CASE 7208: GULF OIL CORPORATION FOR THE AMENDMENT OF POOL RULES, EDDY COUNTY, NEW MEXICO

CASE NO.

7208

APPLICATION,

TRANSCRIPTS,

SMALL EXHIBITS,

ETC.

Don.
In paragraph 13, Twp 24 S - Rge 26 E, NMPM, Sections 14-17, should be changed to read "Sections 15 - 17: ALL." Pool books indicate that section 14 is not included w/in pool boundaries.

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. 7208
Order No. R-2429-C

APPLICATION OF GULF OIL CORPORATION
FOR THE AMENDMENT OF POOL RULES,
EDDY COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on March 25, 1981, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 7th day of April, 1981, 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 by Order No. R-2429-A, entered March 27, 1963, in Case No. 2737, the Division promulgated special pool rules for the White City-Pennsylvanian Gas Pool in Eddy County, New Mexico, including a provision for 640-acre well spacing and proration units and specified well locations.

(3) That by Order No. R-2429-B, entered April 13, 1964, the Division continued said special pool rules in full force and effect until further order of the Division.

(4) That the applicant in the instant case, Gulf Oil Corporation, seeks the amendment of the special pool rules for the spacing and location of wells in the White City-Pennsylvanian Gas Pool, and seeks to have said pool governed by the provisions of Rule 104 C II(a) of the Division Rules and Regulations for gas pools of Pennsylvanian age, with respect to acreage dedication, but with certain specified locations for wells in said pool.

(5) That the evidence in this case indicates that the wells in the White City-Pennsylvanian Gas Pool are not draining 640 acres as it had been thought that they would, but that in fact the average well in the pool is draining only 257 acres.

(6) That although the Strawn, Atoka, and Morrow zones of the Pennsylvanian all produce gas in the subject pool, production from the pool is mostly from the many separate pay stringers in the Morrow zone which vary greatly in areal extent and in permeability, porosity, and thickness, both within individual stringers and between stringers.

(7) That due to the variation in the areal extent and in permeability, porosity, and thickness of the stringers, there is considerable variation in the amount of original gas in place tapped by the various wells completed in the subject pool, and also in the percent of such original gas in place under each well which may be expected to be recovered by the well.

(8) That due to the variation in the areal extent and in permeability, porosity, and thickness of the stringers in the Pennsylvanian formation in the subject pool, the existing wells (drilled on 640-acre spacing and proration units) are not believed to have encountered many of the smaller stringers in the reservoir, nor are they expected in all cases to effectively and efficiently drain the stringers which they have tapped.

(9) That to reduce the size of the spacing and proration units in the subject pool from 640 acres to 320 acres would result in numerous additional wells being drilled in the pool, and would greatly enhance the chances of tapping all of the productive stringers in the reservoir, and could also improve the drainage of gas from stringers previously tapped by existing wells.

(10) That the wells presently completed in the White City-Pennsylvanian Gas Pool are not effectively and efficiently draining the 640-acre spacing and proration units assigned to them, but if 320-acre spacing and proration units are adopted for said pool, the wells in the pool should more effectively and efficiently drain the spacing and proration units assigned to them.

(11) That according to the evidence submitted in this case, approximately 1.48 billion cubic feet of additional gas may be expected to be recovered by each additional well drilled as the result of amending the existing pool rules and developing the White City-Pennsylvanian Gas Pool on 320-acre well spacing and proration units.

(12) That the amendment of the Special Pool Rules for the White City-Pennsylvanian Gas Pool as promulgated by Division Orders Nos. R-2429-A and R-2429-B is in the public interest and will not cause but will prevent waste, and will not impair but will protect correlative rights.

(13) That the vertical limits of the White City-Pennsylvanian Gas Pool comprise the Pennsylvanian formation and the horizontal limits comprise the following described lands in Eddy County, New Mexico:

TOWNSHIP 24 SOUTH, RANGE 26 EAST, NMPM
Sections 8 and 9: All
Sections 14 through 17: All
Sections 19 through 22: All
Sections 28 through 30: All
Sections 32 through 35: All

TOWNSHIP 25 SOUTH, RANGE 26 EAST, NMPM
Sections 1 through 4: All
Sections 10 through 12: All

(14) That Rule 2 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool should be amended to read in its entirety as follows:

"RULE 2. Each well completed or recompleted in the White City-Pennsylvanian Gas Pool shall be located on a standard unit containing 320 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a single governmental section."

(15) That Rule 4 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool should be amended to read in its entirety as follows:

"RULE 4. Each well shall be located not closer than 660 feet to the nearest side boundary of the dedicated tract nor closer than 1650 feet to the nearest end boundary nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary."

(16) That the effective date of this order and the provisions hereof should be April 1, 1981.

IT IS THEREFORE ORDERED:

(1) That Rule 2 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool in Eddy County, New Mexico, as promulgated by Division Orders Nos. R-2429-A and R-2429-B, is hereby amended to read in its entirety as follows:

> "RULE 2. Each well completed or recompleted in the White City-Pennsylvanian Gas Pool shall be located on a standard unit containing 320 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a single governmental section."

(2) That Rule 4 of said Special Rules and Regulations is hereby amended to read in its entirety as follows:

> "RULE 4. Each well shall be located not closer than 660 feet to the nearest side boundary of the dedicated tract nor closer than 1650 feet to the nearest end boundary nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary."

(3) That the locations of all wells drilled and completed in the White City-Pennsylvanian Gas Pool are hereby approved.

(4) That the operator of each well in the White City-Pennsylvanian Gas Pool shall have until May 1, 1981, to file with the Artesia District Office of the Division new Forms C-102, Well Location and Acreage Dedication Plat, for each of his wells, showing thereon the location of the well and the acreage dedicated thereto pursuant to this order. Failure to so file such plats will subject the well to cancellation of allowable.

(5) That this order shall become effective at 7:00 o'clock a.m. on April 1, 1981, and shall apply to the White City-Pennsylvanian Gas Pool as described in Finding No. 13 above and as it may be subsequently extended by the Division, and to the Pennsylvanian formation within one mile of said pool.

(6) 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

LARRY KEHOE
SECRETARY

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

May 1, 1981

Mr. Joseph Soliz, Attorney
Gulf Oil Corporation
P. O. Box 3725
Houston, Texas 77001

Re: CASE NO. 7208
ORDER NO. R-2429-C-1

Applicant:

Gulf Oil 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 _____
Artesia OCD x
Aztec OCD _____

Other _____

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

CASE NO. 7208
Order No. R-2429-C-1

APPLICATION OF GULF OIL CORPORATION
FOR THE AMENDMENT OF POOL RULES,
EDDY COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE DIVISION:

It appearing to the Division that Order No. R-2429-C, dated April 7, 1981, does not correctly state the intended order of the Division,

IT IS THEREFORE ORDERED:

(1) That Finding No. (13) on page 3 of Order No. R-2429-C is hereby amended to read in its entirety as follows:

"(13) That the vertical limits of the White City-Pennsylvanian Gas Pool comprise the Pennsylvanian formation and the horizontal limits comprise the following described lands in Eddy County, New Mexico:

TOWNSHIP 24 SOUTH, RANGE 26 EAST, NMPM
Sections 8 and 9: All
Sections 15 through 17: All
Sections 19 through 22: All
Sections 28 through 30: All
Sections 32 through 35: All

TOWNSHIP 25 SOUTH, RANGE 26 EAST, NMPM
Sections 1 through 4: All
Sections 10 through 12: All"

(2) That this order shall be effective nunc pro tunc as of April 7, 1981.

DONE at Santa Fe, New Mexico, on this 30th day of April, 1981.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

JOE D. RAMEY
Director

S
fd/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO
25 March 1981

EXAMINER HEARING

IN THE MATTER OF:

Application of Gulf Oil Corporation for the amendment of pool rules, Eddy County, New Mexico.

CASE 7208

BEFORE: Daniel S. Nutter

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Ernest L. Padilla, Esq.
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico 87501

For the Applicant: Joseph G. Soliz, Esq.
THE GULF COMPANIES
P. O. Box 3725
Houston, Texas 77001

I N D E X

E X H I B I T S

MR. NUTTER: We'll call now Case Number 7208.

MR. PADILLA: Application of Gulf Oil Corporation for the amendment of pool rules, Eddy County, New Mexico.

MR. SOLIZ: Mr. Examiner, I am Joseph Soliz, and I am an attorney representing Gulf Oil Corporation. I'm appearing here today in association with William V. Kastler, also an attorney for Gulf Oil Corporation.

MR. NUTTER: We have your letter of appearance by Mr. Kastler in our file, Mr. Soliz.

MR. SOLIZ: Thank you, sir.

We have three witnesses here today that we'd like to present.

(Witnesses sworn.)

CHARLES F. KALTEYER

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

DIRECT EXAMINATION

BY MR. SOLIZ:

Q Would you please state your name for

the record?

A. Charles F. Kalteyer, K-A-L-T-E-Y-E-R.

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

A. Gulf Oil Corporation.

Q. In what location?

A. In Midland, Texas.

Q. And what is your position there?

A. Chief Proration Engineer for the Southwest District.

Q. Are you familiar with Gulf's application in the present case?

A. Yes, sir.

Q. And have you previously testified before the Commission and had your credentials accepted?

A. Yes, sir, I have.

MR. SOLIZ: Are the witness' credentials acceptable?

MR. NUTTER: Yes, they are.

Q. Mr. Kalteyer, what is Gulf seeking in this application?

A. Gulf is seeking the amendment of the special pool rules for the White City Pennsylvanian Gas Pool, which were adopted March 27th, 1963, under Case 2737, and Order No. R-2429A.

These rules provide for 640-acre standard proration units, with wells to be located no nearer than 1650 feet to the boundary of the spacing unit, and no nearer than 330 to any governmental quarter quarter section line.

Q. What amendments to these rules is Gulf proposing?

A. Gulf proposes that the rules be amended to provide for 320-acre proration units with each well to be located no nearer than 660 to the nearest side boundary of the dedicated tract, nor closer than 1650 to the nearest in boundary, nor closer than 330 to any quarter quarter section or subdivision inner boundary.

Q. Why is Gulf making this request to reduce the standard size unit from 640 acres to 320 acres?

A. Gulf has made an extensive study of the field, both from a geological standpoint and the continuity and discontinuity of pays, and from an engineering standpoint as to drainage based on performance.

You will see by the testimony of our next two witnesses why we believe that except for two cases the current wells are not efficiently and effectively draining the reserves under the 640-acre proration unit development pattern.

Q. Mr. Kalteyer, you have before you

Exhibit One. Will you please tell us a little bit about the history of the field?

A. Gulf's Exhibit Number One shows the current outline of the White City Pennsylvanian Gas Pool, as contained within the hachured lines.

The pool was discovered in 1960 by Gulf's Federal Estill"AD" No. 1, now shown as our White City Penn Com 1 Well 1, located in Unit A of Section 29, T24 South, Range 26 East, and highlighted with a blue arrow.

The pool now has 23 wells with proration units covering the 23 sections, or 14,720 acres. The cumulative production as of 1-1-1981 is in excess of 62 billion cubic feet.

In December of 1980 the average rate of production was approximately 1050 Mcf per well.

The last --

MR. NUTTER: That's per day?

A. Yes, Mcf per day per well.

The last extension to the field was in January of 1980, when Gulf completed its Marquardt Federal Well No. 2 in Unit F, Section 12, Township 25 South, Range 26 East, and this well is located in the extreme southeast corner of the field.

As mentioned earlier, under the Case

2737 and Order No. R 2429A, the Oil Conservation Commission approved Gulf's request for the adoption of the 640-acre proration unit pattern.

Our study of the performance clearly points out that with the exception of two wells, the wells in the pool are not capable of efficiently and effectively draining 640 acres, and the rules should be amended to provide for 320-acre standard proration units.

MR. NUTTER: Mr. Kalteyer, before you go any further, this is called the White City Pennsylvanian Gas Pool, so by the nomenclature we think it's producing from the entire Pennsylvanian formation.

What formation is it actually producing from?

A. It does produce from the Strawn, Atoka, and the Morrow.

MR. NUTTER: Strawn, Atoka, and Morrow.

A. Basically Morrow production.

MR. NUTTER: Thank you.

Q. Mr. Kalteyer, was Exhibit Number One prepared under your supervision or direction?

A. Yes, sir.

MR. SOLIZ: Mr. Examiner, at this time I'd like to submit Exhibit Number One into evidence.

MR. NUTTER: Exhibit One will be admitted in evidence.

MR. SOLIZ: I have no other further -- or no further questions of Mr. Kalteyer.

MR. NUTTER: Does anyone have any questions of Mr. Kalteyer? He may be excused.

ROBERT R. CASAVANT

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

DIRECT EXAMINATION

BY MR. SOLIZ:

Q. Would you please for the record state your name?

A. Robert R. Casavant.

Q. And your address and current occupation?

A. P. O. Box 1150, Gulf Oil Building, Midland, Texas, 79702.

Current occupation, Exploration Geologist for Gulf Oil.

MR. NUTTER: How do you spell your last name?

A. C-A-S-A-V-A-N-T.

MR. NUTTER: C-A-S-A-V-A-N-T?

