77'

Perfs 5732-5748'
5775-5785'

Perfs 5870-92'

Perfs 5960-90'
5999-6021'
6039-43'
6051-59'
6065-73'

TD 8300' PB 8280'

EXHIBIT #5 (CONFORMED)

Flow Rates and Fracturing Information
Wells not operated by OXOCO
Rattlesnake Canyon Tight Formation Area
San Juan County, New Mexico

Operator and Well Name	Location	Spud Date	Completion Interval	Pre-Stimulation Rate	Stimulation	Post-Stiumulation Rate
Phillips 3-17 Mesa Unit 32-8	NE SW 17-32-8	5-10-53	5460-5962	Not Reported	Shot w/1592 qts	1190 MCFPD
Pacific Northwest Pipeline						
9-20 San Juan Unit 32-8	NW SW 20-32-8	7-27-55	5410-6194	TSTM*	Sand/Water Frac	2104 MCFPD
24-19 San Juan Unit 32-8	NE NE 19-32-8	6-24-57	5368-5816	Not Reported	Sand/Water Frac	1163 MCFPD

*It was reported that three pre-stimulation gas production tests were made after perforation of three distinct perforated intervals, each test showing Mesa Verde gas produced at rates too small to measure. The intervals tested were:
1) 6142'-6150' and 6158'-6258'
2) 5914'-5922' and 5930'-5936' and 6042'-6067'
3) 5790'-5858'

EXHIBIT NO. 6 (CONFORMED)

Flow Rates and Fracturing Information
OXOCO-Operated Wells
Rattlesnake Canyon Tight Formation Area
San Juan County, New Mexico

Well Name and Number	Location	Spud Date	Completion Interval	Pre-Stimulation Flow Rate*	Post-Stimulation Flow Rate	Frac. Gals.	Treatment #Sand
OXOCO Trail Canyon #1	SW NE 8-32-8	11-27-79	5865-5990	TSTM	1626 MCFPD AOF Measured Rate	60,910	140,000
OXOCO Trail Canyon #2	NW SW NE 18-32-8	1-23-81	7559-7599	TSTM**	Mesa Verde not stimulated or completed		
OXOCO Trail Canyon #3	NW SW NE 7-32-8	5-13-82	5671-6073	12 MCFPD***	2961 MCFPD Measured Rate	83,080	81,000

*The open hole intervals tested were all gas drilled, there being no mud in the hole during testing.

**This natural production test encompassed the interval from the base of the intermediate casing (3944') to base of point lookout (6200'). Gas production was reported as too small to measure.

***This natural production test encompassed the interval from the base of the intermediate casing (3896') to the base of the point lookout (6176'). Gas production was measured at the rate of 12 Mcf/D.

EXHIBIT NO. 7 (CONFORMED)

CALCULATED PERMEABILITY BASED
ON WELL TEST FROM OXOCO TRAIL CANYON NO. 3
RATTLESNAKE CANYON TIGHT FORMATION AREA
SAN JUAN COUNTY, NEW MEXICO

Calculation of permeability with Darcy's Law

$$k = \frac{QU_gTZ \ln (0.61\ r_e / r_w)}{703\ h\ (Pe^2 - Pf^2)}$$

Where:

Q = gas flowing rate, SCF/D - 12,000
U_g = gas viscosity, cp calculated as 0.0142
T = reservoir temperature, R^o - 610
Z = gas compressibility calculated as 0.9091
r_e = drainage radius of 1490 ft. for 160 acres
r_w = wellbore radius of 0.281 ft.
h = net pay estimated at 126 feet from Perforated Interval
P_e = static shut-in reservoir pressure at drainage radius r_e, psia calculated as 1177
P_f = Flowing subsurface pressure, psia estimated as 14 psia

k is permeability in Darcies

$$k = \frac{(12{,}000 \times 0.0142 \times 610 \times 0.9091 \ln (0.61 \times 1490/0.281)}{(703 \times 126 \times (1177^2 - 14^2)}$$

k = .0000062433 D.
.00624 md.