A. That's correct.

MR. NUTTER: Thank you.

Q. Mr. Casavant, could you tell us something about your educational and your occupational background?

A. Yes. I received a BS in zoology in 1976 and a Bachelor of Science in geology in 1977 from Eastern Illinois University, Charleston, Illinois.

I also completed an oceanography minor from the same school.

I have graduate credits towards an MS at the University of Texas Permian Basin, Odessa, Texas.

My employment post my educational background was with Exploration Logging, Incorporated, based out of Houston and Oklahoma City from 1977 to January, 1979, as a Senior Wellsite Geologist and Pressure Engineer. Experience ranged from the Gulf Coast to the -- Oklahoma, and I'd say close to 70 percent of my experience was centered in the Delaware Basin of Texas and New Mexico, as well as the Morrow Anadarko area, Oklahoma.

After this I joined -- came on with Gulf Oil Corporation in Midland in January of '79 up to the present as an exploration geologist, experienced stratigrapher and explorationist, mainly in the Northwest Shelf of both

the Delaware and the Midland Basin areas, with emphasis on the Pennsylvanian systems in both.

In addition I worked a production period as a production geologist out of the Hobbs area office from August, 1979, to December, 1979.

Q. Are you familiar with Gulf's application in this case?

A. Yes, I am.

Q. In the course of your employment have you had an occasion or an opportunity to study in detail the White City Pennsylvanian Gas Pool?

A. Yes, I have.

MR. SOLIZ: Mr. Examiner, are the witness' credentials acceptable to the Commission?

MR. NUTTER: Yes, he's qualified.

Q. Mr. Casavant, you have before you Exhibit Number Two. Could you explain that to the Examiner?

A. Yes, sir. Exhibit Number Two is a type log. It's a density neutron log, No. 1 Gulf Energy and Minerals, No. 1 Estill "AD" Federal No. 1 in Section 19, Township 24 South, 26 East.

Present on your Exhibit Number Two we have indicated the top of the Strawn formation picked at 10253; the top of the Atoka, 10428; and the top of the Morrow

at 10830.

The purpose of the type log is to demonstrate the productive zones sought after through the pool area and the nature of the sediment from a log characteristic.

The Strawn is basically a carbonate unit. The Atoka throughout the pool limits is primarily a carbonate unit, interrupted occasionally by clastics; and of course the top of the Morrow is the Morrow limestone and the lower part is the clastic interval, which makes up, like I said, the most percentage of the production in the Pennsylvanian Pool.

Q. Okay.

A. With these three formations what the -- I mean the significance of these things throughout the pool area is basically they represent an overall transgressive sequence of deposition throughout the pool area, represented by periods of standstills, which we will get into with the Morrow Clastics.

Okay, that's all.

Q. You also have before you an exhibit marked Number Three. Would you refer to that and explain that to the Examiner?

A. Exhibit Number Three is a structure map over the White City Penn Pool limits, mapped on top of the Morrow limestone, a structural and stratigraphic datum easily

correlated through the area regionally.

The index map shows the regional location of the White City Penn Pool in its relationship to the South Carlsbad Field and other surrounding regional features.

MR. NUTTER: What do the contours on the map indicate?

A. Those are also on the Morrow.

MR. NUTTER: Morrow contours.

A. Yes. This is a computer map on the -- that I originated on the index map and on the left your structure map that you are looking at is an interpretive structure map, ; here the contours are tightened up to accentuate the structure throughout the pool.

Contour interval is 100 feet and the unit outline is indicated in both index as well as interpretive structure maps.

Q. Mr. Casavant, you also have before you Exhibit Number Four. Would you explain the significance of your Exhibit Four?

A. Exhibit Number Four is partly interpretive and partly factual, you might say. We're looking at a combination 3-D, or three dimensional stratigraphic structural overview of the White City Penn Pool. The structural closures you see on the top of the 3-D model here are the actual

structural contours you have in Exhibit Number Three, those line up. The scale again on the horizontal is greatly exaggerated because of the nature of the section, the thickness of it.

Demonstrated here is the lead-in to not only is the field -- not only is the structural emphasis in the area a reason for the production throughout the pool, but also the stratigraphic and the depositional nature of this field must be looked at in order to determine the problem we have at hand here in determining for breaking down our proration units.

One thing you might notice there is the Morrow limestone, the clastics, and the second clastic intervals are illunstrated. The very discontinuous -- or erratic nature of the sands both in a vertical sense as well as a horizontal sense, the majority of the sands are located in the central part of the field and the north part of the field and they become of lesser frequency to the south and the southeast, and this will be illustrated with later exhibits.

So we're looking at here a very erratic and unpredictable type of deposition from this 3-D. The north arrow there will indicate that when we'll be able to position your full unit for you.

Q. Okay. I'd like now to direct your

attention to Exhibit Number Five. Would you please now explain this exhibit for Mr. Nutter?

A. Okay. Exhibit Number Five is up on the wall here, Mr. Nutter. It's a stratigraphic cross section E-E through the central part of the ten pool area. You have that in front of you, I believe, or do you have the copy? It would probably be easier for you to pull that out.

MR. NUTTER: This one here?

A. Exhibit Number Five.

MR. NUTTER: Well, I didn't want to unfold that.

A. Okay.

MR. NUTTER: What's the line of your cross section? Just tell me that and I'll put it on here.

A. Okay, it's right through the central part of the field. Okay.

MR. NUTTER: Okay, what -- what pool wells are on that cross section? There's one in Section 4 on there?

A. One in Section 4.

MR. NUTTER: Maybe you could just take this map and draw that cross sectional line across that pool there with the orange pen and I'll follow your cross section.

A. Sir, the wells circled in orange there

are the wells (inaudible).

This is a stratigraphic cross section hung on the Morrow limestone as the datum to knock out the structure, so to speak, and what we'd like to illustrate here is the -- in the index part, the dark formation unit lines here are regional formation units that I used for correlation throughout the area.

However, the slashed or the hachured marks that you see here are the genetic sand units that I correlated throughout the pool area, and these are related, based on gamma ray resistivity, as well as sample log characteristics, and in correlating these clastics throughout the field and pool unit, we're looking primarily at the Morrow Clastics interval, we're noticing a very high degree of variability in a horizontal sense.

Taking the first sand we start to develop a certain signature of the sand and we come to the next borehole and it changes quite a bit. We keep going, and some places we actually have the sand absent. it's completely gone. We pick it back up, we pick it strong, and as you go down the section you notice the different colors here represent the different sand units that we map, and the variability extends throughout your exhibit; taking a closer look at it you'll be able to see that there's a high degree of lateral

variation.

Also, between these particular sand units are shale units, which isolate these in a vertical sense, too. So we're looking at more or less small depsotional pods that are not continuous and related to one another in the sense of both pressure, porosity, permeability, as well as clastic material.

So what we're trying to show by this cross section is that we also have stratigraphic and depositional reasons that plays in the production or the nonproduction from borehole to borehole.

MR. NUTTER: And this is why you think that these wells on the 640 aren't producing --

A. Yeah, I don't believe --

MR. NUTTER: -- because they're missing some of these pods --

A. Absolutely, and then in some places they're present that we don't know about. In other words, we're in between two boreholes, and I think that we're not adequately testing this clastic series in trying to get the maximum reserves from this area.

And this is demonstrated both in -- this whole thing was cross sectioned and this is just one of the cross sections, but the Upper Clastic and the Lower Clastic

interval represents this kind of behavior, very, very erratic depositional history to it.

Now these lead into the last exhibit, Exhibit Number Six.

Q. Exhibit Number Six, would you explain that exhibit?

A. Okay, Exhibit -- I don't know if you can -- the best thing for you to do --

MR. NUTTER: There's a pointer down there, if you think you need a pointer.

A. I thought I was tall enough.

MR. NUTTER: You may be tall enough, your arms aren't long enough.

A. Again here's our position for the full outline of the study area involved and what we did was, we went -- this is a type log or just one of the logs out of the field, and broke up all the particular sand units throughout the Upper and Lower Clastic intervals and then assigned to them in an environmental interpretation based on the gamma ray, resistivity, and sample characteristics. This is done many times in an academic sense, but we are applying it to industry, and in this particular case I -- from each of these sands, for instance, sand A,up through sand A, I studied just each sand separately and reconstructed what I call the

paleo-environmental reconstruction of the deposition of that one particular sand at that time.

MR. NUTTER: Now these are all Morrow sands, aren't they?

A. Yes, sir.

MR. NUTTER: I see.

A. And what we're looking at here, Stage A, coincides with the deposition of Sand A, Sand B with Stage B, Sand C with Stage C, and so on. And just standing back and looking at this, we can see visually a variability in the position and a variability or quality of these sands, not only in time but in the type of sand throughout the pool unit, and this is -- the pool unit is mainly centered in the center portion of these little maps, okay.

MR. NUTTER: Now what are the white lines running through the orange colored area?

A. Okay, the white lines represent the best sand quality and signature of the channel sand. Okay. And, of course, where we have the orange, or on your exhibits which will be dark blue, represents the most massive accumulation of productive sands: I'm saying that could contribute productively.

Also, this is -- the orange or the white area represent where we have the coarsening upwards of

sand units, which are the -- and the fining upwards, which are the productive units through this pool.

So we come into the green parallel lines, we're starting to break up in our -- our sand packages are becoming more or less erratic and sand is not being deposited in that one particular place like it was in times previous. So if you pick a point here we have absolutely no sand, just marine shale, we move over in a relative position and the next time we have a deposition of a better sand.

So what we're saying here by looking at this thing in layers is we're seeing the variation being spelled out in the story, and the blue, of course, is where we have absolutely no sands present, or if we do, they're very, very broken up and not significant enough for production.

So what we're doing, we're unfolding the story of the Morrow deposition from the first sands and the second sands, showing the high -- the high degree of variability, not only of deposition but as we'll see in our engineering study, this relates to our porosity and permeability per reservoir.

Are there any questions of this exhibit?

MR. NUTTER: Not now.

A. I might add that a confirmation on this particular small area of the Northwest Shelf of the Delaware

Basin , that representing there those pulses in the dumping of the clastics, truely represents a deltaic type of deposition, so at least through the pool area we have, I feel, a very good handle on the way these things are behaving.

Q. Mr. Casavant, do you have an opinion based on your study of the White City Pennsylvanian Gas Pool as to whether or not the now existing wells will actually drain the 640-acre units now applicable to the unit?

A. No, from preliminary study of the porosity and the sands that we actually perfed, in addition to the depositional history that we've uncovered and cross sectioned, I do not think they will adequately drain 640 acres. I do see a need to break that down.

Q. And do you feel that the drilling of additional wells is the only way which would insure recovery of hydrocarbons that will not be recovered out of the now existing wells?

A. I do, to adequately test it, yes.

Q. Okay. Is it your recommendation, then, that the White City Pennsylvanian Gas Pool rules be amended to provide for 320-acre spacing rather than 640-acre spacing presently applicable to it?

A. I do.

Q. Mr. Casavant, have Exhibits Number Two,

Three, Four, Five, and Six been prepared under your direction and supervision?

A. Yes, they have.

MR. SOLIZ: Mr. Examiner, at this time I would like to submit Exhibits Two through Six into evidence in this case.

MR. NUTTER: Gulf Exhibits Two through Six will be admitted.

MR. SOLIZ: I have no other questions of Mr. Casavant.

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Casavant, your Exhibit Number Four, Exhibit Number Five, and Exhibit Number Six, all seem to relate to the producing formations below the Upper Morrow Clastics. Now Mr. Kalteyer stated that the pool was producing from the Strawn, Atoka, and Morrow, and I think one of your exhibits also -- oh, your -- your log --

A. Yes, sir.

Q. Showed the Strawn and the Atoka also. Now does this broken string of pods and lenses and the discontinuity that you see here in the Morrow formation apply also to the Strawn and to the Atoka?

A. On a material basis of what the material is, no, but porositywise, yes. We don't quite understand yet the carbonate units of the Strawn and the Atoka through the field. Now, there's only, I think we have two Atoka wells that are presently on production and there are three wells that are producing from the Strawn, but the majority of the wells throughout the area, and outside of the pool area, are Morrow prospects, so to speak, or Morrow -- or basically --

Q. Well, are some of these wells perforated in all of these zones or more than one of these zones, or that would be like Strawn and Atoka and Morrow, or Atoka and Morrow, or are they all either Strawn or Atoka or Morrow?

A. No, they're -- there are some presently producing out of several of the formations, in the pool area -- in the pool limit.

Q. Well, do you believe that a well that may not be draining 640 acres in the Morrow might be draining 640 acres in the Strawn or Atoka?

A. No, sir, not -- not from my experience with carbonate rock. I do not believe that we have that kind of drainage characteristics to carbonate rocks.

Q. So all of these exhibits apply to Morrow only. You feel that there is this lack of permeability or something in the Strawn and the Atoka that's preventing that

drainage also?

A. Yes, sir, that could be the case. Clastics do have a history anyway of -- both from a depositional viewpoint and from an engineering viewpoint, of having much greater drainage than the carbonates in this area.

So we weren't too worried with the porosity through these Strawn and Atoka sections.

Q. Now all of the colors on Exhibit Number Five there are down below the top of the Upper Morrow Clastics. As a matter of fact, the Morrow limestone at the top of the cross section, are any of those wells perforated in Strawn and Atoka, do you know?

A. No, I do not know. I'd have to -- we may have the data. I could refer that question to the engineer.

Q. But the bulk of your study here has been to the Morrow, hasn't it?

A. Yes, sir. The nature of the Atoka and the nature of the Strawn and, of course, the production standpoint of drilling -- the spacing, or at least the control involved is very widespread through this area, so if we have better control on the Morrow and the erratic nature of the Morrow, is what we're primarily seeking, but also the porosity in the Atoka and Strawn is just as questionable.

Q. I see.

MR. NUTTER: Are there any other questions of Mr. Casavant? He may be excused.

JEFFREY P. ORTWEIN

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

DIRECT EXAMINATION

BY MR. SOLIZ:

Q. Would you please state your name, address, and occupation for the record?

A. Jeffrey P. Ortwein, O-R-T-W-E-I-N, P. O. Box 670, Hobbs, New Mexico.

Q. And could you tell us your occupation?

A. I'm a reservoir engineer for Gulf Oil Corporation.

Q. Could you tell us something about your educational background and your occupational experience?

A. Yes, sir. I graduated from Penn State University with a BS in petroleum engineering in 1979. Previous to that I had worked one summer as an engineer.

I joined Gulf in June '79 and have one year and nine months engineering experience with Gulf in

southeast New Mexico.

Q. You said you had some experience in the summer of '78?

A. Yes, sir.

Q. And who was that with?

A. This was with Quaker State Oil Company in Pennsylvania.

Q. Are you familiar with Gulf's application in this case?

A. Yes, sir I am.

Q. And in the course of your employment have you had occasion to study in detail the White City Pennsylvanian Gas Pool?

A. Yes.

Q. And was this in Hobbs, in the Hobbs Area Office?

A. Yes.

MR. SOLIZ: Mr. Examiner, are the witness' credentials acceptable?

MR. NUTTER: Yes, they are.

Q. Mr. Ortwein, you have before you what's been marked as Exhibit Number Seven, and I'd like to ask you to identify it.

A. Exhibit Seven is a table of all the

wells in the White City Penn Gas Pool from which I made an engineering study to determine the areal extent that hydrocarbons were being drained in the Pennsylvanian formation from these wells.

Q. What sources of data or information did you review in order to come up with your -- with the information contained on Exhibit Number Seven?

A. The data in Exhibit Seven came from log data, completion data, performance curves, and P/z curves.

Q. What do you mean when you refer to P/Z curves?

A. P/Z is a bottom hole pressure versus time versus cumulative production curve, but the pressure is corrected with -- using the Z factor, compressibility, for straight line extrapolation purposes.

Q. Approximately for what period of time do the data cover that you reviewed for this study?

A. This data covered a period of time from the completion of the discovery well in April, 1960, up to approximately December, 1980.

Q. Okay. Now based upon the data that you've just described and the information appearing in Exhibit Seven, do you have any opinion as to the area being drained on an average by the wells presently producing from the White

City Penn Pool?

A. Yes, the results of my analysis show that the average drainage per well is 257 acres.

Q. Was Exhibit Number Seven prepared under your supervision or direction?

A. Yes.

Q. I'd like you now to refer to Exhibit Number Eight and ask you to identify that exhibit, please.

A. Exhibit Eight consists of supportive reservoir parameters. These parameters were used in the volumetric calculation of gas in place for the existing wells.

Q. What sources of information did you review in order to come up with the numbers that appear on this Exhibit Eight?

A. Most of the numbers come from log data but some came from completion and DST information.

Q. And by DST I assume you refer to drill stem tests?

A. Yes.

Q. Would you explain how Exhibit Eight relates to Exhibit Seven?

A. The information in Exhibit Eight was used to calculate a volumetric original gas in place on a per acre basis. This appears in column one of Exhibit Seven.

This volumetric original gas in place per acre then was compared to the original gas in place obtained from actual well performance projected from the P/Z curve.

From this comparison the calculated drainage area per well was obtained.

Q. Was Exhibit Number Eight also prepared under your supervision and your direction?

A. Yes.

Q. I'd like to ask you now to refer to Exhibit Number Nine, which I believe is broken down into three sub-parts, Nine-A, Nine-B, and Nine-C, and ask you to identify them.

A. Exhibit Nine is broken into three parts, A, B, and C. These are bottom hole pressure versus time plots for all the wells in the pool. If you could refer back to Exhibit One it would help me to explain this exhibit, the lease plat.

Okay, part A contains plots for the three -- top three rows of sections in the pool. There are seven rows of sections. Part A contains plots for the wells in Rows 1, 2, and 3, Sections 8 through 22.

Part B contains plots for all the wells in the third, fourth, and fifth rows of the pool, which is

Sections 19 through 35, and Part C contains the plots for the wells in Rows 5, 6, and 7, or Section 32 through Section 12 of the township below.

So in each plot one row of wells is seen in the previous plot.

These pressure-time plots illustrate a lack of continuity between offsetting wellbores. You can see that as new wells were drilled nearly all came in at near virgin reservoir pressure, on the order of 5000 pounds, and looking towards the righthand side of the page you can see that at present there exists wide variations in bottom hole pressures of offset wellbores; a range from about 13 to 2400 psi -- 3400 psi.

Q. Okay, as I understand it, then, it's your testimony that the presently existing producing wells do not adequately drain the 640-acre spacing?

A. That's correct.

Q. Is it your opinion, then, that if additional wells were drilled the hydrocarbons now underlying the 640-acre spacing units will be produced?

A. Yes, that's also correct.

Q. I'd like you now to refer to Exhibit Number Ten and identify that for us.

A. Firstly, Exhibit Ten shows that cumu-

lative gas recovery to date is 62 Bcf.

Secondly, it shows that the ultimate recovery expected for each existing well is around 4 Bcf, and finally, each additional well can expect to recover somewhere around 1.5 Bcf. Those additional would be infill wells drilled on 320-acre spacing.

Q. How did you arrive at the average ultimate gas recovery?

A. The ultimate recovery for the existing wells was based on an extrapolated pressure cutoff on the P/Z plots.

Q. Were Exhibits Number Nine and Ten also prepared under your direction or supervision?

A. Yes.

Q. Okay. In order to summarize your testimony, I'd like to ask you whether or not you have an opinion based on a study of all the data you've prepared, relating to the White City Pennsylvanian Gas Pool, as to whether or not the now existing wells will actually drain the 640-acre units now applicable to the wells?

A. My study shows that the existing spacing is inadequate and that additional wells are needed to recover the hydrocarbons under each proration unit.

Q. And you feel like the drilling of addi-

tional wells is the only way which would insure recovery of hydrocarbons that would not -- that will not be recovered out of the now existing wells?

A. Yes.

Q. And based on the present 640-acre spacing unit, Gulf is prevented from drilling additional wells, is that correct?

A. Would you repeat that, please?

Q. And based on the present 640-acre spacing unit, Gulf would be prevented from drilling some of the additional wells, is that correct?

A. Yes, that's correct.

Q. Is it your recommendation, then, that the White City Pennsylvanian Gas Pool rules be amended to provide for 320-acre spacing rather than 640-acre spacing in accordance with Gulf's application?

A. Yes.

Q. Is it your opinion that the granting of Gulf's application would result in the prevention of waste, the protection of correlative rights, and be in the interest of conservation?

A. Yes.

Q. Do you have anything further to add to any testimony you've already given?

MR. SOLIZ: Mr. Examiner, at this time I'd like to submit Exhibits Seven through Ten into evidence in this case.

MR. NUTTER: Gulf's Exhibits Seven through Ten will be admitted in evidence.

MR. SOLIZ: I have no further questions of this witness.

CROSS EXAMINATION

BY MR. NUTTER:

Q. Now, Mr. Ortwein, in your Exhibit Number Seven, you have calculated the original gas in place on a volumetric basis and it's millions of cubic feet per acre.

A. Yes, sir.

Q. Now, you used the data that's on Exhibit Eigh' to make that volumetric calculation, is that correct?

A. That's correct.

Q. And I notice two or three wells here don't have any volumetric figures. Is that because logs were not available or you couldn't make an interpretation of the proper data from those logs, or something?

A. Yeah, either we couldn't get the logs or they weren't deep enough to use to adequately get a feel

for the porosity or --

Q. Now, in using those logs and making this volumetric calculation, were some of those wells perforated and completed in the Strawn as well as the Atoka and the Morrow?

And are all three of those formations included in these volumetric reserves?

A. Yes, sir, if you lookat the bottom of Exhibit Seven.

Q. Okay.

A. Gulf has three wells, the White City Penn Gas Com No. 1, No. 2, and No. 3 No. 1, each of these are listed on two separate entries. One completion was a Strawn and the second Atoka in both wells, and also on the pressure time plots the workovers were indicated.

On that No. 1 Well we had perforated the Atoka and Morrow simultaneously but the Atoka came in so good that we set a bridge plug and we aren't producing Morrow right now.

Q. And so you made your volumetric calculation of reserves there.

Then you took your P/Z on your -- against your cumulative production and determined what the cumulative production on these wells is going to be.

A. Yes, sir.

Q. And that's the second column on Exhibit Seven.

A. Yeah that's an extrapolation to P/Z equals zero.

Q. And then you took the -- the figure in column A and multiplied that by 640 acres to find out what the calculated reserves would be under the 640-acre tract?

A. Kind of; kind of skipped that step in that we did the volumetric on the per acre basis, but if you did multiply column one by the 640, that will be the original gas in place in the whole proration unit, which would give you the same comparison.

Q. And then if you took the P/Z calculation of ultimate gas, you'd find that it's coming from only 268 acres on that first well, rather than the calculated volume under the 640.

A. Yes, sir.

Q. Now, on your Exhibit Ten you show a cumulative gas recovery at 1-1-81 to be 62 billion.

A. Yes, sir.

Q. And there are 23 wells in the pool. Now you also sho your average ultimate gas recovery per well to be 4 billion. Now is that based on the 23 wells that are

in the pool?

A. Yes, sir.

Q. So that would give us a total for the pool ultimate recovery of about 92 billion.

A. That's correct.

Q. So we're getting 6/9ths -- we have gotten 6/9ths of the total reserves so far, is that it?

A. Yes, that's correct.

Q. Now, how did you estimate what your additional infill gas recovery per well is going to be?

A. Well, I took the existing wells and went from the calculated drainage area into a drainage radius and plotted this up on worksheet, and then proposed 1980/1980 infill locations, and I tried to draw what I thought -- what I figured these wells would drain and then I planimetered the additional area that the existing well wouldn't drain, and using the volumetric and a numerical recovery factor, I backed into an average in additional --

Q. So the additional recovery per well is a volumetric calculation that you planimetered out after drawing a radius of drainage for the existing well?

A. Yes, sir.

Q. And the radius of drainage was based on your 268 acres for that first well on Exhibit Seven, is that

it?

A. Right.

Q. And you think that is about 1-1/2 billion cubic feet per well?

A. Yes, sir.

Q. On an infill program.

A. Yes, sir, that's -- that's the starting point. We may recover more.

Q. Now I presume some of these tracts that have produced pretty good, for example, the one well there that's drained over 1000 acres according to Exhibit Seven, you wouldn't have an infill well in there, would you?

A. Probably not, but we haven't -- well, we need to -- that particular well is in a funny location. It's in the very corner of the proration unit. That's our White City Penn No. 1 in Section 29, so we may possibly in that case have a --

Q. Well, that was the discovery well for the pool.

A. Yes, sir.

Q. So it got a head start, didn't it?

A. Yes.

Q. And it is right in the corner, the extreme corner of the proration unit.

MR. NUTTER: Are there any other questions of this witness? He may be excused.

MR. SOLIZ: Mr. Examiner, we've completed our case now.

MR. NUTTER: Mr. Kalteyer I'll ask you now. On these proposed rules that you've got, you're simply proposing that the spacing units be changed from 640 acres to 320 acres, but you're not proposing that the well location requirements, that 320 acres would be under the statewide rules for Pennsylvanian pools in southeast New Mexico, but you're not proposing well locations in accordance with those statewide rules.

MR. KALTEYER: That's correct because the original rules were 1650 from the boundary.

MR. NUTTER: So you would --

MR. KALTEYER: So we left it at that.

MR. NUTTER: You don't want to abolish the pool rules; you want to keep the special pool rules because you've got a special well location requirement.

MR. KALTEYER: Yes, sir that's correct.

MR. NUTTER: I see.

Are there any questions for Mr. Kalteyer on his well locations?

Do you have anything further, Mr.

Soliz?

MR. SOLIZ: No, sir.

MR. NUTTER: Does anyone have anything they wish to offer in Case 7208?

We'll take the case under advisement.

(Hearing concluded.)

SALLY W. BOYD, C.S.R.
Rt. 1 Box 193-B
Santa Fe, New Mexico 87501
Phone (505) 455-7409

C E R T I F I C A T E

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

Sally W. Boyd C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 7208, heard by me on 3/25 1981.