EXHIBIT NO. 7A

CALCULATED PERMEABILITY BASED
ON WELL TEST FROM GARDNER NO. 1
RATTLESNAKE CANYON TIGHT FORMATION AREA
BLANCO MESAVERDE FIELD
SAN JUAN COUNTY, NEW MEXICO

Calculation at permeability with Darcy's Law

$$k = \frac{QU_gTZ \ln (0.61\ r_e/r_w)}{703\ h\ (Pe^2 - Pf^2)}$$

Where:

Q = gas flowing rate, SCF/D - 47,000
U_g = gas viscosity, cp calculated as 0.0142
T = reservoir temperature, R^0 - 610
Z = gas compressibility calculated as 0.9091
r_e = drainage radius of 1490 ft. for 160 acres
r_w = wellbore radius of 0.26 ft.
h = net pay estimated at 149 feet from Gardner well No. 5. A porosity log was not run on the Gardner No. 1
P_e = static shut-in reservoir pressure at drainage radius r_e, psia calculated as 1177
P_f = Flowing subsurface pressure, psia estimated as 45 psia

k is permeability in Darcies

$$k = \frac{(47{,}000 \times 0.0142 \times 610 \times 0.9091 \ln (0.61 \times 1490/0.26)}{703 \times 149 \times (1177^2 - 45^2)}$$

k = 0.0000208 D.
= 0.0208 md.

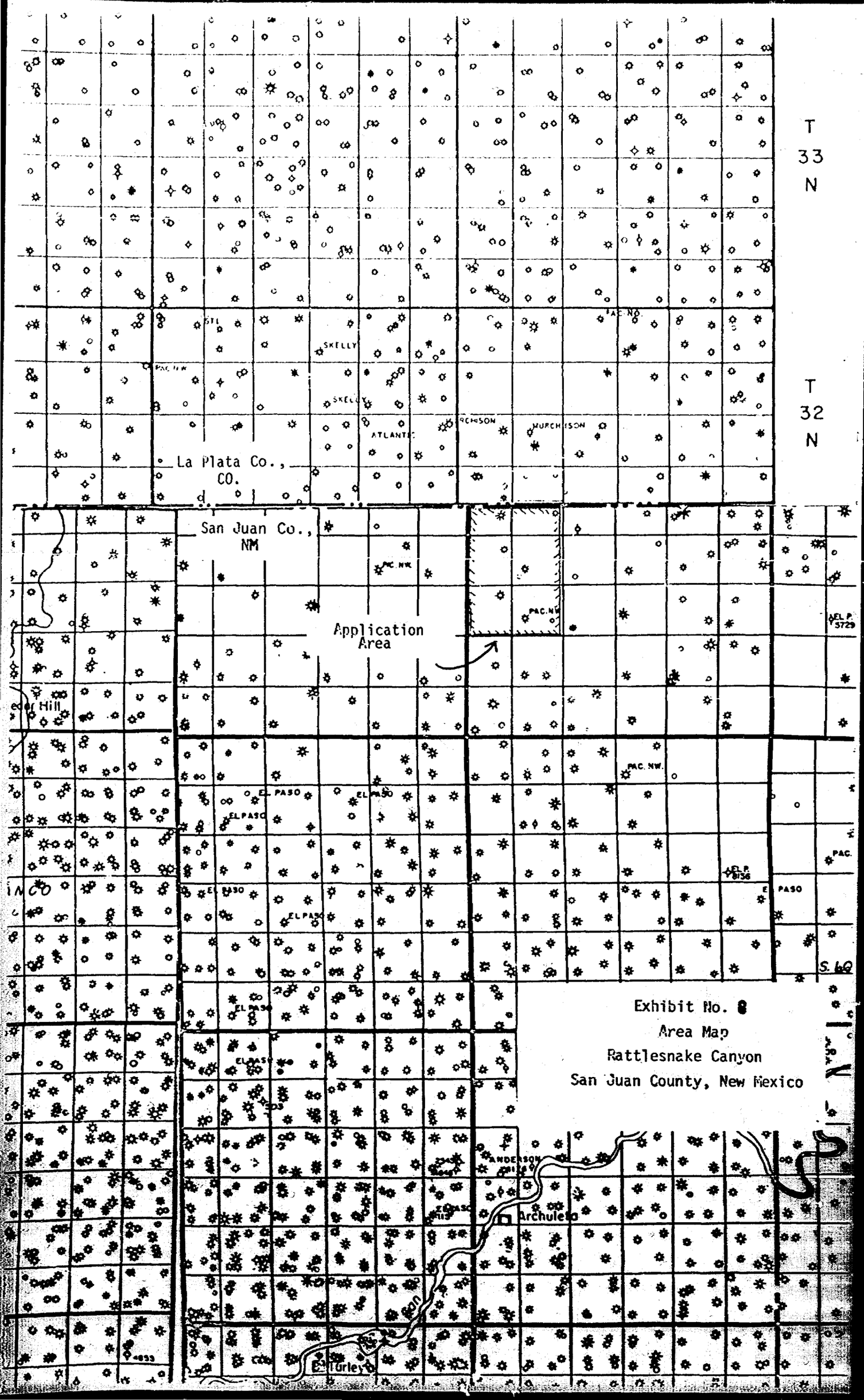


Exhibit No. 8
Area Map
Rattlesnake Canyon
San Juan County, New Mexico

Dockets Nos. 32-82 and 33-82 are tentatively set for October 13 and October 27, 1982. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 29, 1982

9 A.M. - MORGAN HALL, STATE LAND OFFICE BUILDING,
SANTA FE, NEW MEXICO

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 7686: In the matter of the hearing called by the Oil Conservation Division on its own motion to permit Energetics Corporation, United States Fidelity and Guaranty Company, and all other interested parties to appear and show cause why the Hanes Corporation Well No. 1, located in Unit F of Section 9, Township 24 South, Range 2 East, Don Ana County, should not be plugged and abandoned in accordance with a Division-approved plugging program.

CASE 7687: Application of Amoco Production Company for salt water disposal, Union County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Glorieta formation in the perforated interval from 1718 feet to 1780 feet in its former State FI Well No. 2 (2034 362P) located 660 feet from the South line and 1320 feet from the East line of Section 36, Township 20 North, Range 34 East.

CASE 7688: Application of Mountain States Petroleum Corporation for an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a well to be drilled 990 feet from the North and East lines of Section 19, Township 15 South, Range 28 East, Buffalo Valley-Penn Gas Pool, the N/2 of said Section 19 to be dedicated to the well.

CASE 7689: Application of Tesoro Petroleum Corporation for a tertiary oil recovery project, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks authority to convert its Hospah Sand Unit Waterflood Project to a polymer-augmented waterflood and, pursuant to Section 212.78 of the U. S. Department of Energy Regulations and Section 4993 of the Internal Revenue Code, seeks certification of said project as a qualified tertiary oil recovery project.

CASE 7690: Application of C & K Petroleum, Inc. for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formations underlying the E/2 SW/4 of Section 27, Township 16 South, Range 37 East, Casey-Strawn Pool, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 7679: (Continued from September 15, 1982, Examiner Hearing)

Application of C & K Petroleum, Inc. for the amendment of Order No. R-4857-A and for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Division Order No. R-4857-A to provide that the lands pooled by said order shall be the W/2 SE/4 of Section 27, Township 16 South, Range 37 East, dedicated to its Shipp 27 Well No. 2 located in Unit O in said Section 27. Applicant, further seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the E/2 SE/4 of the aforesaid Section 27, to be dedicated to a well to be drilled in Unit P of said Section 27. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 7680: (Continued and Readvertised)

Application of Unichem International, Inc. for an exception to Order No. R-3221, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Order No. R-3221 to permit the commercial disposal of produced brine into several unlined surface pits located in Section 2, Township 23 South, Range 29 East.

CASE 7691: Application of Dugan Production Corporation for compulsory pooling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Basin-Dakota Pool underlying the W/2 of Section 5, Township 24 North, Range 9 West, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 7692: Application of Forister & Sweatt for an unorthodox well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval of an unorthodox location 990 feet from the North line and 1650 feet from the East line of Section 5, Township 13 South, Range 31 East, Southeast Chaves Queen Gas Area, the E/2 of said Section 5 to be dedicated to the well.