Examiner
Oil Conservation Division

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

April 9, 1981

Mr. Joseph Soliz, Attorney
Gulf Oil Corporation
P. O. Box 3725
Houston, Texas 77001

Re: CASE NO. 7203
ORDER NO. R-2429-C

Applicant:

~~Gulf Oil 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 _____

Other _____
_____

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO
25 March 1981

EXAMINER HEARING

IN THE MATTER OF:

Application of Gulf Oil Corporation for the amendment of pool rules, Eddy County, New Mexico.

CASE 7208

BEFORE: Daniel S. Nutter

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Ernest L. Padilla, Esq.
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico 87501

For the Applicant: Joseph G. Soliz, Esq.
THE GULF COMPANIES
P. O. Box 3725
Houston, Texas 77001

I N D E X

E X H I B I T S

MR. NUTTER: We'll call now Case Number 7208.

MR. PADILLA: Application of Gulf Oil Corporation for the amendment of pool rules, Eddy County, New Mexico.

MR. SOLIZ: Mr. Examiner, I am Joseph Soliz, and I am an attorney representing Gulf Oil Corporation. I'm appearing here today in association with William V. Kastler, also an attorney for Gulf Oil Corporation.

MR. NUTTER: We have your letter of appearance by Mr. Kastler in our file, Mr. Soliz.

MR. SOLIZ: Thank you, sir.

We have three witnesses here today that we'd like to present.

(Witnesses sworn.)

CHARLES F. KALTEYER

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

DIRECT EXAMINATION

BY MR. SOLIZ:

Q Would you please state your name for

the record?

A. Charles F. Kalteyer. K-A-L-T-E-Y-E-R.

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

A. Gulf Oil Corporation.

Q. In what location?

A. In Midland, Texas.

Q. And what is your position there?

A. Chief Proration Engineer for the Southwest District.

Q. Are you familiar with Gulf's application in the present case?

A. Yes, sir.

Q. And have you previously testified before the Commission and had your credentials accepted?

A. Yes, sir, I have.

MR. SOLIZ: Are the witness' credentials acceptable?

MR. NUTTER: Yes, they are.

Q. Mr. Kalteyer, what is Gulf seeking in this application?

A. Gulf is seeking the amendment of the special pool rules for the White City Pennsylvanian Gas Pool, which were adopted March 27th, 1963, under Case 2737, and Order No. R-2429A.

These rules provide for 640-acre standard proration units, with wells to be located no nearer than 1650 feet to the boundary of the spacing unit, and no nearer than 330 to any governmental quarter quarter section line.

Q What amendments to these rules is Gulf proposing?

A. Gulf proposes that the rules be amended to provide for 320-acre proration units with each well to be located no nearer than 660 to the nearest side boundary of the dedicated tract, nor closer than 1650 to the nearest in boundary, nor closer than 330 to any quarter quarter section or subdivision inner boundary.

Q Why is Gulf making this request to reduce the standard size unit from 640 acres to 320 acres?

A. Gulf has made an extensive study of the field, both from a geological standpoint and the continuity and discontinuity of pays, and from an engineering standpoint as to drainage based on performance.

You will see by the testimony of our next two witnesses why we believe that except for two cases the current wells are not efficiently and effectively draining the reserves under the 640-acre proration unit development pattern.

Q Mr. Kalteyer, you have before you

Exhibit One. Will you please tell us a little bit about the history of the field?

A. Gulf's Exhibit Number One shows the current outline of the White City Pennsylvanian Gas Pool, as contained within the hachured lines.

The pool was discovered in 1960 by Gulf's Federal Estill"AD" No. 1, now shown as our White City Penn Com 1 Well 1, located in Unit A of Section 29, T24 South, Range 26 East, and highlighted with a blue arrow.

The pool now has 23 wells with proration units covering the 23 sections, or 14,720 acres. The cumulative production as of 1-1-1981 is in excess of 62 billion cubic feet.

In December of 1980 the average rate of production was approximately 1050 Mcf per well.

The last --

MR. NUTTER: That's per day?

A. Yes, Mcf per day per well.

The last extension to the field was in January of 1980, when Gulf completed its Marquardt Federal Well No. 2 in Unit F, Section 12, Township 25 South, Range 26 East, and this well is located in the extreme southeast corner of the field.

As mentioned earlier, under the Case

2737 and Order No. R-3439A, the Oil Conservation Commission approved Gulf's request for the adoption of the 640-acre proration unit pattern.

Our study of the performance clearly points out that with the exception of two wells, the wells in the pool are not capable of efficiently and effectively draining 640 acres, and the rules should be amended to provide for 320-acre standard proration units.

MR. NUTTER: Mr. Kalteyer, before you go any further, this is called the White City Pennsylvanian Gas Pool, so by the nomenclature we think it's producing from the entire Pennsylvanian formation.

What formation is it actually producing from?

A. It does produce from the Strawn, Atoka, and the Morrow.

MR. NUTTER: Strawn, Atoka, and Morrow.

A. Basically Morrow production.

MR. NUTTER: Thank you.

Q. Mr. Kalteyer, was Exhibit Number One prepared under your supervision or direction?

A. Yes, sir.

MR. SOLIZ: Mr. Examiner, at this time I'd like to submit Exhibit Number One into evidence.

MR. NUTTER: Exhibit One will be admitted in evidence.

MR. SOLIZ: I have no other further -- or no further questions of Mr. Kalteyer.

MR. NUTTER: Does anyone have any questions of Mr. Kalteyer? He may be excused.

ROBERT R. CASAVANT

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

DIRECT EXAMINATION

BY MR. SOLIZ:

Q. Would you please for the record state your name?

A. Robert R. Casavant.

Q. And your address and current occupation?

A. P. O. Box 1150, Gulf Oil Building, Midland, Texas, 79702.

Current occupation, Exploration Geologist for Gulf Oil.

MR. NUTTER: How do you spell your last name?

A. C-A-S-A-V-A-N-T.

MR. NUTTER: C-A-S-A-V-A-N-T?

A. That's correct.

MR. NUTTER: Thank you.

Q. Mr. Casavant, could you tell us something about your educational and your occupational background?

A. Yes. I received a BS in zoology in 1976 and a Bachelor of Science in geology in 1977 from Eastern Illinois University, Charleston, Illinois.

I also completed an oceanography minor from the same school.

I have graduate credits towards an MS at the University of Texas Permian Basin, Odessa, Texas.

My employment post my educational background was with Exploration Logging, Incorporated, based out of Houston and Oklahoma City from 1977 to January, 1979, as a Senior Wellsite Geologist and Pressure Engineer. Experience ranged from the Gulf Coast to the -- Oklahoma, and I'd say close to 70 percent of my experience was centered in the Delaware Basin of Texas and New Mexico, as well as the Morrow Anadarko area, Oklahoma.

After this I joined -- came on with Gulf Oil Corporation in Midland in January of '79 up to the present as an exploration geologist, experienced stratigrapher and explorationist, mainly in the Northwest Shelf of both

the Delaware and the Midland Basin areas, with emphasis on the Pennsylvanian systems in both.

In addition I worked a production period as a production geologist out of the Hobbs area office from August, 1979 to December, 1979.

Q. Are you familiar with Gulf's application in this case?

A. Yes, I am.

Q. In the course of your employment have you had an occasion or an opportunity to study in detail the White City Pennsylvanian Gas Pool?

A. Yes, I have.

MR. SOLIZ: Mr. Examiner, are the witness' credentials acceptable to the Commission?

MR. NUTTER: Yes, he's qualified.

Q. Mr. Casavant, you have before you Exhibit Number Two. Could you explain that to the Examiner?

A. Yes, sir. Exhibit Number Two is a type log. It's a density neutron log, No. 1 Gulf Energy and Minerals, No. 1 Estill "AD" Federal No. 1 in Section 19, Township 24 South, 26 East.

Present on your Exhibit Number Two we have indicated the top of the Strawn formation picked at 10253; the top of the Atoka, 10428; and the top of the Morrow

at 10830.

The purpose of the type log is to demonstrate the productive zones sought after through the pool area and the nature of the sediment from a log characteristic.

The Strawn is basically a carbonate unit. The Atoka throughout the pool limits is primarily a carbonate unit, interrupted occasionally by clastics; and of course the top of the Morrow is the Morrow limestone and the lower part is the clastic interval, which makes up, like I said, the most percentage of the production in the Pennsylvanian Pool.

Q. Okay.

A. With these three formations what the -- I mean the significance of these things throughout the pool area is basically they represent an overall transgressive sequence of deposition throughout the pool area, represented by periods of standstills, which we will get into with the Morrow Clastics.

Okay, that's all.

Q. You also have before you an exhibit marked Number Three. Would you refer to that and explain that to the Examiner?

A. Exhibit Number Three is a structure map over the White City Penn Pool limits, mapped on top of the Morrow limestone, a structural and stratigraphic datum easily

correlated through the area regionally.

The index map shows the regional location of the White City Penn Pool in its relationship to the South Carlsbad Field and other surrounding regional features.

MR. NUTTER: What do the contours on the map indicate?

A. Those are also on the Morrow.

MR. NUTTER: Morrow contours.

A. Yes. This is a computer map on the -- that I originated on the index map and on the left your structure map that you are looking at is an interpretive structure map, ; here the contours are tightened up to accen tuate the structure throughout the pool.

Contour interval is 100 feet and the unit outline is indicated in both index as well as interpre- tive structure maps.

Q. Mr. Casavant, you also have before you Exhibit Number Four. Would you explain the significance of your Exhibit Four?

A. Exhibit Number Four is partly interpre- tive and partly factual, you might say. We're looking at a combination 3-D, or three dimensional stratigraphic structural overview of the White City Penn Pool. The structural closures you see on the top of the 3-D model here are the actual

structural contours you have in Exhibit Number Three. those line up. The scale again on the horizontal is greatly exaggerated because of the nature of the section, the thickness of it.

Demonstrated here is the lead-in to not only is the field -- not only is the structural emphasis in the area a reason for the production throughout the pool, but also the stratigraphic and the depositional nature of this field must be looked at in order to determine the problem we have at hand here in determining for breaking down our proration units.

One thing you might notice there is the Morrow limestone, the clastics, and the second clastic intervals are illunstrated. The very discontinuous -- or erratic nature of the sands both in a vertical sense as well as a horizontal sense, the majority of the sands are located in the central part of the field and the north part of the field and they become of lesser frequency to the south and the southeast, and this will be illustrated with later exhibits.

So we're looking at here a very erratic and unpredictable type of deposition from this 3-D. The north arrow there will indicate that when we'll be able to position your full unit for you.

Q. Okay. I'd like now to direct your

attention to Exhibit Number Five. Would you please now explain this exhibit for Mr. Nutter?

A. Okay. Exhibit Number Five is up on the wall here, Mr. Nutter. It's a stratigraphic cross section E-E through the central part of the ten pool area. You have that in front of you, I believe, or do you have the copy? It would probably be easier for you to pull that out.

MR. NUTTER: This one here?

A. Exhibit Number Five.

MR. NUTTER: Well, I didn't want to unfold that.

A. Okay.

MR. NUTTER: What's the line of your cross section? Just tell me that and I'll put it on here.

A. Okay, it's right through the central part of the field. Okay.

MR. NUTTER: Okay, what -- what pool wells are on that cross section? There's one in Section 4 on there?

A. One in Section 4.

MR. NUTTER: Maybe you could just take this map and draw that cross sectional line across that pool there with the orange pen and I'll follow your cross section.

A. Sir, the wells circled in orange there

are the wells (inaudible).

This is a stratigraphic cross section hung on the Morrow limestone as the datum to knock out the structure, so to speak, and what we'd like to illustrate here is the -- in the index part, the dark formation unit lines here are regional formation units that I used for correlation throughout the area.

However, the slashed or the hachured marks that you see here are the genetic sand units that I correlated throughout the pool area, and these are related, based on gamma ray resistivity, as well as sample log characteristics, and in correlating these clastics throughout the field and pool unit, we're looking primarily at the Morrow Clastics interval, we're noticing a very high degree of variability in a horizontal sense.

Taking the first sand we start to develop a certain signature of the sand and we come to the next borehole and it changes quite a bit. We keep going, and some places we actually have the sand absent. it's completely gone. We pick it back up, we pick it strong, and as you go down the section you notice the different colors here represent the different sand units that we map, and the variability extends throughout your exhibit; taking a closer look at it you'll be able to see that there's a high degree of lateral

variation.

Also, between these particular sand units are shale units, which isolate these in a vertical sense, too. So we're looking at more or less small depsotional pods that are not continuous and related to one another in the sense of both pressure, porosity, permeability, as well as clastic material.

So what we're trying to show by this cross section is that we also have stratigraphic and depositional reasons that plays in the production or the nonproduction from borehole to borehole.

MR. NUTTER: And this is why you think that these wells on the 640 aren't producing --

A. Yeah, I don't believe --

MR. NUTTER: -- because they're missing some of these pods --

A. Absolutely, and then in some places they're present that we don't know about. In other words, we're in between two boreholes and I think that we're not adequately testing this clastic series in trying to get the maximum reserves from this area.

And this is demonstrated both in -- this whole thing was cross sectioned and this is just one of the cross sections, but the Upper Clastic and the Lower Clastic

interval represents this kind of behavior, very, very erratic depositional history to it.