CASE 7693: Application of Forister & Sweatt for compulsory pooling, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Southeast Chaves Queen Gas Area underlying the E/2 of Section 5, Township 13 South, Range 31 East, to be dedicated to a well to be drilled at an unorthodox location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of of applicant, as operator of the well and a charge for risk involved in drilling said well.

CASE 7681: (Continued from September 15, 1982, Examiner Hearing)

Application of Cibola Energy Corporation for an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of an Ordovician gas well to be drilled 330 feet from the North line and 990 feet from the East line of Section 13, Township 9 South, Range 27 East, the E/2 of said Section 13 to be dedicated to the well.

CASE 7682: (Continued from September 15, 1982, Examiner Hearing)

Application of Cibola Energy Corporation for an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a Mississippian gas well drilled 330 feet from the North line and 330 feet from the West line of Section 34, Township 11 South, Range 28 East, the W/2 of said Section 34 to be dedicated to the well.

CASES 7694 and 7695: Application of Depco, Inc. for compulsory pooling, Chaves County, New Mexico. Applicant, in each of the following two cases, seeks an order pooling all mineral interests from the surface down through the Abo formation underlying the lands specified in each case, each to form a standard 160-acre gas spacing and proration unit to be dedicated to a well to be drilled at a standard location thereon. Also to be considered in each case will be the cost of drilling and completing said wells and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the wells and a charge for risk involved in drilling said wells:

CASE 7694: NW/4 Section 21; and

CASE 7695: NE/4 Section 21

Both in Township 5 South, Range 25 East.

CASE 7696: Appication of Arco Oil and Gas Company for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Mississippian through Ellenburger formations underlying the E/2 of Section 31, Township 20 South, Range 36 East, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASES 7528 and 7529: (Continued and Readvertised)

Application of JJ-CC, Limited for compulsory pooling, Chaves County, New Mexico. Applicant, in each of the following two cases, seeks an order pooling all mineral interests down through the Abo formation underlying the lands specified in each case, each to form a standard 160-acre gas spacing and proration unit to be dedicated to a well to be drilled at a standard location thereon. Also to be considered in each case will be the cost of drilling and completing said wells and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the wells and a charge for risk involved in drilling said wells:

CASE 7528: NW/4 Section 4, Township 5 South, Range 24 East

CASE 7529: NE/4 Section 4, Township 5 South, Range 24 East

CASE 7697: Application of Oxoco Production Corp. for designation of a tight formation, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the designation of the Mesaverde formation underlying Sections 7, 8, 17, 18, 19 and 20, Township 32 North, Range 8 West, containing 3160 acres, more or less, as a tight formation pursuant to Section 107 of the Natural Gas Policy Act and 18 CFR Section 271.701-705.

BEFORE THE

OIL CONSERVATION DIVISION

NEW MEXICO DEPARTMENT OF ENERGY AND MINERALS

IN THE MATTER OF THE APPLICATION
OF OXOCO PRODUCTION CORPORATION
FOR DESIGNATION OF TIGHT FORMATION,
SAN JUAN COUNTY, NEW MEXICO.

CASE 7697

CERTIFICATE OF FILING

Comes now OXOCO PRODUCTION CORPORATION, by and through its undersigned attorneys, and hereby certifies that a copy of the complete set of all exhibits which applicant proposes to offer or introduce at the hearing on the above-referenced application, together with a statement of the meaning and purpose of each, has been delivered to the Mineral Management Service in Albuquerque, New Mexico, on this 14th day of September, 1982, as is required by Section D of the Oil Conservation's Special Rules and Procedures for Tight Sand Formation Designation under Section 107 of the Natural Gas Policy Act of 1978.

CAMPBELL, BYRD & BLACK, P.A.

By William F. Carr

William F. Carr
Attorneys for Applicant
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SEP 14 1982

September 14, 1982

Mr. Joe D. Ramey
Division Director
Oil Conservation Division
New Mexico Department of Eenrgy
& Minerals
Post Office Box 2088
Santa Fe, New Mexico 87501

HAND DELIVERED

Re: Application of Oxoco Production Corporation for Designation of Tight Formation, San Juan County, New Mexico

Dear Mr. Ramey:

Enclosed in triplicate is the application of Oxoco Production Corporation in the above-referenced matter.