Now these lead into the last exhibit, Exhibit Number Six.

Q. Exhibit Number Six, would you explain that exhibit?

A. Okay, Exhibit -- I don't know if you can -- the best thing for you to do --

MR. NUTTER: There's a pointer down there, if you think you need a pointer.

A. I thought I was tall enough.

MR. NUTTER: You may be tall enough, your arms aren't long enough.

A. Again here's our position for the full outline of the study area involved and what we did was, we went -- this is a type log or just one of the logs out of the field, and broke up all the particular sand units throughout the Upper and Lower Clastic intervals and then assigned to them in an environmental interpretation based on the gamma ray, resistivity, and sample characteristics. This is done many times in an academic sense, but we are applying it to industry, and in this particular case I -- from each of these sands, for instance, sand A, up through sand A, I studied just each sand separately and reconstructed what I call the

paleo-environmental reconstruction of the deposition of that one particular sand at that time.

MR. NUTTER: Now these are all Morrow sands, aren't they?

A. Yes, sir.

MR. NUTTER: I see.

A. And what we're looking at here, Stage A, coincides with the deposition of Sand A, Sand B with Stage B, Sand C with Stage C, and so on. And just standing back and looking at this, we can see visually a variability in the position and a variability or quality of these sands, not only in time but in the type of sand throughout the pool unit, and this is -- the pool unit is mainly centered in the center portion of these little maps, okay.

MR. NUTTER: Now what are the white lines running through the orange colored area?

A. Okay, the white lines represent the best sand quality and signature of the channel sand. Okay. And, of course, where we have the orange, or on your exhibits which will be dark blue, represents the most massive accumulation of productive sands; I'm saying that could contribute productively.

Also, this is -- the orange or the white area represent where we have the coarsening upwards of

sand units, which are the -- and the fining upwards, which are the productive units through this pool.

So we come into the green parallel lines, we're starting to break up in our -- our sand packages are becoming more or less erratic and sand is not being deposited in that one particular place like it was in times previous. So if you pick a point here we have absolutely no sand, just marine shale, we move over in a relative position and the next time we have a deposition of a better sand.

So what we're saying here by looking at this thing in layers is we're seeing the variation being spelled out in the story, and the blue, of course, is where we have absolutely no sands present, or if we do, they're very, very broken up and not significant enough for production.

So what we're doing, we're unfolding the story of the Morrow deposition from the first sands and the second sands, showing the high -- the high degree of variability, not only of deposition but as we'll see in our engineering study, this relates to our porosity and permeability per reservoir.

Are there any questions of this exhibit?

MR. NUTTER: Not now.

A. I might add that a confirmation on this particular small area of the Northwest Shelf of the Delaware

Basin , that representing there those pulses in the dumping of the clastics, truely represents a deltaic type of deposition, so at least through the pool area we have, I feel, a very good handle on the way these things are behaving.

Q. Mr. Casavant, do you have an opinion based on your study of the White City Pennsylvanian Gas Pool as to whether or not the now existing wells will actually drain the 640-acre units now applicable to the unit?

A. No, from preliminary study of the porosity and the sands that we actually perfed, in addition to the depositional history that we've uncovered and cross sectioned, I do not think they will adequately drain 640 acres. I do see a need to break that down.

Q. And do you feel that the drilling of additional wells is the only way which would insure recovery of hydrocarbons that will not be recovered out of the now existing wells?

A. I do, to adequately test it, yes.

Q. Okay. Is it your recommendation, then, that the White City Pennsylvanian Gas Pool rules be amended to provide for 320-acre spacing rather than 640-acre spacing presently applicable to it?

A. I do.

Q. Mr. Casavant, have Exhibits Number Two,

Three, Four, Five, and Six been prepared under your direction and supervision?

A. Yes, they have.

MR. SOLIZ: Mr. Examiner, at this time I would like to submit Exhibits Two through Six into evidence in this case.

MR. NUTTER: Gulf Exhibits Two through Six will be admitted.

MR. SOLIZ: I have no other questions of Mr. Casavant.

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Casavant, your Exhibit Number Four, Exhibit Number Five, and Exhibit Number Six, all seem to relate to the producing formations below the Upper Morrow Clastics. Now Mr. Kalteyer stated that the pool was producing from the Strawn, Atoka, and Morrow, and I think one of your exhibits also -- oh, your -- your log --

A. Yes, sir.

Q. Showed the Strawn and the Atoka also. Now does this broken string of pods and lenses and the discontinuity that you see here in the Morrow formation apply also to the Strawn and to the Atoka?

A. On a material basis of what the material is, no, but porositywise, yes. We don't quite understand yet the carbonate units of the Strawn and the Atoka through the field. Now, there's only, I think we have two Atoka wells that are presently on production and there are three wells that are producing from the Strawn, but the majority of the wells throughout the area, and outside of the pool area, are Morrow prospects, so to speak, or Morrow -- or basically --

Q. Well, are some of these wells perforated in all of these zones or more than one of these zones, or that would be like Strawn and Atoka and Morrow, or Atoka and Morrow, or are they all either Strawn or Atoka or Morrow?

A. No, they're -- there are some presently producing out of several of the formations, in the pool area -- in the pool limit.

Q. Well, do you believe that a well that may not be draining 640 acres in the Morrow might be draining 640 acres in the Strawn or Atoka?

A. No sir, not -- not from my experience with carbonate rock. I do not believe that we have that kind of drainage characteristics to carbonate rocks.

Q. So all of these exhibits apply to Morrow only. You feel that there is this lack of permeability or something in the Strawn and the Atoka that's preventing that

drainage also?

A. Yes, sir, that could be the case. Clastics do have a history anyway of - both from a depositional viewpoint and from an engineering viewpoint of having much greater drainage than the carbonates in this area.

So we weren't too worried with the porosity through these Strawn and Atoka sections.

Q. Now all of the colors on Exhibit Number Five there are down below the top of the Upper Morrow Clastics. As a matter of fact, the Morrow limestone at the top of the cross section, are any of those wells perforated in Strawn and Atoka, do you know?

A. No, I do not know. I'd have to - we may have the data. I could refer that question to the engineer.

Q. But the bulk of your study here has been to the Morrow, hasn't it?

A. Yes, sir. The nature of the Atoka and the nature of the Strawn and, of course, the production standpoint of drilling -- the spacing, or at least the control involved is very widespread through this area, so if we have better control on the Morrow and the erratic nature of the Morrow, is what we're primarily seeking, but also the porosity in the Atoka and Strawn is just as questionable.

Q. I see.

MR. NUTTER: Are there any other questions of Mr. Casavant? He may be excused.

JEFFREY P. ORTWEIN

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

DIRECT EXAMINATION

BY MR. SOLIZ:

Q. Would you please state your name, address, and occupation for the record?

A. Jeffrey P. Ortwein, O-R-T-W-E-I-N, P. O. Box 670, Hobbs, New Mexico.

Q. And could you tell us your occupation?

A. I'm a reservoir engineer for Gulf Oil Corporation.

Q. Could you tell us something about your educational background and your occupational experience?

A. Yes, sir. I graduated from Penn State University with a BS in petroleum engineering in 1979. Previous to that I had worked one summer as an engineer.

I joined Gulf in June '79 and have one year and nine months engineering experience with Gulf in

southeast New Mexico.

Q. You said you had some experience in the summer of '78?

A. Yes, sir.

Q. And who was that with?

A. This was with Quaker State Oil Company in Pennsylvania.

Q. Are you familiar with Gulf's application in this case?

A. Yes, sir I am.

Q. And in the course of your employment have you had occasion to study in detail the White City Pennsylvanian Gas Pool?

A. Yes.

Q. And was this in Hobbs in the Hobbs Area Office?

A. Yes.

MR. SOLIZ: Mr. Examiner, are the witness' credentials acceptable?

MR. NUTTER Yes, they are.

Q. Mr. Ortwein, you have before you what's been marked as Exhibit Number Seven, and I'd like to ask you to identify it.

A. Exhibit Seven is a table of all the

wells in the White City Penn Gas Pool from which I made an engineering study to determine the areal extent that hydrocarbons were being drained in the Pennsylvanian formation from these wells.

Q. What sources of data or information did you review in order to come up with your -- with the information contained on Exhibit Number Seven?

A. The data in Exhibit Seven came from log data, completion data, performance curves, and P/z curves.

Q. What do you mean when you refer to P/Z curves?

A. P/Z is a bottom hole pressure versus time versus cumulative production curve, but the pressure is corrected with -- using the Z factor, compressibility, for straight line extrapolation purposes.

Q. Approximately for what period of time do the data cover that you reviewed for this study?

A. This data covered a period of time from the completion of the discovery well in April, 1960 up to approximately December, 1980.

Q. Okay. Now based upon the data that you've just described and the information appearing in Exhibit Seven, do you have any opinion as to the area being drained on an average by the wells presently producing from the White

City Penn Pool?

A. Yes, the results of my analysis show that the average drainage per well is 257 acres.

Q. Was Exhibit Number Seven prepared under your supervision or direction?

A. Yes.

Q. I'd like you now to refer to Exhibit Number Eight and ask you to identify that exhibit please.

A. Exhibit Eight consists of supportive reservoir parameters. These parameters were used in the volumetric calculation of gas in place for the existing wells.

Q. What sources of information did you review in order to come up with the numbers that appear on this Exhibit Eight?

A. Most of the numbers come from log data but some came from completion and DST information.

Q. And by DST I assume you refer to drill stem tests?

A. Yes.

Q. Would you explain how Exhibit Eight relates to Exhibit Seven?

A. The information in Exhibit Eight was used to calculate a volumetric original gas in place on a per acre basis. This appears in column one of Exhibit Seven.

This volumetric original gas in place per acre then was compared to the original gas in place obtained from actual well performance projected from the P/Z curve.

From this comparison the calculated drainage area per well was obtained.

Q. Was Exhibit Number Eight also prepared under your supervision and your direction?

A. Yes.

Q. I'd like to ask you now to refer to Exhibit Number Nine, which I believe is broken down into three sub-parts, Nine-A, Nine-B, and Nine-C, and ask you to identify them.

A. Exhibit Nine is broken into three parts, A, B, and C. These are bottom hole pressure versus time plots for all the wells in the pool. If you could refer back to Exhibit One it would help me to explain this exhibit, the lease plat.

Okay, part A contains plots for the three -- top three rows of sections in the pool. There are seven rows of sections. Part A contains plots for the wells in Rows 1, 2, and 3, Sections 8 through 22.

Part B contains plots for all the wells in the third, fourth, and fifth rows of the pool, which is

Sections 19 through 35, and Part C contains the plots for the wells in Rows 5, 6, and 7, or Section 32 through Section 12 of the township below.

So in each plot one row of wells is seen in the previous plot.

These pressure-time plots illustrate a lack of continuity between offsetting wellbores. You can see that as new wells were drilled nearly all came in at near virgin reservoir pressure, on the order of 5000 pounds, and looking towards the righthand side of the page you can see that at present there exists wide variations in bottom hole pressures of offset wellbores; a range from about 13 to 2400 psi -- 3400 psi.

Q. Okay, as I understand it, then, it's your testimony that the presently existing producing wells do not adequately drain the 640-acre spacing?

A. That's correct.

Q. Is it your opinion, then, that if additional wells were drilled the hydrocarbons now underlying the 640-acre spacing units will be produced?

A. Yes, that's also correct.

Q. I'd like you now to refer to Exhibit Number Ten and identify that for us.

A. Firstly, Exhibit Ten shows that cumu-

lative gas recovery to date is 62 Bcf.

Secondly, it shows that the ultimate recovery expected for each existing well is around 4 Bcf, and finally, each additional well can expect to recover somewhere around 1.5 Bcf. Those additional would be infill wells drilled on 320-acre spacing.

Q How did you arrive at the average ultimate gas recovery?

A The ultimate recovery for the existing wells was based on an extrapolated pressure cutoff on the P/Z plots.

Q Were Exhibits Number Nine and Ten also prepared under your direction or supervision?

A Yes.

Q Okay. In order to summarize your testimony, I'd like to ask you whether or not you have an opinion based on a study of all the data you've prepared, relating to the White City Pennsylvanian Gas Pool as to whether or not the now existing wells will actually drain the 640-acre units now applicable to the wells?

A My study shows that the existing spacing is inadequate and that additional wells are needed to recover the hydrocarbons under each proration unit.

Q And you feel like the drilling of addi

tional wells is the only way which would insure recovery of hydrocarbons that would not -- that will not be recovered out of the now existing wells?

A. Yes.

Q. And based on the present 640-acre spacing unit, Gulf is prevented from drilling additional wells, is that correct?

A. Would you repeat that, please?

Q. And based on the present 640-acre spacing unit, Gulf would be prevented from drilling some of the additional wells, is that correct?

A. Yes, that's correct.

Q. Is it your recommendation, then, that the White City Pennsylvanian Gas Pool rules be amended to provide for 320-acre spacing rather than 640-acre spacing in accordance with Gulf's application?

A. Yes.

Q. Is it your opinion that the granting of Gulf's application would result in the prevention of waste, the protection of correlative rights, and be in the interest of conservation?

A. Yes.

Q. Do you have anything further to add to any testimony you've already given?

MR. SOLIZ: Mr. Examiner, at this time I'd like to submit Exhibits Seven through Ten into evidence in this case.

MR. NUTTER: Gulf's Exhibits Seven through Ten will be admitted in evidence.

MR. SOLIZ: I have no further questions of this witness.

CROSS EXAMINATION

BY MR. NUTTER:

Q. Now, Mr. Ortwein, in your Exhibit Number Seven you have calculated the original gas in place on a volumetric basis and it's millions of cubic feet per acre.

A. Yes, sir.

Q. Now, you used the data that's on Exhibit Eight to make that volumetric calculation is that correct?

A. That's correct.

Q. And I notice two or three wells here don't have any volumetric figures. Is that because logs were not available or you couldn't make an interpretation of the proper data from those logs or something?

A. Yeah, either we couldn't get the logs or they weren't deep enough to use to adequately get a feel

for the porosity or --

Q. Now, in using those logs and making this volumetric calculation, were some of those wells perforated and completed in the Strawn as well as the Atoka and the Morrow?

And are all three of those formations included in these volumetric reserves?

A. Yes, sir, if you lookat the bottom of Exhibit Seven.

Q. Okay.

A. Gulf has three wells, the White City Penn Gas Com No. 1, No. 2, and No. 3 No. 1, each of these are listed on two separate entries. One completion was a Strawn and the second Atoka in both wells, and also on the pressure time plots the workovers were indicated.

On that No. 1 Well we had perforated the Atoka and Morrow simultaneously but the Atoka came in so good that we set a bridge plug and we aren't producing Morrow right now.

Q. And so you made your volumetric calculation of reserves there.

Then you took your P/Z on your -- against your cumulative production and determined what the cumulative production on these wells is going to be.

A. Yes, sir.

Q. And that's the second column on Exhibit Seven.

A. Yeah that's an extrapolation to P/Z equals zero.

Q. And then you took the - the figure in column A and multiplied that by 640 acres to find out what the calculated reserves would be under the 640-acre tract?

A. Kind of; kind of skipped that step in that we did the volumetric on the per acre basis but if you did multiply column one by the 640, that will be the original gas in place in the whole proration unit, which would give you the same comparison.

Q. And then if you took the P/Z calculation of ultimate gas, you'd find that it's coming from only 268 acres on that first well, rather than the calculated volume under the 640.

A. Yes, sir.

Q. Now, on your Exhibit Ten you show a cumulative gas recovery at 1-1-81 to be 62 billion.

A. Yes, sir.

Q. And there are 23 wells in the pool. Now you also show your average ultimate gas recovery per well to be 4 billion. Now is that based on the 23 wells that are

in the pool?

A. Yes, sir.

Q. So that would give us a total for the pool ultimate recovery of about 92 billion.

A. That's correct.

Q. So we're getting 6/9ths -- we have gotten 6/9ths of the total reserves so far, is that it?

A. Yes, that's correct.

Q. Now, how did you estimate what your additional infill gas recovery per well is going to be?

A. Well, I took the existing wells and went from the calculated drainage area into a drainage radius and plotted this up on worksheet, and then proposed 1980/1980 infill locations, and I tried to draw what I thought -- what I figured these wells would drain and then I planimetered the additional area that the existing well wouldn't drain and using the volumetric and a numerical recovery factor, I backed into an average in additional --

Q. So the additional recovery per well is a volumetric calculation that you planimetered out after drawing a radius of drainage for the existing well?

A. Yes, sir.

Q. And the radius of drainage was based on your 268 acres for that first well on Exhibit Seven, is that

it?

A. Right.

Q. And you think that is about 1-1/2 billion cubic feet per well?

A. Yes, sir.

Q. On an infill program.

A. Yes, sir, that's -- that's the starting point. We may recover more.

Q. Now I presume some of these tracts that have produced pretty good, for example, the one well there that's drained over 1000 acres according to Exhibit Seven, you wouldn't have an infill well in there, would you?

A. Probably not, but we haven't -- well, we need to -- that particular well is in a funny location. It's in the very corner of the proration unit. That's our White City Penn No. 1 in Section 29, so we may possibly in that case have a --

Q. Well, that was the discovery well for the pool.

A. Yes, sir.

Q. So it got a head start, didn't it?

A. Yes.

Q. And it is right in the corner, the extreme corner of the proration unit.

MR. NUTTER: Are there any other questions of this witness? He may be excused.

MR. SOLIZ: Mr. Examiner, we've completed our case now.

MR. NUTTER: Mr. Kalteyer I'll ask you now. On these proposed rules that you've got, you're simply proposing that the spacing units be changed from 640 acres to 320 acres, but you're not proposing that the well location requirements, that 320 acres would be under the statewide rules for Pennsylvanian pools in southeast New Mexico but you're not proposing well locations in accordance with those statewide rules.

MR. KALTEYER: That's correct because the original rules were 1650 from the boundary.

MR. NUTTER: So you would --

MR. KALTEYER: So we left it at that.

MR. NUTTER: You don't want to abolish the pool rules; you want to keep the special pool rules because you've got a special well location requirement.

MR. KALTEYER: Yes, sir that's correct.

MR. NUTTER: I see.

Are there any questions for Mr. Kalteyer on his well locations?

Do you have anything further, Mr.

Soliz?

MR. SOLIZ: No sir.

MR. NUTTER: Does anyone have anything they wish to offer in Case 7208?

We'll take the case under advisement.

(Hearing concluded.)

C E R T I F I C A T E

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

Sally W. Boyd C.S.R.

I do hereby certify that the foregoing is
a c in
the
heard 3/25 7208, 41, Examiner
Oil Conservation Division

SALLY W. BOYD, C.S.R.
Rt. 1 Box 193-B
Santa Fe, New Mexico 87501
Phone (505) 455-7409

EXHIBIT 7

CASE 7208

MARCH 25, 1981

CALCULATED DRAINAGE AREAS

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

WELL	VOLUMETRIC ORIG. GAS IN PLACE MMSCF/ACRE	BHP/Z ORIG. GAS IN PLACE MMSCF	CALCULATED DRAINAGE AREA ACRES	ASSIGNED PRORATION UNIT ACRES
Pennzoil-Allied "21" Federal No. 1	30.2	8107	268	640
C & K-C. K. Federal No. 1 *		667		640
Gulf-Estill "AD" Federal No. 1	20.9	8902	426	640
C & K-Exxon Federal Com. No. 1	15.2	4763	313	640
C & K-Federal "22" Com. No. 1	22.7	9383	413	640
Texaco-J. M. Gates Federal (NCT-1) No. 1	24.8	900	36	640
HNG-Grynberg "11" Federal Com. No. 1	12.2	3345	274	640
Gulf-Marquart Federal No. 1	21.0	1137	54	640
Gulf-Marquart Federal No. 2	19.9	2414	121	640
Mesa-Moore Federal Com. No. 1	8.8	1187	135	640
Texaco-New Mexico "DD" State Com. No. 1 *		1678		640
Mesa-Ogden Com. No. 1	36.3	4653	128	640
C & K-Pennzoil "9" Federal No. 1 *		3823		640
C & K-Pennzoil Federal No. 1 *		1568		640
Mesa-Ringer No. 1	37.6	315	8	640
Mesa-Ringer Federal Com. No. 2	4.4	241	55	640
Mesa-Strong Federal Com. No. 1	26.2	994	38	640
Grace-White Baby Com. No. 1	30.9	6200	201	640
Mesa-White City Federal "10" Com. No. 1	3.8	558	147	640
Texaco-White City Penn Gas Com. No. 1 *		7072		640
Gulf-White City Penn. Gas Com. 1 No. 1 -	14.7	15526	1056	640
Gulf-White City Penn Gas Com. 1 No. 1 -	32.8	10586	323	640
Gulf-White City Penn. Gas Com. 2 No. 2 -	16.7	3878	232	640
Gulf-White City Penn. Gas Com. 2 No. 2 -	17.9	11972	669	640
Gulf-White City Penn. Gas Com. Unit 3 No.1	5.1	1372	269	640
Gulf-White City Penn. Gas Com. Unit 3 No.1	5.7	1349	237	640
AVERAGE			257	

* Insufficient data to complete calculations.

BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
Gulf's EXHIBIT NO. 7
7208

EXHIBIT 8

CASE 7208

MARCH 25, 1981

RESERVOIR PARAMETERS

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

WELL	Ø (%)	h (Ft)	Sw (%)	Gg	Zi	BHT (°F)	Bgi (SCF/RCF)
Pennzoil-Allied "21" Federal No. 1	6	58	22	.581	.976	189	255.5
C & K-C.K. Federal No. 1*				.579	.992	187	269.9
Gulf-Estill "AD" Federal No. 1	14	14	12	.580	.993	180	278.3
C & K-Exxon Federal Com. No. 1	5	32	18	.573	1.003	196	266.2
C & K-Federal "22" Com. No. 1	17	15	13	.580	.947	182	235.2
Texaco-J. M. Gates Federal (NCT-1) No. 1	20	14	22	.578	.987	192	260.3
HNG-Grynberg "11" Federal Com. No. 1	5	31	32	.630	.984	201	266.9
Gulf-Marquart Federal No. 1	8	28	19	.574	.990	187	265.9
Gulf-Marquart Federal No. 2	10	26	34	.568	.989	184	266.3
Mesa-Moore Federal Com. No. 1	5	30	49	.580	.974	180	263.0
Texaco-New Mexico "DD" State Com. No. 1 *				.576	.987	174	278.9
Mesa-Ogden Com. No. 1	7	67	29	.572	.969	185	250.1
C & K-Pennzoil "9" Federal No. 1 *				.575	.986	188	262.2
C & K-Pennzoil Federal No. 1 *				.573	.940	196	203.0
Mesa-Ringer No. 1	8	58	29	.595	.967	182	261.9
Mesa-Ringer Federal Com. No. 2	5	14	19	.627	.895	189	178.1
Mesa-Strong Federal Com. No. 1	10	30	24	.590	.978	186	264.0
Grace-White Baby Com. No. 1	6	53	14	.574	.983	188	259.8
Mesa-White City Federal "10" Com. No. 1	5	32	77	.580	.961	193	236.5
Texaco-White City Penn Gas Com. No. 1 *				.577	.971	174	267.0
Gulf-White City Penn. Gas Com. 1 No. 1	7	24	29	.575	.975	178	283.1
Gulf-White City Penn Gas Com. 1 No. 1	10	30	18	.635	.998	174	306.3
Gulf-White City Penn. Gas Com. 2 No. 2	9	19	24	.577	.985	160	294.9
Gulf-White City Penn. Gas Com. 2 No. 2	7	27	16	.577	.953	168	258.9
Gulf-White City Penn. Gas Com. Unit 3 No1	13	11	17	.579	.915	185	98.1
Gulf-White City Penn. Gas Com. Unit 3 No1	9	12	8	.579	.906	184	131.5

* Insufficient data

BEFORE EXAMINER [illegible]
OIL CONSERVATION DIVISION
Gulf's EXHIBIT NO. 8
CASE NO. 7208

EXHIBIT 10

CASE 7208

MARCH 25, 1981

RECOVERY

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

CUMULATIVE GAS RECOVERY 1-1-81	62.44 MMMCF	
AVERAGE ULTIMATE GAS RECOVERY PER WELL	4.01 MMMCF	based on pressure cut-off on P/Z plots
AVERAGE ADDITIONAL INFILL GAS RECOVERY PER WELL	1.48 MMMCF	

2324/92

BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
Gulf's EXHIBIT NO. 10
CASE NO. 7208

EXHIBIT 7

CASE 7208

MARCH 25, 1981

CALCULATED DRAINAGE AREAS

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

WELL	VOLUMETRIC ORIG. GAS IN PLACE MMSCF/ACRE	BHP/Z ORIG. GAS IN PLACE MMSCF	CALCULATED DRAINAGE AREA ACRES	ASSIGNED PRORATION UNIT ACRES
Pennzoil-Allied "21" Federal No. 1	30.2	8107	268	640
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HNG-Grynberg "11" Federal Com. No. 1	12.2	3345	274	640
Gulf-Marquart Federal No. 1	21.0	1137	54	640
Gulf-Marquart Federal No. 2	19.9	2414	121	640
Mesa-Moore Federal Com. No. 1	8.8	1187	135	640
Texaco-New Mexico "DD" State Com. No. 1 *		1678		640
Mesa-Ogden Com. No. 1	36.3	4653	128	640
C & K-Pennzoil "9" Federal No. 1 *		3823		640
C & K-Pennzoil Federal No. 1 *		1568		640
Mesa-Ringer No. 1	37.6	315	8	640
Mesa-Ringer Federal Com. No. 2	4.4	241	55	640
Mesa-Strong Federal Com. No. 1	26.2	994	38	640
Grace-White Baby Com. No. 1	30.9	6200	201	640
Mesa-White City Federal "10" Com. No. 1	3.8	558	147	640
Texaco-White City Penn Gas Com. No. 1 *		7072		640
Gulf-White City Penn. Gas Com. 1 No. 1	14.7	15526	1056	640
Gulf-White City Penn Gas Com. 1 No. 1	32.8	10586	323	640
Gulf-White City Penn. Gas Com. 2 No. 2	16.7	3878	232	640
Gulf-White City Penn. Gas Com. 2 No. 2	17.9	11972	669	640
Gulf-White City Penn. Gas Com. Unit 3 No.1	5.1	1372	269	640
Gulf-White City Penn. Gas Com. Unit 3 No.1	5.7	1349	237	640
AVERAGE			257	

* Insufficient data to complete calculations.

BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
GULF EXHIBIT NO. 7
CASE NO. 7208

EXHIBIT 8

CASE 7208

MARCH 25, 1981

RESERVOIR PARAMETERS

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

WELL	Ø (%)	h (Ft)	Sw (%)	Gg	Zi	BHT (°F)	Bgi (SCF/RCF)
Pennzoil-Allied "21" Federal No. 1	6	58	22	.581	.976	189	255.5
C & K-C.K. Federal No. 1*				.579	.992	187	269.9
Gulf-Estill "AD" Federal No. 1	14	14	12	.580	.993	180	278.3
C & K-Exxon Federal Com. No. 1	5	32	18	.573	1.003	196	266.2
C & K-Federal "22" Com. No. 1	17	15	13	.580	.947	182	235.2
Texaco-J. M. Gates Federal (NCT-1) No. 1	20	14	22	.578	.987	192	260.3
HNG-Grynberg "11" Federal Com. No. 1	5	31	32	.630	.984	201	266.9
Gulf-Marquart Federal No. 1	8	28	19	.574	.990	187	265.9
Gulf-Marquart Federal No. 2	10	26	34	.568	.989	184	266.3
Mesa-Moore Federal Com. No. 1	5	30	49	.580	.974	180	263.0
Texaco-New Mexico "DD" State Com. No. 1 *				.576	.987	174	278.9
Mesa-Ogden Com. No. 1	7	67	29	.572	.969	185	250.1
C & K-Pennzoil "9" Federal No. 1 *				.575	.986	188	262.2
C & K-Pennzoil Federal No. 1 *				.573	.940	196	203.0
Mesa-Ringer No. 1	8	58	29	.595	.967	182	261.9
Mesa-Ringer Federal Com. No. 2	5	14	19	.627	.895	189	178.1
Mesa-Strong Federal Com. No. 1	10	30	24	.590	.978	186	264.0
Grace-White Baby Com. No. 1	6	53	14	.574	.983	188	259.8
Mesa-White City Federal "10" Com. No. 1	5	32	77	.580	.961	193	236.5
Texaco-White City Penn Gas Com. No. 1 *				.577	.971	174	267.0
Gulf-White City Penn. Gas Com. 1 No. 1	7	24	29	.575	.975	178	283.1
Gulf-White City Penn Gas Com. 1 No. 1	10	30	18	.635	.998	174	306.3
Gulf-White City Penn. Gas Com. 2 No. 2	9	19	24	.577	.985	160	294.9
Gulf-White City Penn. Gas Com. 2 No. 2	7	27	16	.577	.953	168	258.9
Gulf-White City Penn. Gas Com. Unit 3 No1	13	11	17	.579	.915	185	98.1
Gulf-White City Penn. Gas Com. Unit 3 No1	9	12	8	.579	.906	184	131.5

ufficient data

EXAMINER HUTTER
OIL CONSERVATION DIVISION
Gulf EXHIBIT NO. 8
CASE NO. 7208

EXHIBIT 10

CASE 7208

MARCH 25, 1981

RECOVERY

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

CUMULATIVE GAS RECOVERY 1-1-81	62.44 MMMCF
AVERAGE ULTIMATE GAS RECOVERY PER WELL	4.01 MMMCF
AVERAGE ADDITIONAL INFILL GAS RECOVERY PER WELL	1.48 MMMCF

BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
Gulf EXHIBIT NO. 10
CASE NO. 7208

EXHIBIT 7

CASE 7208

MARCH 25, 1981

CALCULATED DRAINAGE AREAS

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

WELL	VOLUMETRIC ORIG. GAS IN PLACE MMSCF/ACRE	BHP/Z ORIG. GAS IN PLACE MMSCF	CALCULATED DRAINAGE AREA ACRES	ASSIGNED PRORATION UNIT ACRES
Pennzoil-Allied "21" Federal No. 1	30.2	8107	268	640
C & K-C. K. Federal No. 1 *		667		640
Gulf-Estill "AD" Federal No. 1	20.9	8902	426	640
C & K-Exxon Federal Com. No. 1	15.2	4763	313	640
C & K-Federal "22" Com. No. 1	22.7	9383	413	640
Texaco-J. M. Gates Federal (NCT-1) No. 1	24.8	900	36	640
HNG-Grynberg "11" Federal Com. No. 1	12.2	3345	274	640
Gulf-Marquart Federal No. 1	21.0	1137	54	640
Gulf-Marquart Federal No. 2	19.9	2414	121	640
Mesa-Moore Federal Com. No. 1	8.8	1187	135	640
Texaco-New Mexico "DD" State Com. No. 1 *		1678		640
Mesa-Ogden Com. No. 1	36.3	4653	128	640
C & K-Pennzoil "9" Federal No. 1 *		3823		640
C & K-Pennzoil Federal No. 1 *		1568		640
Mesa-Ringer No. 1	37.6	315	8	640
Mesa-Ringer Federal Com. No. 2	4.4	241	55	640
Mesa-Strong Federal Com. No. 1	26.2	994	38	640
Grace-White Baby Com. No. 1	30.9	6200	201	640
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Texaco-White City Penn Gas Com. No. 1 *		7072		640
Gulf-White City Penn. Gas Com. 1 No. 1	14.7	15526	1056	640
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Gulf-White City Penn. Gas Com. 2 No. 2	17.9	11972	669	640
Gulf-White City Penn. Gas Com. Unit 3 No.1	5.1	1372	269	640
Gulf-White City Penn. Gas Com. Unit 3 No.1	5.7	1349	237	640
AVERAGE			257	

* Insufficient data to complete calculations.

BEFORE EXAMINER UTTER
OIL CONSERVATION DIVISION
Gulf's EXHIBIT NO. 7
CASE NO. 7208

EXHIBIT 8

CASE 7208

MARCH 25, 1981

RESERVOIR PARAMETERS

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

WELL	Ø (%)	h (Ft)	Sw (%)	Gg	Zi	BHT (°F)	Bgi (SCF/RCF)
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C & K-C.K. Federal No. 1*				.579	.992	187	269.9
Gulf-Estill "AD" Federal No. 1	14	14	12	.580	.993	180	278.3
C & K-Exxon Federal Com. No. 1	5	32	18	.573	1.003	196	266.2
C & K-Federal "22" Com. No. 1	17	15	13	.580	.947	182	235.2
Texaco-J. M. Gates Federal (NCT-1) No. 1	20	14	22	.578	.987	192	260.3
HNG-Grynberg "11" Federal Com. No. 1	5	31	32	.630	.984	201	266.9
Gulf-Marquart Federal No. 1	8	28	19	.574	.990	187	265.9
Gulf-Marquart Federal No. 2	10	26	34	.568	.989	184	266.3
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Texaco-New Mexico "DD" State Com. No. 1 *				.576	.987	174	278.9
Mesa-Ogden Com. No. 1	7	67	29	.572	.969	185	250.1
C & K-Pennzoil "9" Federal No. 1 *				.575	.986	188	262.2
C & K-Pennzoil Federal No. 1 *				.573	.940	196	203.0
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Mesa-Ringer Federal Com. No. 2	5	14	19	.627	.895	189	178.1
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Grace-White Baby Com. No. 1	6	53	14	.574	.983	188	259.8
Mesa-White City Federal "10" Com. No. 1	5	32	77	.580	.961	193	236.5
Texaco-White City Penn Gas Com. No. 1 *				.577	.971	174	267.0
Gulf-White City Penn. Gas Com. 1 No. 1	7	24	29	.575	.975	178	283.1
Gulf-White City Penn Gas Com. 1 No. 1	10	30	18	.635	.998	174	306.3
Gulf-White City Penn. Gas Com. 2 No. 2	9	19	24	.577	.985	160	294.9
Gulf-White City Penn. Gas Com. 2 No. 2	7	27	16	.577	.953	168	258.9
Gulf-White City Penn. Gas Com. Unit 3 No1	13	11	17	.579	.915	185	98.1
Gulf-White City Penn. Gas Com. Unit 3 No1	9	12	8	.579	.906	184	131.5

* Insufficient data

BEFORE EXAMINER UTTER
OIL CONSERVATION DIVISION
Gulf's EXHIBIT NO. 8
CASE NO. 7208

EXHIBIT 10

CASE 7208

MARCH 25, 1981

RECOVERY

WHITE CITY PENNSYLVANIAN GAS POOL

EDDY COUNTY, NEW MEXICO

GULF OIL CORPORATION
SOUTHWEST DISTRICT
MIDLAND, TEXAS

CUMULATIVE GAS RECOVERY 1-1-81	62.44 MMMCF
AVERAGE ULTIMATE GAS RECOVERY PER WELL	4.01 MMMCF
AVERAGE ADDITIONAL INFILL GAS RECOVERY PER WELL	1.48 MMMCF

7208 - 10

BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
Gulf's EXHIBIT NO. 10
CASE NO. 7208

RECEIVED
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OIL CONSERVATION DIVISION
SANTA FE

The Gulf Companies

LAW DEPARTMENT

William V. Kastler
ATTORNEY

P. O. Box 3725
Houston, Texas 77001

March 17, 1981

Mr. Joe D. Ramey
Director,
New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Case No. 7208, Docket 11-81
Examiner Hearing on Wednesday, March 25, 1981

Dear Mr. Ramey:

Due to the fact that I will be on vacation, I would greatly appreciate your allowing Mr. Joseph G. Soliz, another Gulf Oil Corporation Attorney in Houston, to appear in my place as a representative of Gulf in the above listed case. Mr. Soliz is a member of the Bar of Texas and he has previously appeared on behalf of Gulf under my sponsorship.

Sincerely yours,

Bill Kastler

William V. Kastler

WVK/lsj

cc: Ernest Padilla
General Council
New Mexico Oil
Conservation Division

Joseph G. Soliz

OK

RECEIVED
MAR 13 1981
OIL CONSERVATION DIVISION
SANTA FE

Gulf Oil Exploration and Production Company

March 6, 1981

J. M. Thacker
GENERAL MANAGER PRODUCTION
SOUTHWEST DISTRICT

P. O. Drawer 1150
Midland, TX. 79702

Case 7208

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. Joe D. Ramey

Re: Examiners Hearing
White City-Pennsylvanian Gas Pool
Eddy County, New Mexico

Gentlemen:

This letter will confirm our request to schedule a hearing on your March 25, 1981 Examiners Docket to consider Gulf Oil Corporations request to amend the rules now governing the White City-Pennsylvanian Gas Pool. Our study of this pool indicates that the current wells are not efficiently and effectively draining the reserves under the 640 acre proration unit development pattern.

Gulf will propose that the pool be placed under a rule providing for 320 acre proration units. A spacing rule as proposed will provide that each well shall be located not closer than 660 feet to the nearest side boundary of the dedicated tract nor closer than 1650 feet to the nearest end boundry nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary.

Yours very truly,

R. H. Peacock
Technical Manager

CFK/pm

cc New Mexico Oil Conservation Division
P. O. Box 1980
Hobbs, New Mexico 88240

Gulf

A DIVISION OF GULF OIL CORPORATION

CASE 7200: Application of Estoril Producing Corporation for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion of its Belco Fed. Well No. 1 located in Unit O of Section 15, Township 23 South, Range 34 East, to produce gas and gas liquids from the Strawn and Morrow formations, Antelope Ridge Field, thru parallel strings of tubing.

CASE 7201: Application of Layton Enterprises, Inc. for a unit agreement, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Todd Lower San Andres Unit Area, comprising 3256 acres, more or less, of Federal and State lands in Township 7 South, Ranges 35 and 36 East.

CASE 7202: Application of Layton Enterprises, Inc. for a waterflood project, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the San Andres formation thru 4 injection wells located in Sections 30, 31 and 32 of its Todd Lower San Andres Unit in Township 7 South, Range 36 East.

CASE 7203: Application of Southern Union Exploration Co. of Texas for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Susco Bough "C" Unit Area, comprising 2560 acres, more or less, of State lands in Township 10 South, Range 33 East.

CASE 7204: Application of Bass Enterprises Production Company for salt water disposal, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Delaware formation in the interval from 3820 feet to 3915 feet in its Federal Legg Well No. 1 in Unit B of Section 27, Township 22 South, Range 30 East, Quahada Ridge Field.

CASE 7205: Application of Supron Energy Corporation for a non-standard gas proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 160-acre non-standard Blanco Mesaverde gas proration unit comprising the NE/4 of Section 35, Township 31 North, Range 12 West, to be dedicated to a well to be drilled at a standard location thereon.

CASE 7183: (Continued from March 11, 1981, Examiner Hearing)

Application of Flag-Redfern Oil Company for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its Osudo St. Com Well No. 2 at an unorthodox location 990 feet from the North and East lines of Section 18, Township 20 South, Range 36 East, North Osudo-Morrow Gas Pool.