This applicant requests that this matter be included on the docket for the examiner hearing scheduled to be held on September 29, 1982.

Very truly yours,

William F. Carr

WFC:jh
w/enc.
cc: Mr. Randy Calhoun

BEFORE THE

OIL CONSERVATION DIVISION

NEW MEXICO DEPARTMENT OF ENERGY AND MINERALS

IN THE MATTER OF THE APPLICATION OF OXOCO PRODUCTION CORPORATION FOR DESIGNATION OF TIGHT FORMATION, SAN JUAN COUNTY, NEW MEXICO

CASE 7697

APPLICATION

Comes now OXOCO PRODUCTION CORPORATION, by and through its undersigned attorneys, and as provided in the Oil Conservation Division's Special Rules and Procedures for Tight Formation Designations under Section 107 of the Natural Gas Policy Act of 1978 promulgated by Oil Conservation Division Order No. R-6388 on June 30, 1980, hereby makes application for an order designating certain portions of the Mesaverde formation, Blanco Mesaverde Gas Pool as a tight formation under Section 107 of the Natural Gas Policy Act of 1978 and in support of its application would show the Division:

1. Applicant is the owner and operator of certain interests in the Mesaverde formation underlying the following described lands situated in San Juan County, New Mexico:

Township 32 North, Range 8 West, N.M.P.M.

Sections 7 and 8: All
Sections 17 through 20: All
Containing a total of 3,160 acres, more or less.

2. The Mesaverde formation is expected to have an estimated average in situ gas permeability throughout the pay section of less than 0.1 millidarcy per foot.

3. The average depth of the top of the Mesaverde formation is 5,268 feet and the stabilized production

rate, against atmospheric pressure, of wells completed for production in said formation, without stimulation, is not expected to exceed 188 mcf of gas per day.

4. No well drilled into the Mesaverde formation in the above-described area is expected to produce, without stimulation, more than five barrels of crude oil per day.

5. A complete set of Exhibits which applicant proposes to offer or introduce at the hearing on this application, together with a statement of the meaning and purpose of each exhibit, was filed with the Division and the Mineral Management Service fifteen (15) days prior to the hearing date as required by the Oil Conservation Division's Special Rules and Procedures for Tight Sand Formation Designation under Section 107 of the Natural Gas Policy Act of 1978.

WHEREFORE, Applicant prays that this application be set for hearing before a duly appointed examiner of the Oil Conservation Division on September 29, 1982 and that after notice and hearing as required by law, the Division enter its order recommending to the Federal Energy Regulatory Commission that pursuant to 18 CFR, Section 271.701-705, that the Mesaverde formation underlying the above-described land be designated a tight formation, and making such other and further provisions as may be proper in the premises.

Respectfully submitted,

CAMPBELL, BYRD & BLACK, P.A.

By _____
William F. Carr
Attorneys for Applicant
Post Office Box 2208
Santa Fe, New Mexico 87501
(505) 988-4421

Memo

From

FLORENE DAVIDSON
ADMINISTRATIVE SECRETARY

To Called in by Tom Blueber
9/7/82 September 29

Conoco Production Corp.
Designation of Right
Formation

Mesaverde Formation

Sections 7, 8, 17, 18, 19, and 20
T32N, R8W
San Juan County
3160 acres

OIL CONSERVATION COMMISSION-SANTA FE

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

JCR

CASE NO. 7697
Order NO. R- 7146

APPLICATION OF OXOCO PRODUCTION CORPORATION
FOR DESIGNATION OF A TIGHT FORMATION, SAN JUAN
COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on September 29, 1982, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of November 1982, the Division Director, having considered the testimony, the record, and the premises,

FINDS:

(1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant Oxoco Production Corporation requests that the Division in accordance with Section 107 of the Natural Gas Policy Act, and 18 C.F.R. §271.703 recommend to the Federal Energy Regulatory Commission that the Mesaverde formation underlying the following lands situated in San Juan County, New Mexico, hereinafter referred to as the Mesaverde formation, be designated as a tight formation in said Federal Energy Regulatory Commission's regulations:

Township 32 North, Range 8 West, N.M.P.M.
Sections 7 and 8: All
Sections 17 through 20: All

Containing a total of 3,229 acres, more or less.