CASE 7206: Application of Mobil Producing Inc. for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Devonian formation through perforations from 12,212 feet to 12,218 feet and the open hole interval from 12,240 feet to 12,555 feet in its Santa Fe Pacific Well No. 3 in Unit M of Section 26, Township 9 South, Range 36 East, Crossroads Field.

CASE 7207: Application of Mobil Producing Inc. for lease commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the commingling of Vacuum Grayburg-San Andres production from the State J and State II leases in Section 22, Township 17 South, Range 34 East.

CASE 7208: Application of Gulf Oil Corporation for the amendment of pool rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of the White City-Pennsylvanian Gas Pool Rules to provide for 320-acre spacing rather than 640 acres with well locations specified as being at least 1650 feet from the end boundary and 660 feet from the side boundary of the proration unit.

CASE 7129: (Continued from February 25, 1981, Examiner Hearing)

Application of Koch Exploration Company for compulsory pooling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Dakota formation underlying the N/2 of Section 28, Township 28 North, Range 8 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 7169: (Continued from February 25, 1981, Examiner Hearing)

Application of Koch Exploration Company for compulsory pooling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Dakota formation underlying the S/2 of Section 22, Township 28 North, Range 8 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.

Called in by Chuck Kalleyer 3/5/81

Application of Gulf Oil Corporation
for the amendment of pool rules
Eddy County, New Mexico.

Applicant, in the above-styled cause, seeks the amendment of the White City-Pennsylvanian Gas Pool Rules to ~~change the spacing for from 320 in said pool from 640 acre units to 320-acre units~~ provide for 320-acre spacing rather than 640 acre with well locations specified as being at least 1650 feet from the end boundary and 660 feet from the side boundary of the proration unit.

ROUGH

dr/

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. 7208

Order No. R-2429-C

APPLICATION OF GULF OIL CORPORATION
FOR THE AMENDMENT OF POOL RULES,
EDDY COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on March 25, 19 81, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this _____ day of April, 19 81, 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 by Order No. R-2429-A, entered March 27, 1963, in Case No. 2737, the Division promulgated special pool rules for the White City-Pennsylvanian Gas Pool in Eddy County, New Mexico, including a provision for 640-acre well spacing and proration units and specified well locations.

(3) That by Order No. R-2429-B, entered April 13, 1964, the Division continued said special pool rules in full force and effect until further order of the Division.

(4) That the applicant in the instant case, Gulf Oil Corporation, seeks the amendment of the special pool rules for the spacing and location of wells in the White City Pennsylvanian Gas Pool, and seeks to have said pool governed by the provisions of Rule 104 C II(a) of the Division Rules and Regulations for gas pools of Pennsylvanian age, with respect to acreage dedication, but with certain specified locations for wells in said pool.

(5) That the evidence in this case indicates that the wells in the White City-Pennsylvanian Gas Pool are not draining 640 acres as it had been thought that they would, but that in fact the average well in the pool is draining only 257 acres.

(6) That although the ~~Atoka, Strawn~~ Strawn, Atoka, and Morrow zones of the Pennsylvanian all produce gas in the subject pool, production from the pool is mostly from the many separate pay stringers in the Morrow zone which vary greatly in areal extent and in permeability, porosity, and thickness, both within individual stringers and between stringers.

(7) That due to the variation in the areal extent and in permeability, porosity, and thickness of the stringers, there is considerable variation in the amount of original gas in place tapped by the various wells completed in the subject pool, and also in the percent of such original gas in place under each well which may be expected to be recovered by the well.

(8) That due to the variation in the areal extent and in permeability, porosity, and thickness of the stringers in the Pennsylvanian formation in the subject pool, the existing wells (drilled on 640-acre spacing and proration units) are not believed to have encountered many of the smaller stringers in the reservoir, nor are they expected in all cases to effectively and effeciently drain the stringers which they have tapped.

(9) That to reduce the size of the spacing and proration units in the subject pool from 640 acres to 320 acres would result in numerous additional wells being drilled in the pool, and would greatly enhance the chances of tapping all of the productive stringers in the reservoir, and could also improve the drainage of gas from stringers previously tapped by existing wells.

(10) That the wells presently completed in the White City Pennsylvanian Gas Pool are not effectively and efficiently draining the 640-acre spacing and proration units assigned to them, but if 320-acre spacing and proration units are adopted for said pool, the wells in the pool should more effectively and efficiently drain the spacing and proration units assigned to them.

(11) That according to the evidence submitted in this case, approximately 1.48 billion cubic feet of additional gas may be expected to be recovered by each additional well drilled as the result of amending the existing pool rules and developing the White City-Pennsylvanian Gas Pool on 320-acre well spacing and proration units.

(12) That the amendment of the Special Pool Rules for the White City-Pennsylvanian Gas Pool as promulgated by Division Orders Nos. R-2429-A and R-2429-B is in the public interest and will not cause but will prevent waste, and will not impair but will protect correlative rights.

(13) That the vertical limits of the White City-Pennsylvanian Gas Pool comprise the Pennsylvanian formation and the horizontal limits comprise the following described lands in Eddy County, New Mexico:

TOWNSHIP 24 SOUTH, RANGE 26 EAST, NMPM
Sections 8 and 9: All
Sections 14 through 17: All
Sections 19 through 22: All
Sections 28 through 30: All
Sections 32 through 35: All

TOWNSHIP 25 SOUTH, RANGE 26 EAST, NMPM
Sections 1 through 4: All
Sections 10 through 12: All

(14) That Rule 2 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool should be amended to read in its entirety as follows:

"RULE 2. Each well completed or recompleted in the White City-Pennsylvanian Gas Pool shall be located on a standard unit containing 320 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a single governmental section."

(15) That Rule 4 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool should be amended to read in its entirety as follows:

"RULE 4. Each well shall be located not closer than 660 feet to the nearest side boundary of the dedicated tract nor closer than 1650 feet to the nearest end boundary nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary."

(16) That the effective date of this order and the provisions hereof should be April 1, 1981.

IT IS THEREFORE ORDERED:

(1) That Rule 2 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool in Eddy County, New Mexico, as promulgated by Division Orders Nos. R-2429-A and R-2429-B, is hereby amended to read in its entirety as follows:

"RULE 2. Each well completed or recompleted in the White City-Pennsylvanian Gas Pool shall be located on a standard unit containing 320 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a single governmental section."

(2) That Rule 4 of said Special Rules and Regulations is hereby amended to read in its entirety as follows:

"RULE 4. Each well shall be located not closer than 660 feet to the nearest side boundary of the dedicated tract nor closer than 1650 feet to the nearest end boundary nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary."

(3) That the locations of all wells drilled and completed in the White City-Pennsylvanian Gas Pool are hereby approved.

(4) That the operator of each well in the White City-Pennsylvanian Gas Pool shall have until May 1, 1981, to file with the Artesia District Office of the Division new Forms C-102, Well Location and Acreage Dedication Plat, for each of his wells, showing thereon the location of the well and the acreage dedicated thereto pursuant to this order. Failure to so file such plats will subject the well to cancellation of allowable.

(5) That this order shall become effective at 7:00 o'clock a.m. on April 1, 1981, and shall apply to the White City-Pennsylvanian Gas Pool as described in Finding No. 13 above and as it may be subsequently extended by the Division, and to the Pennsylvanian formation within one mile of said pool.

(6) 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.

DRAFT

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

CASE NO. 7208

Order No. R- 2429-C-1

APPLICATION OF GULF OIL CORPORATION FOR THE AMENDMENT OF POOL RULES, EDDY COUNTY, NEW MEXICO.

NUNC PRO TUNC ORDER

BY THE DIVISION:

It appearing to the Division that Order No. R- 2429-C, dated April 7, 19 81, does not correctly state the intended order of the Division,

IT IS THEREFORE ORDERED:

(1) That Finding No. (13) on page 3 of Order No. R-2429-C is hereby amended to read in its entirety as follows:

"(13) That the vertical limits of the White City-Pennsylvanian Gas Pool comprise the Pennsylvanian formation and the horizontal limits comprise the following described lands in Eddy County, New Mexico:

TOWNSHIP 24 SOUTH, RANGE 26 EAST, NMPM
Sections 8 and 9: All
Sections 15 through 17: All
Sections 19 through 22: All
Sections 28 through 30: All
Sections 32 through 35: All

TOWNSHIP 25 SOUTH, RANGE 26 EAST, NMPM
Sections 1 through 4: All
Sections 10 through 12: All"

(2) That this order shall be effective nunc pro tunc as of April 7, 1981.

DONE at Santa Fe, New Mexico, on this _____ day of April, 1981.

(12) That the amendment of the Special Pool Rules for the White City-Pennsylvanian Gas Pool as promulgated by Division Orders Nos. R-2429-A and R-2429-B is in the public interest and will not cause but will prevent waste, and will not impair but will protect correlative rights.

(13) That the vertical limits of the White City-Pennsylvanian Gas Pool comprise the Pennsylvanian formation and the horizontal limits comprise the following described lands in Eddy County, New Mexico:

TOWNSHIP 24 SOUTH, RANGE 26 EAST, NMPM
Sections 8 and 9: All
Sections 14 through 17: All
Sections 19 through 22: All
Sections 28 through 30: All
Sections 32 through 35: All

TOWNSHIP 25 SOUTH, RANGE 26 EAST, NMPM
Sections 1 through 4: All
Sections 10 through 12: All

(14) That Rule 2 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool should be amended to read in its entirety as follows:

"RULE 2. Each well completed or recompleted in the White City-Pennsylvanian Gas Pool shall be located on a standard unit containing 320 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a single governmental section."

(15) That Rule 4 of the Special Rules and Regulations for the White City-Pennsylvanian Gas Pool should be amended to read in its entirety as follows:

"RULE 4. Each well shall be located not closer than 660 feet to the nearest side boundary of the dedicated tract nor closer than 1650 feet to the nearest end boundary nor closer than 330 feet to any quarter-quarter section or subdivision inner boundary."

(16) That the effective date of this order and the provisions hereof should be April 1, 1981.

RECEIVED
APR 20 1981
OIL CONSERVATION DIVISION

END OF ROLL

#178

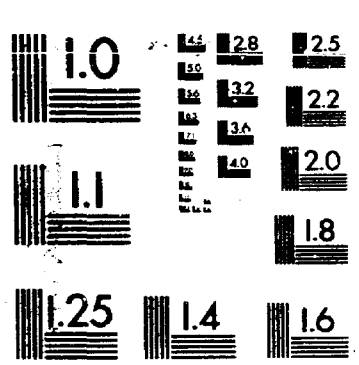
ROLL NUMBER

DOCUMENT TYPE NM OIL CONSERVATION DIVISION

DATE OF FILMING OCTOBER 11th 1985

CAMERA OPERATOR PHIL A. WILDE

ENDING DOCUMENT Box 18 of 25 / CASE # 7208 - GULF OIL CORP.
EDDY COUNTY, NM (APRIL 7th 1981)



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
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STATEMENT OF DOCUMENT CERTIFICATION

All microphotgraphics images of documents following this certificate are of authorized documents in the possession of this Agency. These documents are routinely microfilmed as a necessary operation in the generation of an inviolate document file.

R. David Ortez
SUPERVISOR

STATE OF NEW MEXICO)
) SS.
COUNTY OF VALENCIA)

Sworn and Subscribed to me, A Notary Public,

This 1st day of November, 1993

Lydia Aragon
NOTARY PUBLIC

MY COMMISSION EXPIRES: 10-2-96

- -

CERTIFICATE OF AUTHENICITY

THIS IS TO CERTIFY that the microphotographs appearing on this Roll of Film are accurate and complete reproductions of the records of the, N.M. OIL CONSERVATION DIVISION as delivered in the regular course of business for Micro Filming.

Philip A. Wille
CAMERA OPERATOR

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SUPERVISOR

STATE OF NEW MEXICO)
) SS.
COUNTY OF VALENCIA)

Sworn and Subscribed to me, A Notary Public,

This 1st day of December, 1993

Agnes Aragon
NOTARY PUBLIC

MY COMMISSION EXPIRES: 10-2-96

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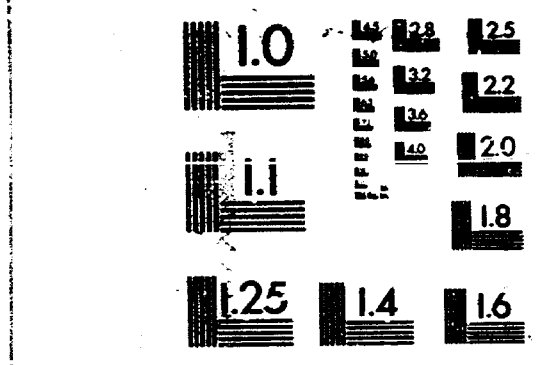
Philip A. Wilde
CAMERA OPERATOR



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

START OF ROLL

#178 B

ROLL NUMBER

DOCUMENT TYPE: N M OIL CONSERVATION DIVISION

DATE OF FILMING: OCTOBER 14th 1985

CAMERA OPERATOR: PHIL A. WILDE

BEGINNING DOCUMENT: Box 18 of 25 / CASE# 7209 - KOCH INDUSTRIES SAN JUAN COUNTY (OCTOBER 1ST 1981)