(3) That the Mesaverde formation underlies all of the above-described lands; that the formation consists of marine and deposits about 2000 feet thick, composed of light gray very fine to fine grained sands well cemented, often argillaceous matrix, with poor visible porosity; and that the top of such formations found at an average depth of 4460 feet below the surface of the area set forth in Finding No. (2) above.

Non-marine

and ~~as well as~~ numerous coals, silts, and shales

(4) That the type section for the Mesaverde formation for the proposed tight formation designation is found at a depth of approximately 4460 feet to 6460 feet on the Gamma Ray Neutron Log from the Oxoco Trail Canyon No. 3 well located in Unit I of Section 7, Township 32 North, Range 8 West, San Juan County, New Mexico.

(5) That five wells have been completed in the Mesaverde formation within the proposed area none of which produced measurable quantities of natural gas prior to stimulation.

(6) That the Mesaverde formation underlying the above-described lands has been penetrated by one other well, which did not produce natural gas from the Mesaverde formation.

(7) That based on an analysis of available data from existing wells within the proposed area and utilizing generally and customarily accepted petroleum engineering techniques and measurements:

(a) the estimated average in situ gas permability throughout the pay section of the Mesaverde formation is expected to be 0.1 millidarcy or less; and

(b) the stabilized production rate, against atmospheric pressure of wells completed for production in the Mesaverde formation, without stimulation, is not expected to exceed production levels determined by reference to well depth, as found in the table set out in 18 C.F.R. §271.703 (2) (B) of the regulations; and

(c) no well drilled into the Mesaverde formation is expected to produce, without stimulation, more than five barrels of crude oil per day.

(8) ~~(4)~~ That within the ~~Basin-Dakota~~ Blanco-Mesaverde Pool are large areas of extensive development and large areas of very limited development.

(9) ~~(5)~~ That the ~~Dakota~~ Mesaverde formation has been approved for infill drilling which permits the subject area to be developed with one ~~Dakota~~ Mesaverde well on each quarter section or 160-acre tract.

(10) ~~(6)~~ That the area for which a tight formation designation is herein sought is one of ~~very~~ limited development comprised of approximately ~~500~~ 10 320-acre proration units of which [illegible]5 are developed by a single well ~~, 206 of which are producing wells and 69 are non-producers~~ all of which are producers.

(11) ~~(7)~~ That no proration unit within the proposed area contains an infill well.

(12) ~~(9)~~ That the evidence presented in this case demonstrated that the application of incentive pricing is reasonably necessary to stimulate futher development of the proposed tight formation underlying the area described in Paragraph 2 hereof.

(13) ~~(10)~~ That within the proposed area there is a recognized aquifer being the Ojo Alamo, found at an average depth of 2250 feet or approximately, 3400 feet above the Mesaverde formation.

(14) ~~(11)~~ That existing State of New Mexico and Federal Regulations relating to casing and cementing of wells will assure that development of the Mesaverde formation will not adversely affect the said aquifer.

(15) ~~(12)~~ That the Mesaverde formation should be recommended to the Federal Energy Regulatory Commission for designation as a tight formation.

IT IS THEREFORE ORDERED:

(1) That it be and hereby is recommended to the Federal Energy Regulatory Commission pursuant to Section 107 of the Natural Gas Policy Act of 1978, and 18 C.F.R. §271.703 of the regulations that the Mesaverde formation underlying the following described lands in San Juan County, New Mexico, be designated as a tight formation:

TOWNSHIP 32 NORTH, RANGE 8 WEST, N.M.P.M.
Sections 7 and 8: All
Sections 17 through 20: All

Containing a total of 3,229 acres, more or less.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year herein-above designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

JOE D. RAMEY
Director

SEAL

WFC/yp

STANDARD PRORATION UNIT AND UNORTHODOX
LOCATION, SAN JUAN COUNTY, NEW MEXICO

Dismiss non-std pro unit
consider only the
non std loc.

CASE 7698: JOEL B. BURR, JR. FOR A NON-STANDARD PRORATION UNIT AND UNORTHODOX LOCATION, SAN JUAN COUNTY, NEW MEXICO

Dismiss non-std pro unit
consider only the
non std loc.